DRAFT
ENVIRONMENTAL ASSESSMENT
FOR
MODIFICATION OF POLICY AT LAKE SIDNEY LANIER RELATIVE TO SEAPLANE OPERATIONS IN DAWSON, FORSYTH, GWINNETT AND HALL COUNTIES, GEORGIA

PREPARED BY:
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AND
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US Army Corps
of Engineers
Mobile District

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1.0 INTRODUCTION:

General:

The National Environmental Policy Act (NEPA) requires Federal agencies to supplement environmental assessments (EA) and environmental impact statements (EIS) in response to new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts (40 CFR 1509(c)(1)(ii)). The purpose of this EA is to evaluate the impacts associated with a proposed change of policy allowing seaplane operations on the Lake Sidney Lanier Georgia project operated by the U.S. Army Corps of Engineers (Corps).

Location:

Lake Sidney Lanier is a reservoir approximately 40 miles Northeast of Atlanta, Georgia. Implementation of the Buford Dam Multiple Purpose Project created Lake Sidney Lanier (Lake Lanier) in 1957. Lake Sidney Lanier is located in the Gainesville Ridges Section of the Piedmont Physiographic Province south of the Blue Ridge Mountains and is the uppermost Corps project on the Chattahoochee River. The main arm of the lake extends 44 miles up the Chattahoochee River from the Buford Dam. A secondary arm extends approximately 19 miles up the Chestatee River. The lake is surrounded by five Georgia counties: Hall, Lumpkin, Dawson, Forsyth, and Gwinnett. The cities of Cumming and Buford are located on the southern end of the lake and the City of Flowery Branch is located on the east side. The City of Gainesville is located on the East side of the Chattahoochee River upstream of the confluence of the Chestatee River. Please see location maps in Appendix A and Appendix B.

Proposed Action:

Currently, the Lake is operating under the overall plan described in the 1987 Updating of the Master Plan for Lake Sidney Lanier (USACE 1987) (1987 Master Plan) (see Section 2 below) and currently does not allow seaplane operations. The proposed action is to change the present policy to allow seaplanes to use the navigable waters of the lake for seaplane operations as outlined in Title 36 CFR PART 328---REGULATION OF SEAPLANE OPERATIONS AT CIVIL WORKS WATER RESOURCE DEVELOPMENT PROJECTS ADMINISTRATED BY THE CHIEF OF ENGINEERS.

Any changes in policy would require review of such changes by the Corps and if the change deviates substantially from the impacts described in the EA, appropriate review and documentation as required by the National Environmental Policy Act (NEPA) will be performed.

Purpose and Need for the Proposed Action:

This EA is for the purpose of changing the policy to open the lake to Seaplane takeoffs and landing operations. Seaplane pilots want to land their aircraft on the lake to access the amenities the lake has to offer such as restaurants, campgrounds, maintenance, and fuel purchases. Acquiring access to those destinations requires permission to land and takeoff on the lake as close to their intended destinations as possible to limit taxi operations so as to not interfere with the lake proper for the boating public. Operations other than arrivals and departures would be limited to taxi operations to intended destinations on the lake.

The USACE needs to rewrite the present policy on seaplane operations to more closely conform to the other lakes in the Mobile district to ensure equal access to recreational amenities and commercial opportunities on the public waters of the Lake Lanier project.

Until such time the lake is opened there are no plans for studies to determine if commercial operations are feasible. When seaplanes are allowed to use the lake, the shore side business's will determine if catering to the seaplane clients will warrant further investments for commercial ventures.

The lake needs to be opened as another place for general aviation pilots to land. The country is losing airports to developers. The lake can serve as a permanent landing area. This provides another opportunity for training pilots for the commercial aviation industry. The uniqueness of seaplane flying may be just the incentive needed to introduce new men and women to the world of aviation.

Public-use seaplane bases (SPBs) throughout the United States are facing constant challenges and threats to their continuing operations from a number of different sources, yet seaplane operations continue to provide valuable services and serve a multitude of purposes, including promotion of local economies. (Appendix J, Practices in Preserving & Developing Public Seaplane Bases)

To some extent, opening the lake to seaplane operations would provide the opportunity for new services to support new aviation related activities. New pilots could begin their training to replace those retiring from commercial carriers which is a growing concern because of the disappearance of smaller airports being forced out by development.

In order to land on the Lake, the present policy that restricts the operation of seaplanes on the Lake Sidney Lanier project waters needs to be rewritten. It should be noted that Lake Allatoona is currently open to seaplane operations. Lake Allatoona is considerably smaller than Lake Sidney Lanier as is shown in the scale map depictions of Lake Allatoona and Lake Sidney Lanier (Appendix B).

The 1987 Master Plan, published by the Corps, Mobile District, is the most recent comprehensive planning document for the entire Buford Project. The 1987 Master Plan, developed with public input, evaluates existing recreation facilities, identifies recreational needs and provides development and management plans to fulfill those needs. The 1987 Master Plan was developed with the goals of enhancement of opportunities for quality recreational experiences, wise management of natural resources, and management of project facilities in an effective and cost efficient manner. In the years since the Master Plan was published, demand for recreational facilities in the area has increased with rapidly increasing regional population growth.

Authority:

Section 4 of the Flood Control Act of 1944 authorized the Chief of Engineers "... to construct, maintain, and operate public parks and recreational facilities in reservoir areas under the control of the Secretary of the Army, and to permit the construction, maintenance, and operation of such facilities." Additional authorizations for development of public recreation facilities at power, flood control, and navigation projects are included in Section 209 of the Flood Control act of 1954, Section 207 of the Flood Control act of 1962, and by the Land and Water Conservation Fund Act of 1965, as amended. The 1954 Act added the authority to grant leases as well as licenses to Federal, State or Local governmental agencies, where appropriate, to facilitate the construction of substantial improvements. For compliance with NEPA, the Final Environmental Statement, Buford Dam and Lake Sidney Lanier, Georgia (Flood Control, Navigation and Power) was prepared in December 1974 by the Corps, Mobile District (*USACE 1974*) (1974 EIS). An Environmental Impact Statement entitled Final Environmental Impact Statement for the Operation and Maintenance of Lake Sidney Lanier, Georgia was prepared in November 2003 by the Corps, Mobile District (*USACE 2003*) (2003 EIS). The purpose of the 2003 EIS was to document the ongoing operation and maintenance activities necessary for flood control, hydropower generation, recreation, natural resources management, shoreline management, and the modification of specific operation and maintenance programs necessary to manage the project on a sustainable basis.

Title 36 CFR, Part 328, Regulation of Seaplane Operations at Civil Works Water Resource Development Projects, Administered by the District Commander (42 FR 220.15 May 2000) This regulation is for the purpose of defining the rules which in conjunction with Title 36, Chapter III, Section 328 govern the operation of seaplanes upon the waters of each lake, individually, within the Mobile District.

This regulation provided the Corps no special governing authority beyond the citation authority already vested in the Operations Project Managers and their staffs. All appropriate State and Federal aviation laws apply to aircraft operations upon or over project lands and waters. For the purpose of this regulation, a seaplane is defined as an aircraft properly registered with the Federal Aviation Administration and equipped to takeoff from and land on the water.

2.0 ENVIRONMENTAL SETTING WITHOUT THE PROJECT:

General Environmental Setting:

The general environmental setting of Lake Sidney Lanier, surrounding lands, and the watershed, has been extensively documented in the 1974 EIS and the 2003 EIS. The lake and the park lands surrounding it have previously been surveyed for ecological and socioeconomic resources as discussed below. In addition, all but a few tracts on the north side of the lake have been surveyed for historic and archaeological resources several years ago.

Lake Sidney Lanier is one of a series of reservoirs within the Apalachicola-Chattahoochee-Flint River (ACF) Basin. Therefore, actions in the upstream portions of the ACF can affect conditions downstream, and the system must be considered as an integrated whole. The ACF Basin, which drains areas of northern and western Georgia, southeastern Alabama and northwest Florida, extends approximately 385 miles from the Blue Ridge Mountains to the Gulf of Mexico at Apalachicola Bay. The basin is comprised of 14,500 square miles in Georgia, 2,800 square miles in Alabama and 2,300 square miles in Florida. The major stream regulation in the basin by the Corps' projects is provided by Lake Sidney Lanier, which has 65% of the total conservation storage capacity available in the basin.

Lake Sidney Lanier is a unique reservoir compared to others operated by the Corps in the Mobile District. It is the most utilized recreation project in the Mobile District; therefore major boat and shoreline overcrowding has resulted. This use combined with extensive residential development around the lake has resulted in shoreline erosion and water quality problems. Other factors influencing shoreline erosion include generally steep slopes and erosive soils. The issues of shoreline development and shoreline erosion are addressed by the Corp's Lake Lanier Project Management Office through the implementation of the *Lakeshore Management Plan*, included as Appendix F to the 2003 EIS. That plan requires limits on construction of new docks and the maintenance of vegetative buffers. Those buffers also provide valuable habitat for wildlife present at Lake Sidney Lanier.

Significant Resource Description

Water Quality.

Water quality of Lake Sidney Lanier has been considered in previous environmental studies including the 1974 EIS and 2003 EIS. The overall water quality of Lake Sidney Lanier is good, but there are indications that without nonpoint source controls the anthropogenic nutrient sources could cause an increase in eutrophication. The main body of the lake has the greatest transparency and the lowest fecal coliform counts and nutrient concentrations. Those areas in the Chattahoochee River and Chestatee River arm that are shallower have the highest levels of turbidity, total suspended solids, chlorophyll *a,* and nutrient concentrations.

Water quality in the lake is potentially affected in numerous ways. Boating activities and operations are one such source; illegal discharges from marine toilets can increase the fecal coliform counts in the lake, and sediment can be re-suspended through boat operations and wakes, although re-suspension is generally a localized condition. Also, refueling and boat operations can introduce hydrocarbons to the water and the introduction of metals and other toxic materials can occur through boat maintenance activities. The Official Code of Georgia Annotated, Section 125-29(c), prohibits discharging the contents of marine toilet holding tanks into Lake Sidney Lanier. The primary loading constituents associated with the land uses in the Lake Sidney Lanier watershed are sediment, total nitrogen, and total phosphorus. Most nutrient loading enters Lake Sidney Lanier from non-Federally owned lands upstream of the lake.

It may be noted that septic systems, point sources, and groundwater are significant contributors to the overall loading of nitrogen and phosphorus; however, the largest source of nutrient loading comes from storm water runoff (2003 EIS).

Fishery Resources:

There are several important species of sport fish in Lake Sidney Lanier, including spotted bass (*Micropterus punctulatus*), largemouth bass (*Micropterus salmoides*), striped bass (*Morone saxatilis),* white bass *(Morone chrysops)*, white crappie (*Pomoxis anularis*), black crappie (*Pomoxis nigromaculatus*), and various sunfish (*Lepomis* spp.). Also inhabiting the lake are yellow perch (*Perca flavescens*), carp (*Cyprinus carpio*), catfish (*Ictalurus* spp.), shad (*Dorosoma* spp.), and blueback herring (*Alosa aestivalis*). Fishing is one of the major recreational attractions of Lake Sidney Lanier.

Wildlife Resources:

Surrounding the lake the forested areas are relatively uniform, consisting of such hardwoods species as tulip poplar (*Liriodendron tulipifera*), pignut hickory (*Carya glabra*), shumard red oak (*Quercus shumardii*), white oak (*Quercus alba*), post oak (*Quercus stellata*), and overcup oak (*Quercus lyrata*) interspersed with loblolly (*Pinus taeda*), white pine (*Pinus strobus*), and Virginia pine (*Pinus virginiana*). Other floral species include slippery elm (*Ulmus rubra*), red maple (*Acer rubrum*), black cherry (*Prunus serotina*), and American beech (*Fagus grandifolia*). The midstory of all three peninsulas contain flowering dogwood (*Cornus florida*), red maple, sourwood (*Oxydendrum arboreum*) and hawthorn (*Crataegus* spp.). The understory contains blueberries (*Vaccineum spp.*), dog fennel (*Eupatorium capillifolium*), various asters (*Aster* spp.), muscadine grape (*Vitis rotundifolia*), greenbriar (*Smilax spp.*) and kudzu vine (*Pueraria lobata*).

Numerous game and non-game species utilize the islands within and the upland areas surrounding the lake. The significant structural diversity within the forested areas (large hardwood overstory trees, scattered openings with shrubs, hardwood midstory, and proximity to water) provides good habitat for a variety of birds, mammals and other animals thus enhancing the area's value as a recreational resource. Those species include white-tailed deer (*Odocoileus virginianus*), wild turkey (*Meleagris gallopavo)*, mourning dove (*Zenaida macroura*), Canada goose, (*Branta canadensis*), rabbit (*Sylvilagus* spp.), and gray squirrel (*Sciurus carolinensis*), as well as a variety of non-game birds, waterfowl, mammals, amphibians, and reptiles which exist in the waters, clearings, and forested areas along the lakeshore.

In recent years, accelerating development of adjacent land areas, outside of Corps-owned property and comprised mostly of residential subdivisions has greatly reduced the amount of contiguous habitat available for animals requiring large habitat areas.

Wetlands and Waters:

Based on the U.S. Department of the Interior National Wetlands Inventory map for the Lake Sidney Lanier (http://www.fws.gov/wetlands/Data/Mapper.html), a general aerial review of the lake and knowledge of the surroundings, multiple streams and creeks flow into the lake and multiple wetland areas are located along the lake. Most of the wetlands are located within the shallow inlets and along the inflow streams, outside of the normal pool of the lake. Photograph reconnaissance flights conducted in August 2013 and February, March 2014 confirm the absence of wetlands in all but a few of the proposed areas affected by the policy change.

Endangered Species:

The U.S. Fish and Wildlife Service by a statement signed July 26, 2006, concurred that species listed under the Endangered Species Act would not be affected and that further action regarding such species would not be required. Comments received from USFWS (log no. NG-15-35-Hall) state that no further action is required under Section 7 (a)(z) of the Endangered Species Act. A copy of the correspondence is included in Appendix I.

Historic and Archeological Resources:

With the exception of a few small tracts to the north, the fee-owned government lands surrounding Lake Sidney Lanier were surveyed for cultural resources between the late 1930s and 1987. These surveys are referenced in Section 3 of the 2003 EIS. The results of these surveys were coordinated with the Georgia State Historic Preservation Office (SHPO) as part of the process for completing the Historic Properties Management Plan for Lake Sidney Lanier Project, Georgia in March 1997 (USACE 1997). The Georgia SHPO concurred with the findings and recommendations outlined in that document, and no further coordination is needed for this area.

Navigation:

Lake Sidney Lanier encompasses 38,000 acres or 59 square miles of water, and 692 miles of shoreline at normal level, a "full summer pool" of 1,071 feet above mean sea level.

The main arm of the lake extends 44 miles up the Chattahoochee River from the Buford Dam. A secondary arm extends approximately 19 miles up the Chestatee River. The area downstream of Highway 369 (Browns Bridge) approximately 9 miles from the dam increases in width to 3 miles in some places and also includes a number of uninhabited islands. Several creeks and inlets open to the main areas of the lake and account for the 692 miles of the shoreline. Named creeks are marked with day markers and depicted on local maps for the convenience of the boating public. Eight bridges cross the lake with room for boats to pass under which give access to the upper reaches of the lake.

Recreation:

Lake Sidney Lanier is the most popular Corps-owned recreation lake in Georgia, popular with boaters, houseboats, jet-skiers and others, particularly around the summer holidays. Over 7.5 million people per year visit the lake, including its campgrounds, boat launching ramps, and marinas.

The rowing and sprint canoeing events during the 1996 Summer Olympics were held at the lake and the Lanier Canoe and Kayak Club continue to hold rowing and canoeing events. Five sailing clubs hold racing events throughout the year.

Numerous Bass fishing tournaments each year bring participants from surrounding states.

The Lake Lanier Islands waterpark ground lease from the Lake Lanier Islands Development Authority which in turn leases the land from the U.S. Army Corps of Engineers caters to thousands of visitors each year to the Islands for lodging, cabin rentals, water sport rentals, golf, camping, and horseback riding.

Socioeconomic Resources:

The following community indicators are based on 2010 data estimated to 2013. The population of the Counties of Dawson, Forsyth, Gwinnett, Hall, and Lumpkin are 22,686; 195,405; 859,304; 185,745; and 30,918, respectively.

The City of Cumming, which lies to the West of the lake, has an estimated 2013 total population of 5,613.

The City of Gainesville which lies to the East of the Chattahoochee arm of the lake has an estimated 2013 total population of 53,533.

The City of Flowery Branch which lies to the East of the main body of the lake has an estimated 2013 total population of 6,145.

The surrounding counties have had an estimated population growth of 116,884 for 2010/2013 time period (USDOC, Census 2010).

In response from the Georgia Mountain Regional Commission, this notice is considered to be consistent with those state or regional goals, policies, plans, fiscal resources, criteria for developments of regional impact, environmental impacts, federal executive orders, acts and/or rules and regulations with which this organization is concerned.

Hazardous and Toxic Materials:

The presence of fuel pumps at the marinas could introduce petroleum constituents in case of spills while servicing the numerous boats that use the lake. Those facilities are routinely inspected and monitored. In addition boaters are cautioned to observe all precautions when fueling to prevent any spills.

Noise:

The major noise producers for the lake are boat motors; the nosiest are offshore racer type boats with two or three 500 hp engines. At speeds of 80 to 100 miles an hour, the exhaust can be heard as far as 3 and 4 miles. Fishing boats, more commonly known as bass boats with outboard motors of 150 to 300 hp often run to their favorite fishing hole especially before sunrise during fishing tournaments. Lake users play loud music for extended periods of time, other noise producers are houseboats that congregate together and can generate moderate to significant noise, which carries long distances over the water. Lastly, there are multiple events throughout the year that include fireworks.

Airspace:

The air space (Appendix F) over Lake Sidney Lanier from Buford Dam to approximately Old Federal Park campground is classified by the Federal Aviation Administration (FAA) as uncontrolled Class G from the surface of the water to 14,500 feet above mean sea level (MSL). The area within an eight mile radius from the center of the Lee Gilmer Airport (KGVL) in Gainesville, GA is classified as Class E controlled airspace from the surface to 18,000 feet. A low altitude airway V-643, crosses the lake in a North-South direction approximately two and half miles West of Lee Gilmer Airport.

The Class E controlled airspace that overlies Lake Sidney Lanier for KGVL, demarks a circle crossing Old Federal Park, Port Royal Marina, Little Hall Park, Wahoo Creek, Olympic Rowing Venue, continuing South and West of the airport back to Old Federal Park.

The Class G controlled airspace over the lake is used at times for flight training and VFR (visual flight rules) traffic to transit the area. Per CFR14 Part 91.119(b), aircraft not landing on Lake Lanier normally stay 1,000 feet above and 2,000 feet horizontal from any obstacle.

Marine Traffic:

The lake has 10 marinas and permitted 10,615 private boat docks to moor water craft of all descriptions (canoes/kayaks, personal watercraft, ski/wakeboard boats, fishing boats, house boats, offshore racers, and sail boats). The majority of the traffic occurs on weekends during the summer months. Fishing boats are seen regularly throughout the year and are more likely to be trailered to the lake and launched at one of the many 76 public boat ramps surrounding the lake.

Each type of boat has a fairly predictable area of use on the lake. Houseboats generally leave the marinas Friday afternoon to reposition to an island for the weekend, returning to their slips Sunday evening. Sailboats, on weekends and select weekday evenings during daylight savings time, can be concentrated during racing events but sail one at a time during the week. Personal watercraft with young operators, ski/wakeboard and boats towing tubes, pick a spot and stay in one area. Bass fishermen zoom from one favorite place to another normally early in the day.

It is not uncommon for the lake to be virtually clear of boat traffic during the weekdays and weekends from Labor Day to Memorial Day. Even during the summer months, traffic is much less and occasionally nonexistent during the week.

3.0 DESCRIPTION OF THE PROPOSAL

This action associated with this EA is a policy change only. The operations of seaplanes on Corps project waters is covered under part 36 CFR ch.III PART 327---REGULATION OF SEAPLANE OPERATIONS AT CIVIL WORKS WATER RESOURCE DEVELOPMENT PROJECTS ADMINISTRATED BY THE CHIEF OF ENGINEERS (Appendix H). The Lanier Seaplanes Pilot Association is asking the District Commander to rewrite the policy that prohibits the operation of seaplanes on the waters of lake Sidney Lanier. There would be no physical changes to the shore line, construction or modification of any kind to boat ramps, campgrounds or any existing recreation facilities.

The following entry would be added to the Seaplane Pilots Associations "Water Landing Directory", following approval of operations:

Lake Lanier – RESTRICTED. Coordinates: N 34' 14 .00 W 083' 57.00 Approx Elev: 1071. **Hazards**: Fluctuating water levels, submerged and floating debris, seasonal waterfowl, and exposed land features: During summer, heavy vessel traffic on weekends and holidays: hazardous rough water on open areas of the lake due to boat wake or moderate and higher winds. **Notes:** Closed weekends and national holidays between April 15 and September 15. Densely populated shoreline and surrounding area are noise sensitive. Seaplanes must maintain at least 500 feet from any vessel, shoreline, docks, bridge, overhead powerline, dam, or related structure during takeoff, landing and taxing except when idle taxiing to or from a specific destination. No more than three consecutive takeoffs or landings in the same section of the lake per day. Seaplane operations prohibited sunset to sunrise. Commercial operations prohibited without permission. Mooring in excess of 24 hours is restricted. Seaplanes must comply with marine rules of the road for power boat and vessel rules set forth in 36 CFR 327.3.
Controlling Agency: USACE Mobile District (251/690-2511) Lake Lanier (770-945-9531)

Unlike airports that use specific runways and established traffic patterns to land and takeoff, the lake offers any open and safe area for operations. In doing so it eliminates the concentration of activity. This allows all users unrestricted use of the lake without conflict. The chances of multiple take off and landings are unlikely. In addition, during the seaplane pilots training it is stressed to not use one particular area for multiple operations. It is part of their training.

The seaplane is in the unique position of being able to provide air service which is practically impossible with any other kind of craft. It offers the public the speed of the airplane with the utility of the boat. It has provided a variety of services which has established it as a valuable means of air transportation. Seaplane landings on Lake Lanier will not supplant the need for land airports to serve scheduled air carrier operations and other flying activities.

Aviation as a whole plays a significant role in the nation's economy and in its transportation network. Every community, whether large or small, needs access to the airways. Seaplanes serve the flying community like a marina serves boating enthusiasts. Those who engage in seaplane flying and related activities could use Lake Lanier as a center of business and pleasure. It provides an opportunity for charter and concession operators, the tourist industry, and other enterprises, as well as employment opportunities for commercial pilots, flight instructors, aircraft mechanics, and flight activity support staff. At Lake Sidney Lanier, the seaplane can provide access to water recreation areas to transient pilots.

General aviation pilots are being forced out of places to fly by airports that are being closed because of encroaching development. The lake needs to be opened as another place for general aviation pilots to land. The lake can serve as a permanent landing area. This provides another opportunity for training pilots for the commercial aviation industry. The uniqueness of seaplane flying may be just the incentive need to introduce new men and women to the world of aviation.

To some extent, opening the lake to seaplane operations would provide the opportunity for new services to support new aviation related activities. New pilots could begin their training to replace those retiring from commercial carriers which is a growing concern because of the disappearance of smaller airports being forced out by development. The first step in any development has to come from allowing seaplane access to the water.

There are approximately 8,000 seaplanes registered in the USA; the vast majority of these are registered in states such as Alaska, Michigan, Minnesota, Florida, and Maine, all of whom have large amounts of lakes (and plenty of seaplanes). Georgia has approximately 150 seaplane rated pilots and perhaps only 25% have their own seaplane. In short it is not anticipated there would be a large number of seaplanes landing on the lake, but rather the contrary. It is the wish of the Lanier Seaplane Pilots Association to enjoy the same access to the waters of the lake afforded the current marine traffic.

4.0 ENVIRONMENTAL IMPACT OF THE PROPOSAL

Numerous studies have shown that the presence of seaplanes has negligible to no effect on the environment. Seaplanes do not have lower units and propellers in the water to expel exhaust or to damage the lake floor or foliage. Waterfowl are as tolerant of seaplanes as they are of the other operators on the lake.

Environmental impacts of the proposed action are described for the following significant resource areas and are compared generally with implementation of the Corps' Master Plan for the purpose of providing outdoor lake recreational facilities, unless otherwise noted below. No change in existing environmental conditions would be expected.

A summary of the environmental impacts associated with allowing seaplane operations, are shown in Table 1. A matrix comparing the total development area of the No Action Alternative.

Table 1 – Summary of Project Impacts by Alternative

Factors	No Action	Corps Master Plan	Preferred Policy Change	Alternative Policy Change
Water Quality	No effect	No effect	No effect	No effect
Fishery	No effect	No effect	No effect	No effect
Wildlife Resources	No effect	No effect	No effect	No effect
Wetlands	No effect	No effect	No effect	No effect
Endangered Species	No effect	No effect	No effect	No effect
Historic / Archeological	No effect	No effect	No effect	No effect
Navigation	No effect	No effect	Negligible	Negligible
Recreation	No effect	No effect	Negligible	Negligible
Socioeconomic	No effect	No effect	Beneficial Minor	Beneficial Minor
Hazardous & Toxic Materials	No effect	No effect	No Effect	No Effect
Noise	No effect	No effect	Negligible	Negative
Airspace	No effect	No effect	No effect	No effect
Marine Traffic	No effect	No effect	Negligible	Negative

Biological and Physical Impacts:

The recommended policy change will have no impact on the Biological and Physical aspects of the lake.

Land Use Changes:

The recommended policy change will have no impact on land use.

Historic and Archeological Resources:

The recommended policy change will have no impact on the Historic and Archeological Resources.

Endangered and Threatened Species:

The potential impact on wildlife and waterfowl resources with the proposed policy change should be minimal as waterfowl are as tolerant of seaplanes as they are of the other operators on the lake.

Boats observed on Lake Sidney Lanier routinely operate amongst the flocks of ducks, geese and gulls at speeds greater then seaplane taxi and takeoff speeds and the waterfowl simply move out of their paths.

Pilots of all types of aircraft are reminded frequently about the hazards of bird strikes especially during migrations. Along with increased awareness and avoidance, it is standard practice to turn on landing / taxi lights when operating where encounters with birds are anticipated. The size of Lake Lanier and available takeoff and landing areas permits almost all approaches and departures to be conducted over the water, thus eliminating the need to overfly the shoreline and nesting areas at low altitudes.

The U.S. Army Corps of Engineers regulations prohibit takeoff and landing maneuvers within 500 feet of any bridge, causeway, overhead powerline, dock, dam, or similar structure. This regulation inadvertently also mandates 500-ft clearance from any nesting sites on bridges.

As provided in the "National Bald Eagle Management Guidelines" (Appendix P) by USFWS, May 2007, nesting buffers for watercraft is 330-feet during breeding season, and 1,000-feet for fixed-wing aircraft during breeding season, as further outlined below:

Category E. Motorized Watercraft use (including jet skis/personal watercraft).

No buffer is necessary around nest sites outside the breeding season. During the breeding season, within 330 feet of the nest, (1) do not operate jet skis (personal watercraft), and (2) avoid concentrations of noisy vessels (e.g., commercial fishing boats and tour boats), except where eagles have demonstrated tolerance for such activity. Other motorized boat traffic passing within 330 feet of the nest should attempt to minimize trips and avoid stopping in the area where feasible, particularly where eagles are unaccustomed to boat traffic. Buffers for airboats should be larger than 330 feet due to the increased noise they generate, combined with their speed, maneuverability, and visibility.

Category G. Helicopters and fixed-wing aircraft.

Except for authorized biologists trained in survey techniques, avoid operating aircraft within 1,000 feet of the nest during the breeding season, except where eagles have demonstrated tolerance for such activity.

The Seaplane Pilots Association has an electronic application "Water Landing Directory" which can be updated easily for the Lake Sidney Lanier project and will mandate clearance from known locations of Osprey/Eagle nests as areas to avoid overflights at low altitude during the nesting season.

Recreation:

Numerous and varied activities abound on the lake. Of the numerous uses of the Lake Sidney Lanier project only those using the lakes surface could be in conflict with seaplane operations.

All recreational boating, paddle boards, canoes/kayaks, personal watercraft waterski/wakeboard/surfing, tubing, runabouts, pontoon, fishing, houseboats, offshore racers, cruisers, sailboats, commercial tow boats, and dinner boats use Lake Sidney Lanier and have right of way over seaplane takeoffs and landings.

During actual operations, seaplane takeoffs and landings are done on clear areas of the lake much like waiting for an opening to launch or retrieve a boat at a boat ramp. At other times the slow taxi speeds will allow hazards to be seen and avoided. Operations other than arrivals and departures would be limited to taxi operations to intended facilities.

Although Lake Sidney Lanier is the most utilized recreation project in the Mobile District it has only, on average, one million more visitors than Lake Allatoona which is approximately one third the size of Lake Lanier and allows seaplane operations.

The following visitation numbers show an average difference of only 1,003,288 visitors to each lake. When adjusted for visitors per acre, the data reveals Allatoona at approximately 11,860 acres supports 499.73 visitors per acre whereas Lake Lanier at 38,000 acres only supports 182.37 visitors per acre.

Lake Allatoona along with the other USACE project lakes in Georgia are and have been open to seaplane operations for some time. Visitation numbers for Lake Allatoona and Lake Sidney Lanier are summarized below: (reference Ken Day e-mail 11-18-15).

Table 2 – Average Lake Visitation Comparison

Fiscal Year (FY)	Allatoona Lake	Lake Sidney Lanier
FY 09	5,281,347	6,863,752
FY 10	6,245,913	7,112,961
FY 11	6,004,769	7,195,417
FY 12	6,175,062	6,548,130
Average Number	5,926,777	6,930,065
*Due to the national transition (modernization) underway to a new Visitation Estimating and Reporting System (VERS), the official visitation numbers for Lake Allatoona and Lake Sidney Lanier for FY 13, FY 14, and FY 15 is still considered FY12 numbers. Projects are currently entering visitation numbers into the new VERS and ERDC advises that once all issues are corrected nationally, visitation for each subsequent FY will be available.		

These numbers shows that on average, Lake Allatoona carries only 1,003,288 visitors less than Lanier in an area comparable to that portion of Lake Sidney Lanier north of Georgia Highway 369 (see map in Appendix M).

Table 3 – Estimated Distribution of Visitation to Lake Sidney Lanier (thousands)

	Camp	Picnic	Boat	Fish	Hunt	Ski/Wake	Swim	Sightsee	Other
2000 (through may)	95	175	285	221	0	23	179	69	258
1999	333	575	1341	1093	1	74	542	387	940
Source: Williams, personal communication, 2002									

It is assumed the Visitation Distribution percentages listed in Table 3 to remain similar for the years 2009 thru 2012.

Because of the large number of recreational users of the lake it should be remembered that the seaplanes would only be operated at speeds over 30 miles per hour during short periods of time such as takeoff and landing on areas of the lake free of boat traffic in the immediate area. During taxi to or from a clear area for takeoff or landing actual speeds would not exceed 3 to 6 mph in displacement mode or 25 to 30 on the step or planing depending on the sea state, boat traffic and distance to the destination. The operating speeds are well below the speed of most boat traffic and allows for safely avoiding other users of the lake.

For the most part each activity is self-regulating. The houseboats and cruisers leave the docks Friday to establish a beach location for the weekend and return to their slips late Sunday.

The fisherman venture out before first light to their favorite spot and if trolling their slow speed allows faster traffic to pass.

The sailors stay in the open parts of the lake for clear wind and once again the relative slower speeds allow faster traffic unhindered passage.

Personal watercraft and boats towing skiers, and tubes tend to exhibit erratic course changes and require special attention to navigate around.

The lake can be extremely busy during the summer but the Corps' Lake Sidney Lanier web site has in the past stated that with 38,000 acres there is room for everyone to enjoy the lake. That remark has since been removed but that does seems to be the case. Collisions between boats are rare and most happen during hours of darkness. There are numerous days of empty water during the week and weekends throughout the year.

It is not the intent of the seaplane to utilize the lake the way boats do. Seaplanes would only use areas of lake not being used by other activities to takeoff or land much like boaters waiting to use a busy boat ramp.

Air Quality:

The recommended policy change will have no impact on air quality.

Water Quality:

It is unlikely the operations of seaplanes would have any effect on the quality of the waters of Lake Sidney Lanier. The exhaust of seaplanes is not discharged into the water and any water pumped out of floats would be free of any oil or fuel.

Floodplain and Wetlands Impacts:

The recommended plan will not impact floodplains and/or wetlands.

Noise Impacts:

Most seaplanes have engines with less than 240 horsepower. Almost all seaplanes are actually quieter than ski boats or bass fishing boats. While seaplanes are louder than many other waterway users, the noise a seaplane generates during takeoff, is infrequent and brief comes on quick and lasts for about thirty to forty seconds during a takeoff. It also seems louder than noise that is heard for more than five minutes because it is then perceived as background noise. Unlike personal watercraft or ski/wake boats, seaplanes are not a source of ongoing background noise. Averaged over time, seaplane operations have a negligible impact on noise pollution.

There are no noise studies to be found for seaplane operations in Georgia. For reference, a noise study for a residential area in Anchorage showing the noise footprint for Lake Hood seaplane base is included in (Appendix K). Lake Hood, adjacent to Ted Stevens International airport is a busy seaplane base with some 65,000 landings and takeoffs a year. This map of the noise footprint shows noise levels falling to 60 decibels (dBs) within a mile or less. For comparison, the range of speech is around 48 dB to 72 dB. A Noise comparison chart illustrates the perceived sound levels (dbs) of different noise producers and is located in Appendix K.

Aesthetics:

Lake Sidney Lanier is a man-made lake with many areas exposed to a great deal of development. Those areas, set aside and controlled by the Corps, have remained in their natural state. The degree to which such facilities provide aesthetic value is highly subjective and dependent upon personal judgment. In general, the aesthetic appeal of the area is typical for semi-suburban areas, with the natural aesthetics having already suffered negative impacts in the past from the construction of Lake Sidney Lanier and its associated recreational uses, and surrounding residential development.

Socioeconomic Resources:

The policy change could present economic opportunities at some point in the future if seaplane traffic increased to warrant service facilities. For the near future, property taxes to the counties for seaplanes moored in those counties would be one of the benefits of the policy change. There is some chance seaplanes from outside the local area could use the lake for recreation purposes bringing revenue to those shoreline facilities and communities visited.

Economic impact can be significant, if, as other areas have demonstrated the community participates in development. Studies show seaplane operations on Lake Union in downtown Seattle produce some 62.7 million dollars. (see Appendix J - "Practices in Preserving and Developing Public-Use Seaplane Bases")

Closer to Lake Sidney Lanier, "Tavares seaplane base sparks downtown renaissance" (Appendix N) reveals an effort in Tavares, Florida to revitalize the community with an 8 million dollar investment. After 4 years community leaders expect the operation will break even or be profitable in a few years. Their efforts resulted in 26 new businesses including 8 new restaurants.

Public Safety:

Seaplanes are regulated by the Federal Aviation Administration (FAA); all pilots must have a current FAA license, and be specially trained and rated in seaplanes.

Per 14 CFR Part 61.56, all pilots are required to have a biennial flight review. This review must consist of at least one hour of flight review and one hour of ground school reviewing FAA regulations, weather, trip planning, and decision making skills. This review must be completed by a certified flight instructor in order to exercise the privileges listed on the pilot's certificate.

Per 14 CFR Part 91 (FAA Regulations) subpart E-Maintenance, Preventive maintenance and Alterations, seaplanes are required to be inspected annually by an FAA certified maintenance technician who holds an Inspection Authorization rating. This is done to prove airworthiness of the aircraft.

Seaplanes are in use all over the world and have an excellent safety record.

- During 13 years of Seaplane flying in the U.S.A. (10+ million flying hours) only three seaplane-boat collisions have occurred and only two of these resulted in injuries or fatalities
- In the same 13 year study period there were over 12,000 fatalities involving boats
- During a recent 5 year period boats collided with other vessels 11,174 times

Statistically, it is considered that Boat/Seaplane accidents are nearly non-existent.

Because seaplanes operate in two different realms of regulatory responsibility, the air and the sea, the seaplane pilot must adhere to the relevant rule for each area of operation. Therefore pilots are to obey both 14 CFR Part 91. 115 (FAA Regulations) (Right-of-Way Rules: Water Operations) and the US Coast Guard's (USCG) International/Inland Navigation Rules.

During takeoff and landing seaplane pilots follow Part 14 CFR 91.115 (a) General. Each person operating an aircraft on the water shall, insofar as possible, keep clear of all vessels and avoid impeding their navigation, and give way to any vessel or other aircraft that is given right of way under this section. The other parts of this section, (b), (c), (d), and (e) are essentially the same as USCG rules for boats. Once on the water's surface, pilots must obey "USCG Inland Navigation Rules" - these are the same rules all vessels on Lake Sidney Lanier are bound. The "USCG COLREGS" are for off shore operations.

As a general rule all pilots and passengers in float planes wear inflatable personal flotation devices for all taxi, takeoff and landing operations.

Apart from standard seaplane operations safety protocol, adequate monitoring by park rangers and other staff at the Lake Lanier Project, in addition to local law enforcement officials, all who patrol the lake assure that sources of potential injury and accident to the public, such as boating accidents, drowning, fire, firearm use, etc. are managed to minimize risk. Some of the safety measures described in the EA would not be relevant to safety issues attributed to seaplane operations; for example: notification of water releases downstream of the dam.

Unsafe activity is the perception when mentioning seaplane operations on Lake Sidney Lanier. Based on the facts of the accidents/crashes that have occurred, aircraft that do crash into the water, rarely ever involve a boat. The hazards and risks are the same as any other airplane would encounter.

The fear of many on Lake Lanier is the chance of collision with boats. A search in 2014 back to 2001 of seaplane accidents during takeoff and landing in the NTSB's data base (Appendix R – "NTSB Seaplane Accident Reports") revealed only ten accidents. Not all were fatal and only one involved a watercraft, a standup type personal watercraft that struck the aft section of the float of a seaplane still in the air while landing.

Seaplane operations on Lake Lanier will only be undertaken during daylight hours, sunrise to sunset and visual conditions. Takeoff speeds of about sixty miles per hour are needed to lift off the water. In less than a minute the seaplane will be off the water and climbing, taking less than two minutes to climb above the 500 feet from persons or property required by the FAA. Thus, total exposure to boat traffic will be less than two minutes. Before or after the takeoff/landing, taxi speeds depend on the water conditions and distance traveled to the destination. Average speeds are typically about six knots at idle taxi and 25 to 30 knots "on the step" or planing.

Seaplanes want to land on the lake to access the recreational amenities the lake has to offer such as restaurants, campgrounds, maintenance, and fuel purchases. The ability to land and takeoff on the lake as close to their intended destinations as possible will lessen the interaction with the boating public. Seaplanes will not be using the lake's surface continually to travel about, like, wake boarders, tubers, boat rides and boats going to other parts of the lake to visit a picnic beach, friends etc. It is highly unlikely that seaplane operations would impact the carrying capacity of the lake considering the landing and takeoff operations would be on areas of the lake free of boat traffic and far less than 1% of the total lake activity. Operations other than arrivals and departures would be limited to taxi operations to intended facilities. Please refer to Appendix S – Airmans Information Manual (AIM) 7−5−8. Seaplane Safety.

Airspace:

The Federal Aviation Administration has expressed no opposition in our working with the Corps of Engineers and the Department of Natural Resources to permit this policy change. Preliminary coordination was conducted with the FAA in 2014 regarding the operation of seaplanes at Lake Sidney Lanier, Aeronautical Study 2013-ASO-2092-NRA (Appendix U – "Shady Grove Harbor"). At that time, the FAA completed a review and determined the airspace over that portion of the lake will not adversely affect the safe and efficient use of that navigable airspace by aircraft. Prior to finalization of the policy change regarding seaplanes, further consultation with the FAA will be conducted. No flight paths from Atlanta, Gainesville, and other areas are being impacted by the proposed activity.

This aeronautical study did not consider the interaction of seaplane operation with surface craft traffic that is regulated by 14 CFR 91.115, (ref. FAA regulations) nor does it give approval for seaplane operations on this body of water. Approval authority is vested with the owner/controlling agency of the body of water, the U.S. Army Corps of Engineers.

The air space (Appendix F) over Lake Sidney Lanier from Buford Dam to approximately Old Federal Park campground is classified by the FAA as uncontrolled Class G from the surface of the water to 14,500 feet above mean sea level (MSL). The area within an 8 mile radius from the center of the Lee Gilmer Airport (KGVL) Gainesville GA is classified as Class E controlled airspace from the surface to 18,000 feet. A low altitude airway V-643, crosses the lake in a North-South direction approximately two and half miles west of Lee Gilmer Airport.

The Class E controlled airspace that overlies Lake Sidney Lanier for KGVL, demarks a circle crossing Old Federal Park, Port Royal Marina, Little Hall Park, Wahoo Creek, Olympic Rowing Venue, continuing South and West of the airport back to Old Federal Park.

Seaplane operations in this area of the lake would be flown at altitudes below the traffic pattern of Gainesville's Lee Gilmer airport unless actually landing at Lee Gilmer.

The Class G uncontrolled airspace over the lake is used at times for flight training and VFR (visual flight rules) traffic to transit the area. FAA regulation CFR14 Part 91.119 (ref. FAA regs.) states: ***Over other than congested areas,*** *an altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure*.

FAA Form 7480-1 Notice for Construction, Alteration and Deactivation of Airports, states, "Notice to the FAA is not necessary if a SPB has only visual flight rules (VFR) operation, is used for a period of less than 30 consecutive days with no more than 10 operations per day, or is used only intermittently, and that landing site is not an established airport, such as river, lake, or pond that is used or intended to be used for less than 1 year. Intermittent use of a site means it is not used for more than three days in any one week and no more than 10 operations are conducted in any one day. These rules convey that an official SPB designation is not needed for a seaplane to operate on a body of water."

After the Corps approval for seaplane operations on the lake, if enough traffic occurs such that these conditions are exceeded, then an application for commercial seaplane operation will require the Form 7480-1 to be submitted to the FAA for their approval.

Marine Traffic:

All manner of water craft use the navigable surface of Lake Sidney Lanier, from paddle boards and canoes to 100 + miles per hour offshore racing boats. The dynamics of motion allows movement vacating one area to another leaving open water surface. Seaplanes would only use short distances (1,500 to 2,000 feet) of water surface to leave the lake and return, under the preferred policy change. The majority of the seaplane operation time would be airborne away from Lake Sidney Lanier. Based on this information, the preferred policy change would have a negligible effect on marine traffic.

The alternative policy change with restricted/designated landing sites would require a longer travel distance and time for planes to taxi from landing sites to their final destination or vise versa, causing an increase in marine traffic or greater potential for conflicts. Some planes would have to travel long distances on the water to get to/from the landing strips. Based on the size of Lake Sidney Lanier and the increased distance and time planes would have to travel on the water to/from designated landing strips, the alternative policy change would have a negative effect on marine traffic.

See Appendix G for some examples of maps and aerial view of areas of Lake Sidney Lanier which are suitable for seaplane operations. Additional maps and supporting documents are provided in Appendix C – Surface Area Study, and Appendix D – USGS Quadrangle Maps.

Prime and Unique Farmland:

The recommended plan will have no effect on prime farmlands or unique agricultural lands.

Hazardous and Toxic Materials:

The recommended plan will not result in impacts to Lake Sidney Lanier relative to Hazardous or Toxic Materials. Appropriate safety measures for fueling facilities will be implemented, just as they are for watercraft fueling operations.

Other Aircraft Types

Helicopters are classified as aircraft by the FAA. As such helicopters equipped with floats or pontoons are now and would be subject to existing Corps regulations or changes brought about by this EA.

Drones are classified as Unmanned Aircraft Systems (UAS) and would fall outside the scope of this EA. UAS's however as of yet are not equipped for operations on the water surface and presently not specifically mentioned in any of the present Title 36 CFR, Part 327 & 328, regulations. On June 21, 2016, the USACE released an official public press release stating that the USACE does not allow drones on project lands. That includes areas that are leased to other agencies and businesses, such as marinas and boating clubs.

Due to the proliferation of Unmanned Aircraft Systems (UAS's /drones) the FAA has just recently ordered the registration of UAS's and issued a new ruling effective August 26 2016 regarding the operations of Unmanned Aircraft Systems (UAS). (Appendix T - UAS summary part 107). As presently written the regulation states UAS operators will be required to get permission from Atlanta Air Traffic Control (ATC) to operate within the Class's B, C, D, & E airspace. Gainesville's Lee Gilmer airport lies within a Class E airspace which extends over a portion of Lake Sidney Lanier.

In addition to the provisions of the Notice of Proposed Rule Making (NPRM), UAS operators must follow required model airplane guidelines (AC-91-57A); see Appendix O. Those guidelines include the operator having to have the UAS insight at all times and to stay clear of aircraft. The use of these aircraft on the public and project lands and waters outside the airport and airspace restrictions (islands, parks, campgrounds, islands, marinas, protected areas, limited use areas, recreation areas, leased areas, privacy, shoreline use permits, wildlife, etc.) will depend on the Corps inclusion and revision of existing Title 36 CHAPTER 111 PART 327.4.

However, Public Law 112-95 specifically prohibits the FAA from promulgating rules regarding model aircraft that meet all of the following statutory criteria:

- The aircraft is flown strictly for hobby or recreational use;
- The aircraft is operated in accordance with a community-based set of safety guidelines and within the programming of a nationwide community-based organization;
- The aircraft is limited to not more than 55 pounds unless otherwise certified through a design, construction, inspection, flight test, and operational safety program administered by a community-based organization;
- The aircraft is operated in a manner that does not interfere with and gives way to any manned aircraft; and
- When flown within 5 miles of an airport, the operator of the aircraft provides the airport operator and the airport air traffic control tower (when an air traffic facility is located at the airport) with prior notice of the operation.

See Appendix T - Unmanned Aircraft Systems (AIM 7−5−5).

Seaplane Operations.

Commercial Seaplane Operations:

The Seaplane community recognizes the possibility of commercial activity on Lake Sidney Lanier. Those activities could include Flight Training, Site Seeing flights, Charter transportation, Maintenance, Fuel and Tie Down or Rental space at marinas. Contact with the marina operators would confirm a willingness to accommodate such operations but each of these examples would have to be approved on their own merits. The USACE position is to work with the marina operators under their established contracts for any business ventures.

An excellent example of the possibilities for economic development is the article on the City of Tavares, FL, which encouraged development of seaplane services to revitalize the city, resulting in 8 new restaurants and a number of new businesses (see Appendix N).

Private Seaplane Operations:

Seaplane pilots want to land their aircraft on the lake to access the amenities the lake has to offer such as restaurants, campgrounds, maintenance, and fuel purchases. Acquiring access to those destinations would best be served by landing and taking off on the lake as close to their intended destinations as possible so as to not to interfere with lake access for the boating public. Operations other than arrivals and departures would be limited to taxi operations to intended facilities.

As part of the operating regulations written into USACE Part 327.4, seaplanes may not be operated at Corps projects between sunset and sunrise unless approved by District Commander.

Unrestricted access to the lake surface allows seaplanes to travel short distances after they have landed. Landing in safe areas close to their destination would reduce the exposure to other surface vessels. It should be remembered, flying is the primary purpose of seaplanes not water activities. Landings and takeoffs only take a minute and require a clear area that does not have to be straight; taxi time on the water will determine the exposure to the traffic on the lake and that would be at slow speed unless long distances are required.

Seaplanes operating on the lake surface are considered a vessel and subject to US Coast Guard regulations. We would assume as a vessel, seaplanes would be able to travel to any part of the lake the same as the varied watercraft depending on their size and operating limitations.

It has been noted that boaters would not be required to remain clear of a marked landing area so an open lake would allow the seaplane operators to land or takeoff where there was no boat traffic. A marked area for seaplanes requires FAA approval to establish approach and departure clearance and the Corps would be required to file paper work to obtain that approval. The cost of installing and maintaining such areas is not considered practicable.

There would be no specific times traveled on the lake during the time between sunrise and sunset. It should be remembered a seaplane could be on the water less than 5 minutes to takeoff and not return to any portion of the lake until much later in the day or possibly as transiting aircraft never to return.

Noise from the prop/engine while traveling the lake would be hardly noticeable at normal taxi speeds. If specific takeoff and landings areas are assigned some distance from the intended destination taxi on the step or on top of the water at a higher speed would still be no louder than most boats on the lake. See Appendix K - “Noise Comparisons”.

The width of wing span around blind points would not be a problem at taxi speeds as experience shows all manner of boats round points of land and narrow coves on the lake without conflict at greater speeds. Takeoff maneuvers would not be undertaken unless there is a clear view of the takeoff area including those vessels approaching. When landing, the field of view is greatly improved from the air to include areas blocked by any land mass from the water.

Seaplanes could be temporarily moored and occupants could spend overnight at islands perhaps on a friend's boat the same as other recreational users. Existing private boat docks, marinas, resorts, etc. could be utilized if the facilities were suitable for use and space is available.

The size difference between recreational boats that frequent Lake Sidney Lanier and the largest/smallest sea planes is in the width and length proportions (see Appendix E - Floatplanes/Seaplanes Guide). The difference is the seaplanes wingspan is wider than boats and average around 38 feet for most 4 place seaplanes. A houseboat can be 15 to 22 feet wide and over 90 feet long. A greater difference is the weight function, the average 18/20 foot boat will weigh in the 3,500 pound range without passengers, and an average 4 place seaplane will weighs around 2,000 to 3,200 pounds with passengers. This makes the seaplane much more fragile and seaplane pilots must operate within those limitations. The larger sailboats, cruisers and houseboats all outweigh even the twin engine seaplanes that could be expected.

If there is room to accommodate a seaplane they should be allowed to be attached/moored to private docks and/or commercial docks. There are permitted docks on Lake Lanier that have houseboats, sailboats, pontoon, and other large cruiser type boats moored alongside. Seaplanes would be able to use available courtesy docks and/or shorelines at parks and campgrounds for mooring the same as other visitors.

Seaplanes should be allowed to stay on project lands and waters for extended periods of time when associated with private docks/commercial docks. Planes would be moored to the shoreline only temporarily, secured for storms, or over-night stays at parks or campgrounds.

If the lake is opened to allow seaplanes, both private and commercial operations will be possible. The size of aircraft used will depend on the resources available to the owner/operator. Private operations would be random in both number of and time of day depending on purpose of the visit to Lake Sidney Lanier. Licensed commercial operations would have more scheduled takeoff and landings. Any operations would be subject to visual flight rules (FAA reg. 91.155) during the period between sunrise and sunset.

See Appendix E - Floatplanes/Seaplanes Guide, which features a few typical aircraft of all sizes of aircraft that can be used for flight training, commercial flightseeing or charter operations.

Seaplane Pilots License Requirements:

This is a guide on the terminology used to describe the licensing, the testing, the minimum age and qualifications of operators, for maintaining a license as it applies to the aircraft that could be used on Lake Lanier.

First pilot certificates and aircraft are identified by Category, Class, and Type to match pilot qualifications to different size and type of aircraft.

Category:
(1) As used with respect to the certification, ratings, privileges, and limitations of airmen, means a broad classification of aircraft. Examples include: airplane; rotorcraft; glider; and lighter-than-air; and
(2) As used with respect to the certification of aircraft, means a grouping of aircraft based upon intended use or operating limitations. Examples include: transport, normal, utility, acrobatic, limited, restricted, and provisional

Class:
(1) As used with respect to the certification, ratings, privileges, and limitations of airmen, means a classification of aircraft within a category having similar operating characteristics. Examples include: single engine; multiengine; land; sea; gyroplane; helicopter; airship; and free balloon. (2) As used with respect to the certification of aircraft, means a broad grouping of aircraft having similar characteristics of propulsion, flight, or landing. Examples include: airplane; rotorcraft; glider; balloon; landplane; and seaplane.

Type:
(1) As used with respect to the certification, ratings, privileges, and limitations of airmen, means a specific make and basic model of aircraft, including modifications thereto that do not change its handling or flight characteristics. Examples include: DC-7, 1049, and F-27.
(2) As used with respect to the certification of aircraft, means those aircraft which are similar in design. Examples include: DC-7 and DC-7C; 1049G and 1049H; and F-27 and F-27F.
For the purpose of this EA, this discussion will pertain to aircraft designed or modified to takeoff, land and operate on the lakes surface.

To clarify the difference between seaplanes and floatplanes, a seaplane is designed with a boat hull to land on the water. A Floatplane is an airplane manufactured with wheels then modified with added floats to land on the water. Either configuration can have retractable wheels to allow amphibious operation.

Licensing:
Licensing requirements PART 61—CERTIFICATION: PILOTS, FLIGHT INSTRUCTORS, AND GROUND INSTRUCTORS (FAA Reference)

For operations on Lake Lanier the following apply. Pilots may have additional certificates and ratings (see reference FAA Regulations & Appendix E - Seaplane Guide for seaplane descriptions).

No Pilots license or medical are required for Ultralight aircraft.

Sport pilot license and a valid driver's license plus a Single Engine Seaplane Rating (SES) required for Piper J-3 page no. 1, Aventura page no. 14, Searey page no. 15.

Recreational, Private, Commercial, or Airline Transport pilot's license and 3rd, 2nd, or 1st class medical plus a Single Engine Sea Rating (SES) for Aircraft page nos.1, 5, 13, and 16.

Private, Commercial, or Airline Transport pilot license and 3rd, 2nd, or 1st class medical plus Multi Engine Sea (MES) Rating for Aircraft page nos. 18 and 19.

Any amphibious aircraft requires a Single (SEL) or Multi Engine Land (MEL) rating in addition.

All pilot applicants shall be able to read, speak, write, and understand the English language. If the applicant is unable to meet one of these requirements due to medical reasons, then the Administrator may place such operating limitations on that applicant's pilot certificate as are necessary for the safe operation of the aircraft;

Testing/Knowledge Requirements:
Under current pilot certification regulations, depending on the type of operation, an operator, currently must obtain either, a sport pilot, recreational pilot, private pilot, commercial pilot or an airline transport certificate. Sport pilot, recreational pilot, or private pilot certificates cannot be used for compensation or hire unless the flight is only incidental to the operator's business or employment.

Typically, to obtain a sport pilot certificate, the operator currently has to: (1) Receive training in specific aeronautical knowledge areas; (2) receive training from an authorized instructor on specific areas of aircraft operation; (3) obtain a minimum of 20 hours of flight experience; and (4) use a valid driver's license in lieu of an airman medical certificate.

To obtain a recreational pilot certificate, the operator currently has to: (1) Receive training in specific aeronautical knowledge areas; (2) receive training from an authorized instructor on specific areas of aircraft operation; (3) obtain a minimum of 30 hours of flight experience; and (4) obtain at least a third-class airman medical certificate.

For a private pilot certificate, the operator currently has to: (1) Receive training in specific aeronautical knowledge areas; (2) receive training from an authorized instructor on specific areas of aircraft operation; (3) obtain a minimum of 40 hours of flight experience; and (4) obtain at least a third-class airman medical certificate.

Conversely, holding at least a commercial pilot certificate allows compensation for hire, but is more difficult to obtain. In addition to the requirements necessary to obtain a sport, recreational or private pilot certificate, applicants for a commercial pilot certificate currently need to also obtain 250 hours of flight time, satisfy extensive testing requirements, and obtain a second-class airman medical.

An airline transport certificate requires more extensive aeronautical knowledge, 1,500 hours of flight experience and a first-class airman medical certificate.

To remain in effect all pilot certificates require a current appropriate class medical (except sport pilot) and a biannual check ride and at least one hour instruction in aeronautical knowledge. Airline Transport pilots must meet these requirement each six months.

A new ruling effective July 2017 permits private pilot certificate holders to take an on line test every two years and a an approval every four years from their primary care doctor attesting to their fitness for flight duties in lieu of the FAA 3rd class medical exam.

- The minimum age of operators
- To be eligible for a student pilot certificate, an applicant must:
- Be at least 16 years of age for other than the operation of a glider or balloon.
- Be at least 14 years of age for the operation of a glider or balloon.
- To be eligible for a sport, recreational or private pilot certificate, an applicant must:
- Be at least 17 years of age for other than the operation of a glider or balloon.
- To be eligible for a commercial pilot certificate, an applicant must:
- Be at least 18 years of age
- To be eligible for an air transport pilot certificate, an applicant must:
- Be at least 21 years of age for other than the operation of a glider or balloon.
- Receive a logbook endorsement from an authorized instructor who:

- Conducted the required ground training or reviewed the person's home study on the aeronautical knowledge areas listed in this part that apply to the aircraft category and class rating sought; and
- Certified that the person is prepared for the required knowledge test that applies to the aircraft category and class rating sought.
- Pass the required knowledge test on the aeronautical knowledge areas listed in §61.125 of this part;
- Receive the required training and a logbook endorsement from an authorized instructor who:
- Conducted the training on the areas of operation listed in §61.127(b) of this part that apply to the aircraft category and class rating sought; and certified that the person is prepared for the required practical test.
- Meet the aeronautical experience requirements of this subpart that apply to the aircraft category and class rating sought before applying for the practical test;
- Pass the required practical test on the areas of operation listed in §61.127(b) of this part that apply to the aircraft category and class rating sought, such as single engine seaplane, single engine land, multi engine land, multi engine seaplane and type ratings for turbojet and aircraft weighing more than 12,500 pounds.

See Appendix L - FAA Regulations: Licensing Requirements for Pilot Certificates

Mishap Reporting:

There are no differences in reporting mishap and rule infractions for seaplanes than those for the boating public and all other users of the project waters. The local 911 Operators have the appropriate procedures in place for emergency situations on the lake.

The USACE, GADNR, Sheriff/Police agencies, and Lessees of US Government Property have the same authority and use the same resources currently in place.

The FAA has additional mishap/accident and violation reporting requirements for seaplane operators. These requirements are spelled out in Title 49 CFR 830 mishap reporting (FAA's Regulations reference).

Contact the NTSB's 24-hour Response Operations Center (ROC) at **844-373-9922** to file a report. A phone call is sufficient initially, but a written follow-up may be required.

The reports are to be made by the "most expeditious method" with follow up reports on NTSB form 6120.1 or 6120.2 within 10 days of an accident. For Georgia, reports should be sent to NTSB, ERA, 45065 Riverside Parkway, Ashburn, VA 20147.

Report an Aircraft Accident to the NTSB:
Federal regulations require operators to notify the NTSB immediately of aviation accidents and certain incidents. An accident is defined as an occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage. An incident is an occurrence other than an accident that affects or could affect the safety of operations. (See FAA references 49- CFR- 830)

Table 4: Enforcement Phone Numbers

Agency	Telephone No.
USACE	770-945-9531
GADNR	770-918-6408
Gwinnett Co. Sherriff	770-619-6500
Hall Co. Sherriff	770-531-6885
Forsyth Co. Sherriff	770-781-2222
Dawson Co. Sherriff	706-344-3535
NTSB	844-373-9922

See Appendix Q: AIM 7−6−2. Aircraft Accident and Incident Reporting

Restricted Objects and Places

Based on the restrictions placed on the other Mobile District lakes that are open to seaplanes, it would be expected that seaplanes takeoff and landing operations would not be permitted within 500 feet of any sensitive areas such as the Buford Dam/Powerhouse, city and county water intake structures, bridges, power-lines, etc.

Although seaplane pilots are trained in techniques dealing with the currents and hazards associated with rivers, landing aircraft in the Chattahoochee River which is located just below the Buford Dam would not be allowed.

5.0 ENVIRONMENTAL JUSTICE (EXECUTIVE ORDER 12898)

The primary objective of an environmental justice analysis is to ensure that vulnerable populations do not bear a disproportionately high and adverse share of human health or environmental effects from proposed federal actions. To address environmental justice concerns, President Clinton issued Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations,* on February 11, 1994 requiring each federal agency to “make the achievement of environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health and environmental effects on minority and low-income populations.”

The EO and accompanying Presidential Memorandum direct federal agencies to identify and analyze the potential socioeconomic impacts of proposed actions in accordance with health and environmental laws and to identify alternatives that might mitigate these impacts The 2003 EIS described the existing demographic makeup of the areas surrounding Lake Lanier and for the State of Georgia. Lake Lanier is not considered an area of disproportionate numbers of minority or low income populations.

The recommended plan will not create disproportionately high or adverse human health or environmental impacts on any low-income populations of the surrounding area.

6.0 PROTECTION OF CHILDREN (EXECUTIVE ORDER 13045).

On April 12, 1991, the President issued EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. The EO seeks to protect children from disproportionately incurring environmental health or safety risks that might arise as a result of Corps policies, programs, activities, and standards. Historically, children have often been present at Lake Lanier as residents and visitors. Inherent in recreational facilities associated with water bodies are safety risks not present in non-water related areas. These include such risks as drowning and boating accidents. The 2003 EIS described the current safety precautions at the lake designed to protect all visitors including children.

The Corps broadcasts by AM radio and siren a warning when water is about to be discharged from the dam to the downstream reach. However, many of the described measures have a direct positive effect on the safety of children. Those include a safety task force at the lake that promotes safety though education aimed at children, training, inspections, and law enforcement, swim lines established at beaches with permanent signs warning of dangers of swimming beyond the line, notifying the public of low water hazards, and rangers performing safety patrols during the recreation season. The recommended plan does not pose any disproportionate environmental health risk or safety risk to children.

7.0 ANY IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS WHICH WOULD BE INVOLVED SHOULD THE RECOMMENDED PLAN BE IMPLEMENTED.

There would be no irreversible or irretrievable commitments of resources involved in the proposed policy change action. Commitments are unanticipated at this time, or have been considered and determined to present negligible impacts. Revocation of this policy at any time in the future would reverse any impacts associated with this plan.

8.0 ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED.

Any adverse environmental effects which cannot be avoided should the recommended project be implemented are expected to be minor individually and cumulatively.

9.0 THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY.

Any adverse environmental effects, which cannot be avoided during implementation of the recommended proposal, are expected to be minor both individually and cumulatively.

The proposed project change constitutes a short-term use of man's environment and is not anticipated to affect long-term productivity. The proposed action will not result in a direct impact to land or water resources, as the action is a policy change and does not include construction of facilities within or along the shoreline of the lake.

10.0 ALTERNATIVES TO THE RECOMMENDED POLICY CHANGE.

"No Action" Alternative:

As evaluated in this EA, the "No-Action" alternative would consist not undertaking the proposed policy change. Under the "No Action" alternative, the plan would not satisfy the demand for seaplane operations of Lake Sidney Lanier. Disadvantages of this alternative are that seaplanes would not have access to the restaurants, campground, maintenance and fuel purchase facilities on Lake Sidney Lanier. Additionally, any other minor beneficial socioeconomic effect such as future commercial ventures would be lost.

Alternative 1 – Restricted/Designated Landing Sites:

Another alternative to the preferred policy change would be to have restricted/designated landing/takeoff sites. The advantage of this alternative would be to reduce areas in which watercraft could encounter planes landing or taking off. However, there are several disadvantages to this alternative plan. This alternative would greatly increase the travel distance and time for planes to taxi from landing sites to their final destination. This would mean the planes would be driving across the lake like a boat for longer distances and times. Based on the size of Lake Sidney Lanier, the average distance and driving time to designated sites would be great and an unnecessary inconvenience for pilots. In addition, the pilots landing at Lake Sidney Lanier would need to be familiar enough with the lake to know the location of all the designated landing/takeoff sites. Furthermore, if the designated areas are made official landing sites, there are then specific FAA regulations for marking and maintaining landing strips as well as paper work the Corps would be required to file in order to obtain this approval.

Documentation related to this EA revealed that the US Army Corp of Engineers is planning to conduct a Master Plan Update in 2017/2018 time frame (and in turn, a possible EIS stemming from those findings). An EIS determination will consider all cumulative impacts for the project as a whole. An EIS study may result in a final determination and/or outcome that is different from and/or in direct opposition to what is determined from this EA (A EA that only addresses a single activity of seaplane operation).

Preferred Alternative – Unrestricted Landing Sites:

As outlined in this EA, the preferred alternative is to allow unrestricted landing sites on Lake Sidney Lanier. Based on the analysis of impacts and the potential for more impact from restricted/limited landing sites, the preferred alternative of unrestricted landing sites was evaluated in detail for this EA.

11.0 COORDINATION.

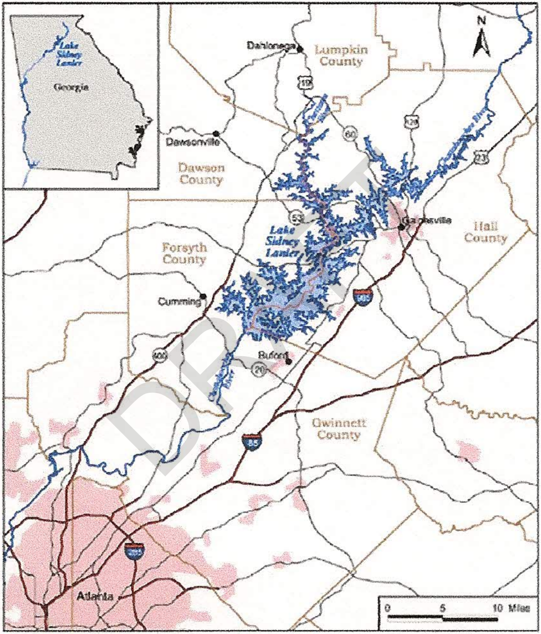
The Lanier Pilot Association has requested comments from the following agencies in regards to allow seaplane operations at Lake Sidney Lanier.

- Lake Lanier Association
- Wildlife Resource Division
- Georgia EPD, Watershed Protection Branch
- U.S. Fish and Wildlife Service
- Georgia Department of Transportation-Aviation Programs
- Georgia Mountain Regional Commission
- Georgia Historic Preservation Division
- National Marine Fisheries Service
- United States Environmental Protection Agency, Region 4
- Public Coordination/Feedback

Please refer to Appendix I for copies of agency correspondence and community input and feedback regarding the proposed policy to allow seaplanes at Lake Sidney Lanier.

APPENDIX A

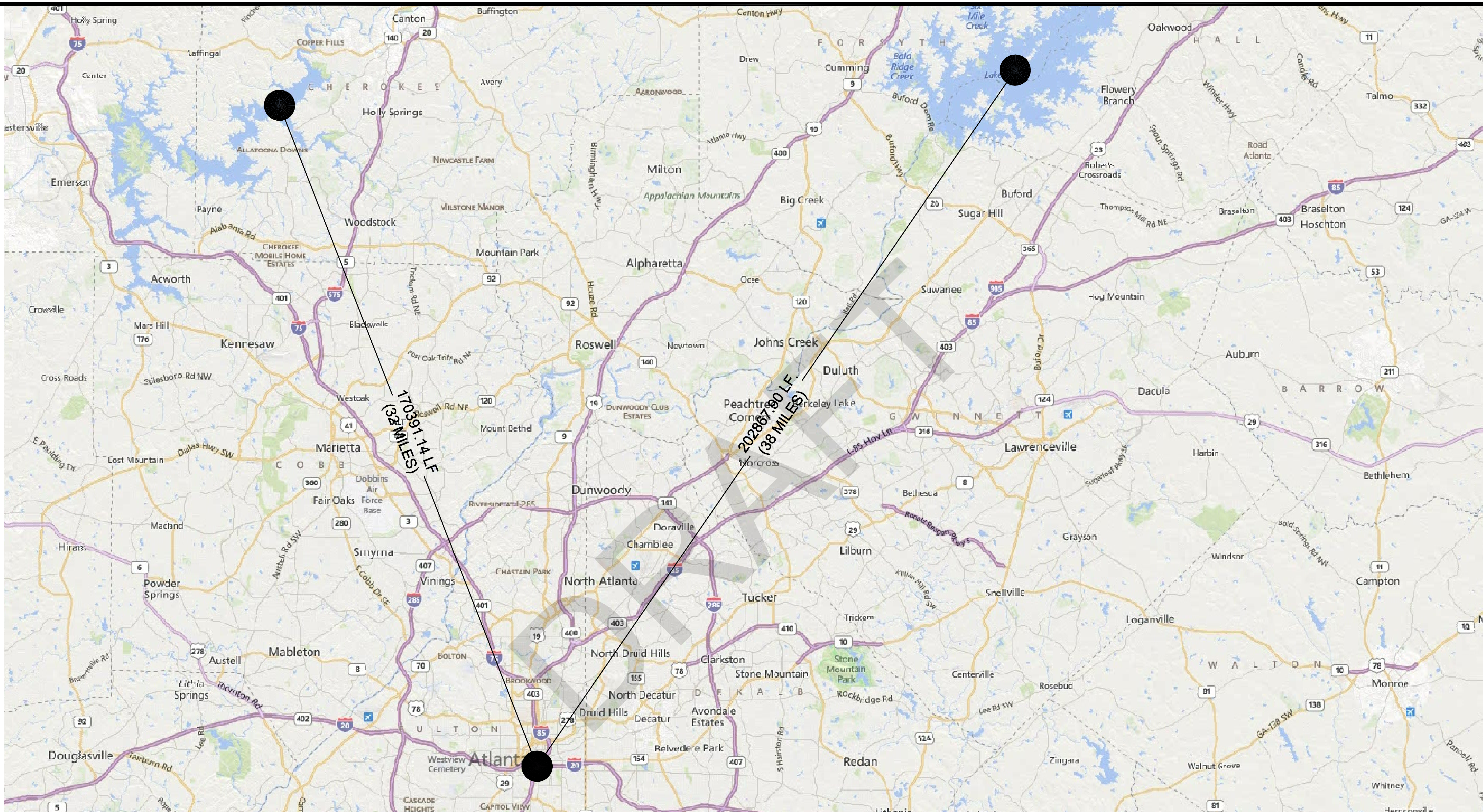
Location Map of Lake Sidney Lanier



Lake Sidney Lanier
Georgia
N
Dahlonega
Lumpkin County
Dawsonville
Dawson County
Forsyth County
Lake Sidney Lanier
Gainesville
Hall County
Cumming
Buford
Gwinnett County
Atlanta
DRAFT
0
5
10 Miles

APPENDIX B

Location and Scaled Comparison Maps of Lake Sidney Lanier and Lake Allatoona



<u>**LOCATION MAP**</u>

SCALE: N.T.S.'

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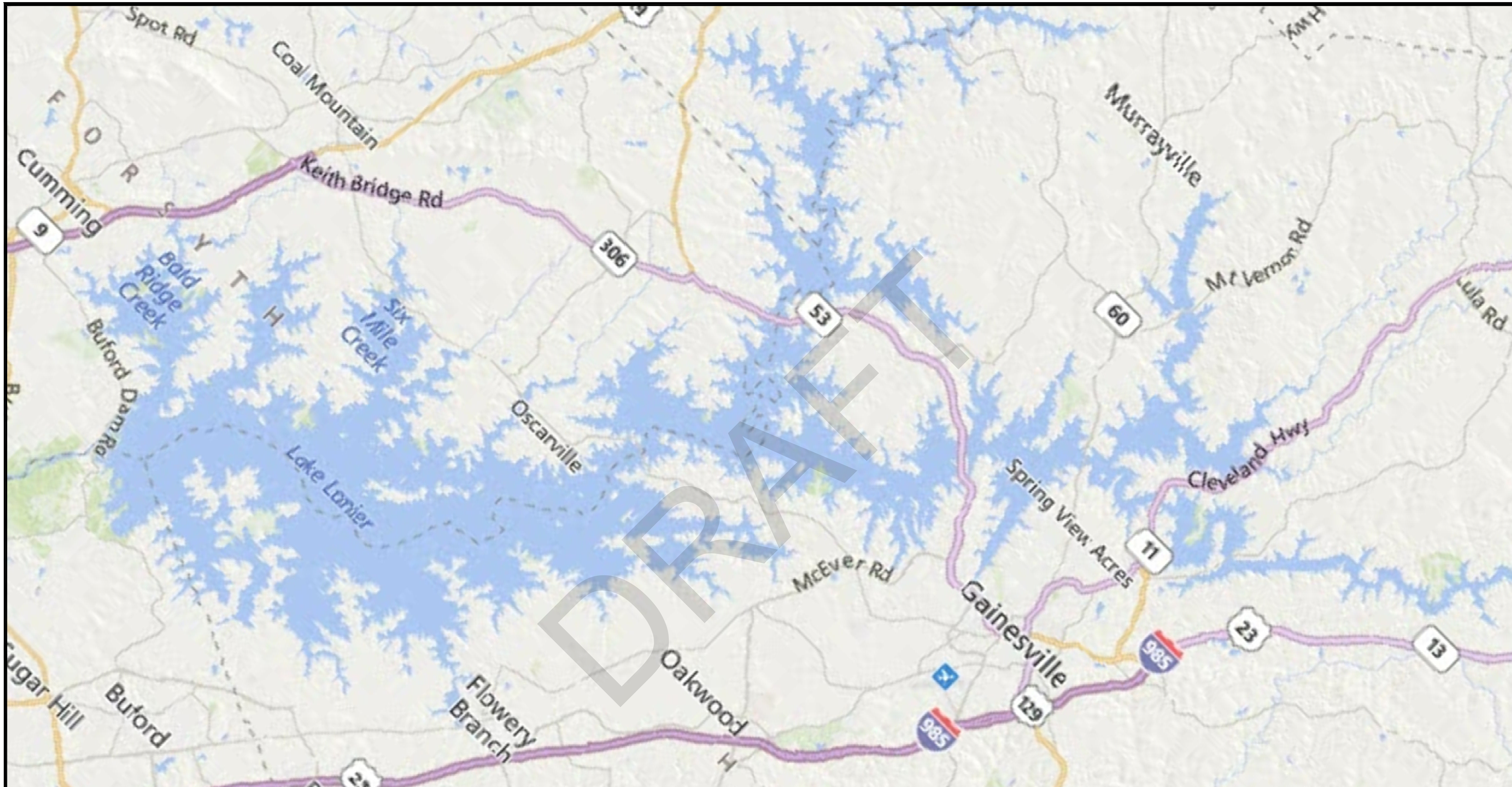
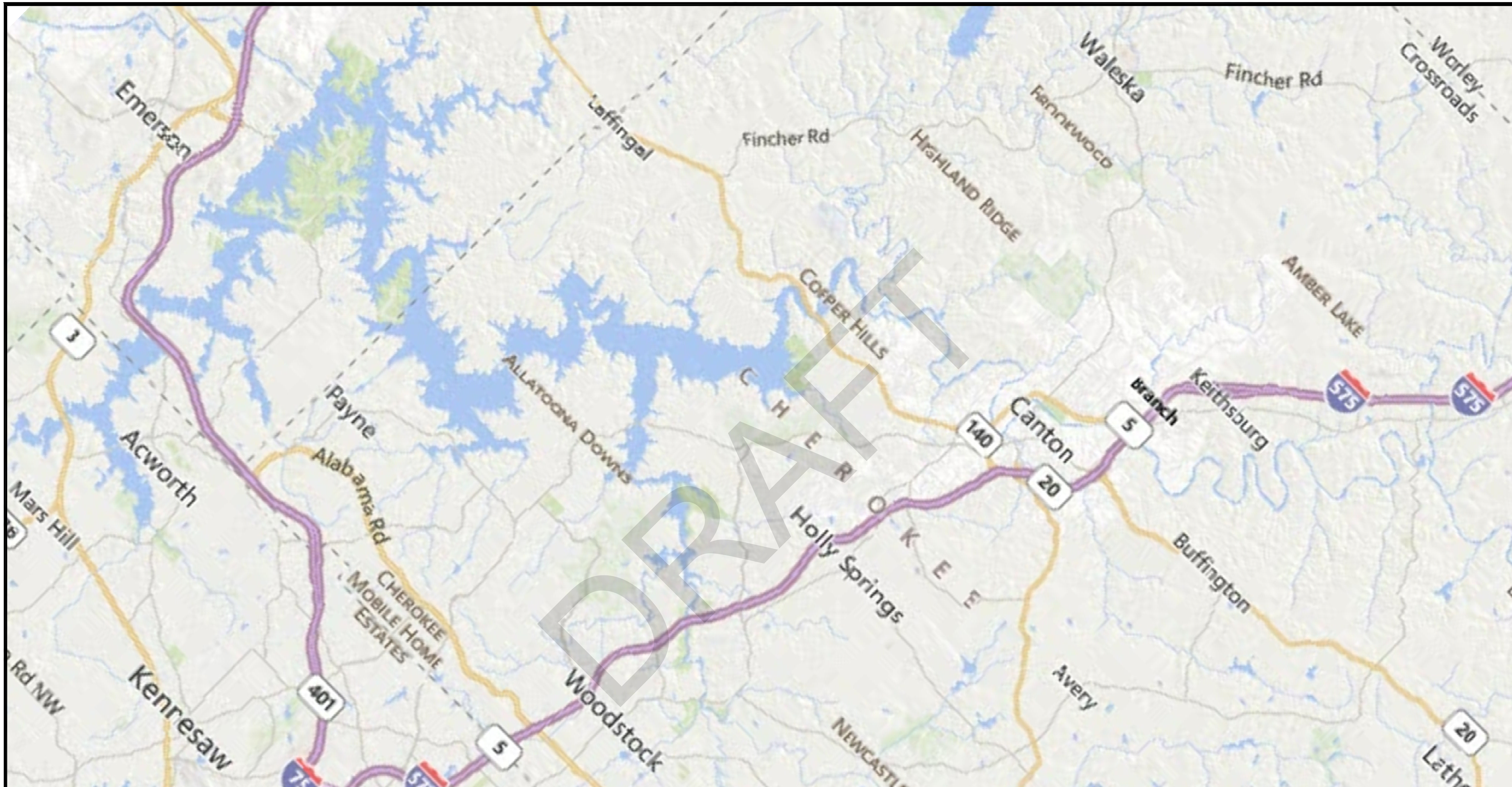


LAKE LANIER

SCALE: 1"=9000'

ENGINEERING MANAGEMENT
Experience ▪ Trust ▪ Solutions

303 Swanson Drive, Lawrenceville, GA 30043
phone 770-962-1387 fax # 770-962-8010
www.eminc.biz



LAKE ALLATOONA

SCALE: 1"=9000'

EMI ENGINEERING MANAGEMENT
Experience ▪ Trust ▪ Solutions
303 Swanson Drive, Lawrenceville, GA 30043
phone 770-962-1387 fax # 770-962-8010
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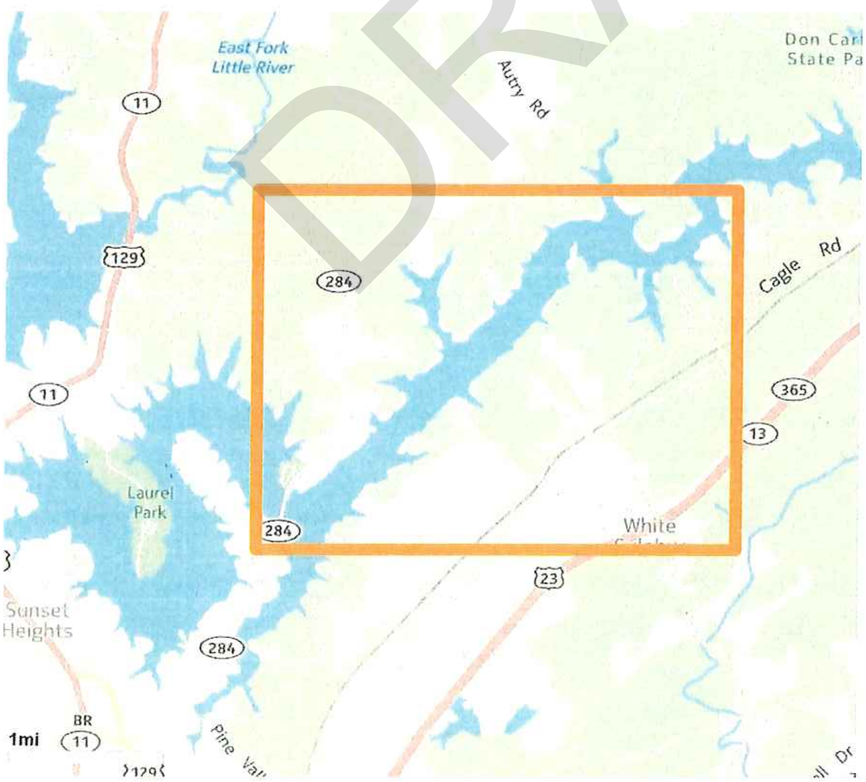
1996 Olympic Rowing Venue




Map
Hartsfield-Jackson Atlanta Int'l
Hartsfield-Jackson South Terminal
Cargo Service Rd
NLVR SE
Hudson Pkwy
Lee St
Airport Blvd
S Inner Loop Rd
Sullivan Rd
Loop Rd
85
75
285
403
407
139
72
14
29
238B
238A
239
58
59
© 2014 DigitalGlobe © 2014 Microsoft Corp


Map
Rogers Rd
Clarks Bridge Rd
Cagle Rd
Lotheridge Rd
Cornelia Hwy
Clarks Bridge Park
284
365
13
23
500m
0.5mi
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APPENDIX C

Surface Area Study

Lake Sidney Lanier Surface area Study

Surface area available for Seaplane takeoff and landing

This document contains maps, aerial and water level views along with Latitude and longitude information keyed to some suitable areas of Lake Sidney Lanier Georgia for takeoffs and landings of Seaplanes

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TABLE OF CONTENTS

INTRODUCTION

This document contains some of the areas of Lake Lanier suitable for seaplane takeoff and landing maneuvers. It should be noted these areas are not the only places seaplanes could land or takeoff. Any area of the lake a watercraft can travel at 30 MPH for 2 minutes without conflict (another vessel or obstruction) a seaplane would be off the water in less than 1 minute and above 500ft. at 2 minutes.


The takeoff run does not have to be straight.

Water depths have not been included in this document. Because the seaplane can taxi in approximately 11/2 feet of water, any obstruction can be easily seen during an inspection of an unfamiliar takeoff area. On Lake Lanier cloudy water conditions after heavy rains occur in narrow creek areas unsuitable for takeoff or landings.

The FAA minimum depth preferred for seaplane landings is 6 ft. but acknowledge 3 ft. is adequate for small single-engine operations. Water less than 6 feet deep is easily seen from seaplanes before landing.

All landings and takeoff areas are assumed to be 500 ft from the nearest docks or developed areas.

Each of the numbered areas documented contains a page that contains an aerial view. Takeoff and landing available lengths and its location is marked on a section of a Lake Lanier topographic map by an oval and arrow showing the cameras location and direction. Following the 1st page each area has separate pages for water level pictures.

Each page is marked with the area name and the central location of the area’s Latitude and Longitude. Each water level picture lists the Lat. & Lon. and the direction the picture was taken.

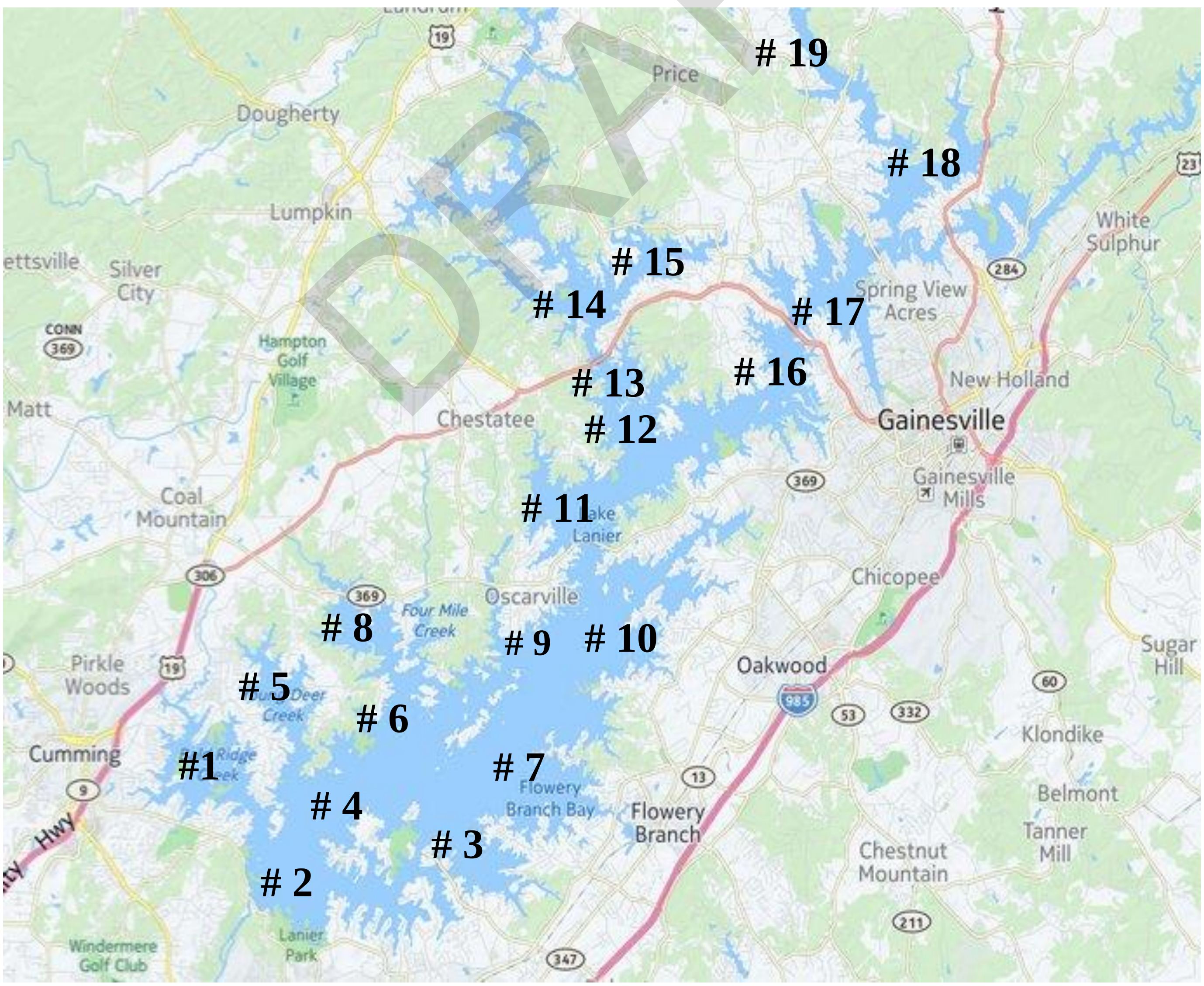
Digital U.S. Department of the Interior, US Geological Survey Quadrangle charts for Buford Dam, Flowery Branch, Chestatee, Gainesville and Clermont are available as PDF files.

This page contains an index of the numbered areas showing the general location of the documented area.

Some areas of the lake are not suitable for seaplane operations due to water surface restricted by USACE regulations. The upper reaches of the Chestatee would fall in this category.

Another area would be the Olympic Rowing Venue, though large enough to fit all of Atlanta Hartsville Jackson International airports runways, approximately 12,000 ft. by 1200 ft , there is an overhead power line at the South West end and the approximate middle of the area. There is a power line just beyond the entrance of Flowery Branch creek as well. These areas could be listed in the Seaplane Associations water directory as to be avoided.

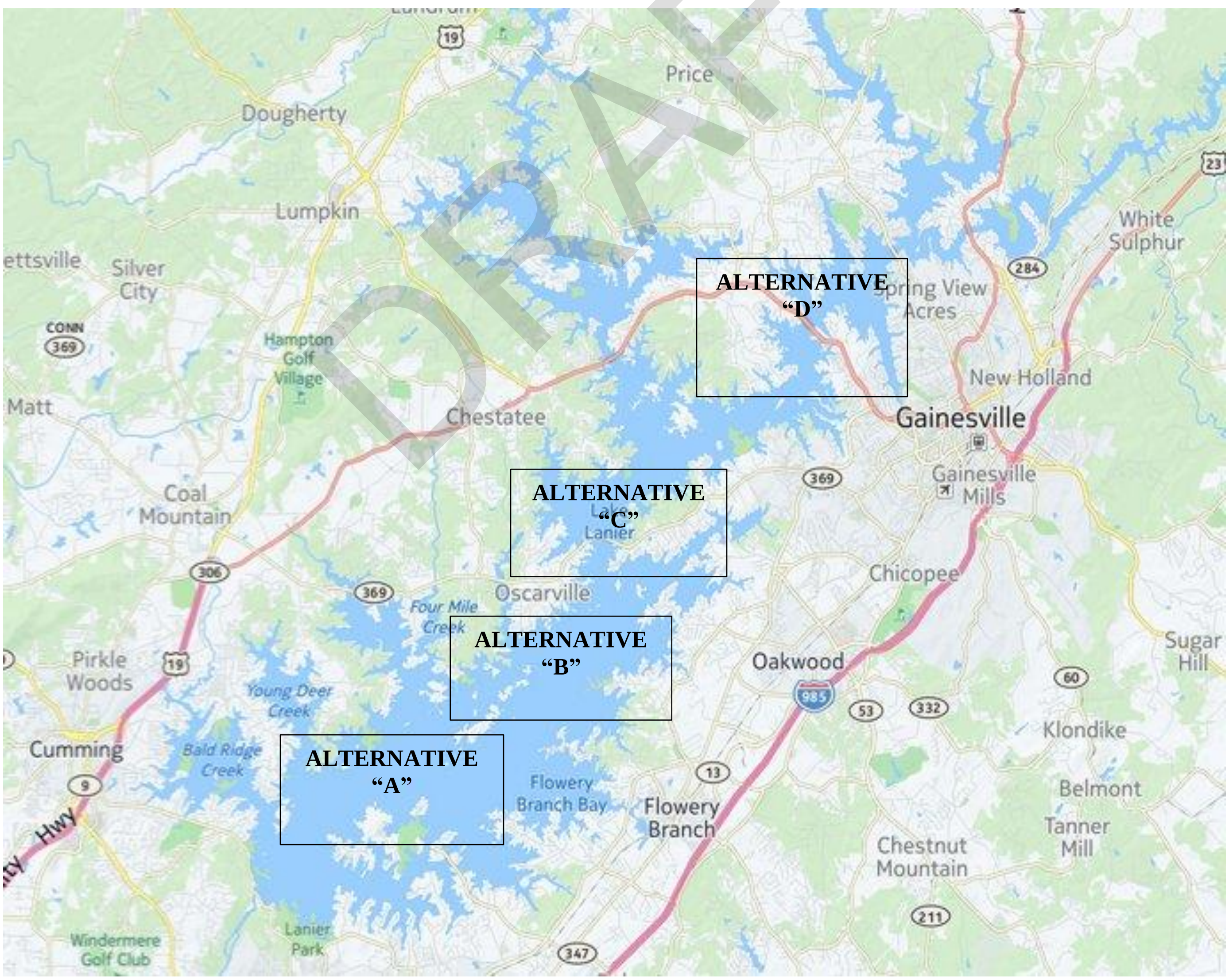
Powerlines crossing the lake will be indicated by this symbol 



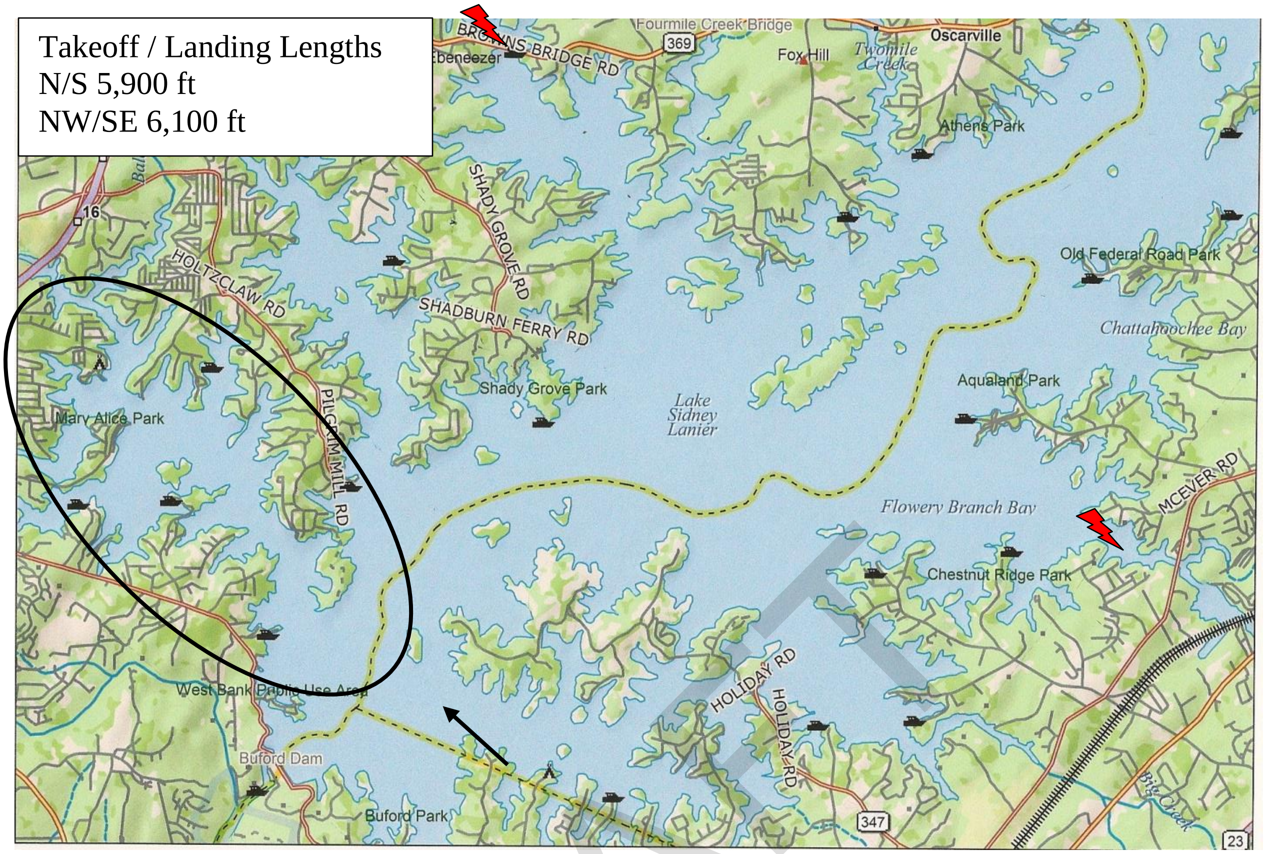
The Limited Landing Site Alternative:

The following areas would be listed as operational areas for the listed reasons, area “A” # 4 Cocktail Cove, for access to Lake Lanier Islands, # 3, Holiday Bay, for access to Holiday Marina, and # 6, Shady Grove, for the campground, area “B” # 7 and # 9, Aqualand, both sides, for fuel and food, and dock space storage. Area “C” # 10, and # 11, In front of Sunrise or in Flat Creek, would have less boat traffic for access to Port Royal for food, fuel and dock storage. Lastly area “D” # 16 and # 17, around the Gainesville Marina for food, fuel and dock space storage. Another area would be # 12, the Chestatee River in adjacent to Duckett Mill camp ground.

Specific sites may require the FAA's additional inspections and applications (FAA 7480-1) with and filing of a FAA 5010-3 Master record of operations for approval of public sites as opposed to intermittent operations across the whole of the lake which should not require applications or site inspections.



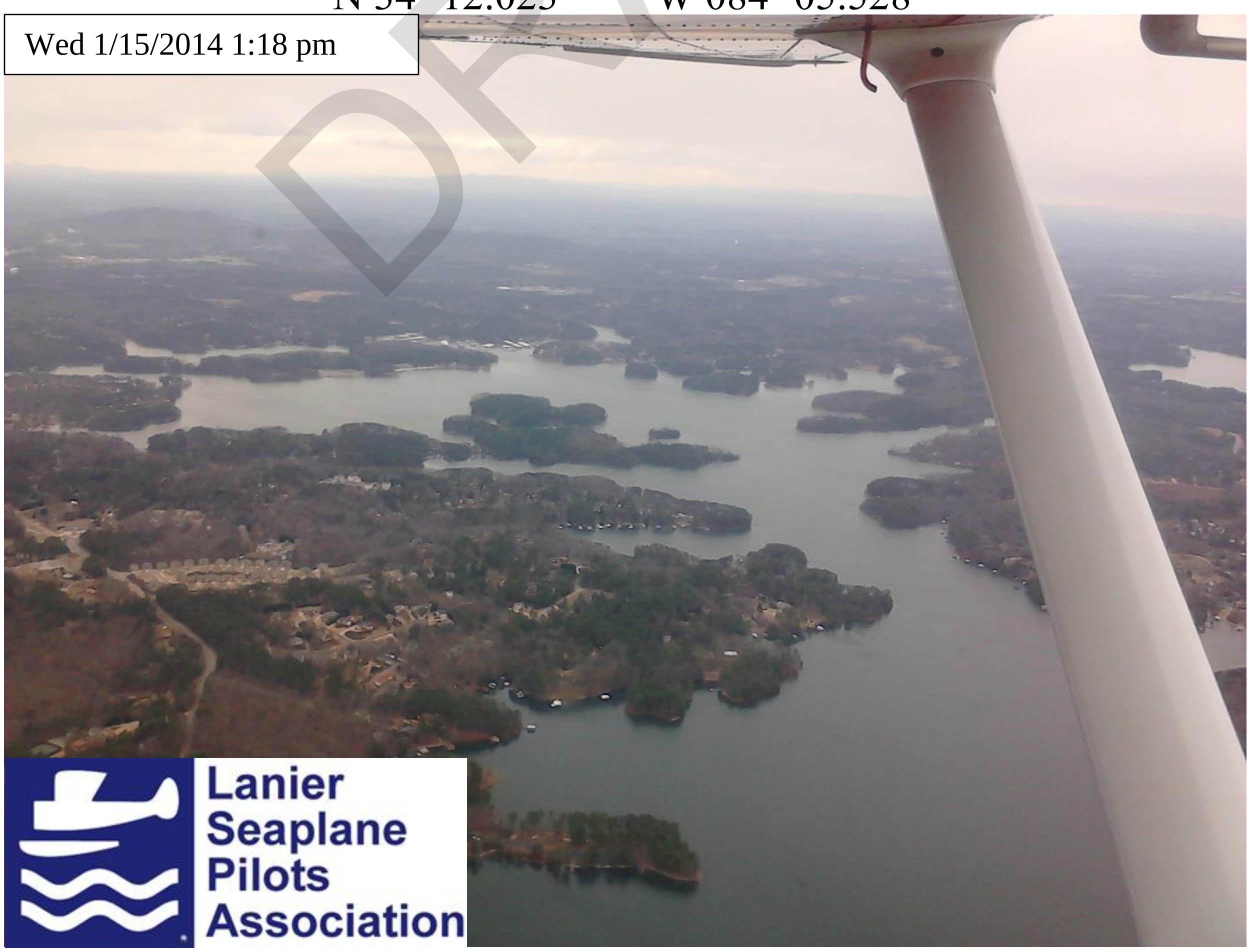
Takeoff / Landing Lengths
N/S 5,900 ft
NW/SE 6,100 ft



Bald Ridge – Mary Alice

N 34’ 12.023   W 084’ 05.528

Wed 1/15/2014 1:18 pm



N 34’ 10.676 W 084’ 04.853 Looking NNW 335’

Bald Ridge – Mary Alice
N 34’ 12.023 W 084’ 05.528

N 34’ 12.112 W 084’ 05.442 Looking SSE 148’

N 34’ 12.112 W 084’ 05.442 Looking SSW 200’

Sunday 3/8/2014 4:24 pm

Bald Ridge – Mary Alice

N 34’ 12.023 W 084’ 05.528

N 34’ 12.112 W 084’ 05.442 Looking NW 328’

Sunday 3/8/2014 4:24 pm

Lanier Seaplane Pilots Association

N 34’ 11.320 W 084’ 05.746 Looking NNE 020’

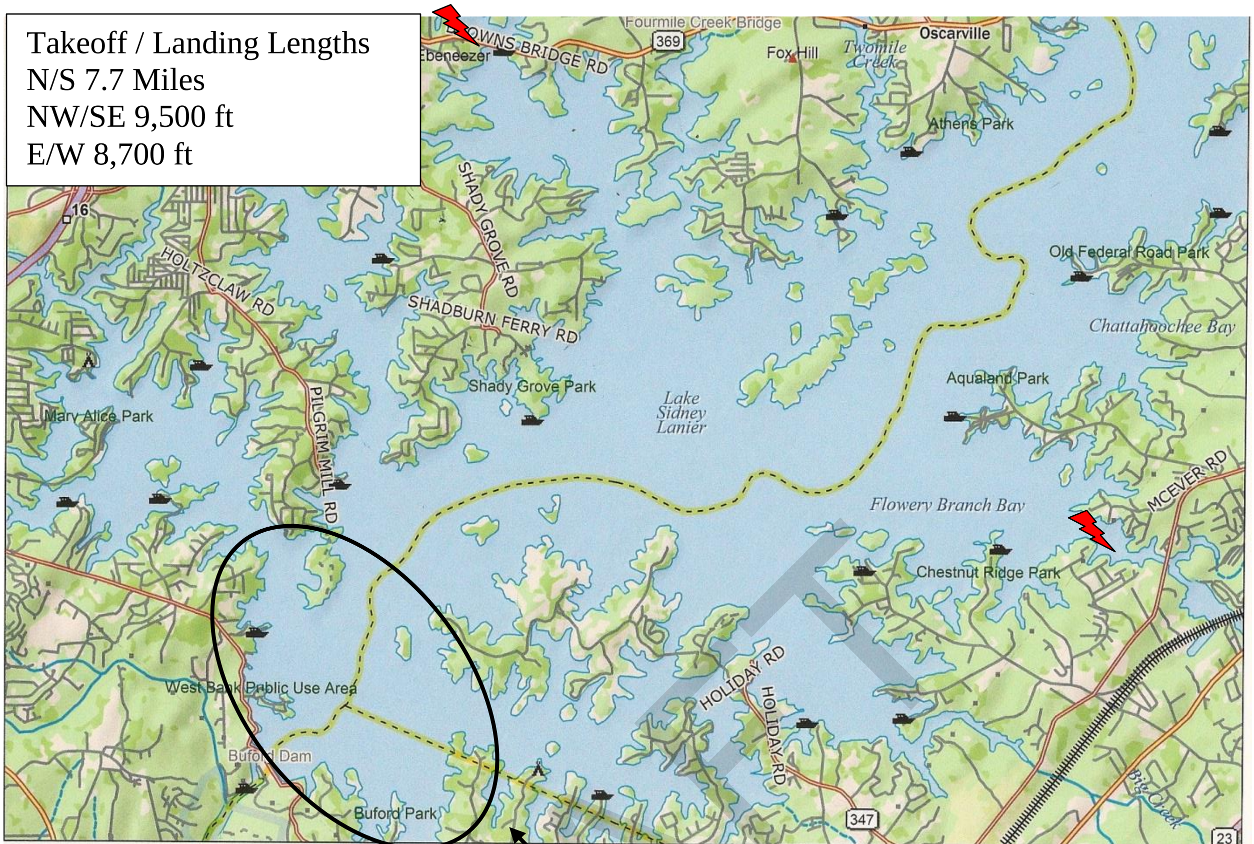
Sunday 3/8/2014 4:37 pm

Bald Ridge – Mary Alice

N 34’ 12.023 W 084’ 05.528

Lanier Seaplane Pilots Association

Takeoff / Landing Lengths
N/S 7.7 Miles
NW/SE 9,500 ft
E/W 8,700 ft



Buford Dam

N 34’ 10.000 W 084’ 03.576

Mon 8/12/13 10:19 am

N 34’ 10.670 W 084’ 04.853 Looking SE 131’

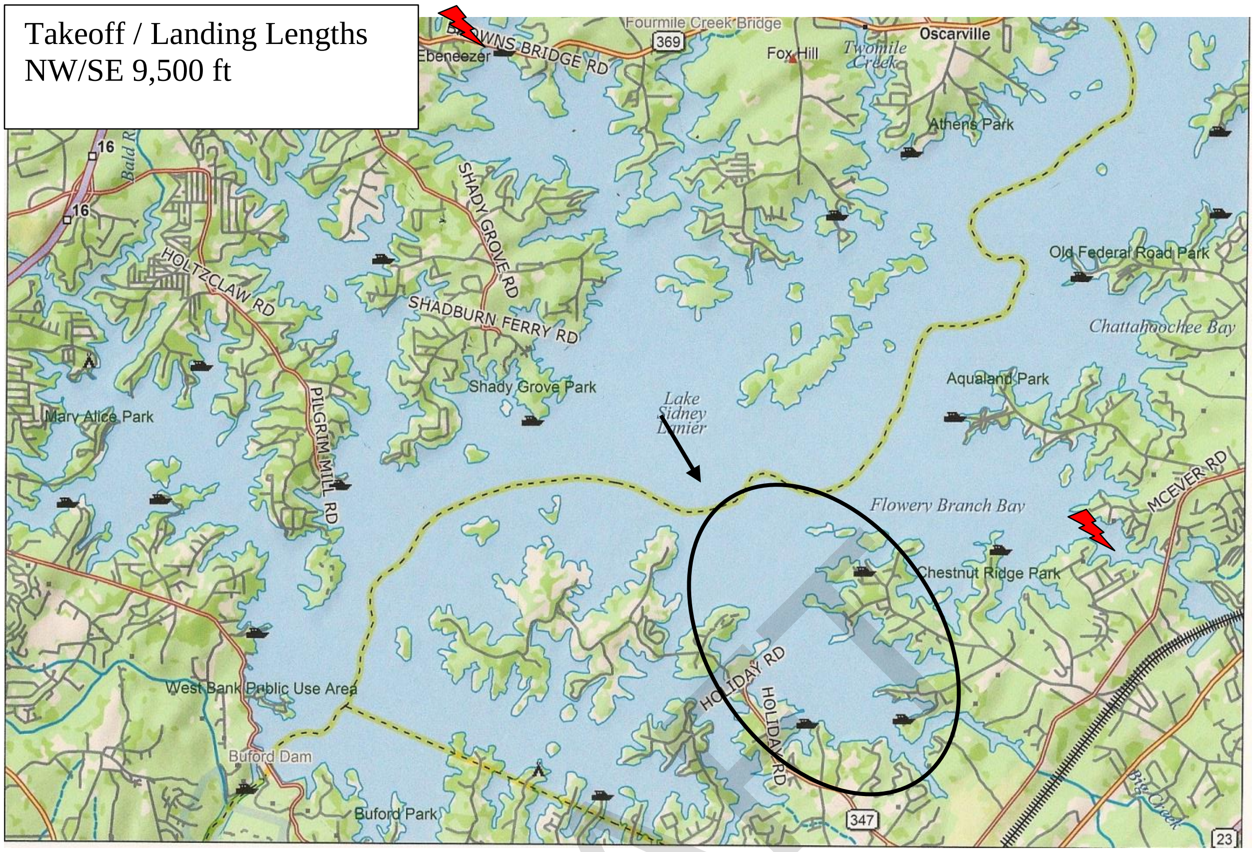
Buford Dam

N 34’ 10.000 W 084’ 03.576

N 34’ 09.557 W 084’ 01.635 Looking NW 320’

Lanier Seaplane Pilots Association

Takeoff / Landing Lengths
NW/SE 9,500 ft



Holiday Marina

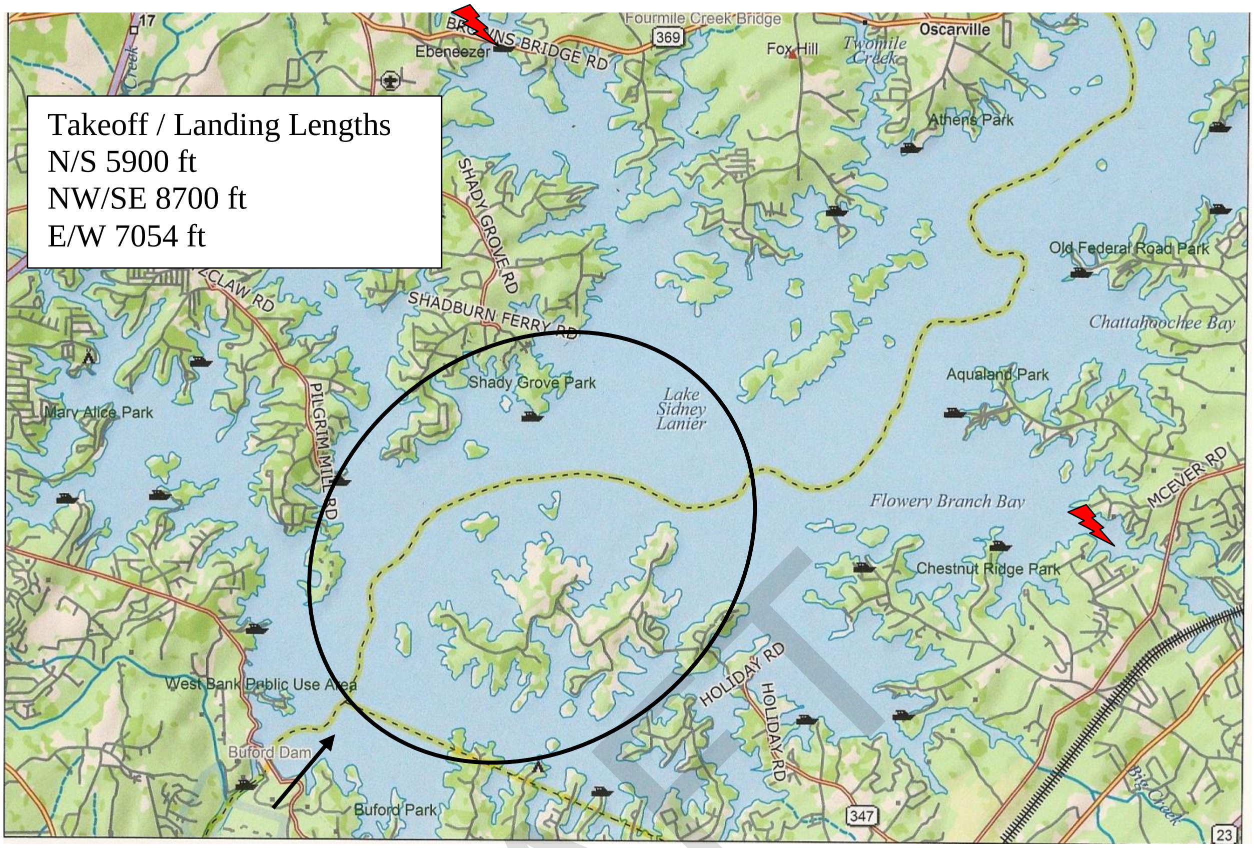
N 34’ 10.502   W 083’ 50.710

Wed 1/15/2014 1:18 pm

N 34’ 12.339 W084’ 01.068 Looking SSE 160’

Holiday Marina
N 34’ 10.502 W 083’ 50.710

N 34’ 09.987 W 083’ 59.333 Looking NW 330’



Cocktail Cove

N 34’ 11.067   W 084’ 02.770

Lanier Seaplane Pilots Association

N 34’ 10.937 W 084’ 03.156 Looking E 075’

Cocktail Cove

N 34’ 11.067 W 084’ 02.770

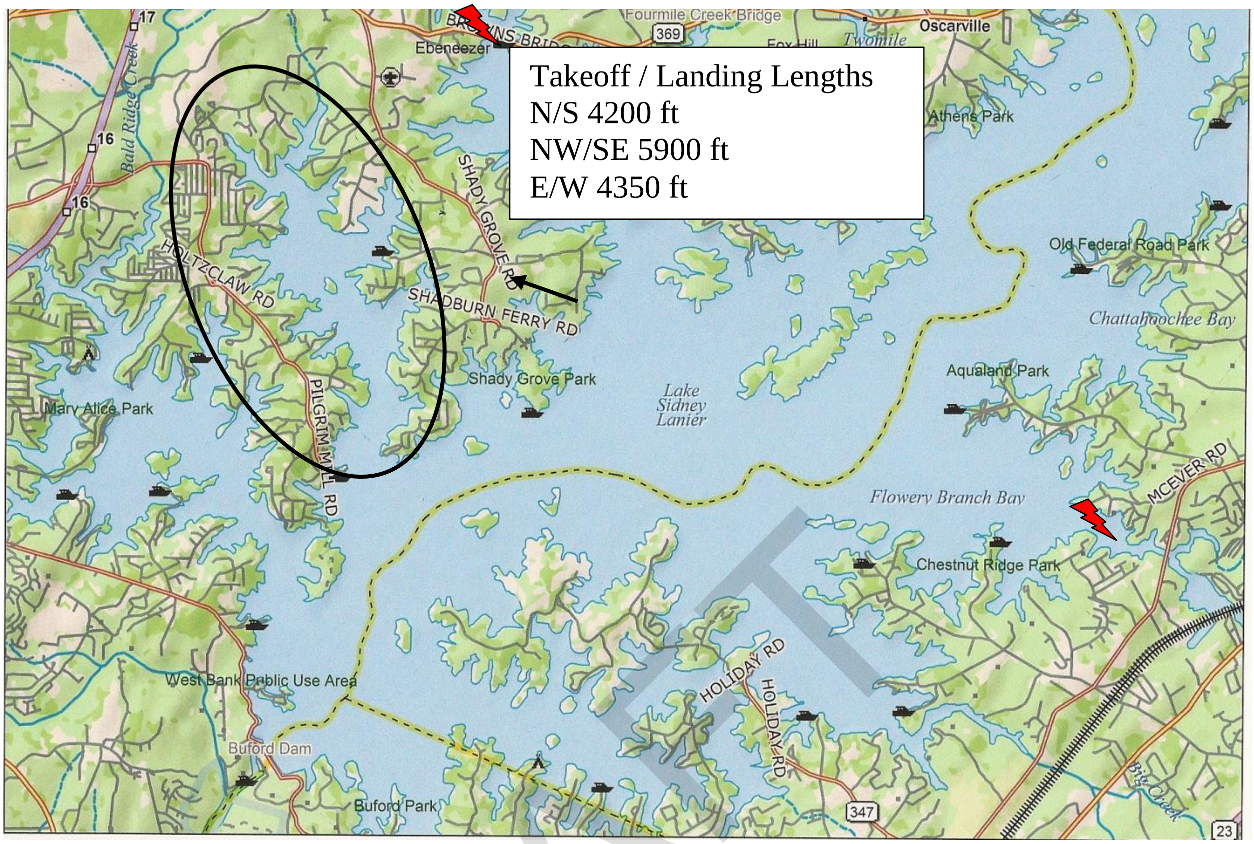
N 34’ 10.937 W 084’ 03.156 Looking ESE 110’

N 34’ 10.937 W 084’ 03.156 Looking SW 226’

Cocktail Cove

N 34’ 11.067 W 084’ 02.770

N 34’ 10.937 W 084’ 03.156 Looking S 190’



Young Deer Creek

N 34’ 13.267   W 084’ 04.045

N 34’ 11.836 W 084’ 03.556 Looking N 010’

Tue 5/5/15 10:43 am

Young Deer Creek

N 34’ 13.267 W 084’ 04.045

N 34’ 11.836 W 084’ 03.556 Looking S 190’

Tue 5/5/15 10:43 am

Lanier Seaplane Pilots Association

N 34’ 12.307 W 084’ 03.467 Looking N 350’

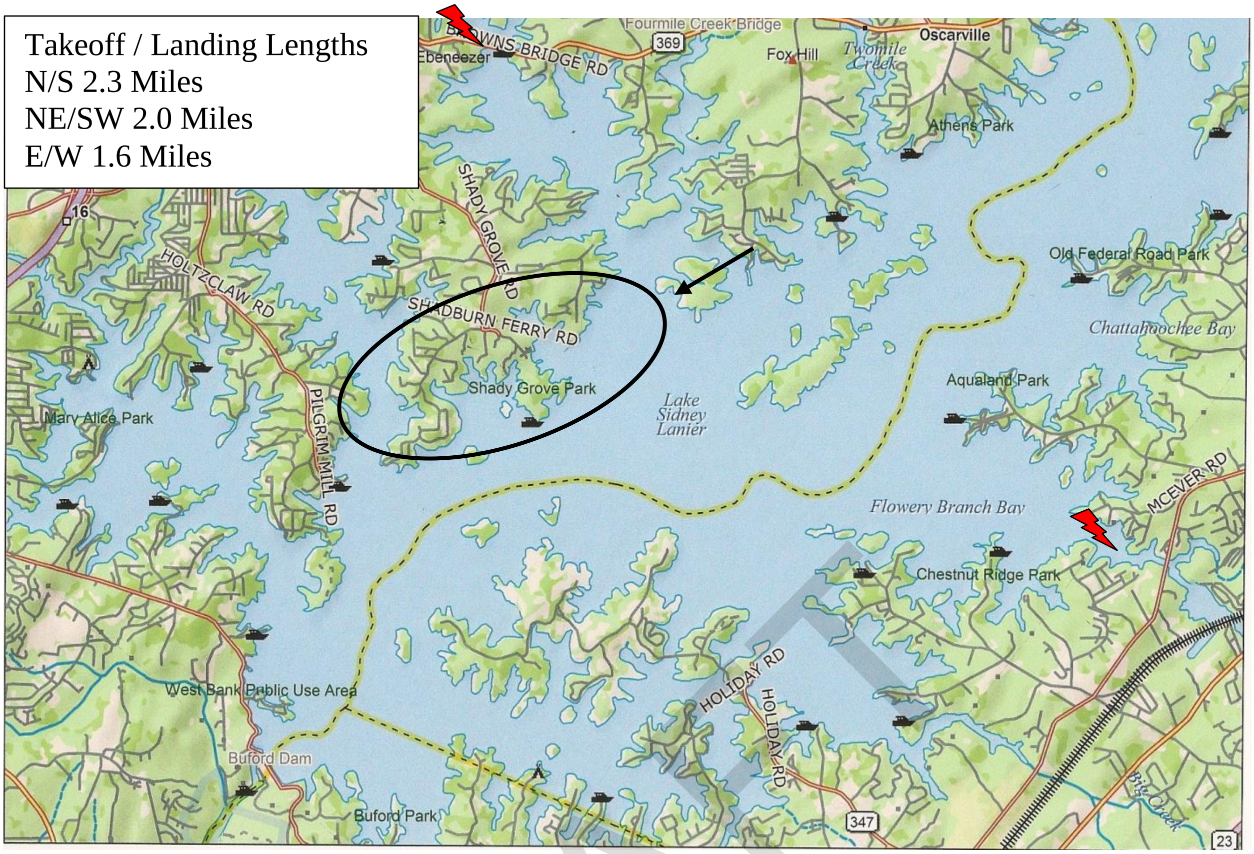
Tue 5/5/15 10:52 am

Young Deer Creek
N 34’ 13.267 W 084’ 04.045

N 34’ 13.182 W 084 03.975 Looking NE 050’

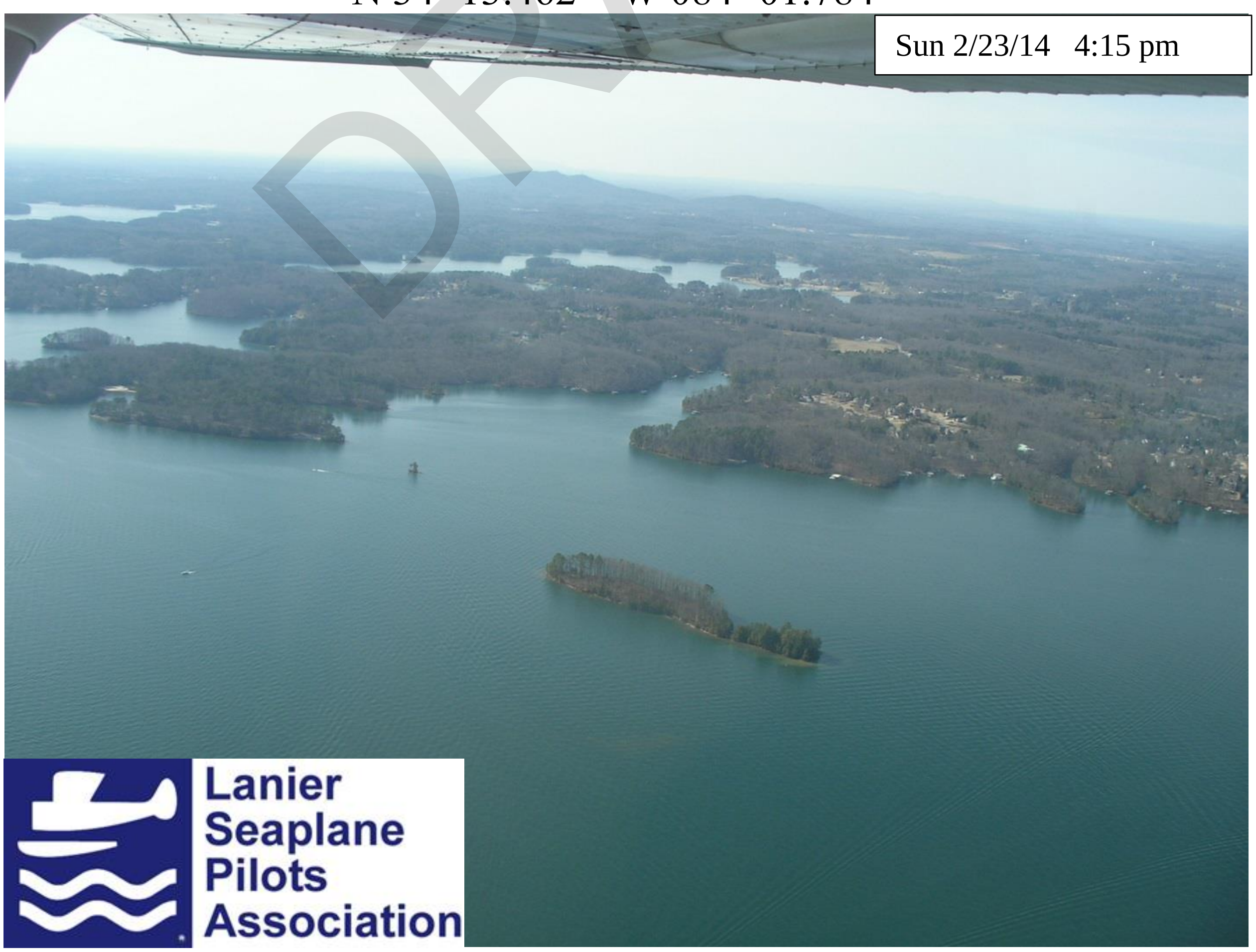
Tue 5/5/15 11:06 am

Takeoff / Landing Lengths
N/S 2.3 Miles
NE/SW 2.0 Miles
E/W 1.6 Miles



Shady Grove Park

N 34’ 13.462   W 084’ 01.784



Sun 2/23/14   4:15 pm

Lanier Seaplane Pilots Association

N 34’’ 12.003 W 084’ 01.429 Looking SSW 200’

Shady Grove Park
N 34’ 13.462 W 084’ 01.784

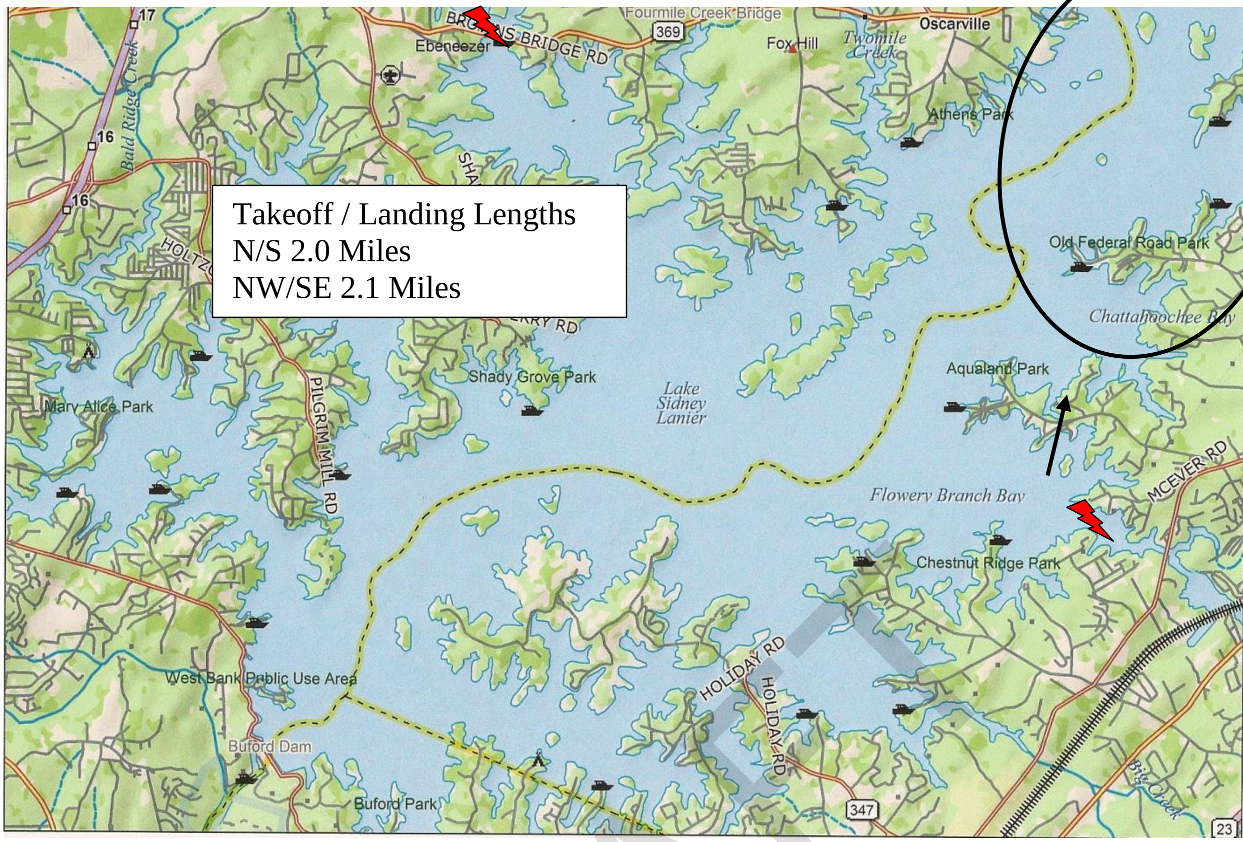
N 34’’ 12.604 W 084’ 01.688 Looking ESE 110’

N 34’’ 12.363 W 084’ 01.089 Looking WNW 290’

Shady Grove Park

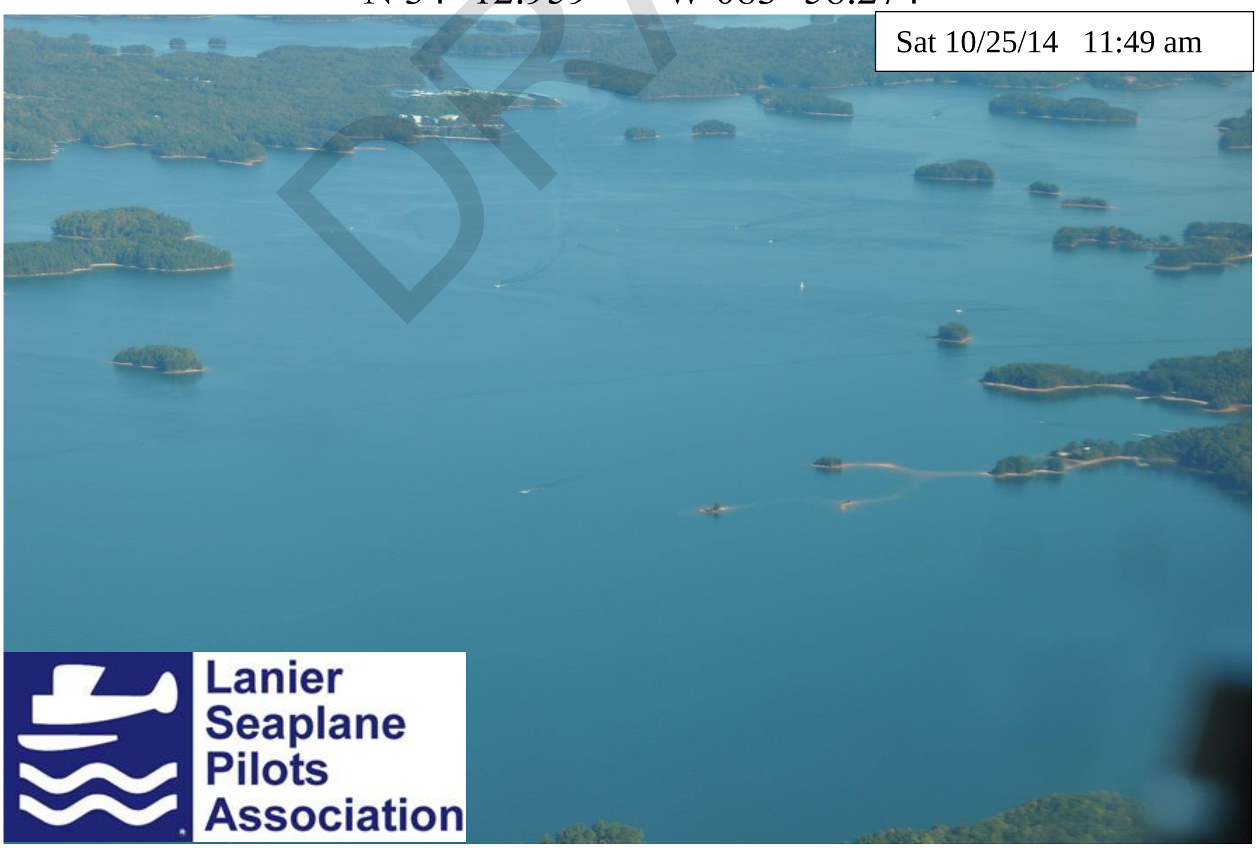
N 34’ 13.462 W 084’ 01.784

N 34’’ 12.384 W 084’ 01.638 Looking NNE 020’



Aqualand to Port Royal

N 34’ 12.959 W 083’ 58.274



N 34’ 11.764 W 083’ 59.028 Looking NNE 020’

Aqualand to Port Royal
N 34’ 12.959 W 083’ 58.274

N 34’ 11.764 W 083’ 59.028 Looking 095’

N 34’ 11.764 W 083’ 59.028 Looking ESE 115’

Sun 3/15/15 3:27 pm

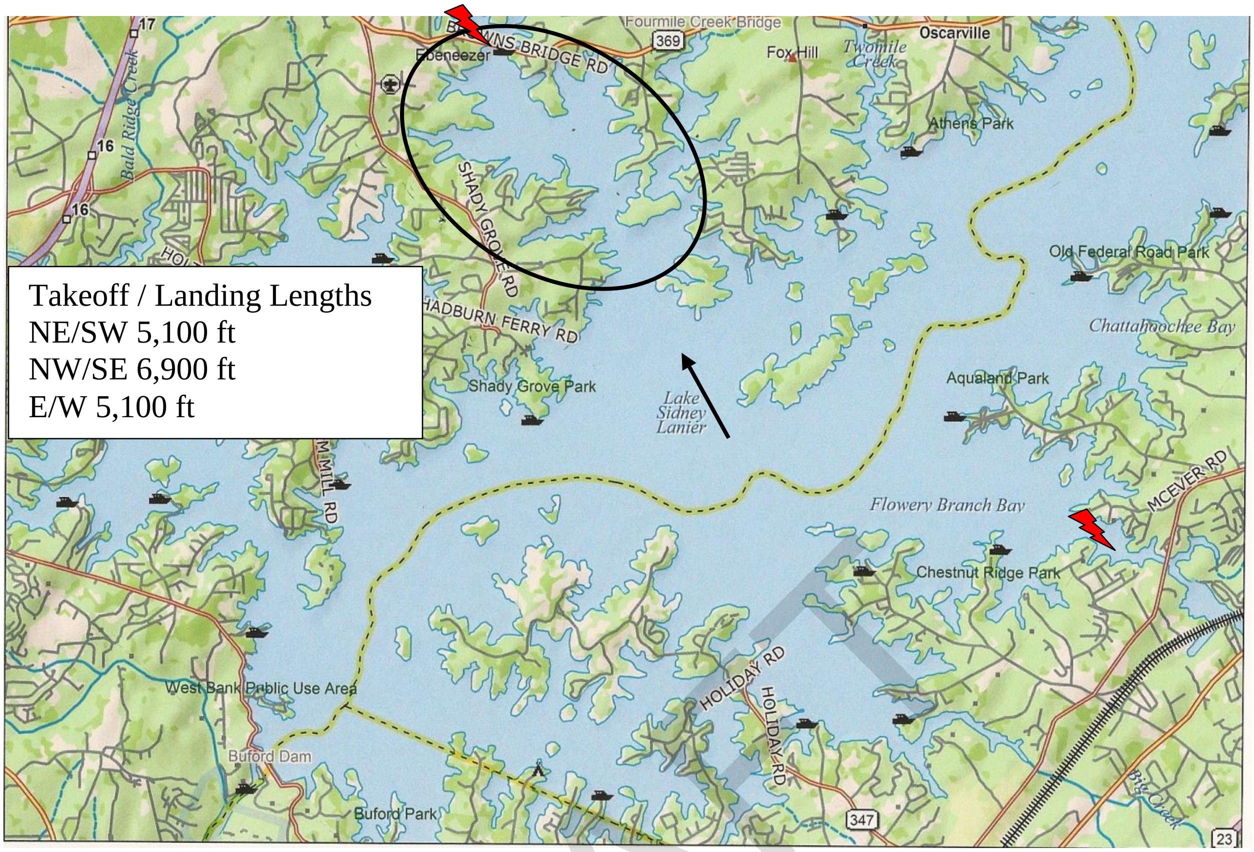
Aqualand to Port Royal

N 34’ 12.959 W 083’ 58.274

N 34’ 11.764 W 083’ 59.028 Looking WSW 250’

Sun 3/15/15 3:28 pm

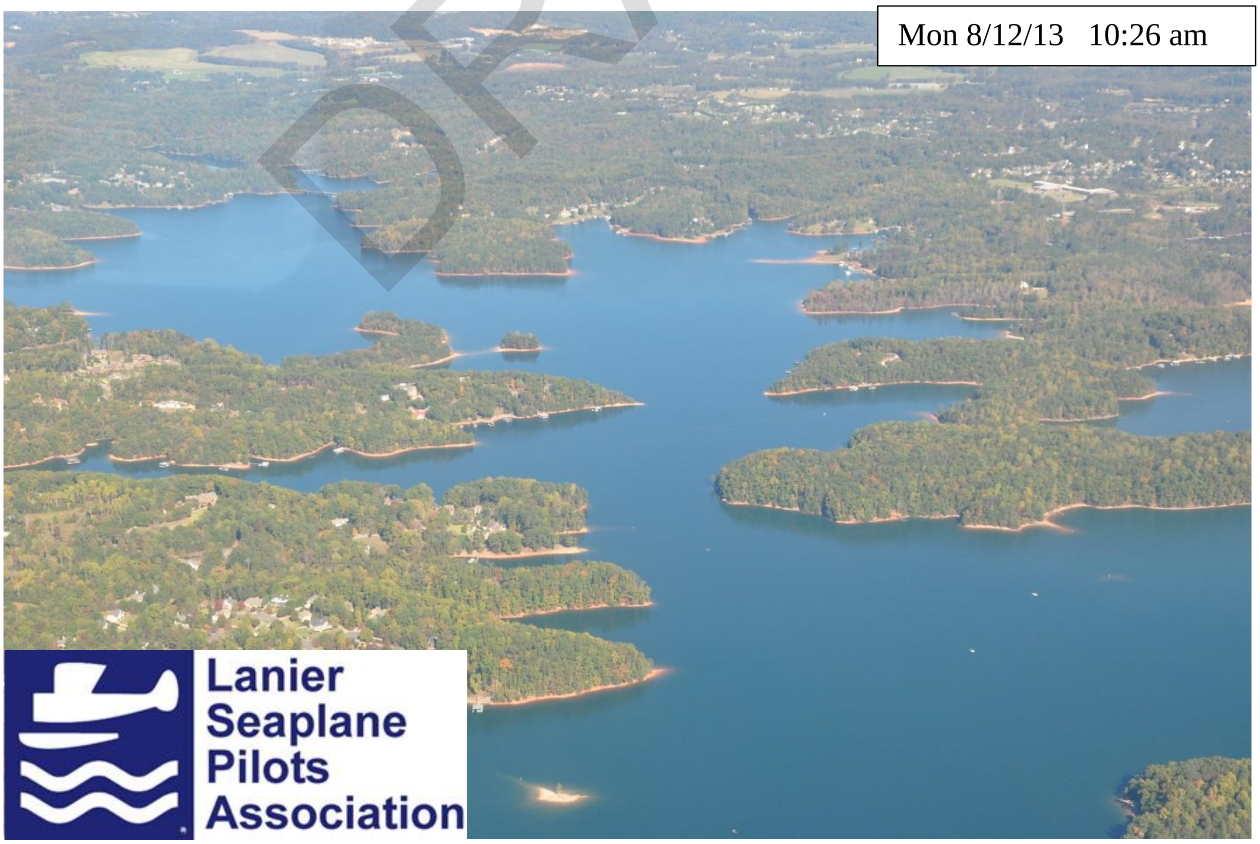
Lanier Seaplane Pilots Association



Charleston Park Bay

N 34’ 14.240 W 084’ 02.186

Mon 8/12/13 10:26 am

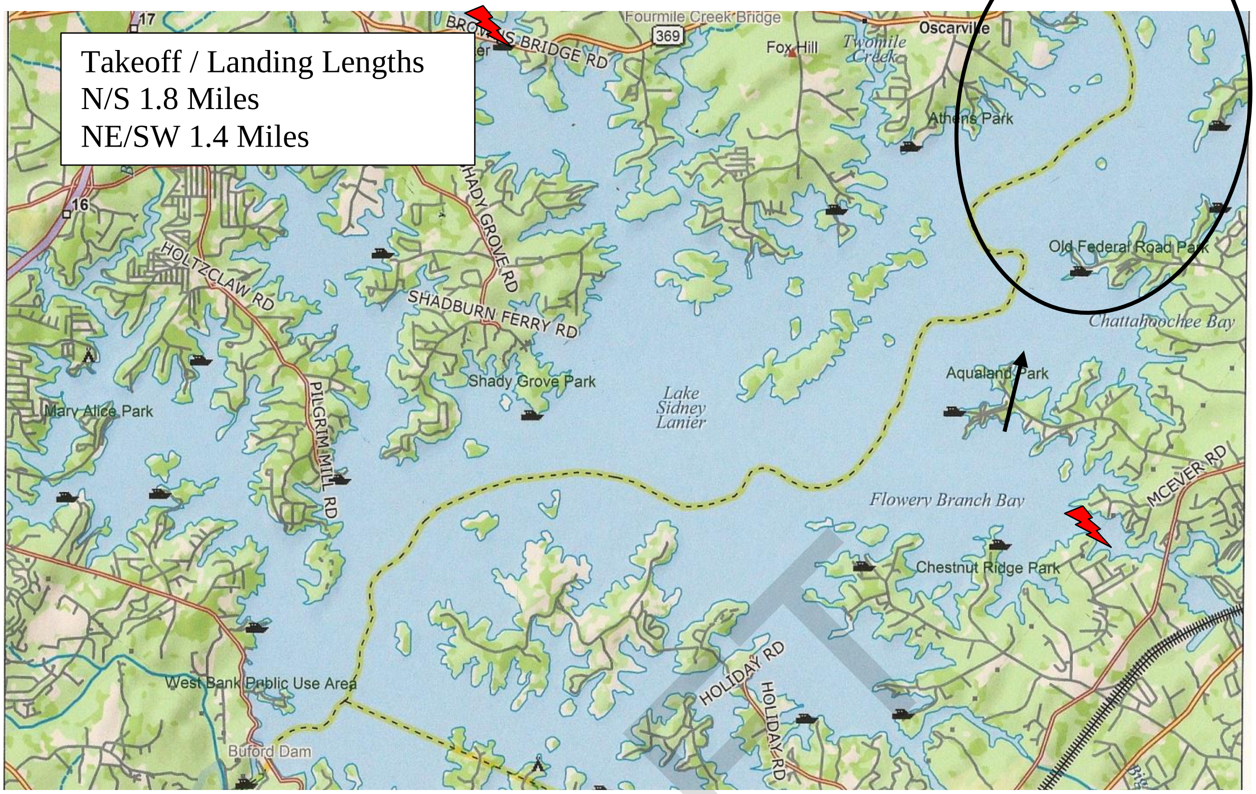


N 34’ 14.000 W 084’ 01.585 Looking WNW 300’

Charleston Park Bay

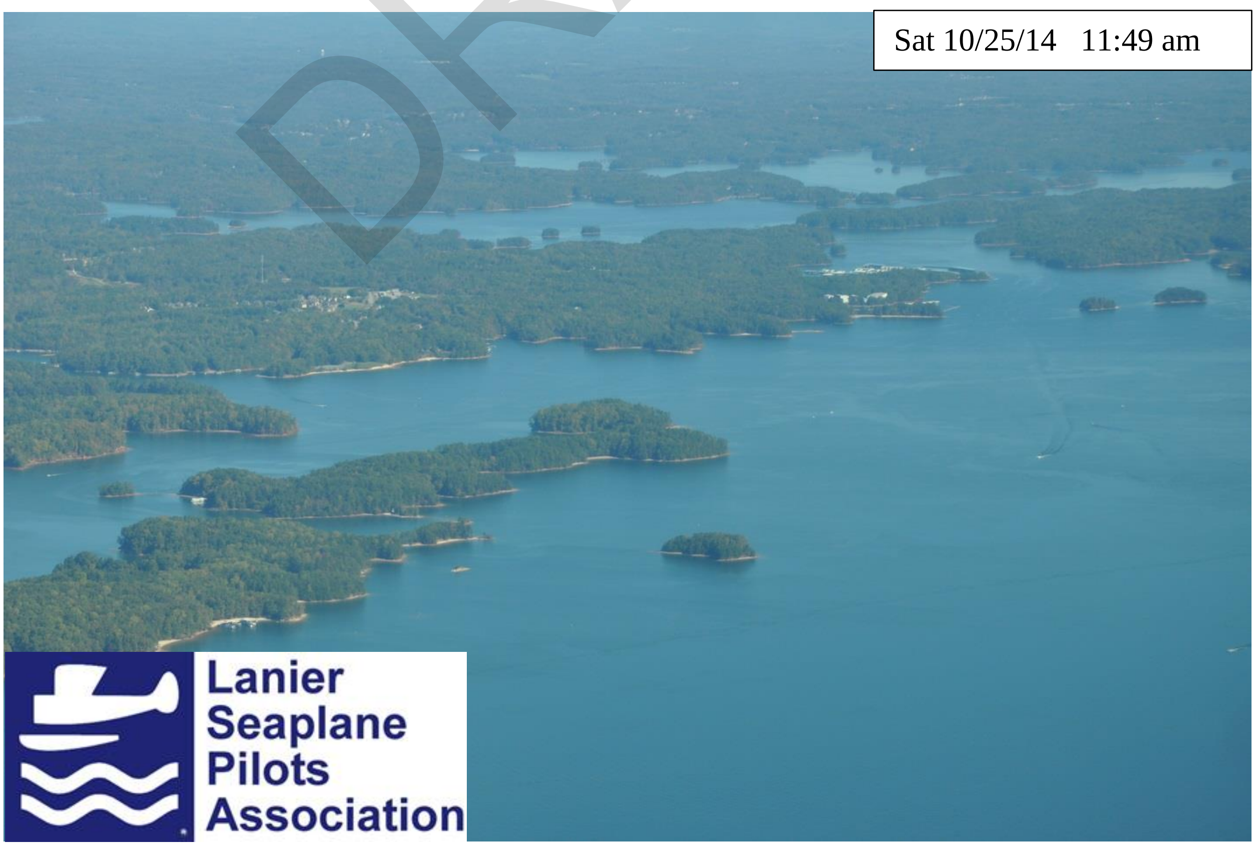
N 34’ 14.240 W 084’ 02.186

N 34’ 14.603 W 084’02.587 Looking SSE 150’



Port Royal

N 34’ 14.254   W 083’ 57.928



N 34’ 14.076   W 083’ 58.172   Looking   NE   055’

Port Royal

N 34’ 14.254   W 083’ 57.928

N 34’ 14.076   W 083’ 58.172   Looking   E 90’

N 34’ 14.076   W 083’ 58.172   Looking   SSE 160’

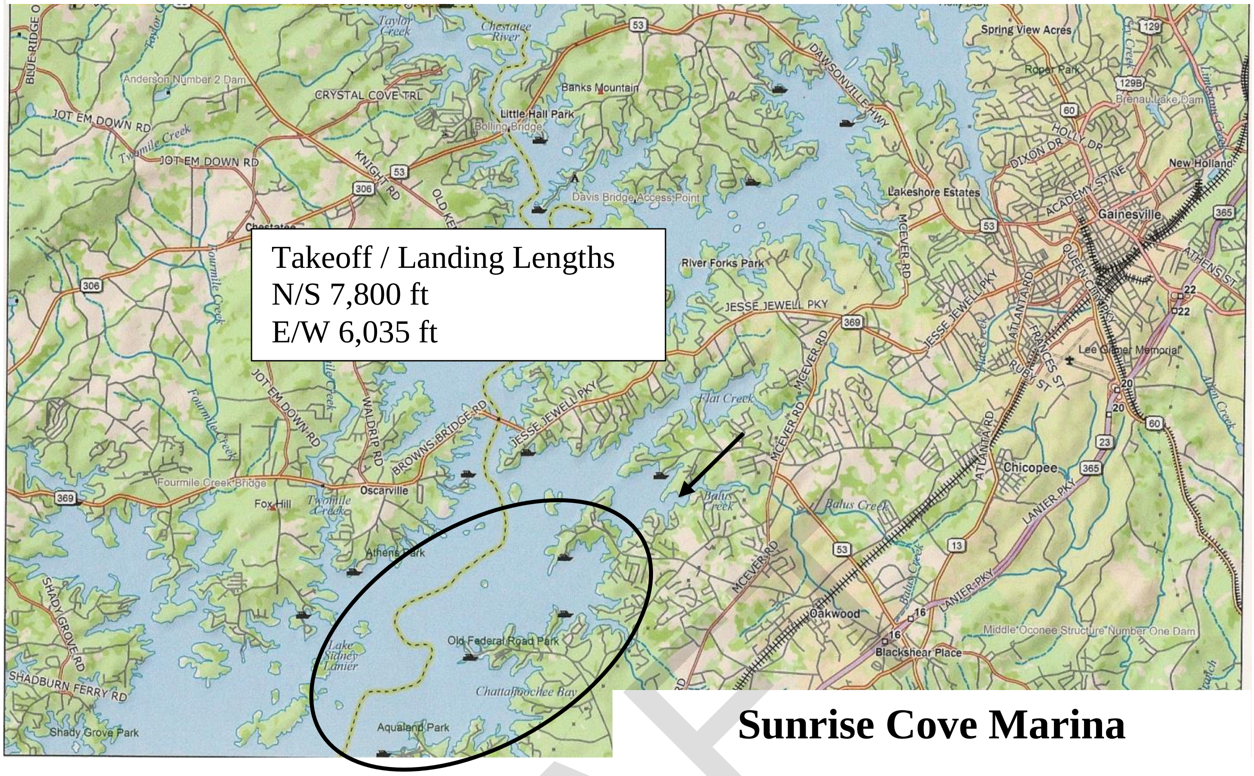
Sun 3/15/15   3:54 pm

Port Royal

N 34’ 14.254   W 083’ 57.928

N 34’ 14.076   W 083’ 58.172   Looking   WSW   250’

Sun 3/15/15   3:54 pm



Sunrise Cove Marina

N 34’ 13.963 W 083’ 56.178

N 34’ 13.986 W 083’ 56.026 Looking WNW 290’

Sun 3/15/15 4:30 pm

Sunrise Cove

N 34’ 13.963 W 083’ 56.178

N 34’ 13.973 W 083’ 56.548 Looking NNW 345’

Sun 3/15/15 4:41 pm

Lanier Seaplane Pilots Association

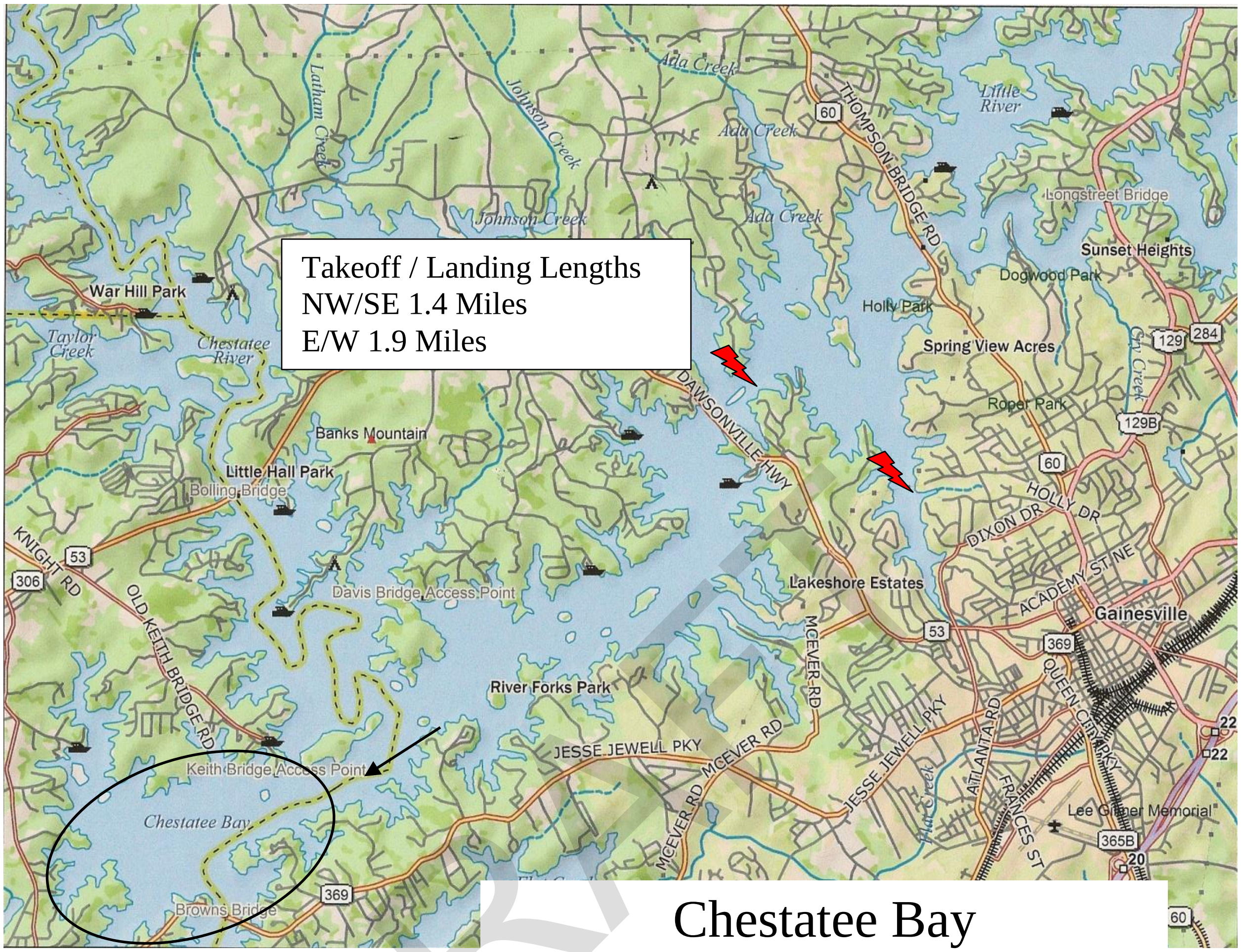
N 34' 14.510 W 083' 57.154 Looking SSE 155'

Sun 3/15/15 5:35 pm

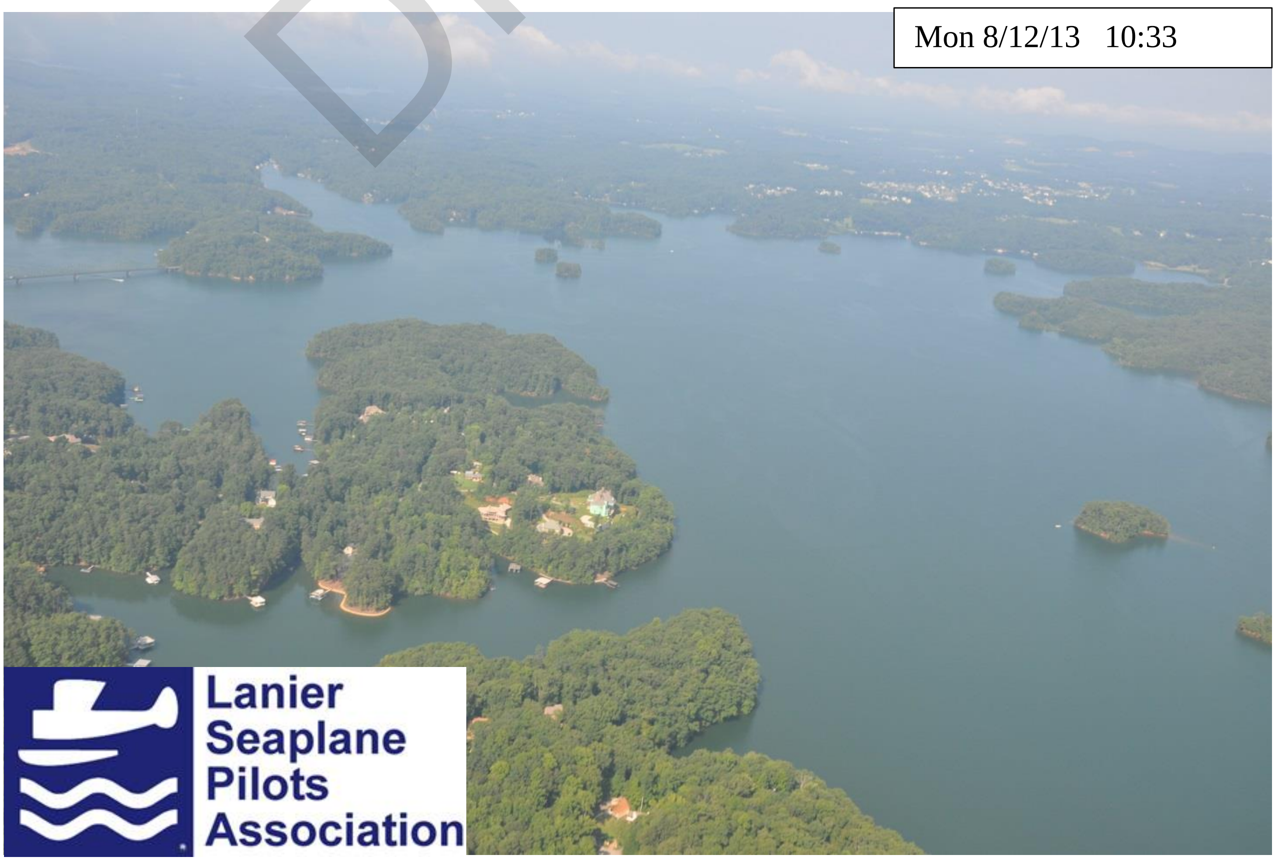
Sunrise Cove

N 34' 13.963 W 083' 56.178

Lanier Seaplane Pilots Association



N 34’ 16.289 W 083’ 57.693



N 34’ 16.335 W 083’ 57.546 Looking W 260’

Chestatee Bay

N 34’ 16.289 W 083’ 57.693

N 34’ 16.335 W 083’ 57.546 Looking SSE 150’

N 34' 16.335 W 083' 57.546 Looking E 080'

Chestatee Bay

N 34' 16.289 W 083' 57.693

N 34' 17.184 W 083' 55.544 Looking W 270'

Chestatee River

N 34' 17.392 W 083' 56.163

N 34’ 17.956 W 083’ 56.738 Looking SSE 152’

Chestatee River

N 34’17.392 W 083’ 56.163

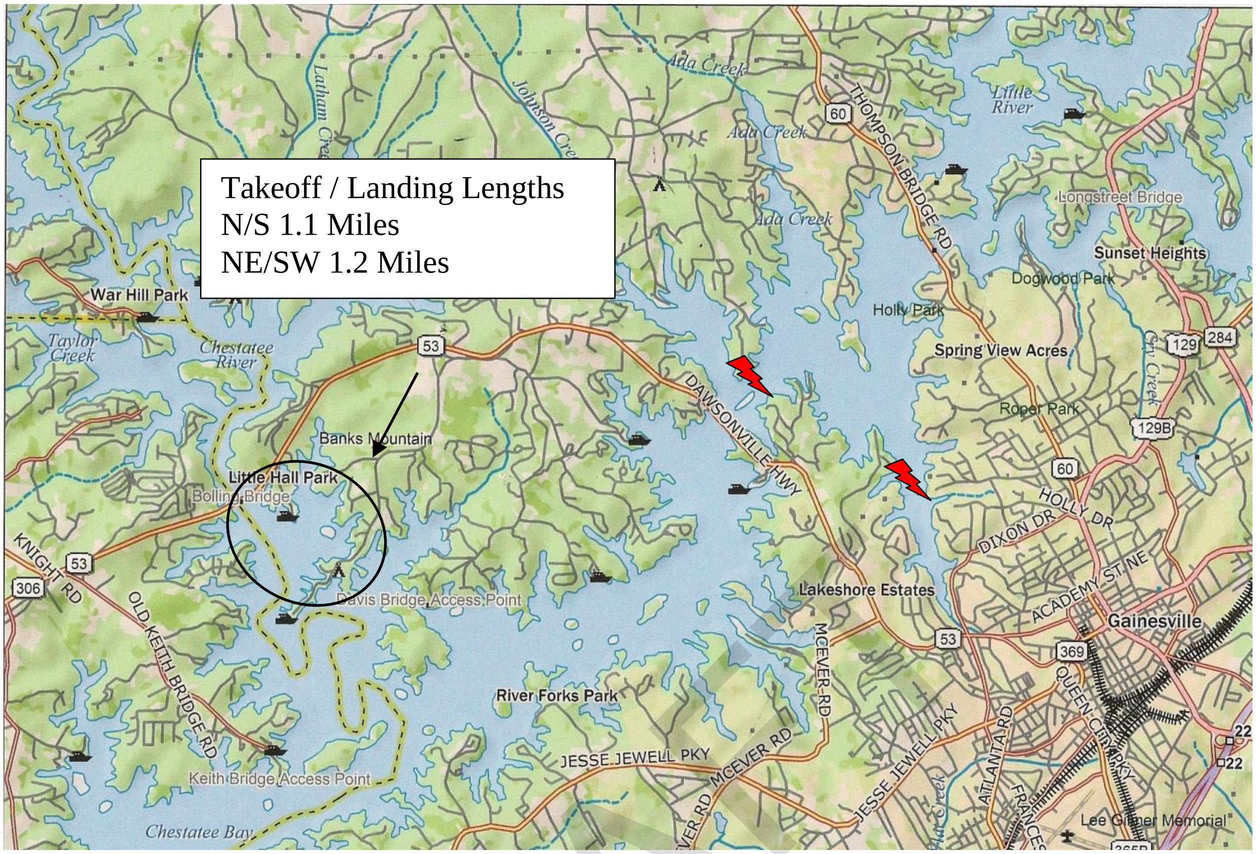
N 34’ 17.345 W 083’ 56.262 Looking NW 330’

Lanier Seaplane Pilots Association

N 34’ 17.345 W 083’ 56.262 Looking NNE 020’

Chestatee River
N 34’17.392 W 083’ 56.163

N 34’ 17.345 W 083’ 56.262 Looking SSW 200’



LITTLE HALL

N 34’ 18.427 W 083’ 56.446

N 34’ 18.287 W 083’ 56.594 Looking SSE 150’

LITTLE HALL

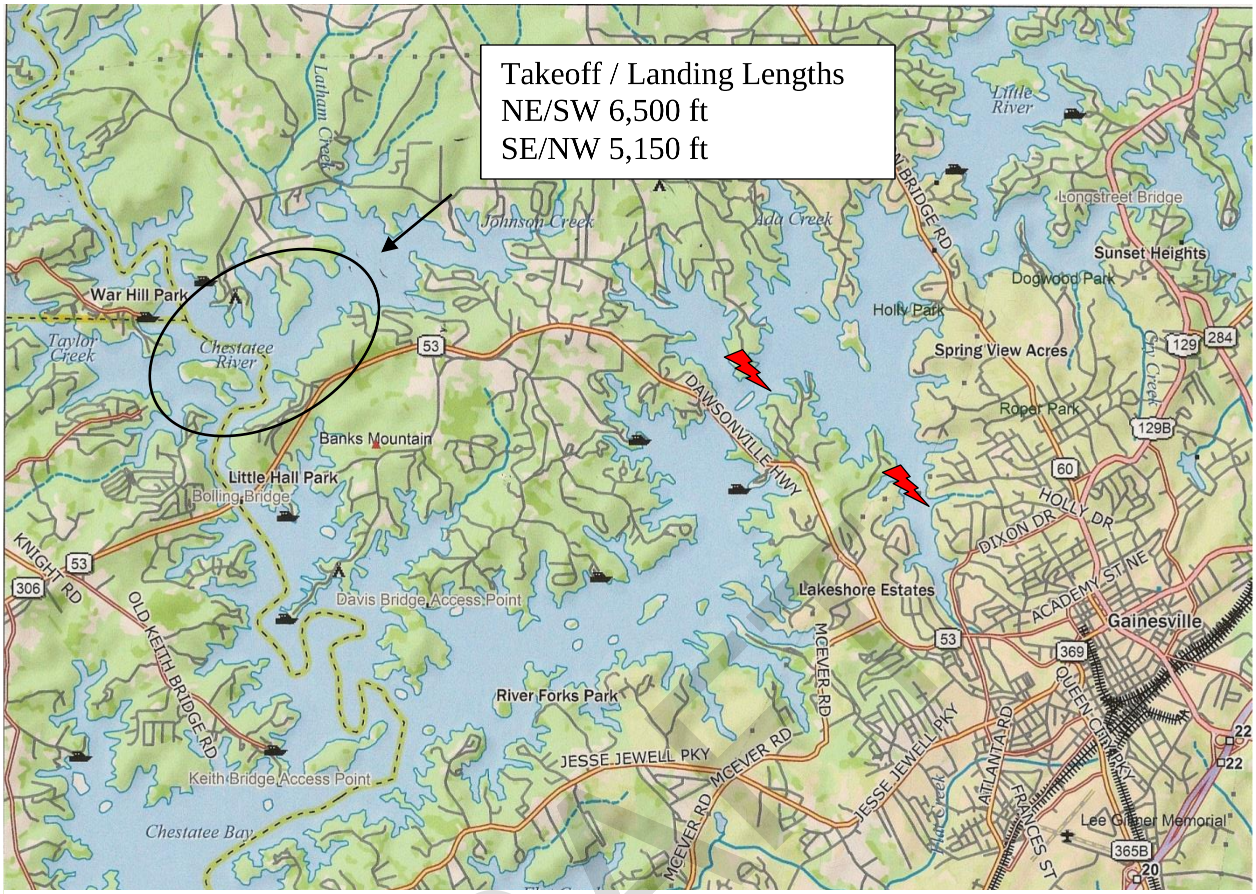
N 34’ 18.427 W 083’ 56.446

N 34’ 18.287 W 083’ 56.594 Looking NNE 020’

N 34’ 18.287   W 083’ 56.594   Looking   SSW 200’

LITTLE HALL
N 34’ 18.427   W 083’ 56.446

Lanier
Seaplane
Pilots
Association



HARBOR POINT & LATHAM CREEK

N 34’ 19.873 W 083’ 56.538

N 34’ 19.795 W 083’ 56.831 Looking NE 050’

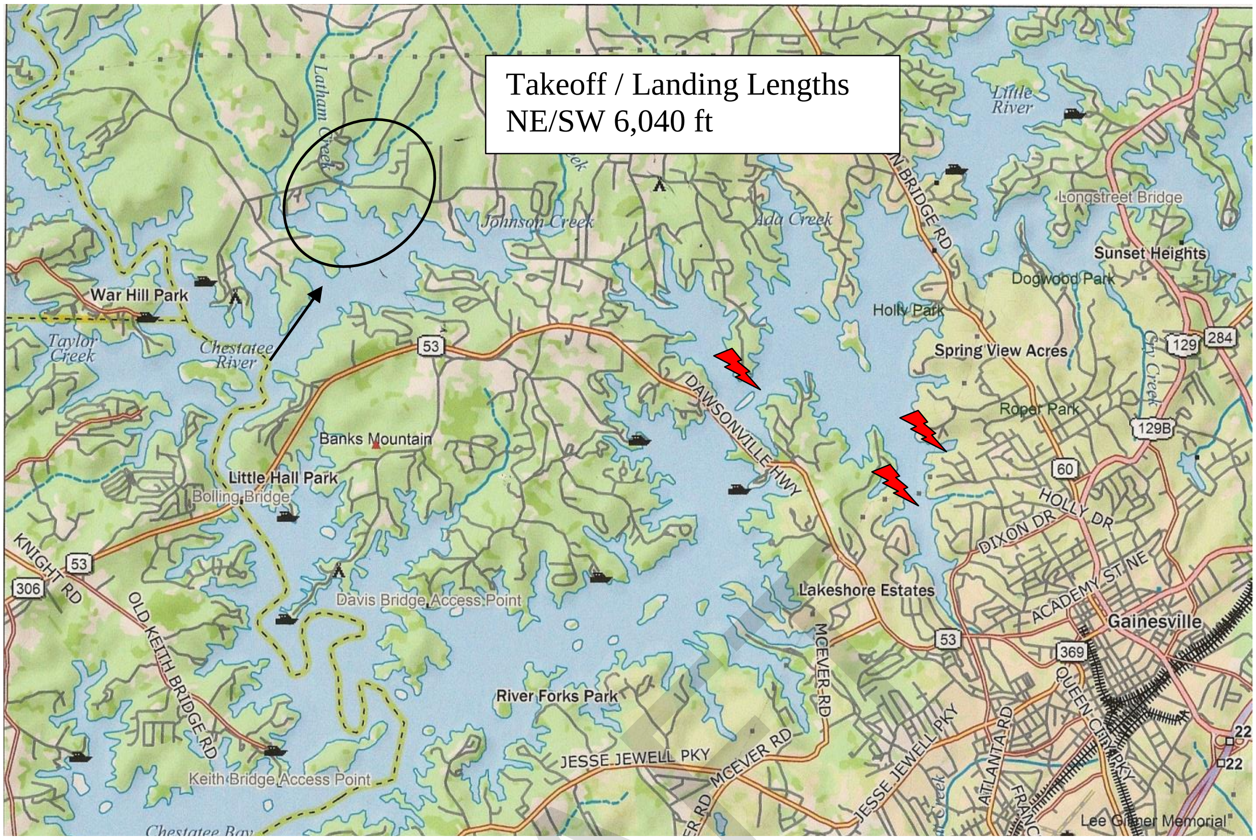
Fri 7/17/15 10:20 am

HARBOR POINT & LATHAM CREEK

N 34’ 19.873 W 083’ 56.538

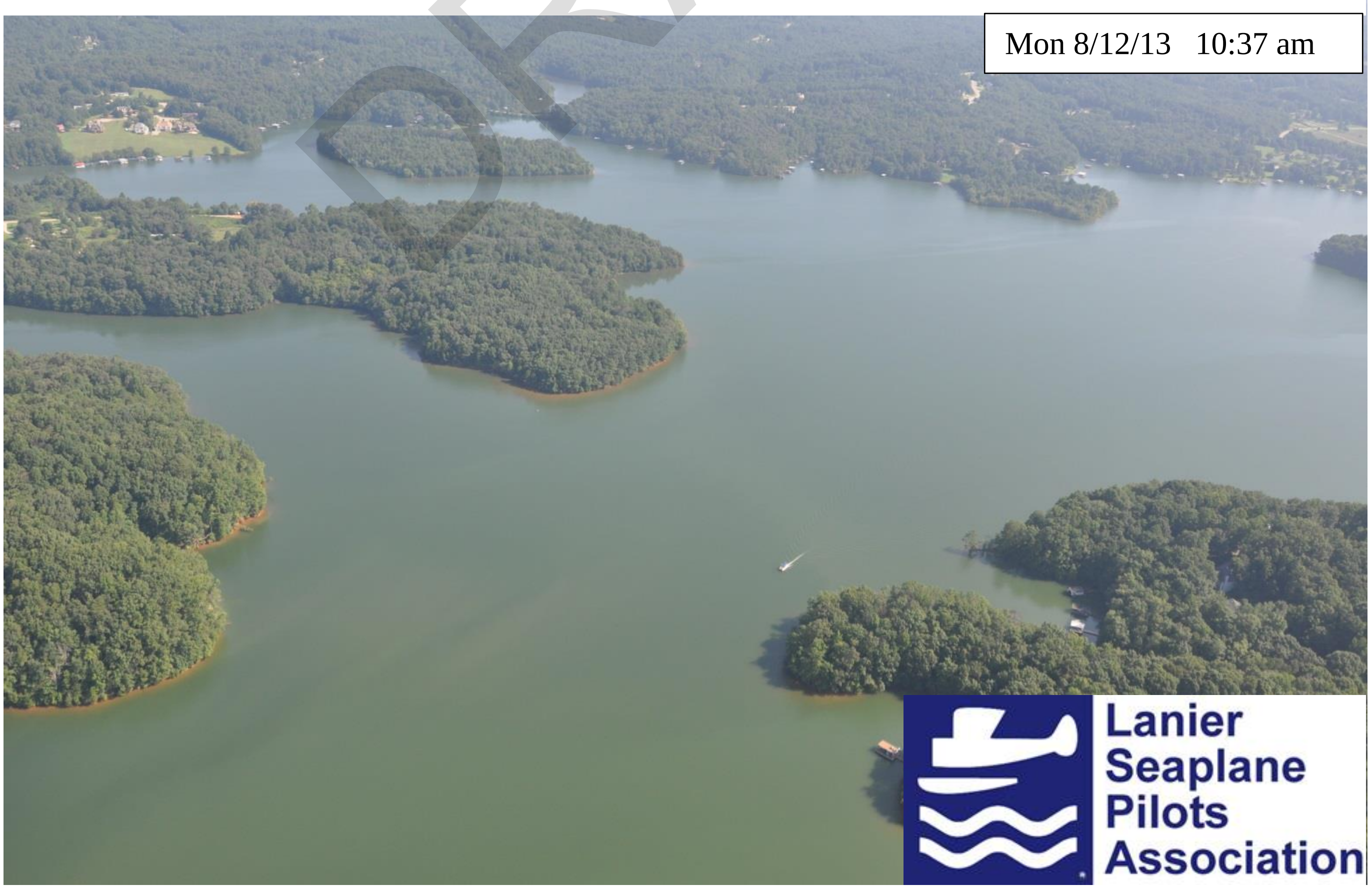
N 34’ 19.795 W 083’ 56.831 Looking NW 320’

Fri 7/17/15 10:20 am



Johnson Creek

N 34’ 20.572 W 083’ 55.243

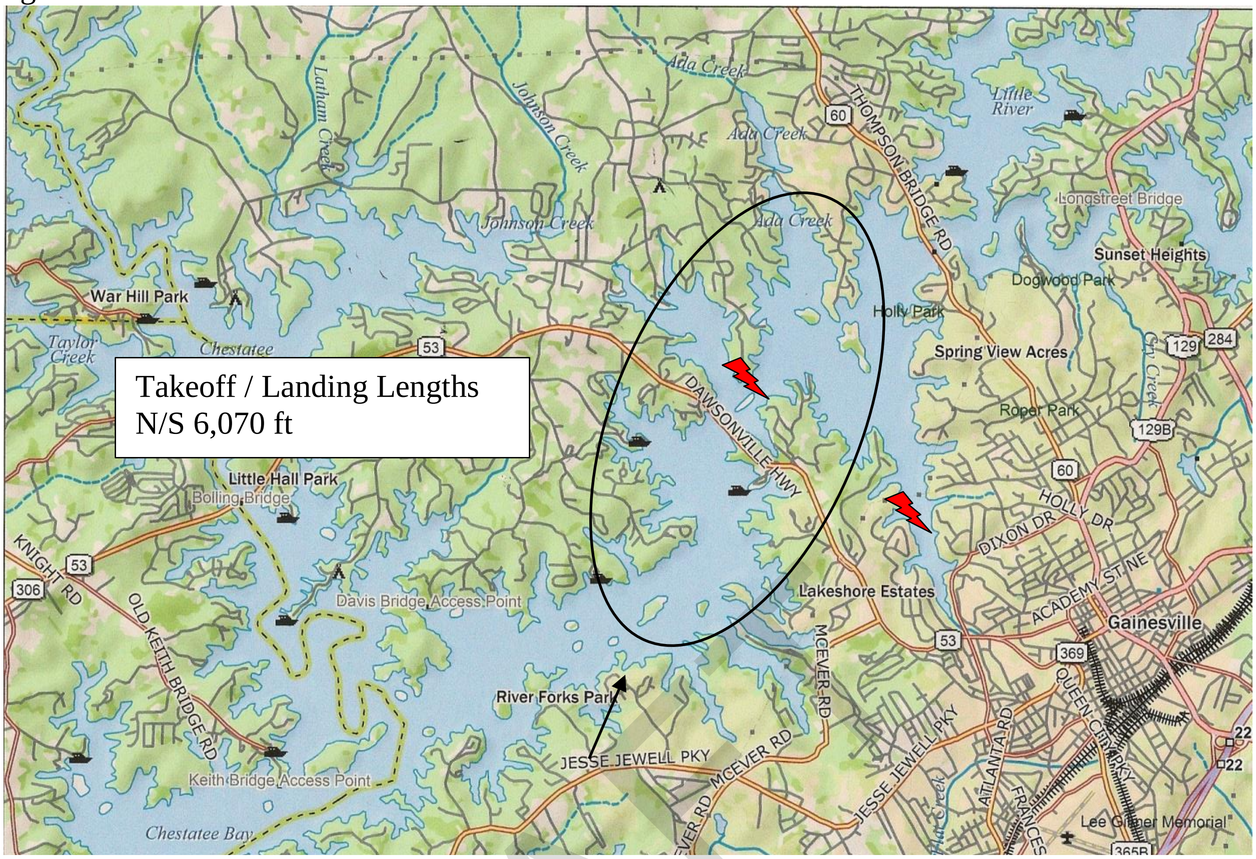


N 34’ 20.620 W 083’ 55.553 Looking ESE 120’

JOHNSON CREEK

N 34’ 20.572 W 083’ 55.243

N 34’ 20.620 W 083’ 55.553 Looking SW 230’



GAINESVILLE MARINA

N 34' 18.622 W 083' 52.855

N 34’ 18.271 W 083’ 52.988 Looking WSW 245’

GAINESVILLE MARINA
N 34’ 18.622 W 083’ 52.855

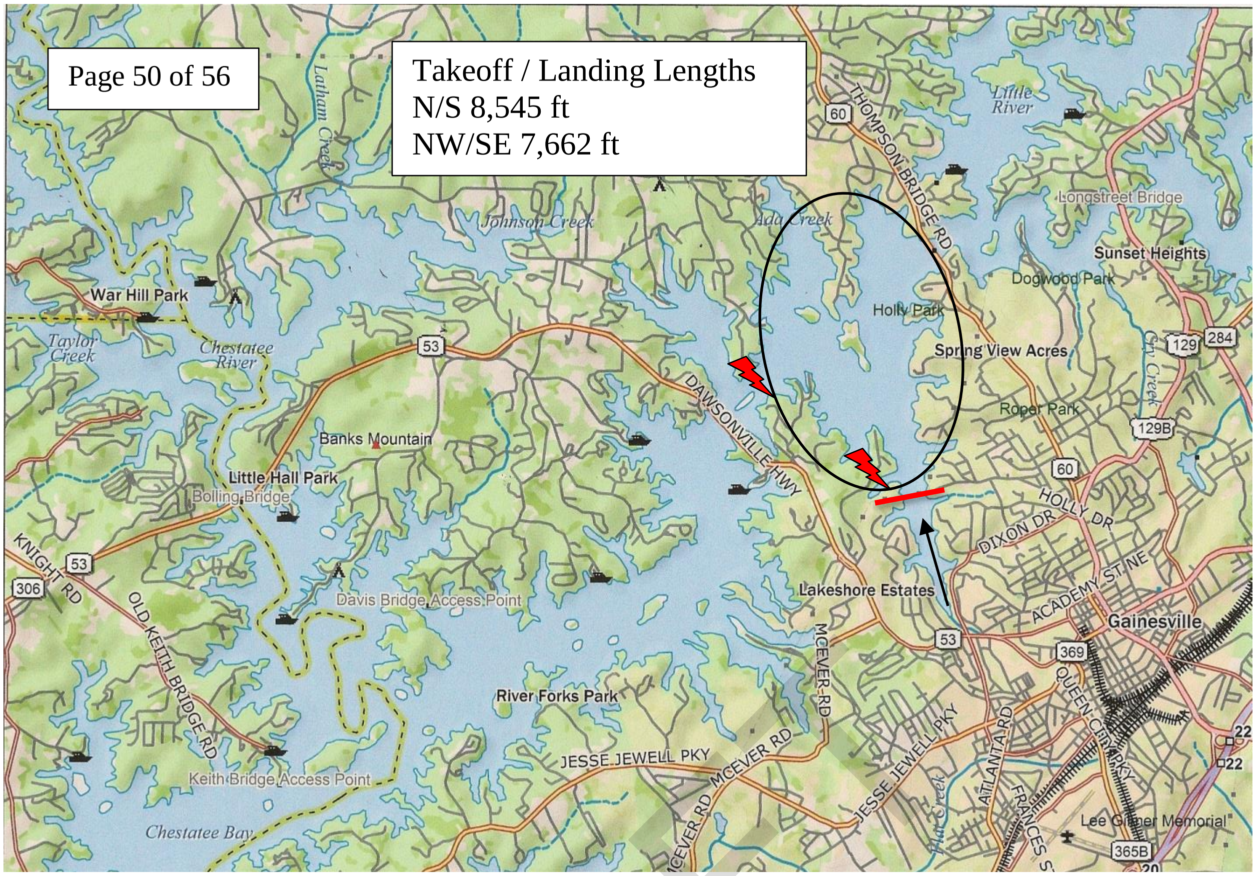
N 34’ 18.271 W 083’ 52.988 Looking NNE 020’

N 34’ 18.622 W 083’ 52.855 Looking SSW 200’

GAINESVILLE MARINA
N 34’ 18.622 W 083’ 52.855

Lanier Seaplane Pilots Association

Takeoff / Landing Lengths
N/S 8,545 ft
NW/SE 7,662 ft



CHATTAHOOCHE COUNTRY CLUB

N 34’ 19.976 W 083’ 51.581

Mon 8/12/13 10:41 am

N 34’ 20.536 W 083’ 51.210 Looking SSW 195’

Sun 5/24/15 1:36 pm

CHATTAHOOCHE COUNTRY CLUB

N 34’ 19.976 W 083’ 51.581

N 34’ 19.893 W 083’ 51.669 Looking SE 100’

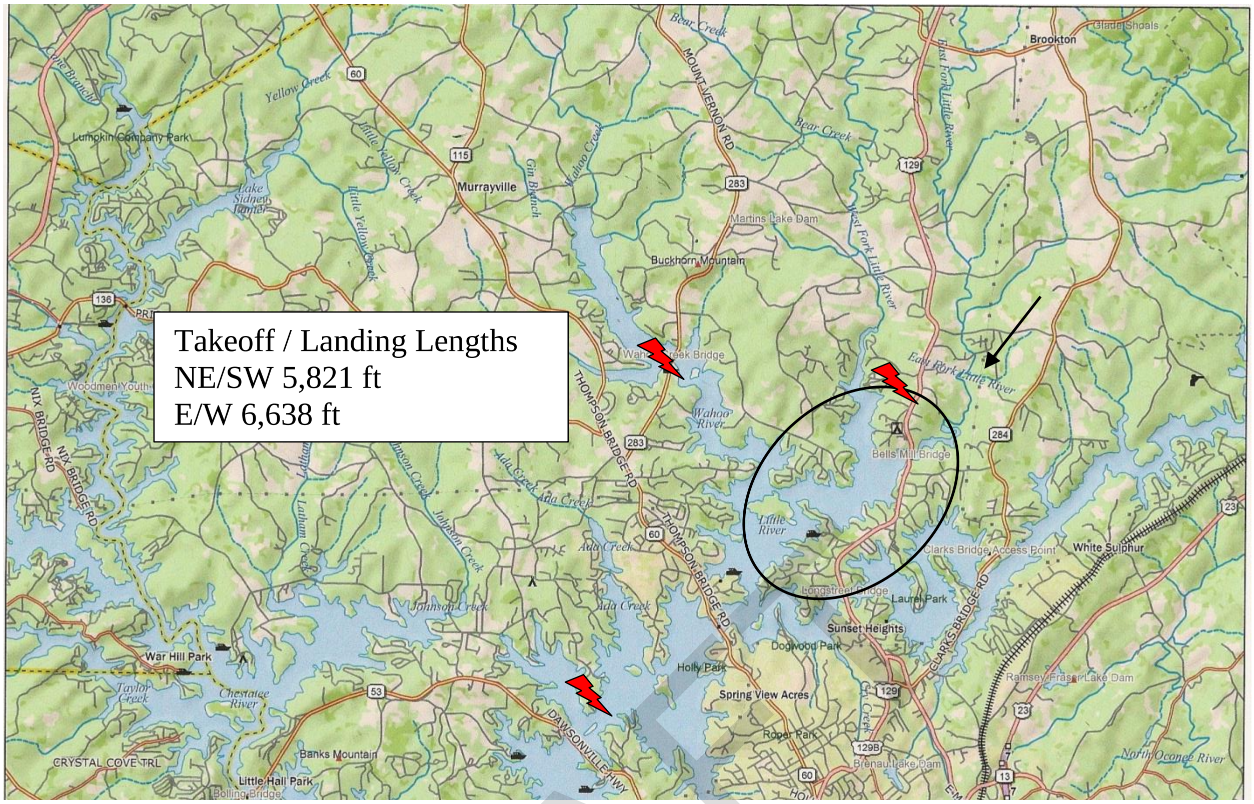
Sun 5/24/15 1:46 pm

N 34’ 19.669W 083’ 51.493 Looking WNW 300’

CHATTAHOOCHE COUNTRY CLUB

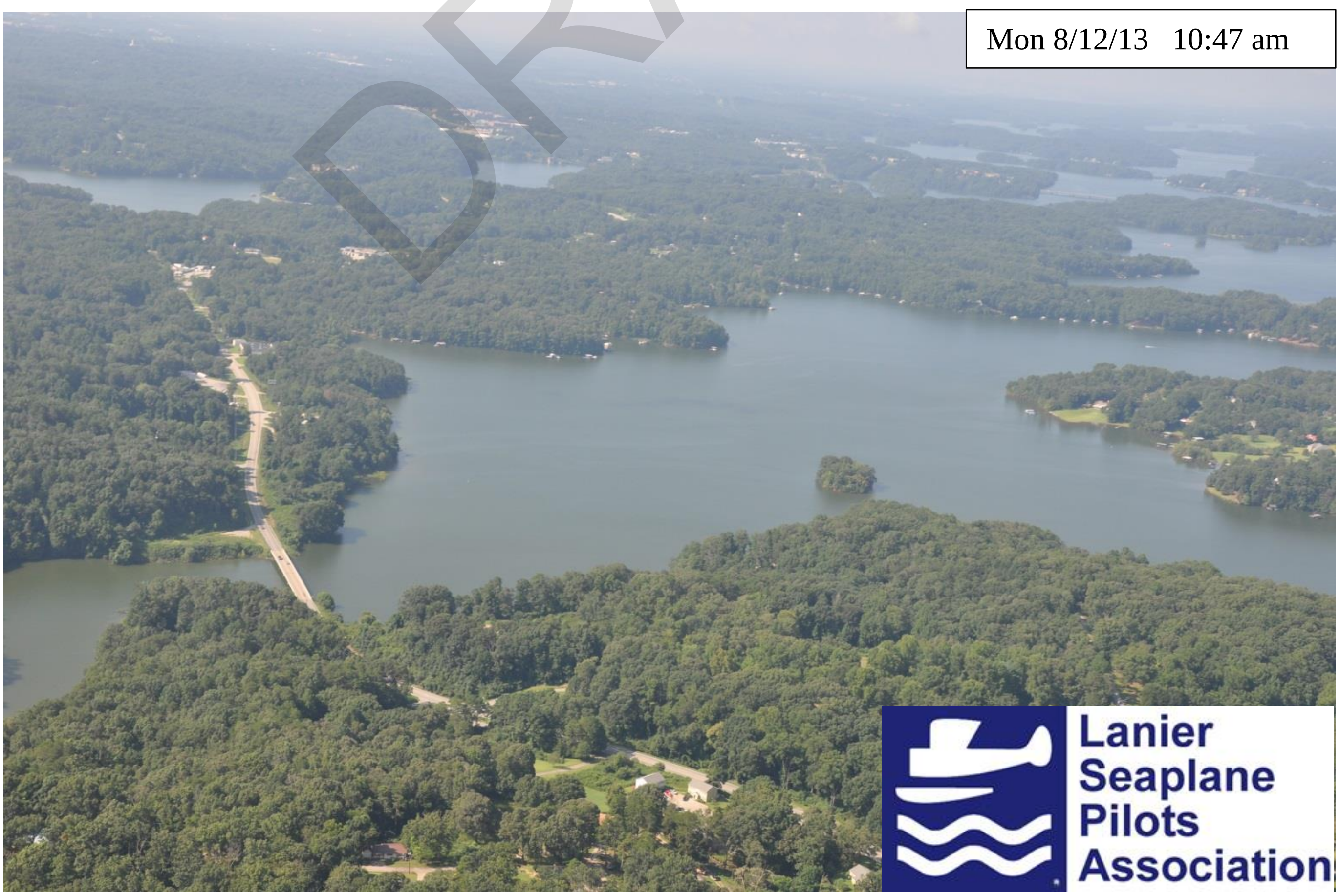
N 34’ 19.976 W 083’ 51.581

N 34’ 19.893 W 083’ 52.185 Looking E SE 120’



Little River   East

N 34’ 21.950   W 083’ 49.162

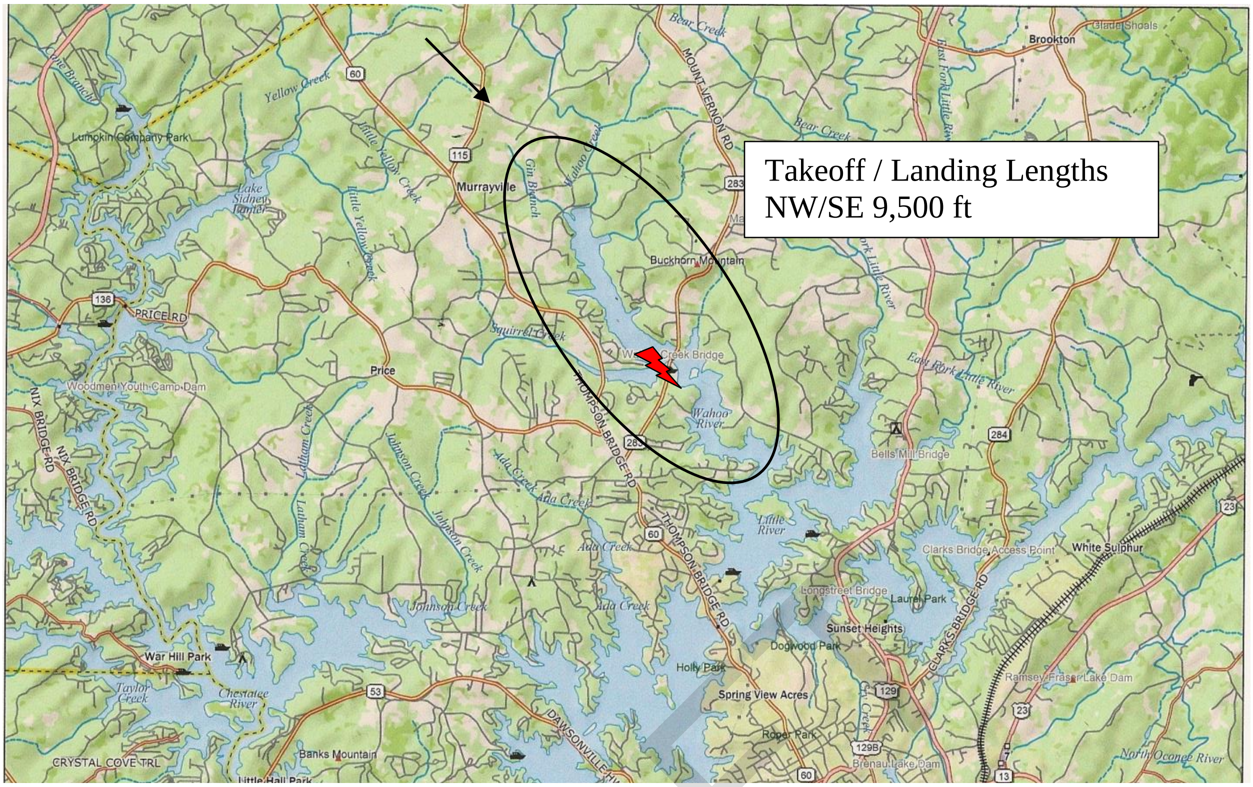


N 34’ 21.986   W 083’ 48.805   Looking WNW 310’

Little River   East
N 34’ 21.950   W 083’ 49.162

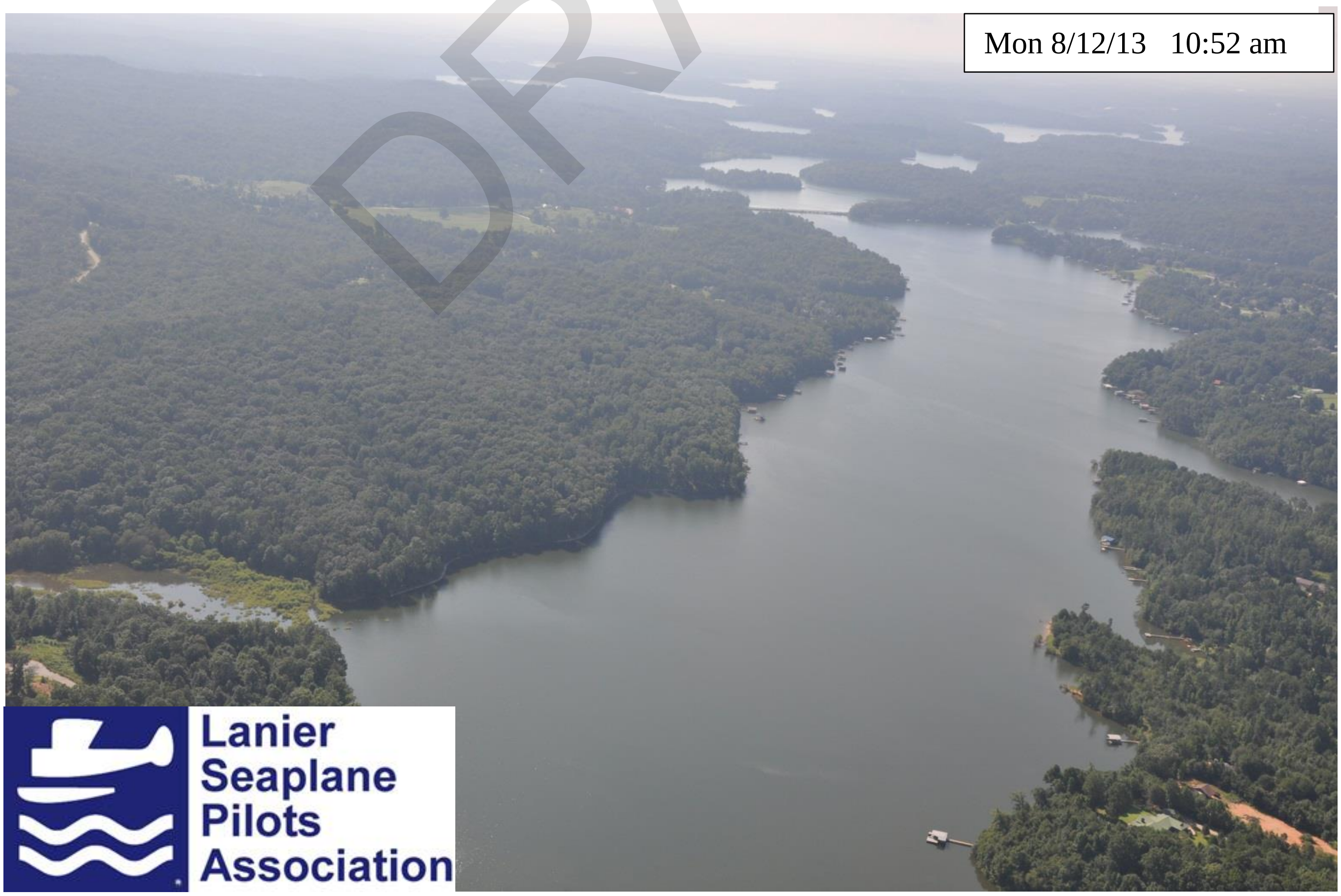
N 34’ 21.986   W 083’ 48.805   Looking W 280’

Lanier
Seaplane
Pilots
Association



Wahoo Creek

N 34’ 23.839 W 083’ 52.263



N 34’ 23.357 W 083’ 51.583 Looking NW 300’

Wahoo Creek

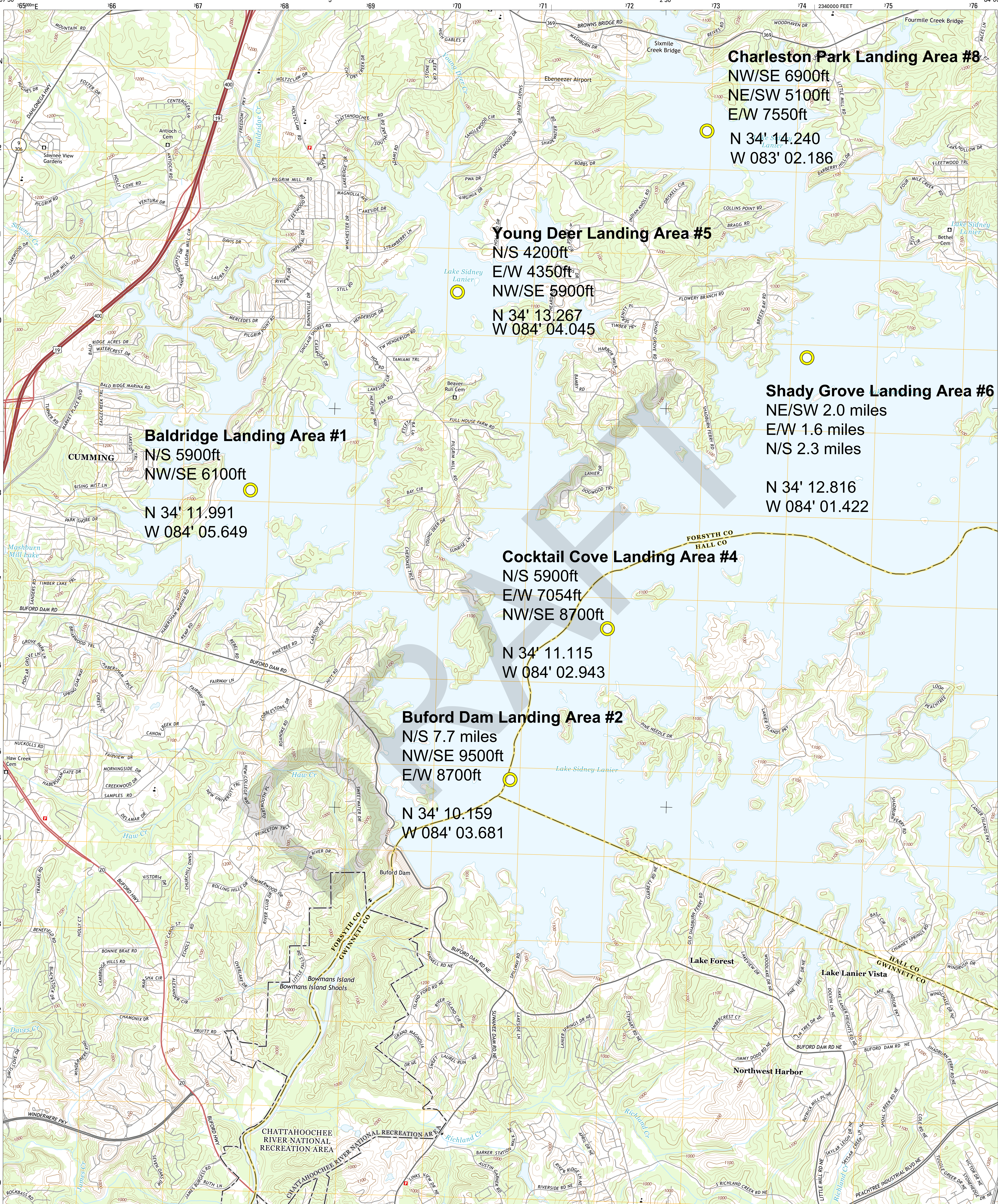
N 34’ 23.839 W 083’ 52.263

APPENDIX D

USGS 7.5-Minute Topographic Quadrangle Maps

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

BUFORD DAM QUADRANGLE
GEORGIA
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid: Universal Transverse Mercator, Zone 16S
10 000-foot ticks: Georgia Coordinate System of 1983 (west zone)

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery....................NAIP, August 2010
Roads....................HERE, ©2013
Names....................GNIS, 2013
Hydrography..........National Hydrography Dataset, 2010
Contours..........National Elevation Dataset, 2010
Boundaries..........Multiple sources; see metadata file 1972 - 2013

UTM GRID AND 2014 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000-m Square ID
GC
Grid Zone Designation
16S

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.16

QUADRANGLE LOCATION

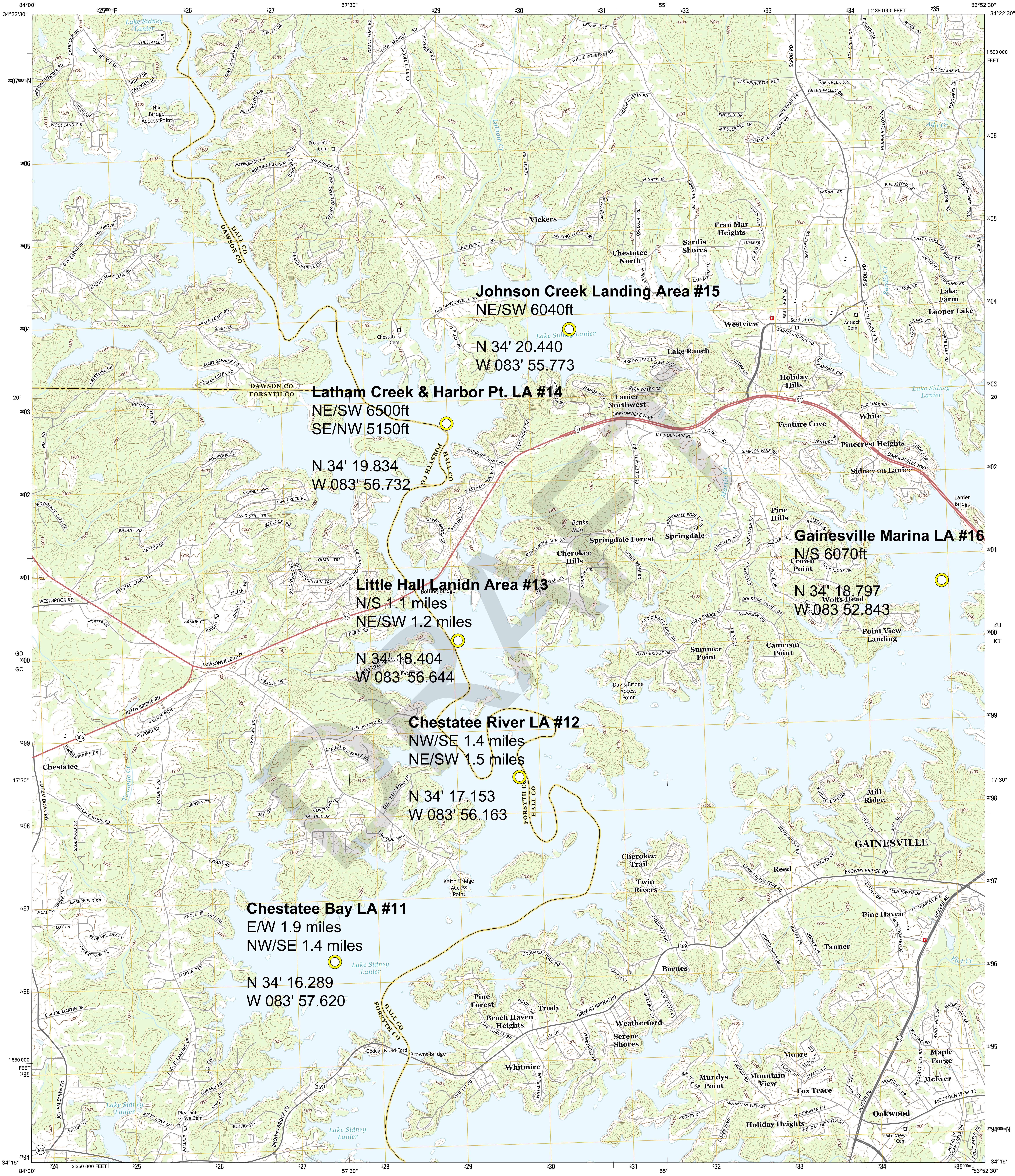
ADJOINING QUADRANGLES
1 Matt
2 Coal Mountain
3 Chestatee
4 Cumming
5 Flowery Branch
6 Duluth
7 Suwanee
8 Hog Mountain

BUFORD DAM, GA
2014

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

CHESTATEE QUADRANGLE
GEORGIA
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid: Universal Transverse Mercator, Zone 17S
10 000-foot ticks: Georgia Coordinate System of 1983 (west zone)

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Imagery .... NAIP, August 2010
Roads .... HERE, ©2013
Names .... GNIS, 2013
Hydrography .... National Hydrography Dataset, 2010
Contours .... National Elevation Dataset, 2010
Boundaries .... Multiple sources; see metadata file 1972 - 2013

UTM GRID AND 2014 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.16

ROAD CLASSIFICATION
Expressway — Local Connector
Secondary Hwy — Local Road
Ramp — 4WD
Interstate Route — US Route — State Route

QUADRANGLE LOCATION

1 Dawsonville
2 Murrayville
3 Clermont
4 Coal Mountain
5 Gainesville
6 Buford Dam
7 Flowery Branch
8 Chestnut Mountain

ADJOINING QUADRANGLES

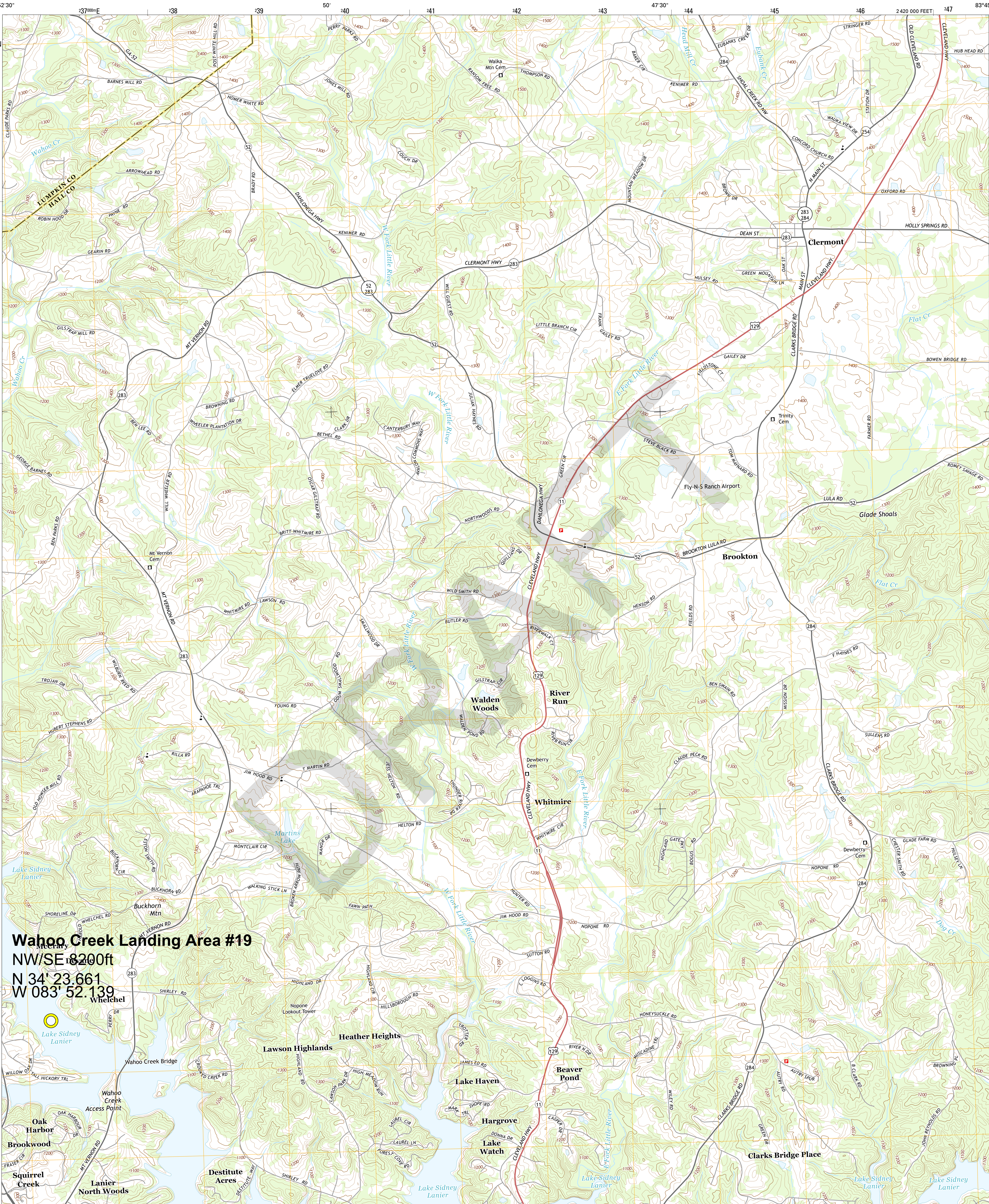
CHESTATEE, GA
2014

USGS science for a changing world

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

CLERMONT QUADRANGLE
GEORGIA
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid: Universal Transverse Mercator, Zone 17S
10 000-foot ticks: Georgia Coordinate System of 1983 (west zone)

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery....NAIP, September 2010
Roads....HERE, ©2013
Names....GNIS, 2013
Hydrography....National Hydrography Dataset, 2010
Contours....National Elevation Dataset, 2010
Boundaries....Multiple sources; see metadata file 1972 - 2013

UTM GRID AND 2014 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000-m Square ID
KU
Grid Zone Designation
17S

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.16

QUADRANGLE LOCATION

ADJOINING QUADRANGLES
1 Dahlonega
2 Cleveland
3 Leaf
4 Murrayville
5 Lula
6 Chestatee
7 Gainesville
8 Gillsville

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

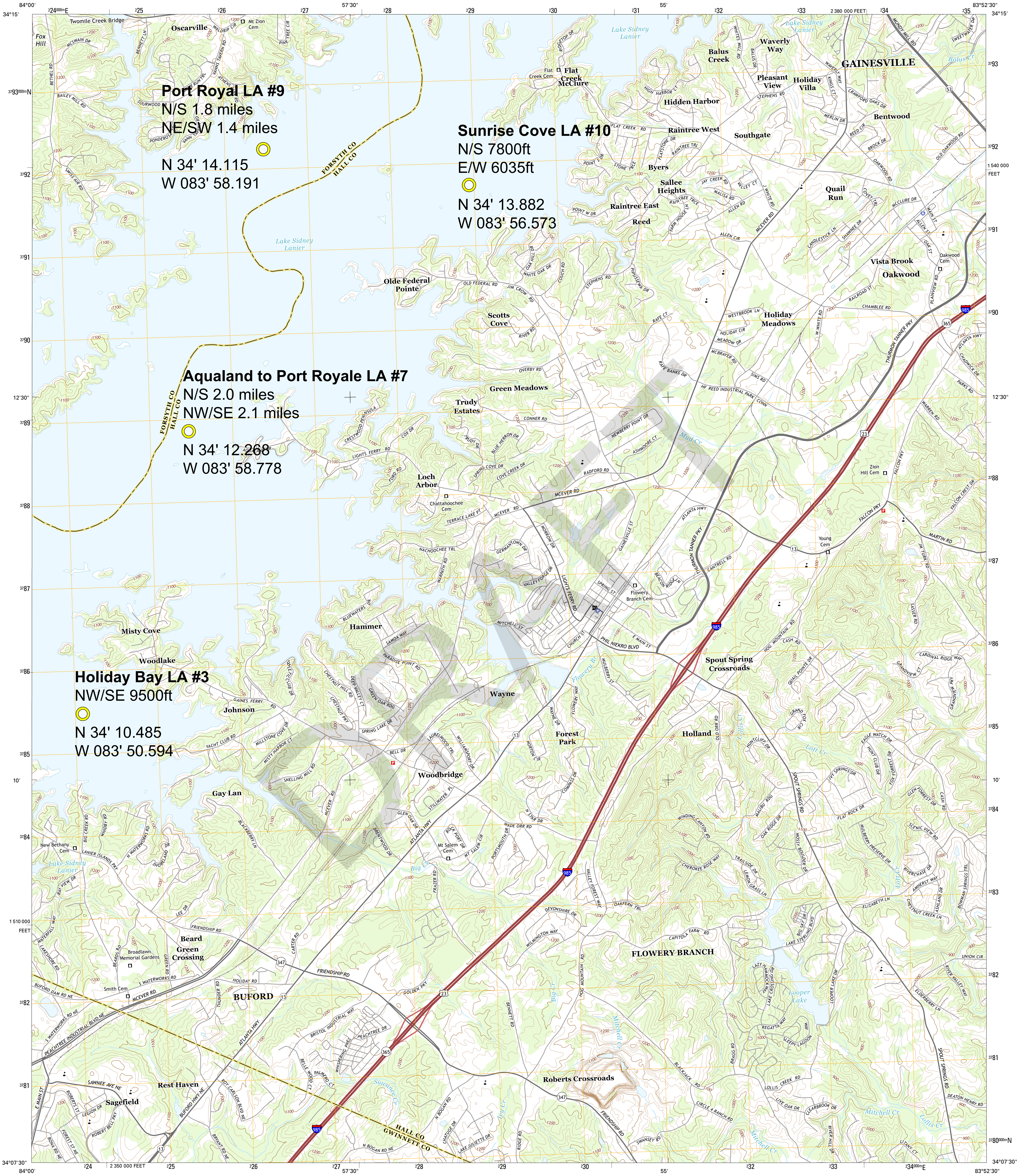
CLERMONT, GA
2014

USGS science for a changing world

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

FLOWERY BRANCH QUADRANGLE
GEORGIA
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid: Universal Transverse Mercator, Zone 17S
10 000-foot ticks: Georgia Coordinate System of 1983 (west zone)

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Imagery....NAIP, August 2010
Roads....HERE, ©2013
Names....GNIS, 2013
Hydrography....National Hydrography Dataset, 2010
Contours....National Elevation Dataset, 2010
Boundaries....Multiple sources; see metadata file 1972 - 2013

UTM GRID AND 2014 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.16

QUADRANGLE LOCATION

ADJOINING QUADRANGLES
1 Coal Mountain
2 Chestatee
3 Gainesville
4 Buford Dam
5 Chestnut Mountain
6 Suwanee
7 Hog Mountain
8 Auburn

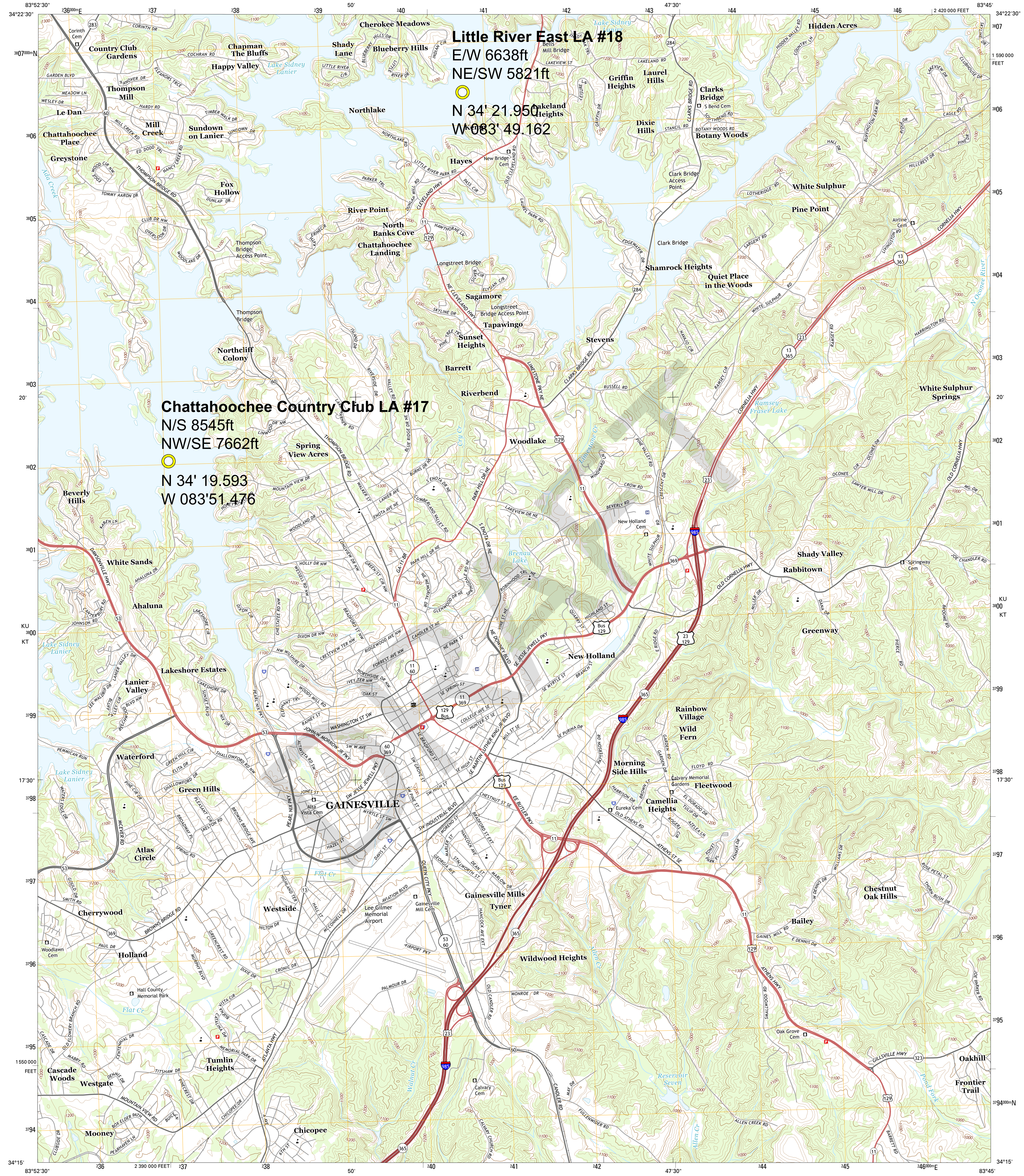
ROAD CLASSIFICATION
Expressway | Local Connector
Secondary Hwy | Local Road
Ramp | 4WD
Interstate Route | US Route | State Route

FLOWERY BRANCH, GA
2014

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map
US Topo

GAINESVILLE QUADRANGLE
GEORGIA-HALL CO.
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid: Universal Transverse Mercator, Zone 17S
10 000-foot ticks: Georgia Coordinate System of 1983 (west zone)

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Imagery....................NAIP, September 2010
Roads....................HERE, ©2013
Names....................GNIS, 2013
Hydrography....................National Hydrography Dataset, 2010
Contours....................National Elevation Dataset, 2010
Boundaries....................Multiple sources; see metadata file 1972 - 2013

5° 21′
95 MILS
1° 35′
28 MILS
MN
GN

UTM GRID AND 2014 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000-m Square ID
KU
KT
3800
Grid Zone Designation
17S

SCALE 1:24 000

KILOMETERS
METERS
MILES
FEET

CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the
National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.16

GEORGIA
QUADRANGLE LOCATION

1 Murrayville
2 Clermont
3 Lula
4 Chestatee
5 Gillsville
6 Flowery Branch
7 Chestnut Mountain
8 Pendergrass

ADJOINING QUADRANGLES

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

GAINESVILLE, GA
2014

APPENDIX E

Floatplanes/Seaplanes Guide

Floatplanes / Seaplanes (a guide)

Lanier Seaplane Pilots Association

Disclaimer:

This guide does not cover all the different models and modifications to the listed aircraft.

Engine models, amphibious floats, wing tip, STOL kits and other modifications can alter to some degree the dimensions listed.

https://en.wikipedia.org

Photo Credits: J L Winter, Troy Wheeler, https://search.yahoo.com/yhs/search?

Table of Contents

Seaplane / Floatplane Definition

A Seaplane is designed with a boat hull to land on the water. A Floatplane is an airplane manufactured with wheels then modified with added floats to land on the water. Either configuration can have retractable wheels to allow amphibious operation

Differences, Ultralight, Sport Pilot and Certified aircraft.

Ultralight aircraft requirements.

Seats	1
Max. Empty Weight (Powered Aircraft)	254 lbs
Max. Empty Weight (Unpowered Aircraft)	155 lbs
Max. Fuel Capacity	5 Gallons
Max. Speed @ Full Power	55 knots
Max. Stall Speed (Power Off)	24 knots

If the aircraft has more than 1-seat or exceeds any of the above criteria, is not an ultralight, and thus not eligible for operation under Part 103.

LightSport aircraft requirements.

Seats	1 or 2
Max. Gross Weight (Powered Aircraft)	1,320 lbs 1,430 lbs for seaplanes
Single, reciprocating engine	
Fixed landing gear	(retractable landing gear for seaplanes)
Max. Speed @ Full Power	120 knots (138 mph)
Max. Stall Speed (Power Off)	45 knots (51mph)

In addition to fixed-wing airplanes, light-sport aircraft also include powered parachutes, weight-shift control aircraft, balloons, airships, gliders and gyroplanes.

Any aircraft that meets the definition of a light-sport aircraft as called out in 14 CFR Part 1.1 is eligible to be operated by a sport pilot. These aircraft can be certificated in any category, such as standard, experimental amateur-built, experimental exhibition, experimental light sport aircraft (E-LSA), or special light sport aircraft (S-LSA).

Certified aircraft

All other aircraft in this guide fall into the definition of certified aircraft. These aircraft are subject to the airworthiness standards called out in some 405 pages listed in 14 CFR Part 23. (appendix (?))

Those standards cover Performance, Flight Characteristics, Controllability and Maneuverability, Stability, Spinning, Ground and Water Handling Characteristics, Structure, Flight Loads, Water Loads, Floats and Hulls, Powerplant, and subsystems, Operating Limitations and Information and more.

FAA regulation Part 23 covers every nut, bolt, and equipment items required for manufacturing, and operating each Certified aircraft for use in the United States.

The majority of seaplanes that would be used on Lake Lanier would fall in the normal category.

The normal category is limited to airplanes that have a seating configuration, excluding pilot seats, of nine or less, a maximum certificated takeoff weight of 12,500 pounds or less, and intended for non-acrobatic operation.

The aircraft in this guide are listed in order as single engine float planes followed by single engine seaplanes and last as multiengine seaplanes.

Difference between Land and Sea configurations

The planes are prepared at the factory or modification facility to become a float plane. All the aluminum surfaces inside and out are coated with green zinc chromate paint to resist corrosion, control cables are replaced with stainless steel cables, V struts, float attach points, strengthen engine mounts, and many reinforcements were added to beef up the airframe for the rigors of float flying. The engine cowling may be modified to increase engine cooling.

There are 4 lifting rings on top of the fuselage and a dorsal fin under the tail. The hooks are for lifting the plane to do float maintenance and repair. The dorsal fin restores positive yaw stability to the airplane making up for the large amount of float area forward of the center of lift.

The last feature common to floatplanes is a longer and flatter pitch prop. This yields increased low end thrust and better acceleration and climb capability. It also means that in cruise flight the prop will overspeed if allowed to.

Float Construction and Operation

To be legally certified, each float must displace or float at least 85% of the max gross weight of the airplane which gives a good degree of safety in case one or both floats are damaged.

Each float contains water tight bulkheads, each with its own pump-out port. This again adds a degree of safety in case of damage, but primarily it keeps any water in the floats from shifting fore or aft in flight, which could easily throw the plane out of C.G. limits. Each compartment should be pumped out prior to the first flight of the day and after any significant number of landings or significant time on the water.

The floats are constructed of aluminum and thousands of rivets, and should be mostly watertight while not in motion; the pounding of landing and waves will force some water through the seams. Since the aluminum is thin the floats must be taken care of. Rocks, stumps, and logs will easily wreck a float, thus you should always be cognizant of your path and the waters around you. Newer model floats are made with composite materials with the design features.

The keel of the float is actually very strong and provides much of the rigidity of the float system. It is even possible to make a grass landing with the floats and do little if any damage. A hard runway landing is also possible in an emergency but I imagine the sound would be terrible.

The float to airframe connection is extremely rigid. All forces are transferred from the floats to the airplane. This is the reason for the extra bracing and beefiness in the airframe. It will also teach you to avoid hard landings as the spine-airplane connection is also rather rigid.

You will soon come to realize how important the suspension of a land plane is.

Ultralight Requirements

Number of available seats	**Criteria**	
One	Max Fuel Capacity	5 Gallons
	Max Speed @ Full Power	55 Knots
	Max Stall Speed (Power Off)	24 Knots

Weights

Max Empty Weight (Powered Aircraft)	254 lbs.
Max Empty Weight (Unpowered Aircraft)	155lbs

If the aircraft has more than 1-seat or exceeds any of the above criteria, is not an ultralight, and thus not eligible for operation under Part 103.

These are the legal rules by which we fly; they are the most lenient in the world. These privileges, however, carry responsibilities: while there are no specific legal requirements, ultralight pilots *must* be trained just like any other pilot

Piper
Specifications | J-3 Cub

Number of available seats

Two

Dimensions

Length: 22.ft 5 in

Height: 8 ft. 5 in

Wingspan 35 ft. 3 in

Weights

Max Takeoff Weight: 1220 lbs.*

*Includes passengers, baggage and fuel

CubCrafters
Specifications | CC18-180 Top Cub

Number of available seats

Two

Dimensions

Length: 23.ft 6 in

Height: 8 ft. 5 in

Wingspan 35 ft. 3 in

Weights

Max Takeoff Weight: 2300 lbs.*

*Includes passengers, baggage and fuel

Piper
Specifications | PA-18

Number of available seats

Two

Dimensions

Length: 22.ft 7 in

Height: 8 ft. 8 1/2 in

Wingspan 35 ft. 2 1/2 in

Weights

Max Takeoff Weight: 1750 lbs.*

*Includes passengers, baggage and fuel

Aviat
Specifications | Husky A-1C-180

Number of available seats

Two

Dimensions

Length: 22.ft 7 in

Height: 7 ft. 5 in

Wingspan 35 ft. 6 in

Weights

Max Takeoff Weight: 2200 lbs.*

*Includes passengers, baggage and fuel

Cessna
Specifications | C-150-150 hp

Number of available seats

Two

Dimensions

Length: 24 ft. 1 in

Height: 9 ft. 1 in

Wingspan 32 ft. 8 1/2 in

Weights

Max Takeoff Weight: 1700 lbs.*

*Includes passengers, baggage and fuel

Cessna
Specifications | C-172P 160 hp

Number of available seats

Four

Dimensions

Length: 26 ft. 8 in

Height: 11 ft. 11 in

Wingspan 36 ft.

Weights

Max Takeoff Weight: 2,220 lbs.*

*Includes passengers, baggage and fuel

Cessna
Specifications | C-185 Skywagon

Number of available seats

Four

Dimensions

Length: 25 ft. 9 in

Height: 12 ft. 2 in

Wingspan 35 ft. 10 in

Weights

Max Takeoff Weight: 3,350 lbs.*

*Includes passengers, baggage and fuel

Cessna
Specifications | U206

Number of available seats

Four to Six

Dimensions

Length: 32 ft.

Height: 13 ft. 5 in

Wingspan 39 ft.

Weights

Max Takeoff Weight: 3,792 lbs.*

*Includes passengers, baggage and fuel

de Havilland Beaver
Specifications | DHC-2

Number of available seats

1 Pilot

7 Passengers

Dimensions

Length: 30 ft. 3in

Height: 13 ft.

Wingspan 48 ft.

Weights

Max Takeoff Weight: 5,100 lbs.*

*Includes passengers, baggage and fuel

Cessna
Specifications | 208B Grand Caravan EX

Number of available seats

One or Two Crew

Nine passengers

14 with FAA Part 23 waiver

Dimensions

Length: 41.ft 6 in

Height: 15 ft. 1 in

Wingspan 52 ft. 1 in

Weights

Max Takeoff Weight: 8,807 lbs.*

*Includes passengers, baggage and fuel

Adventura II
Specifications

Number of available seats

Two

Dimensions

Length: 23.ft

Height: 7 ft.

Wingspan 30ft 8 in

Weights

Max Takeoff Weight: 1,232 lbs.*

*Includes passengers, baggage and fuel

Searey
Specifications

Number of available seats

Two

Dimensions

Length: 22 ft. 5 in

Height: 6 ft. 5 in

Wingspan 30 ft. 10 in

Weights

Max Takeoff Weight: 1370 lbs.*

*Includes passengers, baggage and fuel

Lake
Specifications l LA 250 Renegade

Number of available seats

Four

Dimensions

Length: 28 ft. 4 in

Height: 10 ft. 0 in

Wingspan 38 ft.

Weights

Max Takeoff Weight: 3,050 lbs.*

*Includes passengers, baggage and fuel

Republic
Specifications | Seabee RC-3

Number of available seats

Four

Dimensions

Length: 27 ft. 10.5 in

Height: 10 ft. 1 in

Wingspan 37 ft. 8 in

Weights

Max Takeoff Weight: 3,150 lbs.*

*Includes passengers, baggage and fuel

Lockwood Aircam Specifications

Number of available seats

One Crew

One Passengers

Dimensions

Length: 27ft

Height: 8 ft. 4 in

Wingspan 36 ft.

Weights

Max Takeoff Weight: 1,680 lbs.*

*Includes passengers, baggage and fuel

Grumman Goose
Specifications | G-21-A

Number of available seats

1 to 3 Crew

5 to 7 Passengers

Dimensions

Length: 38ft 6 in

Height: 16 ft. 2 in

Wingspan 49 ft.

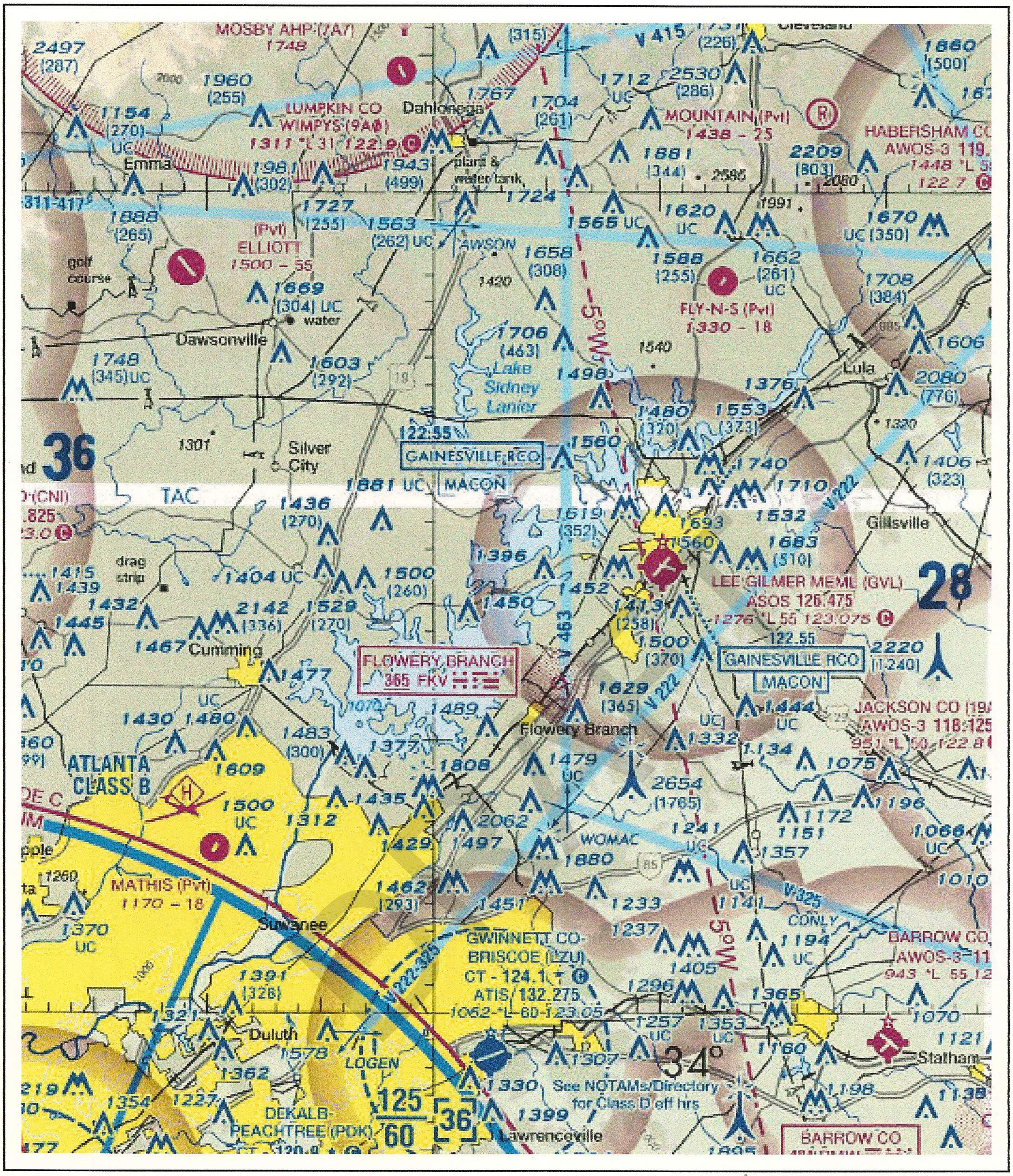
Weights

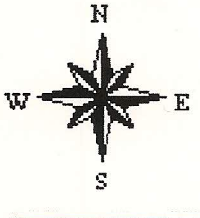
Max Takeoff Weight: 8,000 lbs.*

*Includes passengers, baggage and fuel

APPENDIX F

Atlanta Sectional Aeronautical Chart over Lake Sidney Lanier





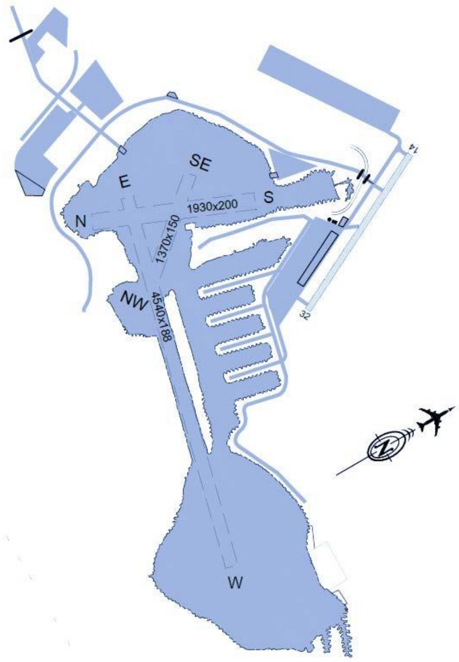
Atlanta sectional
Aeronautical Chart

FltPlan.com

Printed:Aug 05, 2014

APPENDIX G

Comparison of Lake Hood and Lake Union with Lake Sidney Lanier



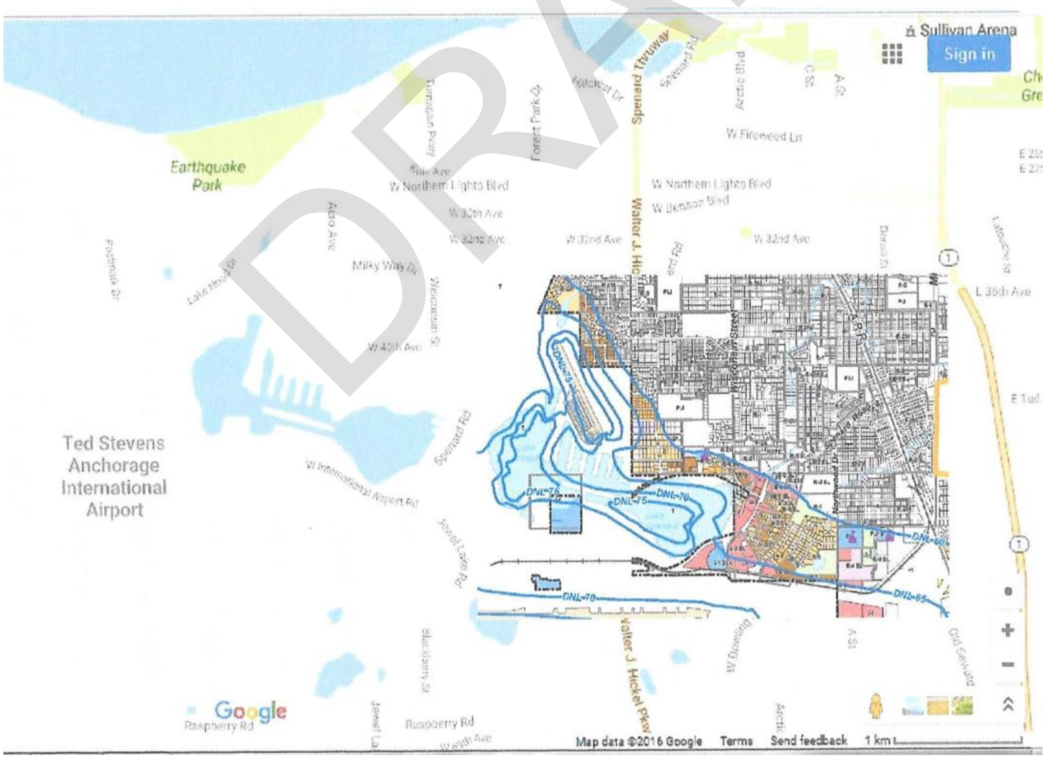
Today, Lake Hood Seaplane Base includes a 4,540-foot by 188-foot east/west waterway, a 1,930-foot by 200-foot north/south waterway, and a 1,370-foot by 150-foot northwest/southeast waterway.

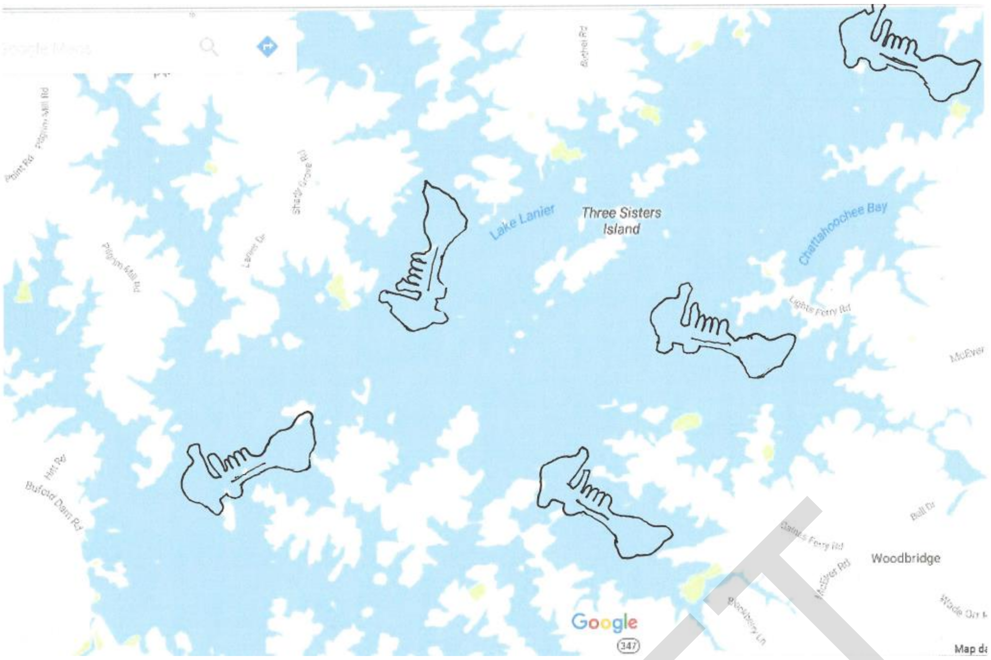
Lake Hood has 500 slips for floatplanes and 500 tiedowns at the gravel strip. In addition several areas are designated as ski-plane parking areas.[8] Transient aircraft parking includes 26 spaces for wheeled aircraft and eight spaces for float planes. A full range of services are available for aircraft operators at Lake Hood.

Lake Hood Seaplane Base is recognized as the busiest seaplane base in the world. In 2012, Lake Hood Seaplane Base saw 67,000 flight operations (take-offs and landings). In June 2012, the busiest month of the year, there were 13,159 operations, averaging 439 operations per day. The value of Lake Hood Seaplane Base to the Anchorage aviation community is evident in the long waiting list (over 300 names) to secure a float plane slip. Applicants at the bottom of the waiting list can expect a ten-year wait.

- Lake Hood is the only public seaplane facility serving Anchorage, Alaska's largest city, with a population of 300,000 residents. The ten-year wait to secure a floatplane slip attests to critical role the facility plays in the local aviation community.
- Lake Hood supports year-around flying, serving float operations in the summer and ski operations in the winter. LHD's gravel strip is open to wheeled aircraft in all seasons.
- Lake Hood connects Anchorage to dozens of remote recreation lodges and rural villages that rely on floatplane and small aircraft services to support their operations, moving customers/residents and supplies continuously throughout the year, especially during the busy summer visitor season. Ski equipped aircraft use Lake Hood during the winter.
- Lake Hood serves as a base for a wide variety of aviation-related services, ranging from aircraft repairs and maintenance to flight training.

Insert shows Lake Hood Noise contours.

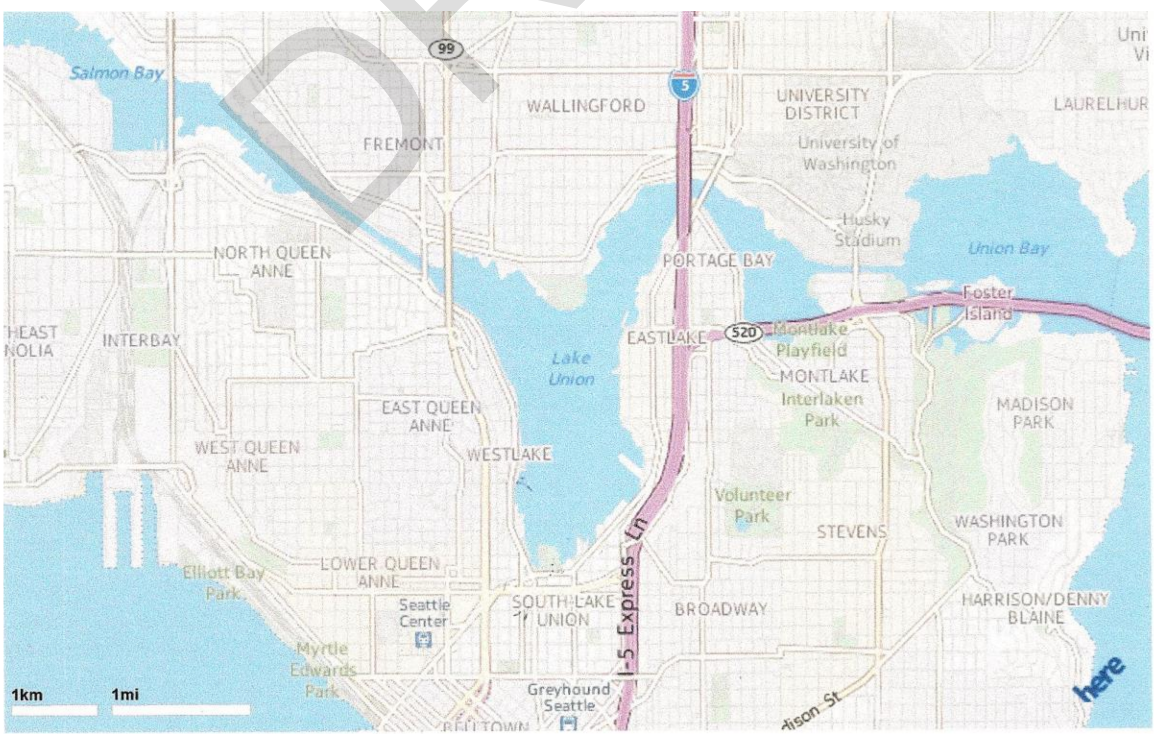




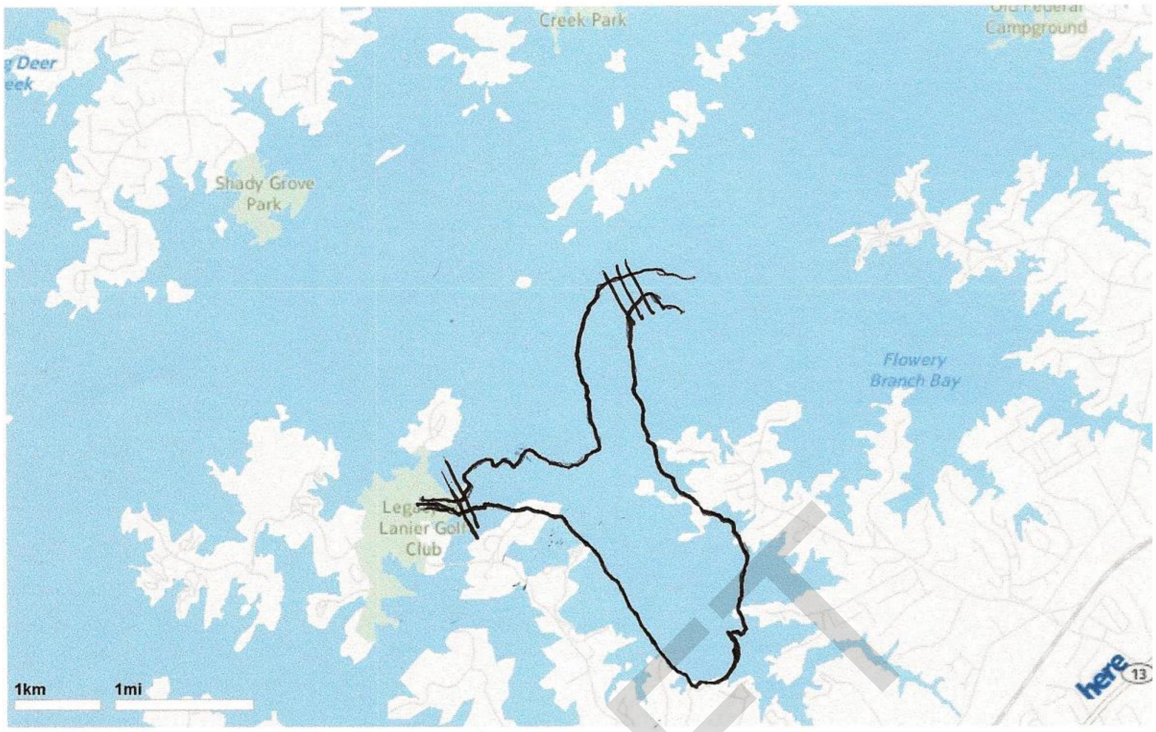
Lake Hood outlines (to scale) displayed on South portion of Lake Lanier above and in front of Gainesville Marina below.

Description **English:** Lake Union in Seattle, looking west towards the Fremont Cut and Puget Sound. Shot from approx 1,700' MSL.

Date 6 November 2011



Outline of Lake Union drawn at same scale over Holiday bay on Lake Lanier



APPENDIX H

USACE – Regulation of Seaplane Operations

CESAM-OP-TR

Project Operations
REGULATION OF SEAPLANE OPERATIONS
AT CIVIL WORKS WATER RESOURCE DEVELOPMENT PROJECTS
ADMINISTERED BY THE
MOBILE DISTRICT
U.S. ARMY CORPS OF ENGINEERS

1. REFERENCE: Title 36 CFR, Part 238, Regulation of Seaplane Operations at Civil Works Water Resource Development Projects Administered by the Chief of Engineers (42 FR 220, 15 November 1977).

2. PURPOSE AND SCOPE: This regulation is for the purpose of defining the rules which in conjunction with Title 36, Chapter III, Section 327.4 govern the operation of seaplanes upon the waters of each lake, individually, within the Mobile District. This regulation provided the Corps with no special governing authority beyond the citation authority already vested in the Operations Project Managers and their staffs. All appropriate State and Federal aviation laws apply to aircraft operations upon or over project lands and waters. For the purpose of this regulation a seaplane is defined as an aircraft properly registered with the Federal Aviation Administration and equipped to takeoff from and land on the water.

3. REGULATION BY INDIVIDUAL PROJECT:

a. Allatoona Lake - Seaplane takeoff and landing maneuvers are allowed between sunrise and sunset on Allatoona Lake except on Saturdays, Sundays, Memorial Day, Independence Day, Labor Day, and any other declared national holidays between 15 April and 15 September of every year. Takeoff and landing maneuvers are prohibited within 500 feet of any bridge, causeway, overhead powerline, dock, dam, or similar structure. Extreme caution should be exercised by pilots to avoid submerged and floating debris. All Seaplane takeoff and landing maneuvers are prohibited upon the Acworth Subimpoundment.

b. Alabama River Lakes

(1) Claiborne Lake - Seaplane takeoff and landing maneuvers are allowed between sunrise and sunset on Claiborne Lake. Takeoff and landing maneuvers are prohibited within 500 feet of any bridge, causeway, overhead powerline, dock, dam, or similar structure. Extreme caution should be exercised by pilots to avoid submerged and floating debris.

(2) William "Bill" Dannelly Reservoir - Seaplane takeoff and landing maneuvers are allowed between sunrise and sunset on William "Bill" Dannelly Reservoir. Takeoff and landing maneuvers are prohibited in the stretch of lake from 500 feet downstream to 500 feet upstream of Selma Marina and the stretch of lake from 500 feet downstream to 500 feet upstream of Beech

Supersedes previous edition dated 16 Dec 1985

Creek Marina. Takeoff and landing maneuvers are also prohibited within 500 feet of any bridge, causeway, overhead powerline, dock, dam, or similar structure. Extreme caution should be exercised by pilots to avoid submerged and floating debris.

(3) R. E. "Bob" Woodruff Lake - Seaplane takeoff and landing maneuvers are allowed between sunrise and sunset on R. E. "Bob" Woodruff Lake. Takeoff and landing maneuvers are prohibited in the following areas: from Jones Bluff Lock and Dam to one mile upstream; the entire Swift Creek Arm and from its mouth one-half mile downstream on the Alabama River; form 1,000 feet downstream to 1,000 feet upstream of the city limits of Montgomery, Alabama and upstream of the confluence of the Coosa and Tallapoosa Rivers; and within 500 feet of any bridge, causeway, overhead powerline, dock, dam, or similar structure. Extreme caution should be exercised by pilots to avoid submerged and floating debris.

c. Black Warrior and Tombigbee River Lakes - Seaplane takeoff and landing maneuvers are allowed between sunrise and sunset on all Black Warrior and Tombigbee River Lakes; Coffeeville Lake (except at the Choctow Wildlife Refuge); Demopolis Lake, Warrior Lake, Oliver Lake, Holt Lake and Bankhead Lake. Seaplane operations are restricted at Choctaw Wildlife Refuge between river mile 122 and river mile 128.5. Takeoff and landing maneuvers are prohibited within 500 feet of any bridge, causeway, overhead powerline, dock, dam, or similar structure. Extreme caution should be exercised by pilots to avoid submerged and floating debris.

d. Carters Lake - Seaplane takeoff and landing maneuvers are allowed between sunrise and sunset on Carters Lake.. Takeoff and landing maneuvers are prohibited within 500 feet of any bridge, causeway, overhead powerline, dock, dam, or similar structure. Extreme caution should be exercised by pilots to avoid submerged and floating debris. Seaplane takeoff and landing maneuvers are prohibited on the entire reregulation pool including the tailwaters of Carters Dam.

e. Okatibbee Lake - Seaplane takeoff and landing maneuvers are allowed between sunrise and sunset on Okatibbee Lake. Takeoff and landing maneuvers are restricted to a north/south stretch from Okatibbee Dam to Collinsville Park approximately 3,000 feet wide and an east/west stretch from the middle of the main channel to Pine Springs Park approximately 2,000 feet wide. Takeoff and landing maneuvers are prohibited within 500 feet of any bridge, causeway, overhead powerline, dock, dam, or similar structure. Extreme caution should be exercised by pilots to avoid submerged and floating debris.

f. Lake Seminole - Seaplane takeoff and landing maneuvers are allowed between sunrise and sunset on all Portions of Lake Seminole. Takeoff and landing maneuvers are prohibited within 500 feet of any bridge, causeway, overhead powerline, dock, dam, or similar structure. Extreme caution should be exercised by pilots to avoid aquatic plant growth and other submerged and floating debris.

g. Lake Sidney Lanier - Seaplane takeoff and landing maneuvers are prohibited on all portions of Lake Sidney Lanier.

h. Walter F. George/ George W. Andrews Lakes

(1) Walter F. George Lake - Seaplane takeoff and landing maneuvers are allowed between sunrise and sunset on Walter F. George Lake from the Eufaula Wildlife Refuge downstream. Takeoff and landing maneuvers are prohibited within 500 feet of any bridge, causeway, overhead powerline, dock, dam, or similar structure. Extreme caution should be exercised by pilots to avoid submerged and floating debris.

(2) George W. Andrews Lake - Seaplane takeoff and landing maneuvers are prohibited on all portions of George W. Andrews Lake.

i. West Point Lake - Seaplane takeoff and landing maneuvers are allowed between sunrise and sunset on West Point Lake. Takeoff and landing maneuvers are permitted only in an area from 500 feet downstream of the Alabama Highway 701/Georgia Highway 109 bridges south to a line between the southern point of West Point Overlook and the southern point of Maple Creek. This includes portions of the main stem of the Chattahoochee River and the Wehadkee Creek, Stroud Creek and Veasley Creek embayments. Takeoff and landing maneuvers are prohibited within 500 feet of any bridge, causeway, overhead powerline, dock, dam, or similar structure. Extreme caution should be exercised by pilots to avoid submerged and floating debris.

j. Tennessee-Tombigbee Waterway - Seaplane takeoff and landing maneuvers are allowed between sunrise and sunset on the Tennessee-Tombigbee Waterway except for those portions between navigation mile (NM) 330 and 360 (downstream of John C. Stennis Lock and Dam to upstream of Aberdeen Lock and Dam) and between NM 369 and 401 (downstream of Amory Lock to upstream of John Rankin Lock) and between NM mile 421 (downstrean of Mississippi Highway 30 Bridge) to Pickwick Lake at Mississippi Highway 25 Bridge. Takeoff and landing maneuvers are prohibited within 500 feet of any bridge, causeway, overhead powerline, dock, dam, or similar structure. Pilots are cautioned that during the months of October through February migratory waterfowl are especially active on the Waterway. Care should be exercised to avoid the increased risk of collision. Extreme caution should be exercised by pilots to avoid submerged and floating debris. Pilots are strongly cautioned to consult aviation charts for restricted air space controlled by the Columbus Air Force Base (CAFB).

Takeoff and landing maneuvers may be permitted in the excluded areas on a case by case basis provided there is advance coordination with the Corps and the CAFB for approval. A contact list to request approval is provided below. Pilots should contact the Corps location nearest the site of the proposed takeoff/landing maneuver.

John C. Stennis L&D (NM 335)	601-328-7075	Aberdeen Lock (NM 358)	601-369-7966
Amory Lock (NM 371)	601-256-4051	Glover Wilkins Lock (NM 376)	601-651-4966
Fulton Lock (NM 391)	601-862-7431	John Rankin Lock (NM 398)	601-585-3080

Seaplane takeoff and landing maneuvers are additionally prohibited in the following restricted zones that have been identified on the Tennessee-Tombigbee Waterway:

Aliceville Lake Between Navigation Miles 308.7 and 309.7	Pool D Between Navigation Miles 400.5 and 401.5
Gainesville Lake Between Navigation Miles 287.9 and 288.9	

4. SPECIAL SAFETY PRECAUTIONS: Each lake upon which the regulation provide for Seaplane takeoff and landing maneuvers is subject to varying degrees of fluctuation and varying conditions. Pilots operating seaplanes on any lake in the Mobile District should take special care to avoid seasional waterfowl, floating and submerged debris, and exposed land features which occur as a result of such fluctuation. Caution should also be exercised in avoiding boats on all lakes, especially but not limited to the areas near marina, park, and public access points.

26 March 1998
Date

/s/________
Timothy K. Reddy
Lieutenant Colonel
Corps of Engineers
Acting District Engineer

APPENDIX I

Agency and Community Correspondence

RULES USED WHEN SEAPLANES ARE ON THE WATER

Any time a seaplane is operating on the water, whether under power or not, it is required to comply with USCG navigation rules applicable to vessels. The USCG rules say, in part, "A seaplane on the water shall, in general, keep clear of all vessels and avoid impeding their navigation…"

The FAA states that FAR 91.115 pilots should ensure compliance with those USCG rules. Here is the opening statement in 91.115

"*Each person operating an aircraft on the water shall insofar as possible, keep clear of all vessels and avoid impeding their navigation, and shall give way any vessel or other aircraft that is given the right-of-way by any rule of this section.*"

Seaplane pilots are familiar with both sets of rules—USCG and FAA.

Here is the web address for an online copy of USCG navigation rules.

http://www.navcen.uscg.gov/?pageName=navRulesContent

For FAA regulations including 91.115

http://www.faa.gov/regulations_policies/faa_regulations/

Lanier Seaplane Pilots Association

Lanier Seaplane Pilots Association

1660 Palmour Drive AA-5

Gainesville, Georgia 30501

Troy Wheeler

Office 678-989-2395

Cell 404-702-7766

Troy.wheeler@lanierflightcenter.com

www.lanierflightcenter.com

" SEAPLANE " Information

http://www.floatplaneslanier.org

The propeller

The propeller on almost all seaplanes are mounted as high as possible to prevent water contact. It is located behind the float tips on those converted from wheels and on hull type seaplanes, the engine and propeller are mounted above the wing.

Also, the arc of the propeller does not exceed the width of the floats on the float type seaplane.

The engine is shutdown as the seaplane approaches during any arrivals. When ready for departure they are turned nose out by hand before starting the engine.

Start up and Taxi

When the seaplane is ready to depart the dock or mooring, you will hear the pilot yell "CLEAR". This will be your indication to remain clear of the seaplane as the engine is started.

As soon as a seaplane engine starts, the seaplane begins to move forward on the water, unless it is tied up or being held by a handler. There are no brakes or reverse on a seaplane. Be cautious around the seaplane as it moves away from the dock.

As the seaplane leaves the dock, water rudders are used to maneuver on the water. Please be aware that a seaplane has a large turning radius. So stay clear as the pilot maneuvers on the water.

If the pilot needs to move long distances on the water, he will perform a "STEP TAXI".. This is very similar to a boat planning out on the water. In this condition, the seaplane will be traveling at about 25-35 knots, same as a small speed boat, as the seaplane is repositioned.

Take off and Departure

For **Take Off** a seaplane needs about 500 to 1500 ft of water run to lift from the surface and another 1000 to climb to above the tallest sailboats on the lake.

The noise at takeoff power, (78 db) is a good bit less than offshore racing type boats and lasts on average about 25 to 45 seconds.

Normal take off speeds are about 55 to 65 knots.

Landing

While you are on the water boating, you may not hear or see the seaplane approaching or landing. Be assured the pilot is responsible for making sure the landing area is clear and safe to land.

If the pilot has any concerns about safety , the pilot will abort the landing and move to a safer part of the water.

Public Coordination

Lakeside on Lanier, Newspaper - September 2014
http://issuu.com/lanierpublishing/docs/lakesideonlanierseptember2014?e=1223400/9099174
(Original included)

The Times, Newspaper (Gainesvilletimes.com) – July 22, 2014 publication (Original included)

The Lake Destination Lanier, Magazine - August/September 2014
http://issuu.com/thetimes/docs/binder1_60b8649478e200/37?e=0

Online Athens, Athens Banner-Herald, Newspaper – July 22, 2014
http://onlineathens.com/associated-press/2014-07-22/seaplane-pilots-want-land-planes-lake-lanier

Facebook post by Seaplane Pilots Association, Internet – June 29, 2013
https://www.facebook.com/SeaplanePilotsAssociation/posts/470653623025003

Lanier Flight Center, Website news
http://www.lanierflightcenter.com/flying-news/lfc-to-host-meeting-for-opening-lake-to-float-planes/

Star 94, Atlanta Radio Station – June 22, 2014
http://www.star94.com/info-2-go/2014/07/22/planes-landing-on-lake-lanier-it-could-happen

Veooz, Online Chatroom – July 2014
http://www.veooz.com/news/WHLdel1.html

Lake Lanier, Online News – July 2014
http://lakelanier.com/2014/07/local-pilots-seek-land-seaplanes-lake-lanier/

WSB 95.5 Radio – July 22, 2014
http://www.wsbradio.com/news/news/seaplane-pilots-want-land-lake-lanier/ngkZx/

Lakeside News, Online News – September 2, 2014
http://www.lakesidenews.com/seaplane-pilots-seek-access-to-lanier

Atlanta Journal Constitution, Newspaper – July 24, 2014
http://www.ajc.com/news/news/local/lanier-seaplanes/ngm4w/?__federated=1#__federated=1

Forsyth News, Newspaper – July 24, 2014

http://www.forsythnews.com/archives/24948/

Times Free Press, Online News – July 23, 2014
http://www.timesfreepress.com/news/local/story/2014/jul/23/region-digest/262458/

Buford Patch, Online News – July 24, 2014
http://patch.com/georgia/buford/should-seaplanes-be-allowed-on-lake-lanier#.U_2vuye9KK0

Study: Beef pollutes more than other meats

BY SETH BORENSTEIN
Associated Press

BILL WOLF | Associated Press

Cows graze in Rock County, Neb.

WASHINGTON — Raising beef for the American dinner table does far more damage to the environment than producing pork, poultry, eggs or dairy, a new study says.

Compared with the other animal proteins, beef produces five times more heat-trapping gases per calorie, puts out six times as much water-polluting nitrogen, takes 11 times more water for irrigation and uses 28 times the land, according to the study, published Monday in the journal Proceedings of the National Academy of Sciences.

Cows are not efficient at converting feed to protein for human consumption, said lead author Gidon Eshel, an environmental physics professor at Bard College in New York.

Eshel used U.S. government figures to calculate air and water emissions and how much water and land were used in the lifetime production of beef, pork, poultry, dairy and eggs. While other studies have looked at the issue, this is one of the most comprehensive pieces of research quantifying and comparing the U.S. environmental costs of different meats and other animal protein.

The beef industry called the study "a gross oversimplification of the complex systems that make up the beef value chain."

Kim Stackhouse, sustainability director at the National Cattlemen's Beef Association, said that the industry has improved its environmental sustainability in recent years and that the United States produces beef with the lowest greenhouse gas emissions of any country.

In the study, pork, poultry, dairy and eggs all had comparable environmental footprints, so close there were no statistically significant differences among them, Eshel said. But cows were off-the-chart different. The study did not look at plants or fish raised for human consumption.

Cows burp major amounts of methane, a greenhouse gas that is dozens of times more potent than carbon dioxide. Their digestive system makes them produce considerably more methane than pigs, chickens or turkeys do, Eshel said. The manure used to grow feed for cows also releases methane, as does their own bodily waste.

Because they are bigger and take longer to put on weight for meat, cows eat more food over their lifetimes than other animals raised for protein.

Nitrogen, from fertilizer runoff, can harm rivers, lakes and bays, causing oxygen-depleted "dead zones." The use of irrigation water is a major issue out West when there are droughts, like the current one in California. So much land used for farming changes the biodiversity of a location, Eshel said.

"It really looks like beef is a lot worse environmentally than these other meats," said Ken Caldeira, an environmental scientist at the Carnegie Institution for Science. Caldeira wasn't part of this study, but has a separate study of beef's greenhouse gas footprint around the world, published this month in the journal Climatic Change.

Eshel calculates that the average American who switches from beef to pork would reduce the equivalent of 1,200 pounds of carbon dioxide a year, which is about nine days' worth of the nation's per capita greenhouse gas emissions. The EPA calculates that it is the same as the emissions from 61 gallons of gas or what comes out of the smokestack from burning 580 pounds of coal.

Caldeira said his calculations found that "eating a pound of beef causes more greenhouse warming than burning a gallon of gasoline."

Even though pigs have the reputation for being dirty, the data shows that they "come out pretty clean" when compared to cows, Eshel said.

Beef's hoofprint on the environment

A new study says raising beef cattle for the U.S. diet consumes more resources and generates more pollution than raising other forms of livestock.

Raising 1,000 calories of animal-based food takes about:

	Land SQUARE METERS	Water LITERS
Beef	146.6	1,642.2
Poultry	4.1	145.0
Pork	5.3	186.5
Eggs	3.0	104.8
Dairy	8.7	170.8

Generates pollutants including:

	Greenhouse gases KILOGRAMS	Nitrogen GRAMS
	9.6	175.8
	1.7	33.3
	2.0	42.9
	1.5	24.1
	1.9	25.6

NOTE: 1,000 calories is about half the recommended daily food intake for an adult.

Source: Proceedings of the National Academy of Sciences
Associated Press

News of police ties to KKK stuns Central Florida town

BY MIKE SCHNEIDER
Associated Press

JOHN RAOUX | Associated Press

Thrift store owner Mike Blackhall walks outside his store on July 16 in Fruitland Park, Fla. Two police officers are no longer with the city department here after a law enforcement report tied them to the Ku Klux Klan.

FRUITLAND PARK, Fla. — Ann Hunnewell and her central Florida police officer husband knelt in the living room of a fellow officer's home, with pillow cases as makeshift hoods over their heads. A few words were spoken and they, along with a half-dozen others, were initiated into the local chapter of the Ku Klux Klan, she says.

Last week, that five-year-old initiation ceremony stunned residents of the small town of Fruitland Park, who found out an investigative report linked two city officers with the secret hate society that once was violently active in the area. Ann Hunnewell's ex-husband, George Hunnewell, was fired, and deputy chief David Borst resigned from the 13-member Fruitland Park Police Department. Borst has denied being a member.

James Elkins, a third officer who Ann Hunnewell says recruited her and her husband, resigned in 2010 after his Klan ties became public.

The violence against blacks that permeated the area was more than 60 years ago, when the place was more rural and the main industry was citrus. These days, the community of less than 5,000 residents about 50 miles northwest of Orlando has been infused by the thousands of wealthier, more cosmopolitan retirees in the area. Those who live in the bedroom community, which is less than 10 percent black, have reacted not only with shock, but disgust that officers could be involved with the Klan, the mayor said.

"Maybe I'm ignorant, but I didn't realize that they still met and organized and did that kind of thing," said Michele Lange, a church volunteer.

Mayor Chris Bell says he heard stories about a Klan rally that took place two years before he arrived in the 1970s, but he has never seen anything firsthand. As recently as the 1960s, many in law enforcement in the South were members but "it's exceedingly unusual these days to find a police officer who is secretly a Klansman," said Mark Potok, a senior fellow at the Southern Poverty Law Center, which monitors hate groups.

While the Klan used to be politically powerful in the 1920s, when governors and U.S. senators were among

5,000 members nationwide, Potok said.

"The radical right is quite large and vigorous. The Klan is very small," he said. "The radical right looks down on the Klan."

Fruitland Park, though, has been dealing with alleged KKK ties and other problems in the police ranks since 2010, when Elkins resigned after his estranged wife made his membership public.

Last week, residents were told Borst and the Hunnewells had been members of the United Northern and Southern Knights Chapter of the Ku Klux Klan, though its presence in their town wasn't noticeable. The Florida Department of Law Enforcement sent the police chief a report linking the officers to the Klan based on information from the FBI. Both men didn't return repeated phone messages to their homes, but Borst told the Orlando Sentinel he has never been a Klan member.

Ann Hunnewell — who was a police department secretary until 2010 — told Florida investigators that former Police Chief J.M. Isom asked her and her ex-husband to join the KKK in 2008, trying to learn if Elkins was a member. Isom, though, shortly after Elkins resigned, also quit after he was accused of getting incentive pay for earning bogus university degrees.

Current Police Chief Terry Isaacs said he took a sworn oath from Isom, who called Ann Hunnewell's account a lie, and that there was no record of such an undercover investigation.

Johns Hopkins system to pay $190M after doctor secretly took images with cameras

BALTIMORE — A "rogue" gynecologist who used tiny cameras to secretly record videos and photos of his patients has forced one of the world's top medical centers to pay $190 million to 8,000 women and girls.

Dr. Nikita Levy was fired after 25 years with the Johns Hopkins Health System in Baltimore in February 2013 after a female co-worker spotted the penlike camera he wore around his neck and alerted authorities.

Levy committed suicide days later, as a federal investigation led to roughly 1,200 videos and 140 images stored on computers in his home.

"All of these women were brutalized by this," said their lead attorney, Jonathan Schochor. "Some of these women needed counseling, they were sleepless, they were dysfunctional in the workplace, they were dysfunctional at home, they were dysfunctional with their mates. This breach of trust, this betrayal — this is how they felt."

The preliminary settlement approved by a judge Monday is one of the largest on record in the U.S. involving sexual misconduct by a physician. It all but closes a case that never produced criminal charges but seriously threatened Hopkins' reputation.

Associated Press

DEMANDING DANCING
Gainesville intensive draws ballet master's choreography.
Our Region, 1C

LAKEVIEW FOOTBALL RETURNING TO REGION
Q&A with school's athletic director.
SPORTS, 1B

The Times

TUESDAY
JULY 22, 2014

Your news. Your Times. gainesvilletimes.com

50 CENTS
GAINESVILLE, GEORGIA

ELECTION 2014

Polls open at 7 a.m. today

Ballot includes U.S. Senate, Hall school board and state school leader

Times staff reports

Georgia's longest runoff election, mandated by judges to ensure military and other overseas voters had time to return their ballots, finally ends today.

Polls are open from 7 a.m. to 7 p.m. across the state, including precincts throughout Hall County.

The featured race in Hall County is the contest for Post 2 on the Hall County Board of Education, where incumbent Brian Sloan faces novice Mark Pettitt. Sloan just missed the 50 percent plus one vote threshold to avoid a runoff, garnering 49.99 percent of the vote in the May primary. Pettitt, who had 25.04 percent of the primary vote, advanced to the runoff by just seven votes over third

Please see VOTE, 5A

Be heard

- Get up to date on the candidates at gainesvilletimes.com/elections
- Vote between 7 a.m. and 7 p.m. at your designated polling place
- Take a selfie with your peach voting sticker afterward and send it our way @gtimes or on facebook.com/gainesvilletimes

HALL RETIREMENT

Services may merge

BY JOSHUA SILAVENT
jsilavent@gainesvilletimes.com

Hoping to cut costs and streamline services, the Hall County Board of Commissioners is prepared to select a new company to manage employee retirement plans when it meets Thursday.

Human Resources Director Bill Moats has recommended that Northwest Plan Services, based out of Washington state, replace GebCorp and Nationwide for management services related to 401a and 457 retirement plan accounts.

Moats said having two vendors is confusing for employees, increases overlap and redundancy, and makes management of accounts more difficult.

Moving to a single vendor, he added, helps reduce fees, improve education, employee participation, compliance and customer service.

Proposals from seven companies were scored and rated by a 15-person committee, which included employees from several county departments.

"I was kind of surprised at the direction they went," Commissioner Craig Lutz said. "It's not the direction I would have gone."

Lutz added that his experience with larger firms, such as Fidelity, influenced his opinion.

Commissioner Scott Gibbs, one of two elected officials on the committee, said

Please see RETIRE, 5A

LANIER A NEW PORT OF CALL?

Photos by NAT GURLEY | The Times

An aerial view of Lake Lanier on Wednesday afternoon from a small plane. Local seaplane advocate Troy Wheeler says there is a lot of room on the lake for seaplanes. Some U.S. Army Corps of Engineers regulations allow water landings only on weekdays — others have no such restrictions.

Pilots petition Corp of Engineers for right to land on lake

BY JEFF GILL
jgill@gainesvilletimes.com

Troy Wheeler dipped the wings of his bright yellow Piper Cub seaplane toward Lake Lanier as he circled back toward Lee Gilmer Memorial Airport in Gainesville.

Landing at the airport was his only nearby option as Wheeler's craft, which can land on water or land, isn't allowed to land on the 38,000-acre lake — at least for now.

Wheeler's group, the Lanier Seaplane Pilots Association, has petitioned the Army Corps of Engineers to allow seaplanes — also known as float planes — on Lanier's waters.

The pilots "want to be able to use the lake for recreational use, just like everybody else does," Wheeler said. "We're all licensed, insured, responsible people, not 17-year-olds with a Jet Ski and a six-pack."

They have set up a website, floatplanesnlanier.org, that lays out their case for the activity.

"Many of us have homes on Lake Lanier, we have close friends and family that live on Lake Lanier and we want to ensure that Lake Lanier is enjoyed by everyone and that all pilots operate responsibly on this great resource," the website states.

"Unlike a group of 50 bass fishermen racing off to their favorite fishing hole before sunrise from Little Hall Park, there are hardly that many seaplanes in all of Georgia and seaplane operations would be more of a rarity than commonplace."

Seaplane pilots can land at many lakes in the Southeast, including Allatoona Lake in Northwest Georgia, which is operated by the corps.

Some seaplanes can land only on the water. But the ones operated by Lanier Seaplane Pilots Association members can land on water and land, and once they're on water, can pull up to a dock or travel up boat ramps and park — especially convenient when there's a restaurant or other amenities nearby.

"We have customers all over the lake, and myself, who would love to have nothing more than to have a

Please see FLY, 5A

Wheeler and others push his Piper Cub into position early on July 5 at the Cracker Fly-In at Lee Gilmer Memorial Airport.

Victim close to her home when killed

GSP: Motorist won't be charged

BY JEFF GILL
jgill@gainesvilletimes.com

A pregnant Hall County woman was heading home from a Ga. 365 convenience store when she was struck and killed by a motorist Sunday night, a Georgia State Patrol trooper said Monday.

Kimberly Michelle Coates, 29, was crossing Ga. 365 near a Kangaroo store, traveling with a friend, Trooper Devon Fields said.

"When they crossed the righthand southbound lane, (Coates) didn't make it out of the roadway in time," he said.

Please see HIT, 5A

WEATHER 2A

High 82 Low 70

Lake Lanier level: 1,070.89 feet
Up 0.07 feet in 24 hours

DEATHS 2C

Joe T. Adams Jr.
Richard "Dick" Bailey, 87
Charlotte Ann Bowman, 62
Roberta Clark, 91
Jimmie Wood Cooper, 101
Violet Elaine Crowe, 88
Benjamin Ellerd III, 56
Frances Guyton, 68
Dean James Hayes, 82
G.H. Kinney, 88
Harold Stone Lanier, 92
Kenneth Leonard, 67
Fermon Loudermilk, 66
Thomas Lumsden Jr., 59
Catherine Alice Nash, 67
Keary Maurice Nicely, 39
Sherrie Lynn Nicely, 46
Cleate Mae Roberts, 81
Beth Pirkle Samples, 57
Michael Alan Tone, 57
Virginia "Ginny" Tucker, 70
Pamela Dale Williams, 56
Bobby Joe Wofford, 80
Howard Wyncoop Jr., 76
Russell Earl Yates II, 69

LOTTERY | Drawings for Monday, July 21, 2014

CASH 3 Midday: 0-2-8 Evening: 5-5-7
CASH 4 Midday: 1-4-4-5 Evening: 1-8-5-9
GEORGIA FIVE Midday: 5-9-6-0-3 Evening: 7-3-2-3-5
FANTASY FIVE 1-5-13-26-36
DECADES OF DOLLARS (7/21) 1-3-11-13-17-44
POWERBALL (7/19) 10-17-25-45-53 Power Ball: 9 Current jackpot: $40M
MEGA MILLIONS (7/18) 5-8-59-65-72 Mega Ball: 3 Current jackpot: $58M

Lottery numbers are unofficial. The Georgia Lottery Corp.: 404-215-5000.

TODAY IN HISTORY

On this date:

In 1587, an English colony fated to vanish under mysterious circumstances was established on Roanoke Island off North Carolina.

In 1796, Cleveland, Ohio, was founded by General Moses Cleaveland.

In 1893, Wellesley College professor Katharine Lee Bates visited the summit of Pikes Peak, where she was inspired to write the original version of her poem "America the Beautiful."

In 1916, a bomb went off during a Preparedness Day parade in San Francisco, killing 10 people.

In 1933, American aviator Wiley Post completed the first solo flight around the world as he returned to New York's Floyd Bennett Field after traveling for 7 days, 18 and 3/4 hours.

In 1943, American forces led by Gen. George S. Patton captured Palermo, Sicily, during World War II.

In 1944, the Bretton Woods Monetary Conference concluded in New Hampshire with an agreement to establish the International Monetary Fund and the World Bank.

In 1946, Jewish extremists blew up a wing of the King David Hotel in Jerusalem, killing 90 people.

In 1963, Sonny Liston knocked out Floyd Patterson in the first round of their rematch in Las Vegas to retain the world heavyweight title.

BIRTHDAYS

Opera singer **Licia Albanese** is 101. Former Senate Majority Leader **Bob Dole**, R-Kan., is 91. Actor-comedian **Orson Bean** is 86. Fashion designer **Oscar de la Renta** is 82. Actress **Louise Fletcher** is 80. Rhythm-and-blues singer **Chuck Jackson** is 77. Actor **Terence Stamp** is 76. Game show host **Alex Trebek** is 74. Singer **George Clinton** is 73. Actor-singer **Bobby Sherman** is 71. Former Sen. **Kay Bailey Hutchison**, R-Texas, is 71. Movie writer-director **Paul Schrader** is 68. Actor **Danny Glover** is 68. Singer **Mireille Mathieu** is 68. Actor-comedian-director **Albert Brooks** is 67. Rock singer **Don Henley** is 67. Movie composer **Alan Menken** is 65. Singer-actress **Lonette McKee** is 61. Actress **Joanna Going** is 51. Actor **Rob Estes** is 51. Folk singer **Emily Saliers** (Indigo Girls) is 51.

ON GAINESVILLETIMES.COM

Volunteer and support groups

Looking to give back to the community or need assistance? Check out our resources page filled with options. It's always available online. It is also published biweekly in Sunday Life.

WEATHER

Gainesville 5-Day Forecast AccuWeather.com

TODAY	TONIGHT	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Thunderstorms	A couple of t-storms	Some sun, a t-storm	A strong t-storm	A p.m. t-storm	Partly sunny
HIGH: 82°	LOW: 70°	85°/71°	85°/70°	85°/68°	86°/70°
RFT: 90°	RFT: 72°	RFT: 94°/73°	RFT: 90°/72°	RFT: 91°/69°	RFT: 96°/70°

RFT: The patented AccuWeather.com RealFeel Temperature® is an exclusive index of effective temperature based on eight weather factors.

Almanac

Statistics for Lee Gilmer Memorial Airport through 5 p.m. yesterday

Temperature	
High	82°
Low	70°
Normal high	87°
Normal low	69°
Record high	103° in 1986
Record low	60° in 1971
Precipitation (in inches)	
24 hrs. ending 5 p.m. yest.	0.21
Month to date	3.97
Normal month to date	2.93
Year to date	24.89
Normal year to date	30.05
Record for date	1.83 in 2013

Regional Weather

Shown is today's weather. Temperatures are today's highs and tonight's lows.

Lake Levels

Lake data as of 7 a.m. yesterday

Lake	Full Pool	Present Level	24 hr Change
Lake Lanier	1071.0	1070.89	+0.07
Allatoona Lake	840.0	839.74	+0.11
Burton Lake	1865.0	1865.26	-0.19
Clark's Hill Lake	330.0	328.15	-0.10
Hartwell Lake	660.0	658.53	+0.15
Russell Lake	480.0	474.83	+0.17
West Point Lake	635.0	634.62	+0.27

Today in Weather History™

On July 22, 1918, one lightning strike killed 504 sheep in Wasatch National Park, Utah. In one year, lightning often kills more people than floods, tornadoes or hurricanes do.

Forecasts and graphics provided by AccuWeather, Inc. ©2014

Air Quality

Today's reading

Main Offender: Particulates
Source: EPA

AccuWeather.com UV Index™

The higher the AccuWeather.com UV Index™ number, the greater the need for eye and skin protection.

6

0-2 Low	3-5 Moderate	6-7 High	8-10 Very High	11+ Extreme

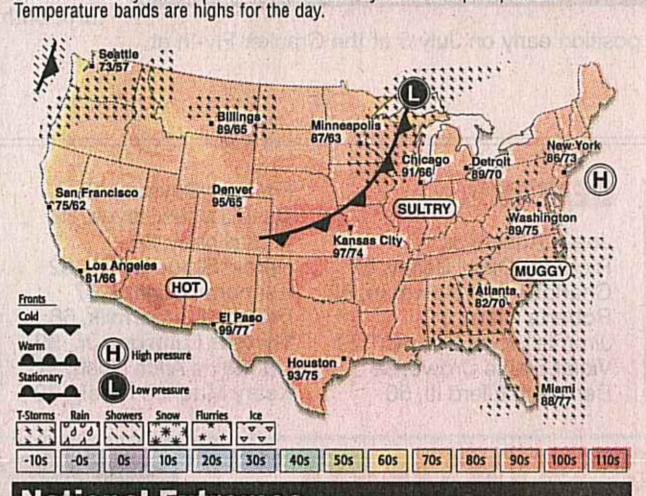
Pollen Count

Yesterday's pollen: Trees, Grass, Weeds

Main Offender: Grasses
Source: NAB

National Weather

Shown are today's noon positions of weather systems and precipitation. Temperature bands are highs for the day.



Sun and Moon

Sunrise today	6:39 a.m.
Sunset tonight	8:44 p.m.
Moonrise today	3:10 a.m.
Moonset today	5:22 p.m.

Moon Phases

New First Full Last

National Extremes

CELEBRITY REPORT

ABC's Paula Faris to replace weekend anchor on 'Good Morning America'

NEW YORK — Paula Faris is replacing the departing Bianna Golodryga as the news anchor on the weekend edition of "Good Morning America."

ABC News said Monday that Faris will start Aug. 8. The "World News Now" anchor joined the network in 2012 from the NBC affiliate in Chicago, and was recently given exposure as ABC News' reporter at the World Cup.

Golodryga is leaving ABC News to join Yahoo.

Faris will be co-anchor of the weekend morning broadcast with Dan Harris. Rob Marciano will also soon be joining the weekend crew as the weather forecaster.

Ex-Destiny's Child member arrested in Myrtle Beach

COLUMBIA, S.C. — A former member of the R&B group Destiny's Child was arrested in Myrtle Beach over the weekend after a night of drinking with two football players, according to authorities.

Records show Farrah Franklin, 33, was booked into the Horry County jail just before 5 a.m. Sunday on a charge of disorderly conduct.

According to police reports, Franklin had been drinking with Daquan Bowers and Ricky Sapp, both former Clemson University football players who are now in the NFL. Bowers — now a defensive end with the Tampa Bay Buccaneers — told Horry County Police he had flown Franklin into town from her home in California to spend time with him.

The three went out drinking Sunday and went back to Sapp's home, according to police. Both men told police Franklin was highly intoxicated and that she was "yelling, slamming doors and refused to stop when asked."

Bowers and Sapp, an outside linebacker with the Houston Texans, called police after she refused to calm down. Officers said they found Franklin lying in a neighbor's yard and the woman told police she "did not have anywhere else to go and was planning on sleeping in the woods."

Franklin was released from jail around noon Sunday after posting $280 bond. Court records listed no attorney for her, and no phone number for her could be found.

Associated Press

AROUND TOWN

Activities happening in and around the Hall County area this week. For changes or to have an announcement listed, contact The Times at 770-718-3435 or email news@gainesvilletimes.com

TODAY

Civic organizations

Rotary Club of Hall County, Gainesville. 11:30 a.m., Recess Gastro-pub, 118 Bradford St. NE, Gainesville. Kim Waters, 770-540-3788.

American Business Women's Association, Gainesville. 5:30 p.m. for networking, 6:30 p.m. for dinner and meeting, Recess Gastro-pub, 118 Bradford St. NE, Gainesville. 770-532-8453 or 770-533-9513.

Cumming Chapter No. 346, Cumming. 7:30 p.m., Order of the Eastern Star, Masonic Lodge, Cumming.

Flowery Branch Masonic Lodge No. 212 F&AM, Flowery Branch. 7:30 p.m., corner of Spring and Gainesville streets, Flowery Branch. 770-536-3056.

Lanier Shrine Club meeting, Gainesville. 6:30 dinner, 7:30 p.m., Gainesville Lodge No. 219, Lakeshore Drive, Gainesville. 404-661-3113.

Dawson County Kiwanis Club, Dawsonville. 11:30 a.m., Ryan's restaurant, 126 Ga. 400, Dawsonville. Angelia Holloway, 706-531-1022, or Regina Varnado, 706-531-1013.

Gainesville Lions Club, Gainesville. Noon, Hibachi Grill, 1500 Browns Bridge Road, Gainesville. Herman Jones, 770-536-2418 or 770-532-8143.

Gainesville Kiwanis Club, Gainesville. 12:30 p.m., Elks Club, 1547 Riverside Drive, Gainesville.

Gainesville Evening Optimist Club, Thompson Bridge Road, Gainesville. Teressa Glazer, 770-534-2595.

Health/fitness

Blood pressure screenings, Gainesville. 10 a.m., Hall County Senior Center, Gainesville, 770-538-2603.

Healing through drumming, Gainesville. 7:30 p.m., Unity of Gainesville, 3361 Clarks Bridge Road, Gainesville. 770-534-0949.

Child Safety Seat Check, Gainesville. 9-11 a.m., Gainesville Justice Center, 701 Queen City Parkway, Gainesville.

First Place 4 Health, Gainesville. 8 a.m., Gainesville First United Methodist Church, 2780 Thompson Bridge Road, Room S-01, Gainesville. Lori Floyd, 770-536-2341.

Lakeshore Walkers Program, Gainesville. 7 a.m. to 9 p.m., Lakeshore Mall, 150 Pearl Nix Parkway, Gainesville.

Leisure

Revival, Gainesville. Featuring preaching from Cody Riley. 7:30 p.m. today through Friday, East Hall Baptist Church, 3339 Joe Chandler Road, Gainesville. 770-535-2269.

Gainesville area stitch-in. 10 a.m., meets in members' homes. Pam Roberts, 770-536-6679.

White County Duplicate Bridge Club, Sautee Nacoochee. 12:30 p.m., Nacoochee United Methodist Church, 1371 Ga. 17, Sautee Nacoochee. Call for reservations. 706-348-6572.

Lanierland Duplicate Bridge Club, Gainesville. 10:30 a.m., 3042 McEver Road, Gainesville. 678-769-5430.

Public meetings

Banks County Board of Commissioners meeting, Homer. 6:30 p.m., board room, Banks County Courthouse Annex, Homer. 706-677-6800.

Seniors

Game Club, Flowery Branch. Card and board games. 8:30 a.m. to noon, Mulberry Creek Community Center, 4491 J.M. Turk Road, Flowery Branch. 770-965-7140.

Legacy Link, Gainesville. Seniors can come for help with low-cost prescription drug assistance programs and learn about rights as a Medicare beneficiary. 8:30 a.m. to 5 p.m., 508 Oak St. NW, Gainesville. 770-538-2650.

HOROSCOPES BY HOLIDAY

ARIES (March 21-April 19). Your friends are important to you, but they'll never know unless you tell them with words, deeds and gifts. Go there. Tell them sincerely, because this is when they will appreciate the gesture the most.

TAURUS (April 20-May 20). It's as though you have lavender-scented oxygen and are inhaling life on a whole new level. Breathe it all in with the relish of a first breath. And look out for those Gemini, Libra and Aquarius people as you do!

GEMINI (May 21-June 21). You'll be invigorated by your team. Sure, some of them are loopy, and others are bossy, but the overall effect will be enthusiasm. Go with it! Acting with decisiveness will inspire the group's confidence in you.

CANCER (June 22-July 22). Some associate the moon with madness, others with romance. Your ruling luminary does command oceans to swell, and your beauty follows the trend. You'll have all of the magnetic power of the moon today — and it's heavenly.

LEO (July 23-Aug. 22). Should you stretch, learn and grow, or should you stay comfortable and contained? It sounds *like a trick* question, and yet there are times when it's better — and it's a very legitimate choice — to stay comfortable and contained.

VIRGO (Aug. 23-Sept. 22). Today you may interact with someone as creative and diverse as you are, and it will be important that you stay focused on your own scene. One topic will lead to another, but bring it back to yours.

LIBRA (Sept. 23-Oct. 23). Plan, take action and complete the mission. This is easy when it's a doable task: grocery shopping, cleaning the house, calling your relatives. It's all important, but only as important as you make it.

SCORPIO (Oct. 24-Nov. 21). Don't take the blame for someone else's mistake, but don't call it out, either. There is a way to be classy and discreet. As you duck out of a bad situation, just know that justice always wins in the end.

SAGITTARIUS (Nov. 22-Dec. 21). Your fanciful mood creates a reality that you and yours would love to inhabit. At the right time, you'll bring this down to earth. Before that, it's frothy fun.

CAPRICORN (Dec. 22-Jan. 19). The one who doesn't get you seems like an idiot. But have you considered that you are not so easily discerned? Your beautiful complications are not for the faint of heart or the simple of mind.

AQUARIUS (Jan. 20-Feb. 18). What you know and what you don't know come together in a yin-yang kind of configuration, and you'll likely be happy with it. Why mess with balance? Seek to know more another day.

PISCES (Feb. 19-March 20). The old saw goes: The audience can't see and hear at the same time. So if you're delivering important information, which you will be today, make sure you're not distracting the listener with anything extraneous.

The Times gainesvilletimes.com

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SUBSCRIPTIONS AND CUSTOMER SERVICE

Police probe other attacks after transients killed

BY JERI CLAUSING
Associated Press

ALBUQUERQUE, N.M. — Three teenagers accused of fatally beating two homeless men beyond recognition with cinder blocks, bricks and a metal fence pole may have been terrorizing transients around Albuquerque for months, police said Monday.

A man who identified himself as the father of two of the boys said they were once homeless themselves and he had no idea what prompted the beatings. One of the boys told police they had attacked about 50 homeless people over the last few months, but had never gone that far. But on Friday night, he was angry about breaking up with his girlfriend, he said.

Alex Rios, 18, and two boys ages 16 and 15 were ordered held on $5 million bond each during initial court appearances Monday. They face murder charges stemming from the brutal attack in an Albuquerque lot where neighbors say transients regularly camped at night.

Following their arrest, the 15-year-old also told police that the trio had been targeting homeless people for the past year, according to a criminal complaint.

Rios

Prosecutors requested bonds of just $1 million, but Metropolitan Court Judge Linda Rogers set it higher, citing the gravity of the alleged crimes and the suspects' potential to flee. The district attorney's office said the younger suspects were charged as serious youthful offenders, meaning they could be tried in adult court.

The two younger defendants, one wiping away tears, sat in the courtroom while Rios made his appearance by closed circuit video from the county jail.

Family and attorneys for the three declined comment after the proceeding.

According to the criminal complaint, the 15-year-old told police the attack lasted more than an hour, and that the trio took turns picking up cinder blocks over their heads and smashing them into the faces of the men who had been sleeping in the field across from his home, according to the criminal complaint.

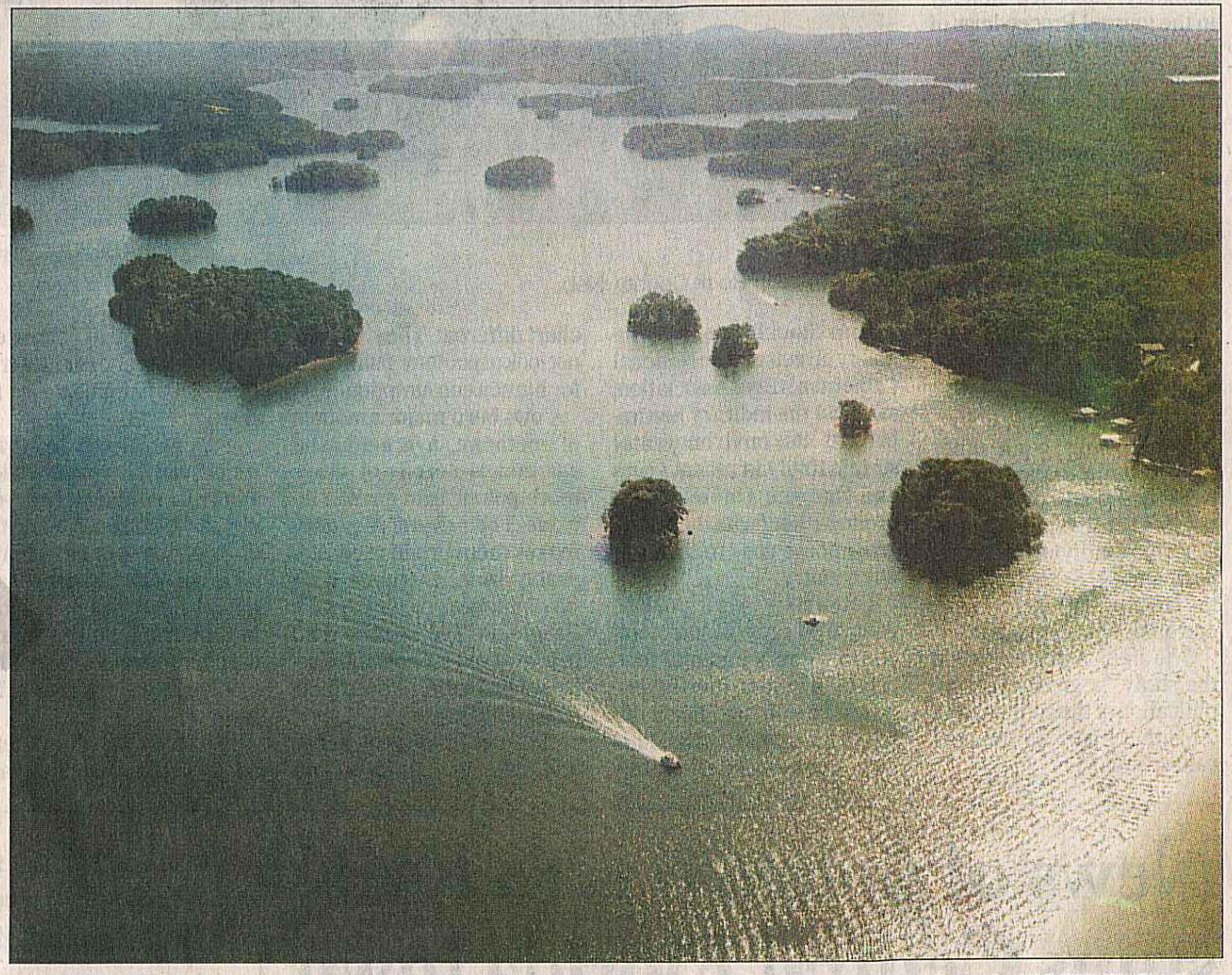
A third transient who escaped led police to the boys, whom he said were known for attacking homeless people. And the father of the two younger defendants told an Albuquerque television station there were rumors his son was violent, but he assumed it was with other kids.

Victor Prieto told KOB-TV he has no idea what prompted the beatings, and that he and his family had once been homeless themselves.

"It's so hard that he could do that to someone where ... I mean, like I said, we came from there," said Prieto, who said he was the father of the 15- and 16-year-olds accused. "You know what I mean? We're not there now, but that's where we ... we got out of there," Prieto said.

SCOTT ROGERS | The Times

New Holland precinct assistant poll manager Dinah Wallace unpacks items for the precinct Monday afternoon at the former East Hall library in preparation for today's runoff election.



Photos by NAT GURLEY | The Times

An aerial view of Lake Lanier on Wednesday afternoon, from a small plane.

VOTE: Perdue, Kingston have drawn spotlight

■ Continued from 1A

candidate Traci McBride.

Statewide, the race gathering the most attention is the runoff between former CEO David Perdue and U.S. Rep. Jack Kingston, R-Savannah, for the Republican nomination for the U.S. Senate seat being vacated by Saxby Chambliss, R-Moultrie. The winner faces Democrat Michelle Nunn and Libertarian Amanda Swafford, a former Flowery Branch councilwoman, in the November general election.

Perdue led in Hall County in the primary, and both he and Kingston have made several stops in the county since the primary as North Georgia looks to be a key to deciding which of the two South Georgia residents will get the GOP nod.

Both Republicans and Democrats will pick their nominees for state school superintendent in today's runoffs. John Barge left the post to run for governor, losing to incumbent Nathan Deal in the primary, opening the race for the schools post.

Republican Michael Buck, chief academic officer for the state Department of Education, and Richard Woods, a longtime educator in Irwin County, are running in the Republican runoff, while state Rep. Alisha Thomas Morgan and former Decatur School Board Chairwoman Valarie Wilson are competing in the Democratic contest.

The Associated Press contributed to this report.

RETIRE: Next step is to review plan operation

■ Continued from 1A

he thought the process for selecting a new vendor had worked well.

"I'm really excited because I think, for the first time, employees have had a voice," he added.

Moats said bringing Northwest on board could cut costs for account management services from about $350,000 annually to less than $200,000.

"The rate that we are negotiating will be much lower than what we are paying currently," Moats added.

Northwest was not the low bidder, but officials said that was not the only consideration.

"Cost is one factor we were looking at ... but there are other components to it," Moats said, adding that record keeping, customer service and employee education were critical, as well.

"It's not just a fee-based decision."

Northwest is expected to take over the retirement plans by Jan. 1, 2015.

The change in vendor impacts about 1,300 full-time county workers.

Northwest will be responsible for managing about $67 million in retirement plan assets.

"This is just the first step in this process ...," Moats said. "The next step is to review plan design, which is how the plan operates."

Changes to the retirement plan design could include the types of investment funds used and whether new employees should be automatically enrolled, among other things.

The Hall County Board of Commissioners meets at 6 p.m. Thursday at the government center, 2875 Browns Bridge Road in Gainesville.

HIT: Victim was only 300 feet from her home

■ Continued from 1A

Following the accident at 9:30 p.m., officials discovered the victim was pregnant. She and the child were pronounced dead at the scene.

Coates was in the final three months of her preg-

yards away from the house," Fields said.

The driver, Joshua Buehler, 38, of Atlanta, tried to swerve to avoid hitting the woman but ended up striking her with the front of his car.

"There's not going to be any charges on the driver of the vehicle," Fields said.

FLY: 'Once you're on the water, you become a boat'

■ Continued from 1A

seaplane parked at our dock," said Wheeler, who is also president of Lanier Flight Center at the airport.

The pilots group started the formal process last year with the corps, flying to district offices in Mobile, Ala.

Officials told the group to work on several things, including getting support.

"That's when we held town hall meetings here at the airport," said Wheeler, the national Seaplane Pilots Association's Georgia field director. "We had a good turnout."

Wheeler said he's gotten a negative vibe from some people about their chances of getting a corps permit, but the progress so far with the agency "has been somewhat encouraging but (there are some) steps."

The corps is requiring the group to conduct an environmental assessment if it wants to continue pursuing the permit.

"This would require them to look at several alternatives — locations throughout the lake that could meet their needs but generally lack civil infrastructure, such as bridges and transmission lines," said Pat Robbins, spokesman at the corps' Mobile office.

Then, the assessment would need to look at various impacts, such as economic benefits associated with the proposal and any issues with threatened or endangered species.

"Once they complete that, we would publish a public notice and allow 45 days for the public to review the proposal," Robbins said. "Any issues raised in the public review would need to be addressed, and when all is completed, they would present the package for a decision by the commander."

Wheeler said the group likely will need to hire somebody who can help them with the assessment.

The pilots, learning the corps would bill them for its work in the review, were able to raise $5,000 in 24 hours, he said.

The big concerns are boat traffic and effects on neighbors — and there's plenty of both around Lanier. The lake attracts more than 7 million visitors annually.

Using Allatoona's restrictions, seaplanes would need to land and take off at least 500 feet from the shore, so smaller coves and very narrow channels would be off limits.

"There's plenty of open water out there that would be suitable (for landing),"

Wheeler, left, and Tony Herdener talk Wednesday about the pros of allowing seaplanes to land on Lake Lanier. Both men are on the focus group for allowing seaplanes to land on the lake.

Wheeler said. "And once you're on the water, you become a boat. Then, you follow all the boat rules."

And the group has agreed that, between Memorial Day and Labor Day, Lanier's busiest season, seaplanes wouldn't land on weekends and federal holidays.

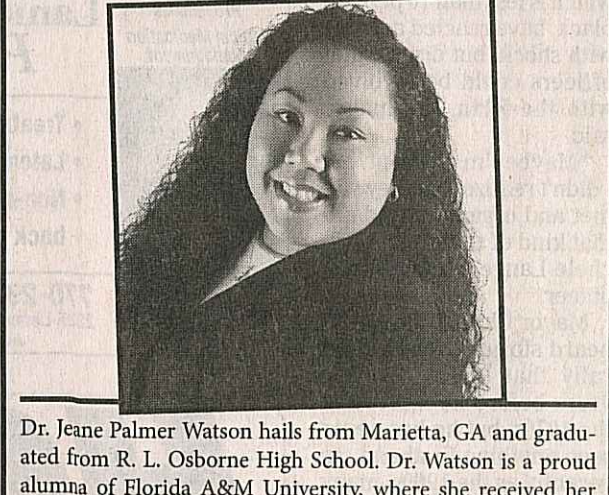
"We're OK with that — you wouldn't want to go out then, anyway," Wheeler said.

Joanna Cloud, executive director for the Gainesville-based Lake Lanier Association, said her group isn't opposed to seaplane landings "assuming similar control measures are implemented ... as are already in place at Allatoona Lake."

Tony Herdener, chief financial officer at Northeast Georgia Health System, is a Lanier Flight Center student and pilot whose dream is to fly a seaplane.

He said he believes allowing seaplanes on Lanier could draw pilots from throughout the Southeast.

"It would be a huge attraction, (a boost) to the economy, and it's fun," Herdener said.



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INSIDE THIS ISSUE

New marina on Lake Lanier

A new marina is coming to Lake Lanier after the first of the year, and Lanier veteran marina operator Barkley Geib will be managing it. To be located at Sunset Cove at Lake Lanier Islands, the marina will include a ship's store and gas dock. Page 44

Lake Lanier Shore Sweep

Calculating the tons of trash, garbage and Styrofoam collected over the past 25 years through the annual Lake Lanier Shore Sweep would keep your head spinning. This year's event is set for Saturday, September 27. Page 2

Lanier Car Show & Auction

A new event to support our military has arrived on our shores: the first-ever Lake Lanier Auto Show and Auction on Saturday, October 11, at Lake Lanier Islands' Peachtree Point. Page 52

Also inside:

PHOTO BY SHANE CRIDER

Seaplanes could be coming to Lake Lanier if a local flight center gets approval from the U.S. Army Corps of Engineers. Story, page 25.

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Shore Sweep improvements keep annual event effective, fun

By Pamela A. Keene

Calculating the tons of trash, garbage and Styrofoam collected over the past 25 years through the annual Lake Lanier Shore Sweep would keep your head spinning. With an average of 20 tons per year – and that's on the low side – the figure is almost mind-boggling. The number of people who have participated at least one ShoreSweep is staggering.

This year's event on Saturday, September 27, promises to be even bigger and more effective than ever. Not only will participants collect trash and debris on Saturday, reporting to one of 10 locations around the lake, volunteers have been working for weeks to scout the shoreline's problem areas, set up advance drop-off locations and gather supplies and community partners.

"By dividing the lake into 10 zones and having zone captains for each, we are able to identify where to focus our work," said Gordon Brand, LLA board member and chair of Shore Sweep. "We started with a pilot program in Dawson County eight or nine years ago to use this approach, and it has proved to be an excellent and efficient way to accomplish our clean-up goals."

Shore Sweep began 26 years ago with a group of concerned volunteers and association members who gathered trash along the shorelines of the lake. Over the years, it has grown to attract more than 1,000 volunteers who show up on the last Saturday of September to collect garbage around the lake.

Until recently, the association provided captains at designated locations for the morning event, then sponsored a centrally located after party for all the volunteers. Brand suggested to the board that the lake be divided into zones – using Dawson County as a pilot – to see if the event could be even more effective.

"We've even set up an advance drop-off location that will be available the week before Shore Sweep at Deer Island for people to bring in trash if they can't participate on Saturday," he said. "We've been working closely with the Corps of Engineers to expand our participation."

Seven days prior to Show Sweep, volunteers may drop off garbage at the Deer Island location's designated area. On the day of Shore Sweep, Brand said that a barge from Marine Specialties Inc. – one of the event's main corporate sponsors – will bring the trash down to War Hill Park for removal.

Work for Shore Sweep has been going on for months. Brand and his team have divided the lake into 10 zones. "We get volunteers to do scouting reports to determine where to focus our volunteers and this has really helped us collect even more trash and Styrofoam," he said. "We also have four volunteers in their boats who survey the shoreline and then on Shore Sweep day, they come and assist with trash removal."

He said that the association can always use more volunteers, particularly those who are willing to bring their boats to assist on the day of Shore Sweep. "We can

See Shore Sweep, page 12

DNR offering $1,000 grant to conservation teacher

The Nongame Conservation Section of the Georgia Department of Natural Resources is offering a $1,000 grant to a third-, fourth- or fifth-grade public or private school teacher in Georgia who demonstrates exceptional energy and innovation in teaching life sciences.

Through education, research and management, the Nongame Conservation Section works to safeguard Georgia's native diversity of wild animals, plants and their habitats – while also striving to increase public enjoyment of the outdoors.

The purpose of the grant is to recognize and help an outstanding teacher who uses Georgia's nongame wildlife as the context for learning third-, fourth- or fifth-grade curriculum standards, according to Linda May, DNR environmental outreach coordinator.

"Students who learn about plants, wildlife and habitats often develop an appreciation for these diverse natural resources and are then motivated to be good stewards of the environment – not just during childhood but also as adults," said May, who works with the Nongame Conservation Section.

Nongame wildlife refers to native animals that are not fished for or hunted and rare plants not harvested, such as gopher tortoises and Georgia aster.

Previous grant recipients fostered a love of Georgia's natural heritage and taught students how to contribute to healthy ecosystems through their everyday actions. For example, at Rocky Branch Elementary in Watkinsville, teacher Shawna Babin and third-graders explored soils, plant adaptations and habitat types using worm farms and greenhouses.

More recently, students at Whit Davis Elementary in Athens created Georgia-specific habitats with representative animals in aquariums for the school's science laboratory, all with guidance from science specialist Steven King and the University of Georgia's Warnell School of Forestry and Natural Resources.

Students observed the aquarium activity and recorded findings in a journal and through videos broadcast on the school's district cable TV channel.

This fall, another teacher will be selected to receive funding based on project design and how well the grant proposal questions are answered.

Projects that are especially creative and teach about Georgia's rare or endangered species, as well as those that can't be funded otherwise, will earn bonus points. See www.georgiawildlife.com/Teaching-ConservationGrant for details.

The deadline to apply is Sept. 15, 2014. DNR will notify the grant winner and award funding in October.

■ **MORE INFO:** Linda May 706-557-3226

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• Don Carter

Continued from Page 46

outdoors and the park's amenities and "get a bite to eat at a nice restaurant" in Gainesville or nearby city, Wagner said.

He added that establishing the Lanier park "is like opening a new store in a popular downtown area." It adds new flavor and "gives people something different." The new shop on the block is just getting started. The current trail system, consisting of about two miles of paved paths and a one-mile cove trail, is part of a trail-building venture that may take years to complete. The first part, a ? mile nature trail along a peninsula between the beach and Dog Creek Cove, may open this month.

Wagner said 22 miles of separate hiking and equestrian trails are planned, along with a paddle trail that is part of a 36.2 mile water passage from the Chattahoochee River in Helen to Clarks Bridge on Lake Lanier. The paths traverse bluffs overlooking the lake and lead to isolated peninsulas like Whale's Tale and beautiful Blue Ridge Cove. Paddle in campsites will give overnighters a lake panorama rarely seen from gentle ridges. Wagner said that unlike strenuous trails in the mountains, all of Don Carter's trails will be moderate.

The old saying, "If you build it they will come," fits Don Carter, he added. Visitors have come from all over to the young park that's still in the building phase. "On my first day of patrolling at the campground one of the first tent campers I met were from Colorado," he said.

Those coming most frequently are neighbors from North Hall. Susan and Andrew Wiley, who live minutes away, brought a friend from Connecticut to kayak on the quiet Lanier channel last month. The Wileys said they jog through the park often and looked forward to renting a canoe and kayak for a peaceful first time paddle with their friend. Wagner said kayaks and canoes far outnumber motorboats launching from park boat ramps or trolling the upper reaches of the lake.

One popular facet of the park's personality will be missed this fall with the departure of Interpretive Ranger Clint Eller. The affable, knowledgeable herpetologist and naturalist had to take time off from weekend programs to care for his ailing father. Wagner said he is seeking another interpretive ranger to host programs this fall. As of late August, the bluegrass festival was the only activity on the fall calendar.

For those desiring to keep their summer tan the color of autumn leaves, the park's sandy beach and swimming area beckon even after first frost. However, the bathhouse and showers will close before winter's chill. The winter, often a slow time at state parks, will bring a flurry of activity at Don Carter where hundreds of collegiate rowers plan to sleep in cottages and stroke out on the lake. Rowers from the University of Michigan are among those who plan winter training at the Lake Lanier Olympic Venue and week-long stays at the park just up the lake.

As summer drew to a close, the park sparkled with year round allure and prospects for a bright future.

Chattahoochee Mountain Music Festival set for park

By Jane Harrison

Don Carter State Park presents the Chattahoochee Mountain Music Festival Sept. 27 as part of Your State Parks Day.

The event, with free parking and admission, is one of numerous activities planned at Georgia State Parks that day.

Park Ranger Will Wagner described the festival as the "first big event" at the year-old park. He hopes it will be an annual crowd pleaser and early fall celebration that will grow each year.

The afternoon festival follows a morning of volunteer service planting native trees and shrubs near the park entrance and visitors' center.

Event description: Fall festival with bluegrass music, craft booths and barbecue.

Bluegrass bands: Ellis Walden, Larry Daniels, Georgia Pick & Bow, Now & Then Band, Pressley Girls

Time: Noon-7 p.m.

Location: Day Use Area (near the beach), Don Carter State Park, 5000 N. Browning Bridge Rd., Gainesville.

Admission: Free parking, free admission. Per plate charge for barbecue.

Park volunteers: Those desiring to help "Dress up the Park" report to the visitors' center 10 a.m.-noon. Bring shovel, gloves and water.

Arts & Craft Vendors: The park is accepting local craft vendors' applications for through the Friday before the festival. Booth cost is $35.

Other State Park Day activities: See the Outdoor Calendar for activities at Unicoi, Smithgall Woods, and Tallulah Gorge.

■ MORE INFO: 770-450-7726, www.gastateparks.org

Coming in for a landing: Seaplane pilots seek access to Lake Lan

By Pamela A. Keene

It's not unusual for seaplanes to land on lakes around the country. In fact, they are already allowed to land on Allatoona Lake, as well as many other bodies of water.

"We're hoping to get permission from the Corps of Engineers to land on Lake Lanier, because it would have positive economic impact on this area," said Troy Wheeler, a pilot with Lanier Flight Center. "Seaplanes would be able to land, then taxi to docks. Most states in the U.S. are seaplane friendly."

Wheeler also said that recreation on Lanier would be enhanced because bringing seaplanes to the lake would make it possible for more people to visit here.

The position by the U.S. Army Corps of Engineers appears to be open to the idea, as long as the group follows the formal process for gaining lake access.

"We would require an environmental assessment," said Pat Robbins with the Corps' Mobile District Office. "This would require them to look at several alternatives, i.e. locations throughout the lake that could meet their needs, but generally lack civil infrastructure (bridges, transmission lines, etc).

"Once they have determined the possible alternatives then the EA would need to address economic benefits associated with the proposal, any issues with threatened or endangered species, or other issues that an environment assessment requires addressing," he said. "Once they complete that, (the Corps) would publish a public notice and allow 45 days for the public to review the proposal. Any issues raised in the public review would need to be addressed, and when all is completed (the group) would present the package for a decision by the Commander (in Mobile)."

Robbins explained that the timeline for the decision is up to the pilots' organization. "(It depends) on how quickly and thoroughly they get the environmental assessment developed, and then how many comments are received and how long it would take to address any issues that arise from the general public," he said.

Wheeler said that the group is already working with an engineering firm to develop the assessment. "Our proposal in many ways will mirror the restrictions in place on Allatoona," he said. "The Corps has even given us a template and guidelines to work from. It's just a matter of completing the assessment and getting it to them."

Troy Wheeler with the Super Cub on floats at the Gainesville airport. PHOTO COURTESY OF LANIER

Safety is also top-of-mind for the pilots' group, he said. "The pilot (who's preparing to land) would always have the final say in whether to land, based on the situation," Wheeler said. "A pilot has a good visualization point when making his approach, and can decide not to land if it's not safe."

Many other lakes that allow seaplane landings have restrictions on the days the planes can land and the areas that are accessible to them. For instance, the planes may only be allo land on weekdays in lo areas. "There haven't b sues I'm aware at other lakes that allow seaplan bins said. "The biggest Lanier would be just th of boat usage that alrea how to create safe oper all activities. The benef be an additional recreat portunity."

Subj: **RE: seaplane operations on lake lanier**
Date: 2/9/2015 7:33:00 P.M. Eastern Standard Time
From: philipburton@gainesvillemarina.com
To: JLWin37@aol.com

Mr. Winter, As we discussed earlier on February 7,2015, I don't see any issue with seaplane's on Lanier during weekdays (except holidays) during the summer months or at all daylight hours during off season Oct. thru March. Gainesville Marina would consider a sublease down the road if seaplanes presented itself to be a commercial operation on Lanier that would benefit recreational users of the lake. Thanks for sharing your interest in this activity on Lanier. Sincerely Philip

---

From: JLWin37@aol.com [mailto:JLWin37@aol.com]
Sent: Saturday, February 07, 2015 11:00 PM
To: philipburton@gainesvillemarina.com
Subject: seaplane operations on lake lanier

Manager, Gainesville Marina

Mr. Burton,

Thank you for taking the time to discuss our efforts working with the Corps of Engineers and the surrounding communities to open the lake to seaplane operations.

In a recent phone call from the Corps office in Mobile, W. W. Fuller, Chief of the Operations Division recommended talking to the Marina's and ask them about working under their contract to provide a business use..If we want to do more than just land on the lake... IE. flight school, sightseeing trips or wanting to keep the airplane at their marina.

Although the *Lake Lanier Seaplane Pilots Association* thinks it would be too early to introduce commercial operations on the lake at first we would like to let the Corps know of any interest on your part to include seaplane needs in future plans for your marina ?

Thank you.

Respectfully

J.L. Winter "Jerry"
Home: 770-889-1837
Cell: 770-329-7012
Email: jlwin37@aol.com

RECEIVED

OCT 08 2014

ATHENS, GA
USFWS

ENGINEERING MANAGEMENT
Experience ▪ Trust ▪ Solutions

Civil and Environmental Engineers

September 29, 2014

U.S. Fish and Wildlife Service
Georgia Ecological Service
105 Westpark Drive
Westpark Center Suite D
Athens, GA 30606-3175

Re: Modification of Policy at Lake Sidney Lanier Relative to Seaplane Operations
Dawson, Forsyth, Gwinnett and Hall Counties, Georgia
Notice of Early Public Review

To Whom It May Concern:

The Lanier Seaplane Pilots Association is in the process of performing an environmental review in order that it may assess the environmental impacts of Modification of Policy at Lake Sidney Lanier in order to allow for to Seaplane Operations.

Enclosed is a narrative that includes a description and information on the proposed modification.

Please review this project for consistency with goals, policies, plans, objectives, programs, environmental impact, or inconsistencies with federal executive orders, acts and/or rules and regulation, and if applicable, with budgetary restraints. We would appreciate a response within 30 days. If you need any further information or wish to discuss the project, please contact me at the phone number or email address provided below.

Sincerely,

Corinne Valentine, P.E.
corval@eminc.biz

Enclosure

14048 FS9

DRAFT

U. S. Fish and Wildlife Service
105 Westpark Drive, Suite D
Athens, GA 30606
706-613-9493 Fax 706-613-6059

FWS Log No. NG-15-35-HALL

Based on the information you provided, no further action is required under Section 7(a)(2) of the Endangered Species Act. However, if new information or changes in the project involve federally-listed species, further consultation with the Service will be required.

Donald W. Imm, Ph.D., Field Supervisor   Date 12/9/14

September 22, 2014

Lanier Seaplane Pilots Association

Re: Request for Modification of Policy at Lake Sidney Lanier relative to Seaplane takeoff and landings

This request is being made on behalf of the Lanier Seaplane Pilot Association.

It is a request that the U.S. Army COE, Mobile District and the U.S. Army COE for Lake Sidney Lanier consider modifying the current policy and approve restricted takeoff and land maneuvers on Lake Sidney Lanier similar and parallel to that of Allatoona Lake. Lake Sidney Lanier covers 38,000 acres, 692 miles of shoreline, with 5 marinas. It was created for hydropower production, flood control, navigation, water quality and supply, recreation, and fish and wildlife management. Its size alone makes Lake Sidney Lanier more suitable for takeoff and land maneuvers compared to Allatoona Lake. Allatoona Lake has 12,000 acres, 270 miles of shoreline, with 8 marinas. It too was created for the same uses as Lake Sidney Lanier.

Seaplanes have no oily bilge water or sewage discharge, no underwater engine exhaust, propeller, or other underwater protrusions, and do not generate a significant wake.

Considerable research and reconnaissance has been made on other Lakes in the Mobile District including Carters, Allatoona, W.F. George and West Point. We have not found any negative impacts or incidents of record involving any Seaplanes.

The policy at Allatoona Lake is Open w/Restrictions. Closed weekends and national holidays between April 15 and September 15. Operations prohibited on Acworth Subimpoundment. Takeoffs and landings prohibited within 500' of any shoreline, bridge, overhead powerline, dock, dam or similar structure. Seaplane ops prohibited sunset to sunrise. Commercial ops prohibited without permission. Mooring in excess of 24 hours is restricted. Seaplanes must comply with marine rules of the road for power boats and vessel rules set forth in 36 CFR 327.3. A reconnaissance at Lake Sidney Lanier has also been made and many areas exist in our opinion that would fit the criteria regarding clear zones that are 500 feet away from bridges and other specified structures.

Seaplanes and their owners/pilots have been proven through statistical data to be a highly respectable and safe group that is highly compatible with communities and waterways such as Lake Sidney Lanier.

Our pilots are highly trained and licensed by the FAA, which leads to their outstanding safety record when compared to power boating and personal watercraft statistics. They also do not require boaters to have any knowledge or additional training, as they take full responsibility for maintaining safe operations in and around boaters on the water.

Should this request be approved, we would not envision a large amount of seaplane traffic on Lake Lanier, especially considering that there are only about 20 licensed units in the State of Georgia.

We have only received positive responses to our concept of Seaplanes operations at Lake Sidney Lanier. We are currently organizing public outreach and communications regarding this potential change and have conducted "Town Hall" meetings at our Hanger at the Gainesville Airport during 2013. We had visibility with a booth set up at the Lake Lanier Association's recent annual meeting held on April 27, 2014, and spoke to the President of the Association, Mr. Val Perry and other community leaders about our proposal.

A recent 5 year study on the environmental effects of Seaplanes the U.S. Army Corps of Engineers, the agency responsible for the waterways in the U.S.A., concluded there to be no impact on Air Quality, Water Quality, Soil Quality, Wildlife, Fisheries, or Hydrology.

A noise comparison chart is provided below which provides examples of different noise level generated by different sources.

Noise	**dBA**	**Example**
Firearm	140+	Various locations
REM Rock Concert	???	Excellent band!
Military Jet	120+	
Jet Ski	110	
Chainsaw	105	Forestry/logging
Grass Cutting	88-100+	Golf Courses
Bulldozers	99	Hotel and golf course construction
Tractors	95	
A82-truck/motorbike/bus	90	Duck Bay, Luss, Firkin Point
All-terrain vehicles	85	
Forklifts	84	
Speedboat	65-95	
Seaplane	75	On take-off @ 1,000' (20 seconds)
Inside car – 30 mph	73	
Normal conversation	65	

- 8 dBA difference is when humans perceive a halving or doubling of sound*
- Information gathered to create the above chart was gathered from several sites: http://www.seaplanes.org/mambo/UserFiles/File/spopsfaq.pdf, http://www.nonoise.org/library/household/index.htm, www.safetyline.wa.gov.au/pagebin/farmhazd0014.htm

As shown in the list above, seaplanes rank fairly low on the noise generation list. It is very important to understand that the 75 dBA at 1,000' stated above is measured at MAXIUM take-off power. In practice, this power is only produced for 20 seconds during the take-off phase and at no other time. As soon as the aircraft exits the water the pilot reduces the power and the noise reduces substantially. Jet skis produce 110 dBA and speedboats produce 65-95 dBA, both of which are greater on average than that of the seaplane noise generation of 75 dBA, which is only generated for the 20 seconds of take-off.

In summary, if approved, the change in policy would allow operations with restrictions: Closed weekends and national holidays between April 15 and September 15; Takeoffs and landings prohibited within 500' of any shoreline, bridge, overhead power line, dock, dam, or similar structure. Seaplane operations prohibited sunset to sunrise. Commercial operations prohibited without permission. Mooring in excess of 24 hours is restricted. Seaplanes must comply with marine rules of the road for power boats and vessel rules set forth in 36 CFR 327.3.

Goodloe, Robin <robin_goodloe@fws.gov>

FW: Seaplane Operations at Lake Lanier

1 message

Corinne Valentine <corval@eminc.biz>
To: "robin_goodloe@fws.gov" <robin_goodloe@fws.gov>
Cc: Kim Kyst <kkyst@eminc.biz>

Tue, Nov 11, 2014 at 10:19 AM

Robin,

In response to your questions:

The potential impact on wildlife and waterfowl resources with the proposed policy change should be minimal as waterfowl are as tolerant of seaplanes as they are of the other operators on the lake. Boats on Lake Lanier routinely operate amongst the flocks of ducks, loons and gulls at speeds greater then seaplane takeoff speeds and the waterfowl simply move out of their paths.

Pilots of all types of aircraft are reminded frequently about the hazards of bird strikes especially during migrations. Along with increased awareness and avoidance, it is standard practice to turn on landing / taxi lights when operating where encounters with birds are anticipated.

The size of Lake Lanier and available takeoff and landing areas permits almost all approaches and departures to be conducted over the water, thus eliminating the need to overfly the shoreline at low altitudes.

The U.S. Army Corps of Engineers regulations prohibiting takeoff and landing maneuvers within 500 feet of any bridge, causeway, overhead powerline, dock, dam, or similar structure. This regulation inadvertently also mandates 500-ft clearance from any nesting sight. As provided in the "National Bald Eagle Management Guidelines" by USFWS, May 2007, nesting buffers for watercraft is 330-ft during breeding season, and 1,000-ft for fixed-wing aircraft during breeding season.

> *Category E. Motorized Watercraft use (including jet skis/personal watercraft). No buffer is necessary around nest sites outside the breeding season. During the breeding season, within 330 feet of the nest, (1) do not operate jet skis (personal watercraft), and (2) avoid concentrations of noisy vessels (e.g., commercial fishing boats and tour boats), except where eagles have demonstrated tolerance for such activity. Other motorized boat traffic passing within 330 feet of the nest should attempt to minimize trips and avoid stopping in the area where feasible, particularly where eagles are unaccustomed to boat traffic. Buffers for airboats should be larger than 330 feet*

due to the increased noise they generate, combined with their speed, maneuverability, and visibility.

Category G. Helicopters and fixed-wing aircraft. Except for authorized biologists trained in survey techniques, avoid operating aircraft within 1,000 feet of the nest during the breeding season, except where eagles have demonstrated tolerance for such activity.

http://www.fws.gov/southdakotafieldoffice/NationalBaldEagleManagementGuidelines.pdf

The Seaplane Pilots Association has a "Water Landing Directory" which will be updated for the Lake Lanier project and will mandate clearance from known locations of Osprey/Eagle nests as areas to avoid at low altitude.

Please let me know if you have any other questions.

Corinne Valentine, P.E.

Engineering Management, Inc.

corval@eminc.biz

From: "Goodloe, Robin" <robin_goodloe@fws.gov>
Date: October 21, 2014 at 2:18:31 PM EDT
To: Corinne Valentine <corval@eminc.biz>
Subject: Seaplane Operations at Lake Lanier

Hi Corinne,

Thanks for your Sept. 29 letter regarding Lanier Seaplane Pilots Association environmental review about modifying policy at Lake Sydney Sanier for seaplane operations.

However, I don't have sufficient information to evaluate the project's potential impact on wildlife resources. Lake Lanier supports nesting bald eagles and ospreys, and a number of gulls, grebes, and ducks use the lake for feeding and loafing. Do you know if the Association has plans for:

1. minimizing bird strikes during takeoffs and landings (both for the pilots' and birds' safety); and
2. avoiding disturbance of nesting eagles and ospreys. The document you sent indicates that takeoffs and landings would be at least 500' from any shoreline, but how low over the treeline (where eagle/osprey nests occur) can the planes fly on takeoff and landing, and are there specific routes for these approaches and departures?

Thanks for the assistance,\

Robin

Robin Goodloe, Supervisory Fish and Wildlife Biologist, North Georgia Office

Georgia Ecological Services

US Fish and Wildlife Service

105 West Park Drive, Suite D, Athens, GA 30606

706-613-9493 X221 706-613-6059 fax

14-048 FS9

To: Corinne Valentine
Engineering Management, Inc.
303 Swanson Drive
Lawrenceville, GA 30043

Fax: 770-962-8010
Email: corval@eminc.biz

From: Georgia Mountains Regional Commission

Applicant: Lanier Seaplane Pilots Association
(Dawson, Forsyth, Gwinnett and Hall Counties), GA

Project: Modification of Policy at Lake Sidney Lanier Relative to Seaplane Operations

Date: ____________________

☑ This notice is considered to be consistent with those state or regional goals, policies, plans, fiscal resources, criteria for developments of regional impact, environmental impacts, federal executive orders, acts and/or rules and regulations with which this organization is concerned.

☐ This organization is in support of the project

This notice is not consistent with:

- ☐ The goals, policies, plans, or fiscal resources with which this organization is concerned. (Line through inappropriate word or words and prepare a statement that explains the rationale for the inconsistency. Additional pages may be used for outlining the inconsistencies.)

- ☐ The criteria for developments of regional impact, federal executive orders, acts and./or rules and regulations administered by your agency. Negative environmental impacts or provisions for protection of the environment should be pointed out. (Additional pages may be used for outlining the inconsistencies.)

☐ This notice does not impact upon the activities of this organization.

☐ This organization has no objections to the proposal.

Kim Kyst

From: Corinne Valentine
Sent: Tuesday, November 11, 2014 10:20 AM
To: robin_goodloe@fws.gov
Cc: Kim Kyst
Subject: FW: Seaplane Operations at Lake Lanier

Robin,

In response to your questions:

The potential impact on wildlife and waterfowl resources with the proposed policy change should be minimal as waterfowl are as tolerant of seaplanes as they are of the other operators on the lake. Boats on Lake Lanier routinely operate amongst the flocks of ducks, loons and gulls at speeds greater then seaplane takeoff speeds and the waterfowl simply move out of their paths.

Pilots of all types of aircraft are reminded frequently about the hazards of bird strikes especially during migrations. Along with increased awareness and avoidance, it is standard practice to turn on landing / taxi lights when operating where encounters with birds are anticipated.

The size of Lake Lanier and available takeoff and landing areas permits almost all approaches and departures to be conducted over the water, thus eliminating the need to overfly the shoreline at low altitudes.

The U.S. Army Corps of Engineers regulations prohibiting takeoff and landing maneuvers within 500 feet of any bridge, causeway, overhead powerline, dock, dam, or similar structure. This regulation inadvertently also mandates 500-ft clearance from any nesting sight. As provided in the "National Bald Eagle Management Guidelines" by USFWS, May 2007, nesting buffers for watercraft is 330-ft during breeding season, and 1,000-ft for fixed-wing aircraft during breeding season.

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> *http://www.fws.gov/southdakotafieldoffice/NationalBaldEagleManagementGuidelines.pdf*

The Seaplane Pilots Association has a "Water Landing Directory" which will be updated for the Lake Lanier project and will mandate clearance from known locations of Osprey/Eagle nests as areas to avoid at low altitude.

Please let me know if you have any other questions.

Corinne Valentine, P.E.
Engineering Management, Inc.
corval@eminc.biz

From: Dixon, Jennifer <Jennifer.Dixon@dnr.state.ga.us>
Sent: Friday, October 10, 2014 2:36 PM
To: Corinne Valentine
Subject: Modification of Policy at Lake Sidney Lanier, Seaplane Operations, Multiple Counties

Corinne,

Our review of the subject project would be under Section 106 of the National Historic Preservation Act. As such, the US Corps of Engineers does not delegate their 106 responsibility. Therefore, we will be working directly with the USACE in reviewing this project for compliance.

Thanks,

Jennifer Dixon, ASID, MHP, NCIDQ
LEED Green Associate

Program Manager
Environmental Review & Preservation Planning
Historic Preservation Division
Georgia Department of Natural Resources

254 Washington Street, SW | Atlanta, GA 30334
P 404.651.6546 | www.georgiashpo.org

GEORGIA
Department of Natural Resources
Historic Preservation Division

From: Gissentanna, Larry <Gissentanna.Larry@epa.gov>
Sent: Thursday, December 11, 2014 10:46 AM
To: Corinne Valentine
Subject: Modification of Policy At Lake Sidney Lanier Relative to Seaplane Operations

Dear Corinne Valentine,

Consistent with Section 102(2)(c) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, the U.S. Environmental Protection Agency (EPA) appreciates the opportunity to review the Modification of Policy at Lake Sidney Lanier relative to seaplane operations.

This notice does not impact the activities of this organization.

EPA recommend that you continue to keep the local community informed and involved throughout the project process; by having community meetings and updating the community through local media (radio, local paper and TV).

Thank you again, for the opportunity to comment, If you have any questions, please contact me via the information below.

Larry O. Gissentanna
DoD and Federal Facilities, Project Manager

U.S. Environmental Protection Agency/ Region 4
National Environmental Policy Act (NEPA) Program Office
61 Forsyth Street, SW
Atlanta, GA 30303-8960
Office: 404-562-8248
gissentanna.larry@epa.gov

From: Goodloe, Robin <robin_goodloe@fws.gov>
Sent: Tuesday, October 21, 2014 2:19 PM
To: Corinne Valentine
Subject: Seaplane Operations at Lake Lanier

Hi Corinne,

Thanks for your Sept. 29 letter regarding Lanier Seaplane Pilots Association environmental review about modifying policy at Lake Sydney Sanier for seaplane operations.

However, I don't have sufficient information to evaluate the project's potential impact on wildlife resources. Lake Lanier supports nesting bald eagles and ospreys, and a number of gulls, grebes, and ducks use the lake for feeding and loafing. Do you know if the Association has plans for:

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2. avoiding disturbance of nesting eagles and ospreys. The document you sent indicates that takeoffs and landings would be at least 500' from any shoreline, but how low over the treeline (where eagle/osprey nests occur) can the planes fly on takeoff and landing, and are there specific routes for these approaches and departures?

Thanks for the assistance,\

Robin

Robin Goodloe, Supervisory Fish and Wildlife Biologist, North Georgia Office
Georgia Ecological Services
US Fish and Wildlife Service
105 West Park Drive, Suite D, Athens, GA 30606
706-613-9493 X221 706-613-6059 fax

14-048 FS9

To: Corinne Valentine
Engineering Management, Inc.
303 Swanson Drive
Lawrenceville, GA 30043

Fax: 770-962-8010
Email: corval @eminc.biz

From: Georgia Department of Transportation - Aviation Programs Carol Comer

Applicant: Lanier Seaplane Pilots Association
(Dawson, Forsyth, Gwinnett and Hall Counties), GA

Project: Modification of Policy at Lake Sidney Lanier Relative to Seaplane Operations

Date: January 6, 2015

X This notice is considered to be consistent with those state or regional goals, policies, plans, fiscal resources, criteria for developments of regional impact, environmental impacts, federal executive orders, acts and/or rules and regulations with which this organization is concerned.

o This organization is in support of the project

This notice is not consistent with:

- o The goals, policies, plans, or fiscal resources with which this organization is concerned. (Line through inappropriate word or words and prepare a statement that explains the rationale for the inconsistency. Additional pages may be used for outlining the inconsistencies.)

- o The criteria for developments of regional impact, federal executive orders, acts and./or rules and regulations administered by your agency. Negative environmental impacts or provisions for protection of the environment should be pointed out. (Additional pages may be used for outlining the inconsistencies.)

X This notice does not impact upon the activities of this organization.

* This organization has no objections to the proposal.

*Subject to a satisfactory air space determination by the Federal Aviation Administration. Please contact Mr. David Dull at 816-329-3693 for guidance on submittal of FAA Form 7460.

Subj:	**RE: seaplane operations on Lake Lanier**
Date:	2/6/2015 4:41:33 P.M. Eastern Standard Time
From:	bpearson@bestinboating.com
To:	JLWin37@aol.com

Hi Jerry, thanks for contacting us!

Yes we'd be happy to work with you. In the past on Lake Allatoona at Park Marina, we've had two seaplanes moored there with us over the years. Neither was a commercial operation, just purely recreational. I would think we could work something out that wouldn't cause conflict or interruption with our own business activities, and would be happy to talk to you about the logistics.

Thanks!

Brent Pearson
Port Royale Marina

From: JLWin37@aol.com [mailto:JLWin37@aol.com]
Sent: Friday, February 06, 2015 4:37 PM
To: bpearson@bestinboating.com
Subject: seaplane operations on Lake Lanier

Mr. B Pearson
Manager, Port Royal Marina

I had stopped by the office and your office manager showed me the build out display and gave me your e-mail address.

I am part of the Lake Lanier Seaplane Pilots Association working with the Corps of Engineers and the surrounding communities to open the lake to seaplane operations. .

Lake Lanier at the present time is not approved for seaplane operations and we are about a year in to the process working with the Corps.

In a phone call from the Corps office in Mobile, Winn Fuller recommended talking to the Marina's and ask them about working under their contract to provide a business use..If we want to do more than just land on the lake... IE. flight school, sightseeing trips or wanting to keep the airplane at their marina.

Because seaplanes have not been a part of the lakes use would there be any interest on your part to include seaplane needs in future plans for your marina ?

Respectfully

J.L. Winter "Jerry"
Home: 770-889-1837
Cell: 770-329-7012
Email: jlwin37@aol.com

APPENDIX J

Seaplane Base Information

WHAT IS A SEAPLANE BASE?

The term used to describe a body of water or private facility that is available to the public is "public use." As it relates to an airport, public use means it is available for use by the general public without prior approval of the airport owner or operator (FAA Order 5010.4 1981; Advisory Circular 150/5200-35A 2010). "Private use" refers to any airport available for use by the owner only, or by the owner and other persons authorized by the owner (Advisory Circular 150/5200-35A 2010).

For the majority of private SPBs listed in both the FAA database and Appendix B, the ownership is designated as being "privately owned." In the case of SPBs, the term "privately owned" generally refers to the land facilities and not the waterway, as waterways fall under the control of a federal, state, or local government agency. In contrast, for a private-use land airport, a private owner actually owns the land on which the runways and taxiways are located. If a private owner makes his or her airport available to the public, then it becomes a public-use airport (albeit privately owned). In all but a few cases, the owner of a public-use land airport also owns or operates the facilities located on it. The same ownership of water and land facilities does not hold true for SPBs.

HISTORY

The history of seaplane development, commencing in 1910, is well documented. The history of the development of seaplane bases is not so well documented. In a telephone conversation on September 15, 2014, Rick Leisenring, curator at the Glenn H. Curtiss Museum in Hammonsport, New York, indicated that when Curtiss developed the first pontoons to be used on an aircraft in the United States in 1911, he used an existing dock to place the aircraft into the water. At first, a beach area was all that was needed, though invariably a pilot usually got wet trying to maneuver and position an aircraft. With some exceptions, existing wooden boat docks were easily adapted to seaplane use, as evidenced by Glenn Curtiss' first efforts.

The first commercial airline operation in the United States began on January 1, 1914, when Tony Jannus, a 24-year-old pilot, formed the Tampa Air Boat Line and piloted a seaplane on scheduled commercial flights between St. Petersburg and Tampa, Florida (Kite-Powell 2014). Though the operation lasted only 4 months, it proved that the concept of commercial aviation was viable. The advent of World War I further promoted the value of seaplanes (Nicolaou 1998).

As seaplane use increased, the construction or need for facilities to specifically accommodate seaplanes naturally followed. The development of seaplanes allowed for travel over large bodies of water and to remote inland rivers or lakes where construction of physical facilities made access impractical or impossible. Pan American Airways (Pan Am) championed the cause of specially constructed SPBs and elaborate terminal buildings for passengers and mail handling located near metropolitan areas (*Age of Adventure* n.d.). Pan Am was the forerunner to today's international airlines. Its president, Juan Tripp, helped to promote the development of concrete ramps for amphibious use and the use of large floating docks with gangways or piers connecting them to the mainland, which laid the foundation for the future design of seaplane bases.

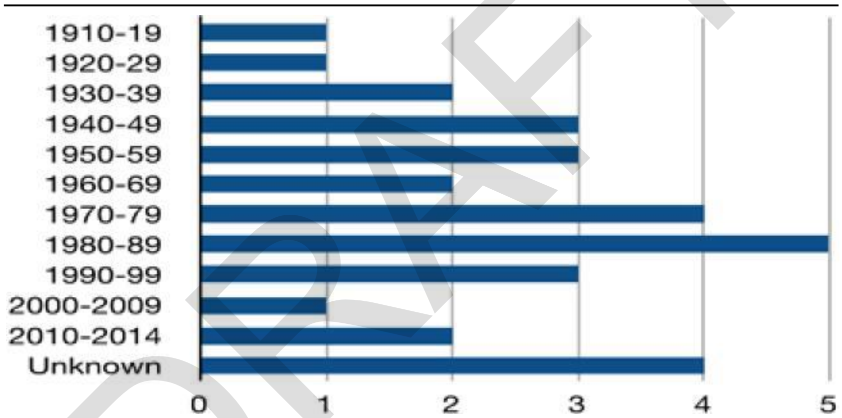
As aircraft and engine technology progressed with the events of World War II, aircraft were able to travel farther. As a result, land airports gained prominence and more were constructed. In the United States, SPBs used for commercial purposes became secondary to land airports, and fell out of favor in the late 1950s (Nicolaou 1998). Figure 2 illustrates the effects on the international manufacture of new seaplane designs as land airports and wheeled aircraft gained prominence. However, the need and desire for access to remote areas continued for recreational use.

Several of the SPBs included in the survey have been in operation for a long time, as shown in Table 2 {Q1}. Long Lake in Sinclair, Maine, was established in 1915 and Lake Hood in Alaska was established in the 1920s. One SPB (Renton, Washington) started with the Boeing Aircraft Company in 1932 after the manufacturer was selected as one of first airmail carriers.

FIGURE 2 Year and number of new seaplane designs produced globally. (*Source*: FUSETRA Seaplane Database 2010. Used with permission.)

TABLE 2

NUMBER AND TIME PERIOD IN WHICH SURVEYED SEAPLANE BASES WERE ESTABLISHED



Source: SMQ Airport Services {Q1}.
Note: Total number of SPBs is 31.

FIGURE 3 Different types of seaplanes. (*Credit*: S. Quilty, SMQ Airport Services)

SEAPLANE TYPES

“Seaplane” is the term used to describe any aircraft that is designed to operate on water. Three general types of seaplanes are floatplanes, flying (hull) boats, and amphibians (Figure 3). A floatplane is an aircraft that has pontoons instead of wheels and

"Seaplane" is the term used to describe any aircraft that is designed to operate on water. Three general types of seaplanes are floatplanes, flying (hull) boats, and amphibians (Figure 3). A floatplane is an aircraft that has pontoons instead of wheels and

is often referred to as a straight floatplane. A flying boat is an aircraft whose fuselage acts as a boat hull with small outrigger pontoons used to help stabilize it. An amphibian seaplane is one that has retractable landing gear, allowing it to operate on land or water. Amphibians can have either pontoons or a hull for operation on the water and are often known as float amphibian or hull amphibian aircraft.

No matter what type of seaplane it is, once it is on the water it becomes a vessel. This conforms to U.S. Coast Guard regulations (United States Coast Guard 2014). In the regulation, the word "vessel" includes every description of watercraft, including nondisplacement craft and seaplanes, used or capable of being used as a means of water transportation. Additional regulatory background is provided later in this chapter. An important note about vessels is that where boats and other watercraft are allowed, so too are seaplanes. Federal aviation regulation Part 91 requires pilots to give way to boaters [14 Code of Federal Regulations (CFR) 91.115].

DEFINING A SEAPLANE BASE

The term "seaplane base" has variable meanings and can lead to confusion when discussing licensing and permitting, capital improvement, governmental financial assistance, maintenance, environmental responsibilities, or its public purpose. As described in the following paragraphs, it is important to note that seaplanes can access many different bodies of water and do not require the designation of an official SPB to operate on water. An official SPB designation provides for depiction on aeronautical charts and possible eligibility for funding assistance.

The FAA's definition of an airport is "an area of land or water that is used or intended to be used for the landing and takeoff of aircraft and includes its buildings and facilities, if any" (14 CFR 1.1). The airport definition includes landing areas developed for conventional fixed-wing aircraft, helicopters, and seaplanes (Foxx 2014). The inclusion of "its buildings and facilities" in the definition creates a challenge for the development and preservation of SPBs, especially in the areas of capital funding and public support, as explained later.

A seaplane base is not defined in 14 CFR Part 1 *Definitions*. There is a definition in AC 150/5395-1A, which is "a dedicated area of water used or intended to be used for the landing and takeoff of seaplanes, water taxiing, anchoring, ramp service, possibly with shoreline, and onshore facilities." The use of the words "possibly with shoreline, and onshore facilities" implies that a beaching or docking area and related facilities are not necessary for an SPB to exist. It is for this reason that the term "seaplane base" can cause confusion.

The term "water operating area" is used in the same advisory circular to mean a designated area on a body of water deemed suitable to facilitate seaplane operations for landing, takeoffs, and water taxiing. Landside facilities are not inferred. The water operating area can be described by latitude and longitude coordinates, Notice to Airmen, or on a layout plan. Reasons to designate a water operating area include to avoid hazardous or unforeseen water obstacles, or to improve the approach or departure paths for aircraft. As with the ability of boats to traverse bodies of water, the absence of a dedicated or designated area does not restrict or exclude a seaplane from operating on a body of water, nor an SPB from being established.

In FAA Order 7110.65V (*Air Traffic Control* 2014), the definition for a landing area mirrors the International Civil Aeronautics Organization definition: "Any locality either on land, water, or structures, including airports/heliports and intermediate landing fields, which is used, or intended to be used, for the landing and takeoff of aircraft whether or not facilities are provided for the shelter, servicing, or for receiving or discharging passengers or cargo." Given these definitions, a water landing area can be an SPB, absent any land facilities.

In the same FAA order, a "sea lane" is defined as a designated portion of water outlined by visual surface markers for and intended to be used by aircraft designed to operate on water. In AC 150/5395-1A, a distinction is made between a sea lane and a marked sea lane. The FAA order does not make that distinction. The AC identifies a sea lane as a defined path within a water operating area dedicated for the landing and takeoff run of seaplanes along its length. A marked sea lane is defined as a sea lane that has its four corners identified by visual markers, such as by buoys. Absent the markers, a sea lane can still exist, but obstacle clearance is not

A sea lane's visual markers allow for an FAA assessment of approach, departure, and traffic pattern obstacles because there is a defined point for the beginning and end of the landing area. Flight path obstacle evaluation is conducted under 14 assured. In a meeting on November 19, 2014, SPA Executive Director Steven McCaughey noted that seaplane pilots generally prefer to not have a sea lane marked, as it reduces their operating flexibility given winds and aircraft operating requirements.

CFR Part 77 *Safe, Efficient Use, and Preservation of the Navigable Airspace.* Under Part 77, an SPB is considered to be an airport "only if its sea lanes are outlined by visual markers" (14 CFR 77.3). If an SPB operator seeks to develop a seaplane base layout plan (SBLP) per AC 150/5395-1A, a diagram depicting a sea lane will allow for the FAA to make an evaluation of Part 77 obstacle surfaces.

Another potential source for the confusion in defining what constitutes a seaplane base is found in AC 150/5200-35A—*Submitting the Airport Master Record in Order to Activate a New Airport*. The instructions for entering data that identifies the owner of a proposed SPB include the following: "If the landing area is a seaplane base, enter the name of the owner of the property on which the shore facility is established" (Advisory Circular 150/5200-35A 2010). According to the instructions, an SPB must have a shore facility. But that is not always the case. This requirement helps to explain why water landing areas may not be registered in the FAA database, or are registered to a private owner located on a public waterway, especially in remote areas. Another reason an SPB may not be listed in the database is because it does not meet the level of activity criteria.

One example to help illustrate the confusion of what may constitute an SPB is Lake Union, Washington, adjacent to the city of Seattle. A review of FAA Form 5010 Airport Master Record data shows both Kenmore Air Harbor and Seattle Seaplanes listed as SPBs—W55 and 0W0. The W55 master record identifies a 5,000-ft water landing area in Lake Union with an SPB listed as Kenmore Air Harbor. A private individual, the chairman of Kenmore Air Harbor, Inc., is listed as the owner. The master record for 0W0 identifies a 9,500-ft water landing area in Lake Union with the airport listed as Seattle Seaplanes and the private owner of Seattle Seaplanes as owner of the SPB.

The issue is that neither of the private operators listed have ownership of the associated water landing area, as they are on a public lake that falls under the purview of the state of Washington, with the city of Seattle having oversight of operational activity. In the example cited, the SPB owners identified on FAA's Form 5010 refers to ownership of the land facilities and not that of the water landing area. This would be similar to the owner of a private fixed-base operator (FBO) at a city-owned land airport being listed as the owner of the airport. It is easy for the private commercial operators to be misconstrued as the owners of the public waterways because of the master record listing.

Other examples are seen at two different public-use SPBs. One is an Alaskan lake that is open to the public but where the water's edge is surrounded by private-use landowners. Many seaplane pilots land and take off in the lake, but they are based at individual private-use lake residences. No public seaplane services are available, but the water landing area is listed as a public-use SPB because one of the lake lot landowners registered it with the FAA.

The other example is an SPB whose Form 5010 lists a private individual on a public-use lake who allows seaplane pilots to use his privately owned dock. The SPB exists in FAA records because an active seaplane pilot on the lake had taken the effort to register it. The active pilot then sold his property. No deactivation of the SPB using FAA Form 7480-1 was undertaken. The new owner, who does not have a seaplane, has continued to send in the annual FAA registration form because he supports seaplane operation. The lake and water landing area are public use and continue to be shown on aeronautical charts. At any time, the new owner could discontinue the registration, make the dock private use, and deactivate the SPB. In doing so, the lake is still available for seaplane operations, though it would be removed from aeronautical charts and the FAA database registry.

The last example illustrates that if an SPB is listed as officially "closed," the waterway may still remain available for use at a pilot's own risk because it is a public-use body of water. This relationship contributes to the confusion about the term "seaplane base."

To better understand what constitutes an SPB, one can reference the Arizona State Aviation Needs Study [*Arizona State Aviation Needs Study* (SANS) 2000]. The SANS describes seaplane facilities as being of two types: seaplane bases and seaplane landing areas. Seaplane bases have a resident operator who provides commercial services such as flight instruction, sightseeing flights, aviation fuel, or aircraft maintenance. Seaplane (or water) landing areas are designated bodies of water on which seaplanes can operate but where no seaplane-specific facilities are available.

The SANS study then lists the following SPBs as active in 2000: Lake Havasu Seaplane Base Lake, Lake Mead Seaplane Landing Area, Lake Roosevelt Seaplane Landing Area, and Lake Powell Seaplane Landing Area. In a 2008 update to the SANS, none of the SPBs were subsequently listed. A search of SPA's 2013 *Water Landing Directory*, which receives information from local pilots and resources, reported the following lakes to have seaplane activity: Lake Havasu Seaplane Base (LaPlaca Flying Service), Lake Mead Seaplane Landing Area, Lake Mohave, Lake Roosevelt Seaplane Landing Area, Lake Powell Seaplane Landing Area, Mormon Lake, and Upper Lake Mary. In a telephone conversation on December 22, 2014, Kenneth Potts, A.A.E., airport grants manager with the Arizona Department of Transportation, said the reason was unclear as to why the previous four SPBs were no longer listed, other than that they are not listed in the NPIAS, though he indicated that the Arizona SASP does include non-NPIAS airports. Potts indicated that the state would probably take a closer look at SPBs in the next SASP update.

OWNERSHIP OPTIONS

Based on the literature search and the previous discussions, the term "seaplane base" therefore includes the following possibilities:

1. A body of water and the land surrounding it is privately owned. Seaplane operators are publicly allowed by the private owner to use the waterway or a land facility.

2. A body of water is publicly owned, but the land surrounding it is privately owned. The waterway is public use, but the land facilities may be privately owned and open to the public, or privately owned and private use.

3. A body of water is publicly owned and open to the public, and a government agency provides a docking area or facility.

This ACRP report focuses on public-use SPBs and includes all three scenarios. The majority of public-use SPBs in the United States are similar to privately owned land airports that are open to the public. The SPB landing, takeoff, and docking areas are available as public use, but the land and facilities are privately owned and operated or leased to a private operator, such as a private business marina or individual docking area.

An example is the SPB at Coeur d'Alene, Idaho. It is listed as being owned by the city. A note in the FAA's *Airport/Facility Directory* lists the docks and office buildings as being owned by a private individual (*Airport/Facility Directory Northwest* U.S. 2014). The individual is then under contract to the city to manage the SPB for the city. In Indiana, many of the lakes available for seaplane operation are owned and operated under the authority of the Department of Natural Resources (DNR). However, of the 22 seaplane bases listed in Indiana, only one has a public landing area operated by DNR (*Water Landing Directory* 2011). The other lakes either have no facilities or have private docks owned by marinas, resorts, or individuals. These types of arrangements have implications for the development and preservation of SPBs throughout the United States.

An exception to the public ownership of SPB facilities is the state of Alaska. The Alaska Department of Transportation and Public Facilities (DOT&PF) owns and operates a large number of SPBs along with their related dock facilities. According to Verne Skagerberg of the Alaska Department of Transportation and Public Facilities in a telephone conversation on September 10, 2014, the department will, on occasion, contract with a local individual or firm to oversee operations if needed. Also, a number of SPBs are listed in the FAA database as being in the public domain. This means they are available for use by the public but that no one individual can make claim to them.

There are few privately owned waterways and few publicly owned SPB landside facilities. The former is because of the long-standing legal oversight of waterways by the federal government for commercial purposes on navigable waters, coupled with laws protecting the waterway environment. The few publicly owned SPBs (with the exception of Alaska) are the result of the historical development of seaplane operations by private industry, when private companies owned the land and constructed docks, ramps, and developed land areas.

Ownership of a river, lake bed, or the lands between high and low watermarks vary according to federal or state law. The SPB at Tavares, Florida, is an example of one of the few waterways that is controlled by a municipality (see chapter seven). The city's property line includes the northern half of Lake Dora, which is where the water landing area is located. Municipal airports with water landing areas, such as New Iberia, Louisiana, is another example. Some lakes have homeowner or lake associations that seek, have certain rights, or are able to exercise control of activities on a body of water.

One last example of possible confusion surrounding the definition of an SPB is found in CFR Part 139. Part 139 is the regulation that requires an airport to have an operating certificate issued by the FAA in order to be served by scheduled air carrier aircraft with more than nine seats. While FAA's basic definition of an airport includes an SPB, under Part 139 the FAA defines an airport as "an area of land or other hard surface, *excluding water*, that is used or intended to be used for the landing and takeoff of aircraft, including any buildings and facilities" (14 CFR 139.5; emphasis added). This means a Part 139 airport operating certificate can be issued only under the regulation to a land airport.

Because the definition of what constitutes a seaplane base and who owns it is unclear, clarification about SPB ownership was sought in the literature, as it has implications for the development and preservation of SPBs in the United States.

In *Compilation of State Airport Authorizing Legislation*, the author writes that the laws of all states provide for a number of common governmental structures that may be used to own and operate an airport (Howick 2012). The structures are (1) direct state ownership and operations, (2) state authorities and corporations, (3) state compacts (multijurisdictional), (4) municipal airports, and (5) private operators. The report goes on to explain how an airport under state jurisdiction has the authority to be owned and operated by different authorized political subdivisions.

In Alaska, four common ownership and operational arrangements have been established for the construction and development of a new SPB:

1. A public entity constructs, owns, and operates the facility.

2. A public entity constructs and owns but contracts with a private operator.

3. A private operator builds the facility on public land, operates it for a period of years, and returns the facility to the public owner at the end of that term.

4. A condominium concept where seaplane owners have ownership rights to a slip and other common assets in a private seaplane facility.

(*Economic Feasibility Study of a New Floatplane Facility Located in Anchorage, Alaska* 2008).

Table 3 identifies the different organizational structures that own or oversee seaplane bases in the United States as culled from the SPB operators that responded to the survey {Q2, Q3} and from the FAA database ("AirportIQ5010" 2014). Some SPBs have well-developed land facilities, though the majority do not.

TABLE 3

LIST OF PUBLIC-USE SEAPLANE BASE OWNERSHIP TYPES IN THE UNITED STATES

STATES OTHER THAN ALASKA		ALASKA	
14	MUNICIPALITY – City	12	CITY
3	MUNICIPALITY – County	3	BOROUGH
3	MUNICIPALITY – City & County	3	CITY & BOROUGH
4	MUNICIPALITY – Town	1	COMMUNITY
2	AIRPORT AUTHORITY	1	NATIVE CORPORATION
3	PORT	1	STATE – Department of Fish & Game
1	PARISH	41	STATE – DOT & Public Facilities
1	STATE – CA Bureau of Parks & Recreation	1	STATE – Division of Lands
1	STATE – CA Dept. of Water Resources	16	STATE – Dept. of Natural Resources
1	STATE – CA State Land Commission	14	STATE – Public Domain
1	STATE – Hawaii	4	FEDERAL – U.S. DOI – National Park Service
1	STATE – LA DOT & Development	1	FEDERAL – U.S. DOI – Fish & Wildlife Service
1	STATE – ME DOT	1	FEDERAL – U.S. DOA – Forest Service
1	STATE – NE DOT	1	FEDERAL – U.S. DOC – Nat'l Marine Fisheries
1	STATE – Ohio Division of Parks & Recreation	27	PRIVATE
5	FEDERAL – U.S. Army Corps of Engineers		
68	PRIVATE		
106	Subtotal +	127	Subtotal = 233 TOTAL

Source: "AirportIQ5010" (2014).

Note: Total does not equal 247 SPBs found in the 2013/14 AOPA directory because four airports were determined to no longer be seaplane bases through study inquiry and 17 were not found in the current FAA 5010 database managed by GCR, Inc. DOI = Department of the Interior; DOA =

PUBLIC ROLE AND PURPOSE

SPBs function in a number of different roles, and they serve a number of different purposes and uses. Seaplanes can operate in highly diverse environments, from congested airspace to unimproved remote locations. Similar to small GA airports and backcountry rural airstrips, a number of issues may impair or reduce seaplane operations. Those issues are described further in chapter five and throughout this study.

Role

The FAA defines a general aviation airport as a public airport that is located in a state and that, as determined by the Secretary of Transportation, does not have scheduled service or has scheduled service with less than 2,500 passenger boardings each year (FAA Modernization and Reform Act 2012). A commercial service airport is one that receives schedule or unscheduled air service and has enplanements or boardings of more than 2,500 passengers. The majority of SPBs are general aviation. A number of Alaskan airports are nonprimary commercial services. Only one SPB is listed as a primary commercial service airport (Lake Hood, Alaska). A primary commercial service airport is one that enplanes more than 10,000 passengers, while a nonprimary commercial service airport is one that enplanes between 2,500 and 10,000 passengers.

SPBs help to provide connections to the larger aviation system by providing access to their respective communities—a role consistent with the goals of the NAS. SPBs support commerce while also serving many functions such as access to medical flights, search and rescue, disaster relief, aerial firefighting, law enforcement, environmental and geological research, fish and wildlife conservation, and recreational use.

Under a national study, an effort was made to better identify the types of aeronautical functions GA airports provide in serving the public interest (*General Aviation Airports* 2012). Commonly referred to as the ASSET Report, it identified four new general aviation airport categories: National, Regional, Local, and Basic (Figure 4).

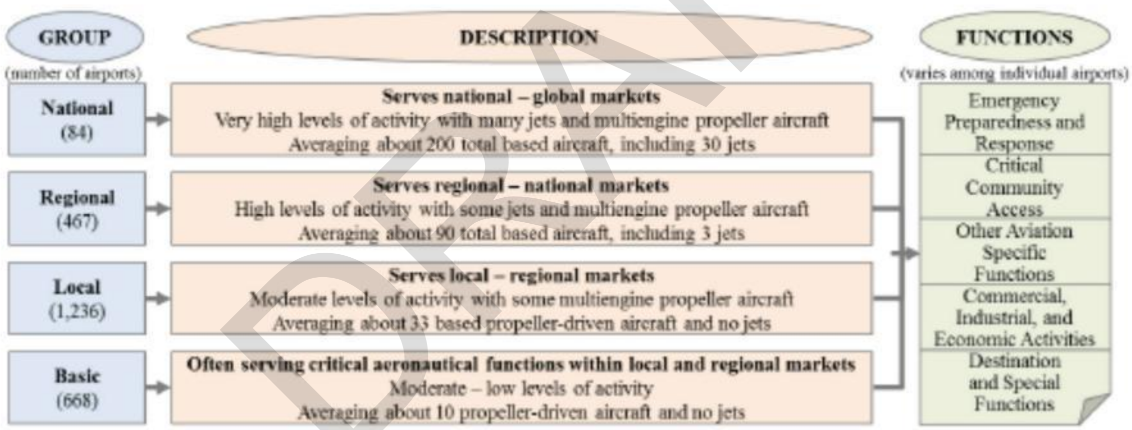


FIGURE 4 Classification of general aviation airports in the GA ASSET Report. (*Source*: *General Aviation Airports: A National Asset* 2012)

The classifications are based on existing activity and will help the FAA in its planning efforts under the NPIAS. A total of 38 SPBs are listed in the NPIAS. Under the ASSET study, no SPBs were listed in the National or Regional roles. Four SPBs are listed in the Local category and 20 are listed in the Basic category. Thirteen SPB facilities remain unclassified because of minimal activity and inadequate data (*Asset 2: In-Depth Review of the 497 Unclassified Airports* 2014).

As part of a SASP, a state aviation agency may recognize the importance of SPBs through a different classification scheme. For instance, the state of Washington classifies its airports according to the following roles (Washington State Department of Transportation 2011).

Class A—Commercial Service Airports

Class B—Regional Service Airports

Class C—Community Service Airports

Class D—Local Service Airports Class

E—Rural Essential Airports Class F—

Seaplane Bases

Fundamentally, an SPB serves as a transition point for seaplane operators. The transition can be from air to water and vice versa, and from water to land and vice versa. An SPB allows for seaplanes to safely take off and land on water, water taxi to and from a dock or beach area, and access land facilities for passenger processing, maintenance, and storage. Some SPBs support the transition role of seaplanes from water to land and vice versa by having lifts or dollies that allow for the removal and installation of pontoons or wheels on aircraft.

Purpose

This report highlights three major purposes or uses for seaplane bases. The first, evidenced mostly in the San Juan County area of Washington State and by the whole of Alaska, is for basic access to the NAS. The NAS is part of the overall transportation system in the United States. San Juan County has limited access to transportation because it is wholly comprised of islands. Boats, ferries, and aircraft are their lifeline to the continent.

The second basic purpose of SPBs is to serve the recreational needs of pilots and passengers. Seaplanes combine the recreational aspects of water usage combined with a flexibility of accessing more than one body of water.

An SPB's third basic purpose is the contribution it can provide to the local economy, whether that contribution is as a basic necessity for transporting persons or cargo, or to serve as an attraction for tourism or business. A number of public-use SPBs are actually sporting or hunting lodges that rely on seaplanes to bring customers to their remote location.

A study evaluating the possibility of a new SPB in Alaska summarizes several purposes for them (*Economic Feasibility Study of a New Floatplane Facility Located in Anchorage, Alaska* 2008).

1. Access to National Aviation System
2. Business
3. Pleasure/recreation
4. Employment
5. Tourism
6. Sightseeing
7. Flight instruction and training
8. Medical evacuation
9. Aerial photography.

An SPB, like any other general aviation airport, can support many types of activities. Table 4 identifies the different uses general aviation airports provide and the percentage of use as reported in the NPIAS data (Foxx 2014).

When asked what purposes their SPBs serve, ACRP survey respondents echoed some of the same uses as the FAA study (Figure 5) {Q4}.

TABLE 4
TYPES AND PERCENTAGE OF ACTIVITIES AT GENERAL AVIATION AIRPORTS LISTED IN THE NPIAS

Category	Percent
General Aviation Use	
Personal	33.5
Instructional	15.3
Corporate/Executive	9.7
Business	8.7
Aerial Observation	5.4
Other	5.2
Aerial Application	3.9
Other Work Use	1.1
External Load (Rotorcraft)	0.9
Aerial Other	0.8
Sightseeing	0.7
Air Medical	0.4
SUBTOTAL General Aviation Use	85.6
On-Demand Federal Aviation Regulation Part 135 Use	
Air Taxi and Air Tours	11.4
Part 135 Air Medical	3.0
SUBTOTAL Part 135 Use	14.4
TOTAL ALL USES	100.0

Source: NPIAS, Foxx (2014).
Note: "Other" is defined as positioning flights, proficiency flights, training, ferrying, sales demonstrations, etc.

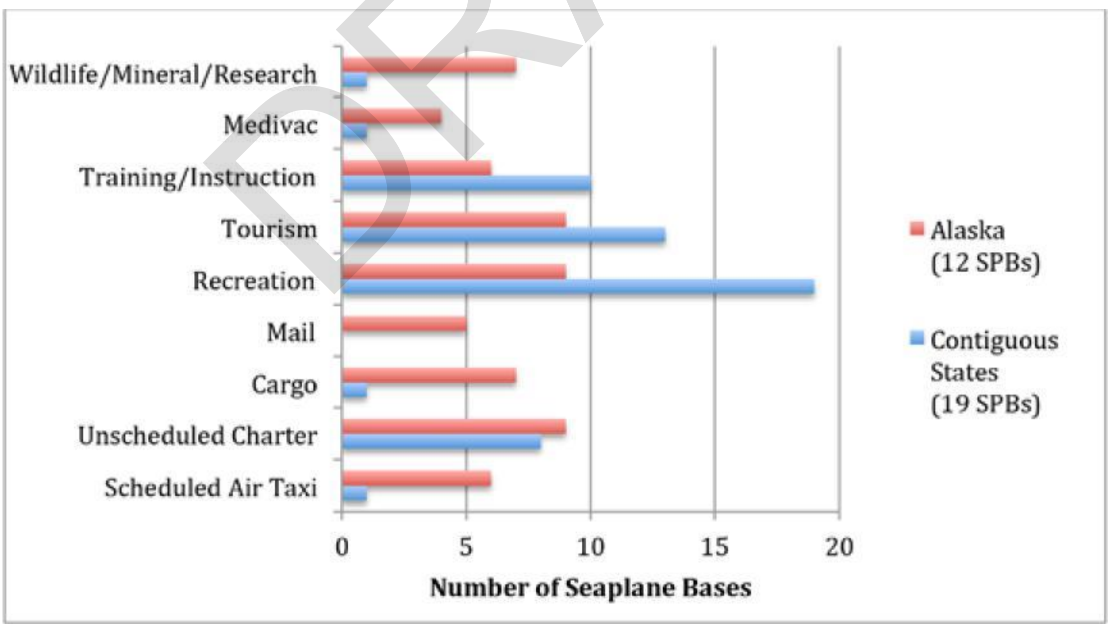


FIGURE 5 Purpose and use of seaplane bases cited by survey respondents. *Note*: Respondents selected multiple purposes as they applied to their SPB. (*Source*: SMQ Airport Services {Q4})

The survey for this report sought to identify the reasons each SPB was established {Q5}. A variety of factors affect the location of an SPB. In one case, a local oil company that used seaplanes requested that the city establish a base. In another case, recreational or commercial pilots requested to have a waterway formally recognized for their use to either conduct flight instruction or provide service to a resort or sporting lodge. Two cities sought to develop their waterfront areas for economic and recreational value and determined that an SPB would enhance those purposes. Twenty-one SPB locations are geographically affiliated with a city, village, or town, while another 10 are remote from a city or town and serve primarily as access to a recreational area or a sport/hunting lodge.

Twenty-four of the 31 SPBs in the survey were designed solely to serve seaplanes; two were designed primarily as marinas that later accommodated seaplanes; and five were designed to accommodate both seaplanes and boats {Q6}.

In an open-ended question asking the reasons pilots choose to use or visit their SPB, operators cited the following wide range of responses, followed by the number of responses (*Note*: respondents identified multiple purposes that may apply) {Q7}.

1. Convenience or only SPB available in the area (11)
2. Availability of fuel (7)
3. Commercial business (lodge, resort, client drop-off, supply pick-up) (5)
4. Recreational opportunities (4)
5. Tourism/sightsee/attend events/visit (4)
6. Hangars/tiedown/transient dock/security (4)
7. Location (3)
8. Training/instruction/rental (3)
9. Maintenance/ float change-out (3)
10. Restaurant/food (3).

REGULATION AND ENVIRONMENTAL ISSUES

The establishment and operation of an SPB can have regulatory oversight from a number of different federal, state, and local governing agencies. Most bodies of water in the United States fall under the purview of the federal government or states. The different forms of ownership or control have implications for the development and preservation of SPBs, especially in the areas of construction, maintenance, operation, use, and promotion.

The commerce clause of the U.S. Constitution creates the authority of the federal government to oversee navigable waterways that can be used to conduct interstate and foreign commerce. Bodies of water contained wholly within a state likely fall under state jurisdiction. However, a body of water's capability for use and transport in commerce determines whether a navigable waterway is subject to federal jurisdiction. A body of water may be entirely within a state, yet be subject to federal oversight.

Chapter II of 33 Code of Federal Regulations describes the authority of the U.S. Army Corps of Engineers (USACE) to regulate navigable waters of the United States (33 CFR 329). As stated in Section 329.4, the definition of navigable waterway is

> Navigable waters of the United States are those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. A determination of navigability, once made, applies laterally over the entire surface of the waterbody, and is not extinguished by later actions or events which impede or destroy navigable capacity. (33 CFR 329.4)

This CFR definition applies specifically to the authority of the USACE. The Clean Water Act features an expanded definition of waters of the United States as it applies to instances of environmental determinations. The definition for "*waters of the United States*" under the act is found in 33 CFR Part 328.3 (33 CFR 328.3).

The USACE regulates the use, administration, and navigation of the navigable waters of the United States as public necessity may require for the protection of life and property (33 CFR 320). The act restricts the construction of piers and other structures along the shoreline or into the navigable waters of the United States unless a permit or other approval is obtained from USACE (33 CFR 322). The USACE District Engineer grants permission for the construction or modification of an SPB on federal waters.

A key aspect of seaplane operation is that once the aircraft is on the water, it is considered to be a vessel. This has consequences for the applicability of rules and regulations governing pilot operation and SPB use on the water. In the air, seaplane operation is regulated by the FAA under 14 CFR Part 91: *General Operating and Flight Rules* (14 CFR 91); Part 119: *Certification: Air Carriers and Commercial Operators* (14 CFR 119); and Part 135: *Operating Requirements: Commuter and On Demand Operations and Rules Governing Persons on Board Such Aircraft* (14 CFR 135).

The responsibility of the United States Coast Guard (USCG) is to promulgate, administer, and enforce rules and regulations governing the safety and life of persons and property on waters subject to federal jurisdiction. The USCG publishes navigation rules (*Navigation Rules and Regulations Handbook* 2014) that specifically define a seaplane as any aircraft designed to maneuver on the water and therefore as a vessel. The USCG district commander grants permission for an SPB to operate on federal waters and for the construction and operation of navigation aids. For non-navigable waterways located on federal lands, permits may be issued by numerous agencies, including the U.S. Forest Service (36 CFR 1; 36 CFR 3).

A number of regulatory and environmental laws affect the development and preservation of SPBs, such as the following:

- U.S. National Invasive Species Act of 1996
- Clean Water Act of 1972
- Oil Pollution Act of 1990
- Federal Water Pollution Control Act
- Nonindigenous Species Aquatic Nuisance Prevention and Control Act of 1990
- Clean Water Act as amended by Comprehensive Environmental Response, Compensation, and Liability Act
- Hazardous Materials Transportation Act
- Magnuson Act of 1976
- Shore Protection Act
- Endangered Species Act
- Marine Mammal Protection Act.

Despite various environmental issues that could be of concern to SPB operators, 15 operators expressed none as a concern for them {Q8}. Seven respondents expressed concerns about fluctuating water levels and its effect on erosion, aquatic vegetation, weed growth, or fish spawning. Four individuals were concerned with the water quality in and around the dock area as a result of potential fuel or oil spillage. Birds and other wildlife were a concern to only two individuals. One respondent each cited invasive species or noise as a concern.

SUMMARY

The history of seaplane development is well documented. However, sparse information is available on the history of SPB development. An SPB is defined as a dedicated area of water used or intended to be used for the landing and takeoff of seaplanes, water taxiing, anchoring, ramp service, possibly with shoreline, and onshore facilities. This definition can cause confusion when discussing licensing and permitting, capital improvement, governmental financial assistance, maintenance, environmental responsibilities, and public purpose, because a mix of SPB ownership options exist. Most waterways are owned by governmental entities, while the land facilities are often privately owned or operated.

SPBs function in a number of different roles, and they serve a number of different purposes and uses. An SPB is generally considered by the FAA to fulfill the role of a general aviation airport with a focus mainly on providing specialized services that scheduled airline service cannot provide. Fundamentally, the role of an SPB is to serve as a transition point for seaplane operators.

This report highlights three major purposes or uses for SPBs—to provide basic access to the NAS, to serve the recreational needs of pilots and passengers, and to make a contribution to the local economy through various commercial activities. Like any other GA airport, an SPB can support many types of activities. Recreational use is the most commonly cited. However, in Alaska and other remote areas where alternate transport modes are limited or nonexistent, SPBs and seaplane activity serve as a lifeline for the community to connect to the NAS.

Department of Agriculture;

SUMMARY

PRACTICES IN PRESERVING AND DEVELOPING PUBLIC-USE SEAPLANE BASES

Public-use seaplane bases (SPBs) throughout the United States are facing constant challenges and threats to their continuing operations from a number of different sources, yet seaplane operations continue to provide valuable services and serve a multitude of purposes, including promotion of local economies.

Seaplanes operate in highly diverse environments, from congested airspace to unimproved remote locations—the latter being more prevalent. Very similar to many small general aviation airports and backcountry airstrips, many pressures and challenges face seaplane operations and, in particular, the viability of SPBs.

The objective of this report is to review current practices in developing and preserving public-use SPBs throughout the United States, and identify their benefits, challenges, and gaps in practice. Collectively, the information in this study provides an overview of SPB operations to those not familiar with them, is useful for discussing the future direction of SPB operation, and serves as an impetus for future research and educational efforts. It further describes potential gaps in data collection, operational activity, facilities, and similar parameters. The challenges and gaps faced in development and preservation efforts are explored, as they may relate to federal and state planning, funding assistance, regulations, and operating requirements. The report reviews and presents for development consideration, information on the SPB planning process, design considerations, permits, regulatory requirements, and SPB facility and service needs. Presented for preservation consideration are aspects of data collection and messaging, comprehensive transportation planning, environmental safeguards, and public outreach possibilities. The report synthesizes available information on all of the topics mentioned in the previous paragraph, to present a state-of-affairs report on SPBs.

Thirty-one of 35 SPB operators from 11 different states responded to a survey seeking information on their current practices, challenges, threats, and outreach activities. The study found that the term "seaplane base" can have different meanings. A public-use SPB can be solely a registered waterway used for takeoff and landing, or it can be a registered waterway site and include land and support facilities, in which case the land facilities can be either publicly owned, privately owned, or publicly owned with a private operator. This report focuses on public-use SPBs and includes all three scenarios. The majority of publicuse SPBs in the United States are similar to privately owned land airports that are open to the public. The SPB landing, takeoff, and docking areas are available as public use, but the land and facilities are privately owned and operated or leased to a private operator, such as a private business marina or individual docking area. Despite the possible confusion, an important distinction is that an official SPB designation on a body of water is not needed for a seaplane to operate. If a boat is permitted to operate on a body of water, then unless seaplane activity is specifically disallowed, a seaplane is permitted to operate as well because both are considered "vessels" under existing laws.

The study also found that SPBs can be grouped into three general categories: (1) those that exist to meet basic community transportation needs and access to the National Airspace

System (NAS) because of their remote location; (2) those that serve a recreational or sporting purpose; and (3) those that serve as an economic focal point for community development and attraction. Alaska and the San Juan County area of Washington State are examples of meeting basic community transportation needs. Where little to no road access connectivity exists, seaplanes provide a lifeline for many communities. The use of SPBs for sporting purposes is seen across the northern U.S. tier, especially in Washington, Minnesota, and Maine, where resorts and sporting lodges prosper. Indiana and Florida are examples of where the recreational use of an SPB is very common. The last category, economic development, recognizes the potential for community growth through the use of SPBs, as an attraction for economic development, commercial activity, and tourism. The towns of Tavares, Florida; Rising Sun, Indiana; and Greenville, Maine, are examples. SPBs in Union Lake, Washington, and Lake Hood, Alaska, provide commercial air service and promote tourism, while SPBs in Louisiana support the oil industry.

The main challenges discovered through the literature search and in the survey are those associated with SPB development, safety, airspace, noise, management, funding, regulation and permitting, environmental regulations, and local compatibility and acceptance. More specifically, the challenges for continued SPB operation are reflected in the competing use of the waterways by other recreational vessels; an unfamiliarity by the general public with SPB facilities, services, and benefits; the different and oftentimes complex nature of regulatory oversight by various governmental agencies; inadequate or weak financial investment, support, and funding of facilities and operation; and a low or dwindling interest in SPB operation and the number of seaplane pilots.

Like any business or recreational activity, an economic value is associated with SPB activities. They employ individuals, they purchase supplies and services from the local community, and they attract commercial and recreational activity to the community. Being included in a state aviation system plan recognizes the value and importance of an SPB and raises awareness of its impact on intergovernmental planning and development reviews.

The high interest and constant monitoring efforts of state aviation agencies and various seaplane pilot associations are the main sources of efforts to preserve many existing publicuse SPBs throughout the United States, and to open new ones. SPB interviewees indicate the development of economic and operational tools and public outreach are needed to help sustain existing SPBs and to develop new ones. The study found that there is a need for better operational data collection, better planning and regulatory acceptance of SPBs, better funding opportunities, and better means to convey the value and benefits of SPB operation to the local communities and other users of public waterways.

APPENDIX K

Noise Comparison Data

Chapter 1

Basic Overview of the Environmental Noise Problem

Introduction

Background

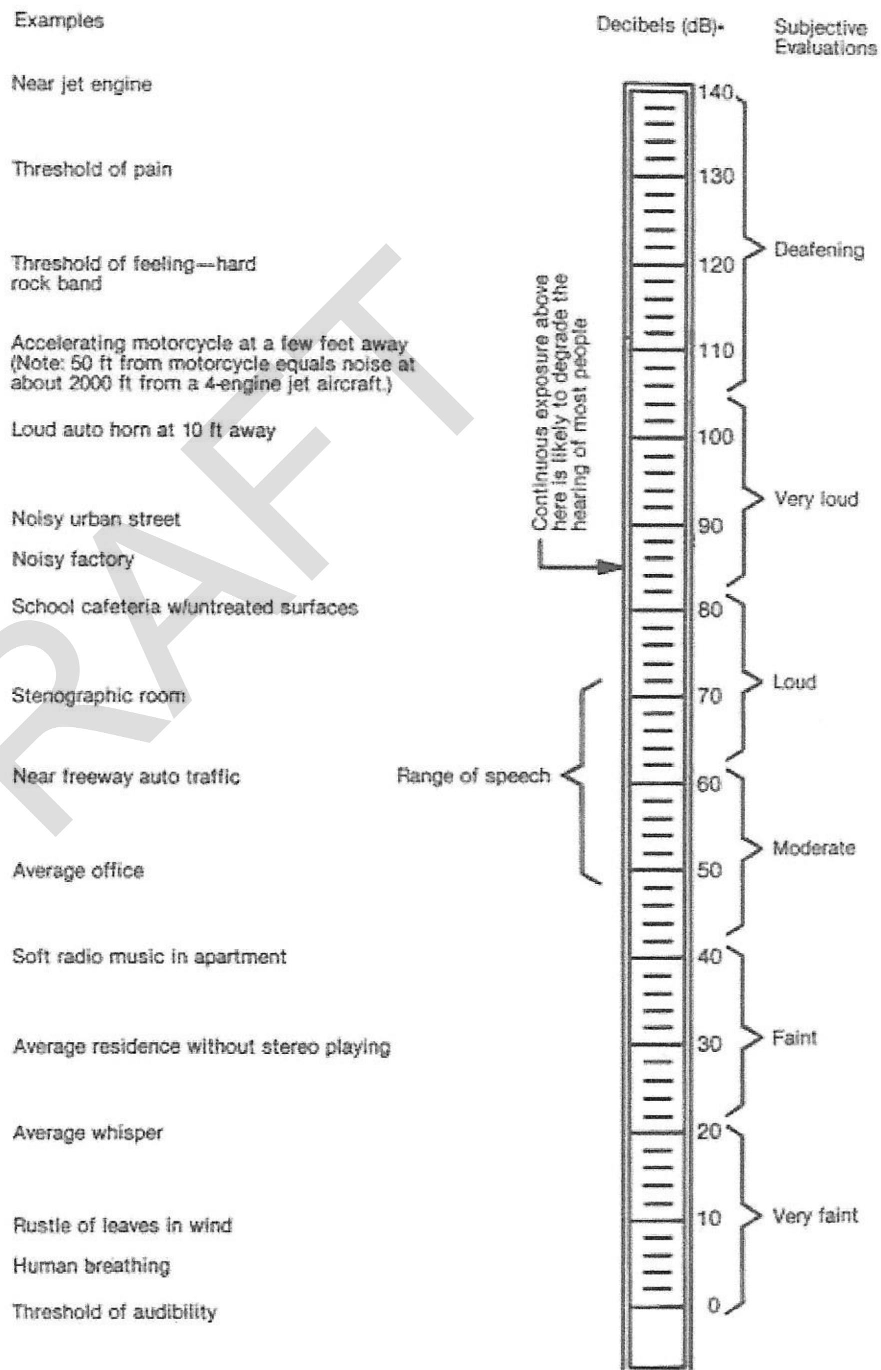
Definition and Scope of the Noise Problem

The air around us is constantly filled with sounds, yet most of us would probably not say we are surrounded by noise. What then is the difference between ordinary sound and what we call noise? The traditional definition of noise is that it is "unwanted sound." Sound becomes unwanted when it either interferes with our normal activities such as sleeping, conversation or recreation, when it causes actual physical harm such as hearing loss or has adverse effects on mental health. As we have become a more urbanized country and as technology has advanced, the level of sound in our environment has reached the point when it sometimes does cause interference and does cause physical and psychological harm, and thus we have developed a noise problem. (See Figure 1 for a listing of common sounds.)

The dimensions of the noise problem have grown larger and larger over the past few decades. In its 1979 Annual Report, The Council on Environmental Quality stated that "nearly half the US population is regularly exposed to levels of noise that interfere with ...normal activities" and about "1 in 10 ...are exposed to noises of duration and intensity sufficient to cause a permanent reduction in their ability to hear."

Figure 1
Common Sounds
Basic Theory: Common Sounds in Decibels (dB)

Some common, easily recognized sounds are listed below in order of increasing sound intensity levels in decibels. The sound levels shown for occupied rooms are typical general activity levels only and do *not* represent criteria for design.



*dB are "average" values as measured on the A-scale of a sound-level meter
(From *Concepts in Architectural Acoustics:* M. David Egan, McGraw Hill, 1972.)

It should be noted that the tachometer stepped green arc markings representing 75% power at sea level, 5000 feet and 10,000 feet are based on the landplane. Refer to the cruise tables in Section 5 for percent power information applicable to the floatplane.

LANDING

Normal landings can be made power on or power off using approach speeds of 60-70 KIAS with flaps up and 55-65 KIAS with flaps down.

GLASSY WATER LANDING

With glassy water conditions, flaps should be extended to 20° and enough power used to maintain a low rate of descent (approximately 200 feet per minute). The floatplane should be flown onto the water at this sink rate with no flare attempted since height above glassy water is nearly impossible to judge. Power should be reduced to idle and control wheel back pressure increased upon contacting the surface. As the floatplane decelerates off the step, apply full back pressure on the control wheel. If this glassy water technique is used in conjunction with an obstacle clearance approach, allowance should be made for appreciably longer total distances than are shown in Section 5 to clear a 50-foot obstacle.

CROSSWIND LANDING

The wing-low slip method should be used with the upwind float contacting the surface first.

NOISE CHARACTERISTICS

The certificated noise level for the Model 172P Floatplane at 2220 pounds maximum weight is 72.2 dB(A). No determination has been made by the Federal Aviation Administration that the noise levels of this airplane are or should be acceptable or unacceptable for operation at, into, or out of, any landing area.

HOT WEATHER OPERATION

Refer to the general warm temperature starting information under Starting Engine in this section. Avoid prolonged engine operation on the ground.

NOISE CHARACTERISTICS AND NOISE REDUCTION

The certified takeoff noise level for the Model 172S at 2550 pounds maximum weight is 75.1 dB(A) per 14CFR36 Appendix G (through Amendment 36-21) and 78.2 dB(A) per ICAO Annex 16 Chapter 10 (through Amendment 4). No determination has been made that the noise levels of this airplane are or should be acceptable or unacceptable for operation at, into, or out of, any airport.

The following procedures are suggested to minimize the effect of airplane noise on the public:

1. Pilots operating airplanes under VFR over outdoor assemblies of persons, recreational and park areas, and other noise sensitive areas should make every effort to fly not less than 2000 feet above the surface, weather permitting, even though flight at a lower level may be consistent with the provisions of government regulations.

2. During departure from or approach to an airport, climb after takeoff and descent for landing should be made so as to avoid prolonged flight at low altitude near noise sensitive areas.

NOTE

The above recommended procedures do not apply where they would conflict with Air Traffic Control clearances or instructions, or where, in the pilot's judgment, an altitude of less than 2000 feet is necessary to adequately exercise the duty to see and avoid other airplanes.

HOT WEATHER OPERATIONS

Refer to the general warm temperature starting information under Starting Engine in this section. Avoid prolonged engine operation on the ground.

NOISE CHARACTERISTICS

The certified takeoff noise level for the Model 182T at 3100 pounds maximum weight is 77.7 dB(A) per 14 CFR 36 Appendix G (through Amendment 36-21) and 81.1 dB(A) per ICAO Annex 16 Chapter 10 (through Amendment 4). No determination has been made that the noise levels of this airplane are, or should be, acceptable or unacceptable for operation at, into, or out of, any airport.

The following procedures are suggested to minimize the effect of airplane noise on the public:

1. Pilots operating airplanes under VFR over outdoor assemblies of persons, recreational and park areas, and other noise sensitive areas should make every effort to fly not less than 2000 feet above the surface, weather permitting, even though flight at a lower level may be consistent with the provisions of government regulations.
2. During departure from or approach to an airport, climb after takeoff and descent for landing should be made so as to avoid prolonged flight at low altitude near noise sensitive areas.

NOTE

The above recommended procedures do not apply where they would conflict with Air Traffic Control clearances or instructions, or where, in the pilot's judgment, an altitude of less than 2000 feet is necessary to adequately exercise the duty to see and avoid other airplanes.

Seaplane Safety Issues

Part 2- Seaplane Noise

I confess I have little patience with people who move into brand new houses near an airport that has been in existence for several decades and who then complain about the airplane noise. Washington Dulles is a case in point.

When it opened in the early 1960's about the only thing disturbed was an errant steer or two, then came the building boom, and all of a sudden community associations in Sterling and Herndon, VA began to complain about "those noisy airplanes."

Swank neighborhoods in McLean and Great Falls, VA voice the same complaints about National Airport (opened in the 1940's). In both cases approach and departure profiles for those airports were altered to expose neighborhoods to the smallest noise footprint possible. The people on the ground are happier (although some won't be happy unless both airports are closed), but the pilots are not because the profiles mean operating at reduced throttle settings or cutting power at critical moments in flight-not to mention the interesting turns to stay over the Potomac River when approaching National Airport to land on Runway 18.

Fifteen years ago when I was house-shopping, I considered buying near the airport where I had learned to fly. The realtor showed me a house just a block or two from the airport grounds, and I remarked from the house's back deck that I had a view of the airport and its airplanes.

"Oh, "she said, "don't worry. That noisy place will soon be closing down. The community association is seeing to that." Imagine her surprise when I indicated that having the airport close by was a positive factor in any purchase decision I would make. (That airport is still in operation, by the way.) Airports have their noise "problems, "real or imagined, and seaplane

operations seem to attract what many aficionados feel is undue attention. At the heart of many complaints about seaplanes is not the issue of safety, which, as we saw in part one of this series, we all need to work on. Some may use the catch-all "safety" to mask their real annoyance-noise.

Is It Really Noise?

Many times communities who don't like the noise of aircraft couch their complaints in safety terms. An airport and a community could have co-existed for dozens of years safely, but instead of coming out and saying they don't like the noise, people will write their legislators about the "safety problem. "One would think airplanes rained out of the sky into their backyards on a daily basis.

One example was Annapolis, MD several years ago. The Maryland State Legislature was about to ban seaplanes from the Severn River because they were "unsafe," so said the legislators. In this case, FAA safety officials went before the appropriate committee and testified that there was no safety problem. It turns out the problem was the owners of half-million dollar, waterfront homes thought they would be disturbed by the noise from the single seaplane that had been operating there. Of course, the noise from their power boats was okay; it was just the seaplane that was noisy.

This story had a happy ending; the Maryland legislature did not ban seaplanes from the Severn. Not all occurrences such as these have had happy endings, though. More and more across the country, state and local jurisdictions have excluded seaplanes from waterways, even those where there had been a long and safe precedent of operation.

As we have seen in Part 1 of this series, quite often safety is not really the issue, given the accident history: only three boat/seaplane accidents and virtually no non-seaplane property accidents over the 13-year period. What it comes down to is that, well, a small airplane with a two-bladed prop is noisy.

But that doesn't mean that aircraft and communities cannot come to a compromise that assures home owners of their serenity and pilots of their access. The Helicopter Association International (HAI) with their "Fly Neighborly" program has won over many a community that previously wanted helicopters banned from the airspace over its homes. There is no reason why the same can't be true of seaplanes.

FAA Noise Studies

FAA recommends that noise impact studies be developed at airports that have or expect adverse noise impacts with their neighboring communities. Grants may be issued to publicly owned airports for this purpose under the Airport Improvement Program, subject to the availability of funds and national priorities. Privately owned airports may be considered for funding when the airports are designated as "reliever" airports in major metropolitan areas with congested commercial airports. Most private airports and seaplane landing areas come no where close to that many operations, but FAA is available to assist and advise on privately financed studies. Occasionally, the seaplane base operator will pay for the noise impact study, but for most seaplane operators the cost is exorbitant. And a contractor's report is likely to favor the position of the entity paying the bills.

Unless the community is Lake Union in Seattle, WA or Lake Hood in Anchorage, AK, the exposure to seaplanes is likely to be single aircraft for infrequent operations. Still, the amount of noise tolerated by any jurisdiction across the country varies according to the community. The federal standard for aircraft noise in a residential area is DNL 65 decibels (dB). (DNL is a measure of noise exposure over 24 hours.) According to how noise exposure is calculated, a Cessna 185 that makes 52 takeoffs per year-one a week-won't cumulatively exceed DNL 65 dB for a listener more than 2,000 feet from the start of the takeoff roll and 250 feet from the takeoff centerline.

Seaplane Noise - Takeoff and Landing

During takeoff an airplane or seaplane uses the most propeller velocity to become airborne. With certain exceptions, takeoffs are accomplished at full power, and power is reduced once the aircraft is established in the climb.

Overflights at 500 feet at cruise power settings can expose people on the ground to far more noise than a landing seaplane. "Dragging" the area before landing is a common practice especially if you are unfamiliar with the water landing area or if you have reason to suspect debris or obstacles might be in the water.

Landings are generally made at greatly reduced power settings, and, consequently, the noise comparison between takeoffs and landings favors landings. According to a Seaplane Pilots Association study, "In fact, seaplane noise levels at low throttle settings may be generally below background noise levels and thus are not measurable."

Most of the noise generated by any airplane comes from the propeller tips. Many are under the misconception that it is engine or exhaust pipe noise that people complain about because we tend to think in terms of automobiles.

The propeller tip Mach number-the tip speed related to the speed of sound at the existing air temperature-and horsepower input to the propeller determine airplane noise output. The number of blades and the propeller's diameter also determine noise output to a lesser degree.

A rule of thumb is that doubling the horsepower at the same tip speed results in an increase in the sound level of five dB. To put it in everyday terms, a five percent increase in RPM will create an increase in the noise level of at least 1.5 dB. (It can increase 3-4 dB.) When tip speed is higher than .9 Mach, "noise levels increase dramatically, "according to SPA.

Table 1 shows eight typical seaplanes and their noise levels as measured from a standard distance of 1,000 feet in a river valley setting. In larger water areas, noise levels may actually be less.

Noise studies have shown that a person perceives different levels of noise from an airplane depending upon the person's position relative to the airplane. The sound is greatest at the prop tips at about 105¼ from the front of the aircraft or about 15¼ aft of the wing tips. As you move forward, the noise level drops by about seven dB up to 30¼ off the nose then drops

precipitously after that. When you move aft, noise decreases more rapidly, dropping up to 12 dB when 160¼ aft of the nose or about 70¼aft of the wing tip. What this means is that when you are directly in front of or behind a seaplane, you perceive considerably less noise than if you were beside it.

As we said, propellers are noisiest when the tip speed is around .9 to .95 Mach, but three-bladed props make less noise than two-bladed props. Three-bladed props develop more thrust for a given rpm than a two-bladed prop at the same rpm; thus, the tip speed is not as great, and the noise is less.

One seaplane FBO converted its Cessna 185's and 206's to three-bladed props and noted a five to six dB decrease for some model propellers.

Q-tip props are thought to be another route for noise reduction. The curled-up tips of the prop blades reduce the airflow off the end of the tip, much like winglets reduce wake vortex at wingtips. The manufacturer does not claim that the Q-tip prop reduces noise, but its diameter is two inches less than the props it replaces. At the same RPM as a non-Q-tip prop it produces more thrust at a less tip speed and thus less noise.

In addition to a person's relative position to the seaplane, noise decreases as the seaplane moves away from the person, generally three to seven dB decrease for each doubling of the distance. For example, if a seaplane's noise level is 87 dB at 1,000 feet, that level should decrease to around 82 dB at 2,000 feet. These figures are approximate, and factors such as temperature, obstacles in the vicinity, and strong winds can affect the noise level as perceived by a person. Vegetation such as thick, tall grass or trees can attenuate noise significantly, but a seaplane operating on open water will have very little help from the surrounding flora. A person's distance from the seaplane and the type of seaplane are the most significant factors in determining the impact of seaplane noise. By virtue of the seaplane's "ideal"operating locale-open water on whose shores may be houses with outdoor decks, docks, pools-noise impact from a seaplane may be attenuated very little.

What is Too Much Noise?

As we said earlier, the answer to this question depends. People who live on one of those airport residential areas are probably way more tolerant of airplane noise than residential areas where people have little or no experience with aviation. An airplane developing full power on takeoff is music to my ears and perhaps yours, but to some it is a dissonant cacophony. And these may be the very people who think nothing of subjecting their entire neighborhood to their riding lawn mowers or leaf blowers. Somehow, they believe that the seaplane-perhaps because it is bigger-is noisier, and many are surprised when comparative tables show common, neighborhood noises which are as loud or louder than seaplanes. However, people become inured to lawn mowers, dishwashers, etc., because they are in common usage. The seaplane showing up in the neighborhood may be a rare occurrence, and, as such, it attracts more attention than the newest yuppie toy, the lawn tractor.

Table 2 is a comparison of the sound levels of various seaplanes and common neighborhood noise. It is interesting to note that a quiet house at 0530 has a perceived sound level of 30 dB and that the next noisiest thing after a robin singing at 50 feet is a DC-10 overhead at 5,000 feet.

Am I Compatible with the Neighborhood?

Out of courtesy and to save a lot of grief, every seaplane operator should ask him- or herself this question.

???????How does my seaplane noise compare to background noise in the neighborhood? If the neighborhood is sandwiched between an interstate highway and your seaplane operations, your noise could get lost in the background.

???????How does my seaplane noise compare with any power boats, motorcycles, trains, trucks, lawn mowers, etc., in the vicinity? A chain saw or motorcycle 25 to 50 feet away far exceeds seaplane noise at 1,000 feet.

???????What is the community's normal activities and what kind of noise does this produce? Obviously, if you want to operate near a retirement home or progressive assistance community, the normal noise levels may be fairly low, and your single takeoff would be highly disruptive.

???????What is the frequency of seaplane activity as compared to similar noise impacts? If the community has little objection to one neighbor who operates a motorcycle in the neighborhood on a daily basis, they may not notice seaplane noise. However, if you consistently operate at times of quiet in the neighborhood, your seaplane activity will stick out like a sore thumb.

One good thing: Outside of Alaska, very little seaplane activity occurs at night, so you're not likely to disrupt anyone's sleep. (Of course, if you operate near a neighborhood where the majority of people work a night shift and sleep during the day...)

???????What are the cumulative effects of seaplane noise when compared to peak noise levels in a community? If everyone in the community mows their lawns starting at 1000, your takeoff may go overlooked at the time.

What all these questions are trying to do is instill a sense of community in you, the seaplane pilot. You may only be transiting the area, but you want to leave people with a good impression of seaplanes and seaplane pilots. SPA publishes a water landing directory, and it also has field directors who are very familiar with their part of the country. A little homework on the community before you fly into it will go a long way in your having a good, safe operation. If you work it right, the next seaplane pilot who flies into the area you left will have an easier time of it. Education goes a long way as well.

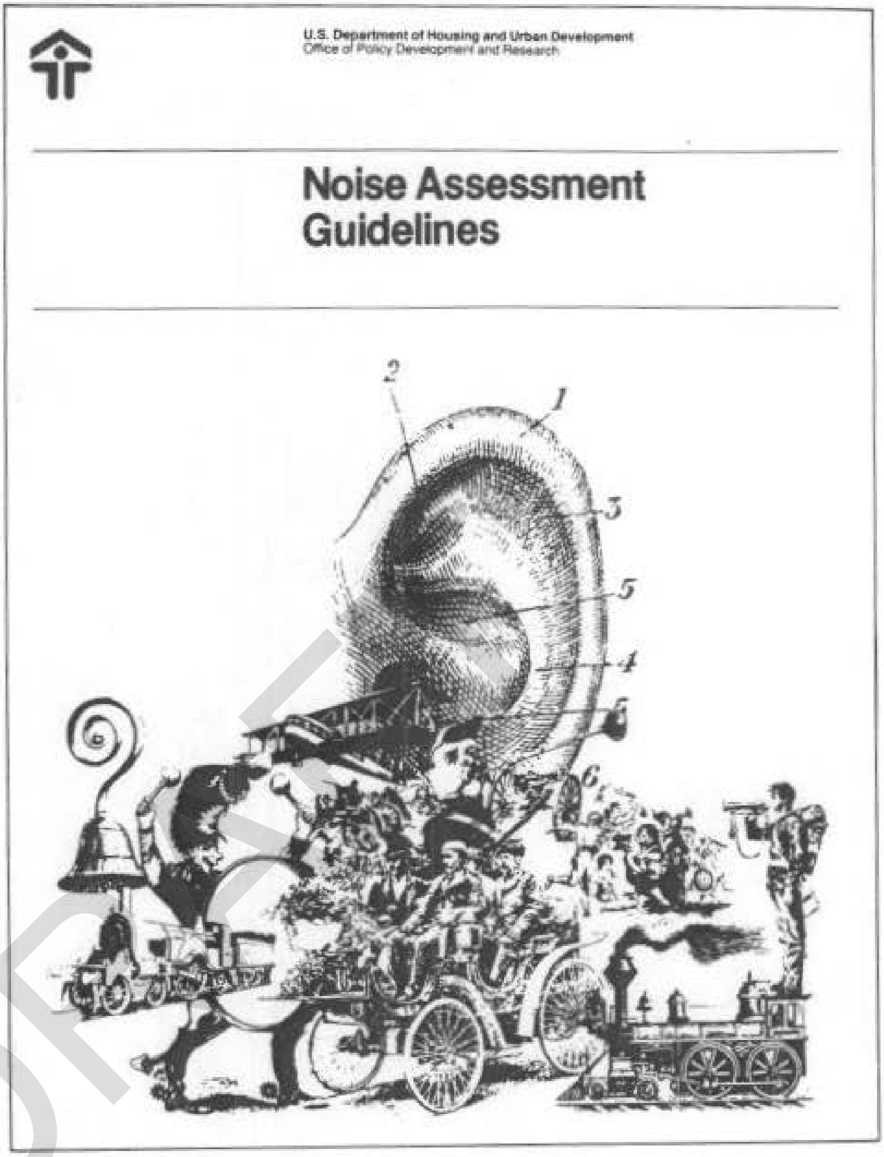
As we said, many people assume that a seaplane is noisy because of its size and their lack of familiarity with it. Some communities may only be convinced after hiring someone to come in and measure noise levels at various times and for various noise-makers. And there will always be some who will never change their minds about seaplane noise no matter how many charts and graphs you show them.

A favorite vacation spot of mine is a lakeside cabin in the northeast. The neighbors there think nothing of the constant din from power boats and personal watercraft because it is a waterfront community; they expect boats to be noisy. But when I mentioned I wanted to land a seaplane there, you would have thought I had suggested devil worship. It turns out another aspect of aviation had ruined it there for seaplanes: The local national guard regularly flies its helicopters and its C-130's low and slow and noisily over the lake. And no amount of logical argument could dissuade them that the noise of a C-172 on floats would be lost among the skiboats and JetSki races. For the most part, if you work with a community, listen to its concerns, present them with convincing evidence, you may be able to turn their concerns.

When all else fails, offer people rides in a seaplane. Show them how safely you operate, how you take community issues in consideration during your operation. Always keep in mind that even though airplane noise is music to your ears, you may have been startled out of peaceful reverie by a blatting motorcycle or the whine of a chain saw. As HAI puts it, "Fly Neighborly!"

Chapter 5

Noise Assessment Guidelines



U.S. Department of Housing and Urban Development
Office of Policy Development and Research

Noise Assessment Guidelines

Noise Assessment Guidelines

Foreword

In choosing among alternative sites for housing, potential noise problems are prominent among the issues that must be examined. These Noise Assessment Guidelines were developed to provide HUD field staff, interested builders, developers, and local officials with an easy-to-use method of evaluating noise problems with a minimum of time and effort.

We believe that this set of tools will simplify the process of balancing the goal of environmental protection with those of efficiency and reduced housing costs. We hope you will find them useful, and invite your comments.

Benjamin F. Bobo
Acting Assistant Secretary for
Policy Development and Research

Stephen J. Bollinger
Assistant Secretary for
Community Planning and
Development

Preface

The Department of Housing and Urban Development, in its efforts to provide decent housing and a suitable living environment, is concerned with noise as a major source of environmental pollution and has issued Subpart B on Noise Abatement and Control to Part 51 of Title 24 of the Code of Federal Regulations.

The policy established by Subpart B embodies HUD objectives to make the assessment of the suitability of the noise environment at a site: (1) easy to perform; (2) uniformly applicable to different noise sources; and (3) as consistent as possible with the assessment policies of other Federal departments and agencies. In furtherance of these objectives, the Office of Policy Development and Research has sponsored research to provide site analysis techniques. These *Noise Assessment Guidelines* do not constitute established policy of the Department but do provide a methodology whose use is encouraged by HUD as being consistent with its objectives. The *Guidelines* provide a means for assessing separately the noise produced by airport, highway, and railroad operations, as well as the means for aggregating their combined effect on the overall noise environment at a site.

This booklet has been prepared by Bolt Beranek and Newman Inc., under Contract No. H-2243R for the U.S. Department of Housing and Urban Development. It is a revision of an earlier edition published in August 1971. With the exception of changes made by the Department, the contractor is solely responsible for the accuracy and completeness of the data and information contained herein.

Contents

Introduction

These guidelines are presented as part of a continuing effort by the Department of Housing and Urban Development to provide decent housing and a suitable living environment for all Americans.

The procedures described here have been developed so that people without technical training will be able to assess the exposure of a housing site to present and future noise conditions. In this context, the site may hold only one small building, in which case the noise assessment is straightforward. Larger sites may hold larger buildings, or many buildings, and the noise level may be different at different parts of the site (or building). Assessments of the noise exposure should be made at representative locations around the site where significant noise is expected. These are designated as "Noise Assessment Locations," abbreviated NAL in the following text.

The only materials required are a map of the area, a ruler (straight edge), a protractor and a pencil. Worksheets and working figures are provided separately.

All of the information you need can be easily obtained – usually by telephone. For convenience, this information is listed at the beginning of each section under headings that indicate the most likely source. While you are obtaining this information, be sure to ask about any approved plans for future changes that may affect noise levels at the site – for example: land-use changes, changes in airport runway traffic, widening of roads, and so forth. In all evaluations, you should assess the condition that will have the most severe or most lasting effect on the use of the site.

Wherever possible, you should try to assess noise environments expected at least ten years in the future.

The degree of acceptability of the noise environment at a site is determined by the outdoor day-night average sound level (DNL) in decibels (dB). The assessment of site acceptability is presented first as an evaluation of the site's exposure to three major sources of noise – aircraft, roadways, and railways. These are then combined to assess the total noise at a site. Worksheets are provided at the back of these Guidelines to use in summarizing your evaluations.

The noise environment at a site will come under one of three categories:

Acceptable (DNL not exceeding 65 decibels) The noise exposure may be of some concern but common building constructions will make the indoor environment acceptable and the outdoor environment will be reasonably pleasant for recreation and play.

Normally Unacceptable (DNL above 65 but not exceeding 75 decibels) The noise exposure is significantly more severe; barriers may be necessary between the site and prominent noise sources to make the outdoor environment acceptable; special building constructions may be necessary to ensure that people indoors are sufficiently protected from outdoor noise.

Unacceptable (DNL above 75 decibels) The noise exposure at the site is so severe that the construction cost to make the indoor noise environment acceptable may be prohibitive and the outdoor environment would still be unacceptable.

When measuring the distance from the site to any noise source, measure from the source to the nearest points on the site where buildings having noise-sensitive uses are located. These points define the Noise Assessment Locations for the site. The relevant measurement location for buildings is a point 2 meters (6.5 feet) from the facade.

If at any point during the assessment the site's exposure to noise is found to be Unacceptable or Normally Unacceptable, every effort should be made to improve the condition, e.g., the location of the proposed dwellings can be changed or some shielding can be provided to block the noise from that source.

Where quiet outdoor space is desired at a site, distances should be measured from the important noise sources to the outdoor area in question and the combined noise exposure should be assessed.

Frequently, the locations of dwellings have not yet been specified at the time the noise assessment of a site is made. In these instances, distances used in the noise assessment should be measured as 2 meters less than the distance from the building setback line to the major sources of noise.

Combining Sound Levels in Decibels

The noise environment at a site is determined by combining the contributions of different noise sources. In these Guidelines, Workcharts are provided to estimate the contribution of aircraft, automobile, truck, and train noise to the total day-night average sound level (DNL) at a site. The DNL contributions from each source are expressed in decibels and entered on Worksheet A. The combined DNL from all the sources is the DNL for the site and is the value used to determine the acceptability of the noise environment.

Sound levels in decibels *are not combined by simple addition!* The following table shows how to combine sound levels:

Table

Difference in Sound Level	Add to Larger Level
0	3.0
1	2.5
2	2.1
3	1.8
4	1.5
5	1.2
6	1.0
7	0.8
8	0.6
9	0.5
10	0.4
12	0.3
14	0.2
16	0.1
greater than 16	0

Use the table by first finding the numerical difference in sound level between two levels being combined. Entering the table with this value, find the value to be added to the larger of the two levels, add this value to the larger level to determine the total. Where more than two levels are to be combined, use the same procedure to combine any two levels; then use this subtotal and combine it with any other level, and so on. Fractional numerical values may be interpolated from the table; however, the final result should be rounded to the nearest whole number.

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Example 1: In performing a site evaluation, the separate DNL values for airports, road traffic, and railroads have been listed on Worksheet A as 56, 63, and 61 decibels. In order to complete the final evaluation of the site, these separate DNL values must be combined. The difference between 63 and 56 is 7; from the table you find that 0.8 should be added to 63, for a subtotal of 63.8. The difference between 63.8 and 61 is 2.8; from the table you interpolate that approximately 1.9 should be added to 63.8 for a total of 65.7 or 66 dB when rounded to whole numbers. This example shows how noise from different sources may be Acceptable, individually, at a site, but when combined, the total noise environment may exceed the Acceptable DNL limit of 65 decibels.

Aircraft

Necessary Information

To evaluate a site's exposure to aircraft noise, you will need to consider all airports (civil and military) within 15 miles of the site. The information required for this evaluation is listed below under headings that indicate the most likely source. Before beginning the evaluation, you should record the following information on Worksheet B:

From the FAA Area Office or the Military Agency in charge of the airport:
- Are current DNL or NEF (Noise Exposure Forecast) contours available? Noise contours are available for almost all military airports. These contours have been developed and published as part of the Air Installation Compatible Use Zone (AICUZ) program of the Department of Defense. The contours are published normally as part of an AICUZ report. Noise contours are also available for many civil airports. When available, they are superimposed on a map with an appropriately marked scale (see Figure 1, page 4).
- Any available information about approved plans for runway changes (extensions or new runways).

From the FAA Control Tower or Airport Operations (if DNL or NEF contours are *not* available):
- The number of nighttime jet operations (10 p.m. - 7 a.m.)
- The number of daytime jet operations (7 a.m. - 10 p.m.)
- The flight paths of the major runways.
- Any available information about expected changes in airport traffic, e.g., will the number of operations increase or decrease in the next 10 or 15 years.

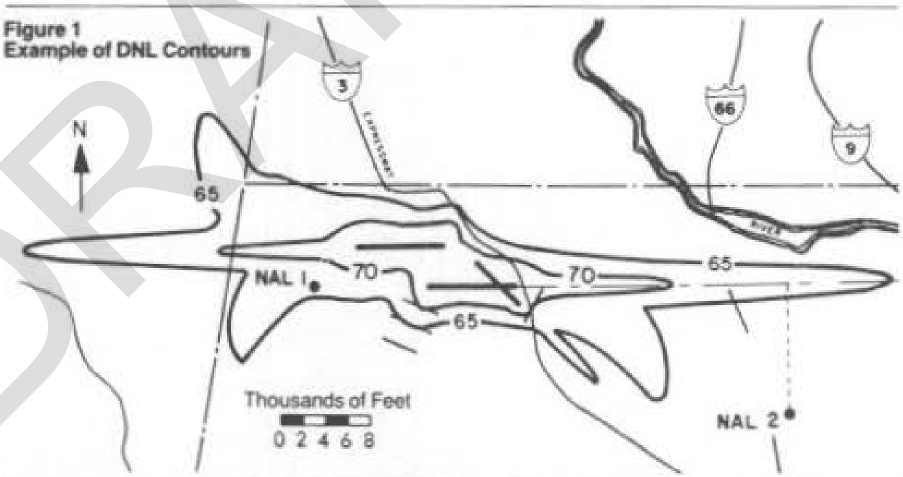
In making your evaluation, use the data for the heaviest air traffic condition, whether present or future.

Evaluation of Site Exposure to Aircraft Noise

If current DNL (or NEF) contours are available (as in Figure 1 page 4), locate the site on the map by referring to the marked distance scale. If there are no other noise sources in the area, you do not need to do anything else. If there are other noise sources affecting the site, you will need to find the precise DNL value so you can combine it with the other sources. Obtain the DNL at the appropriate NAL on the site by interpolation between the contours on either side of the NAL. If NEF contours are used, estimate DNL by adding 35 decibels to the NEF values. Note that contours are usually provided in 5 decibel increments. (See Example 2 on page 4.) When supersonic aircraft operations are present, DNL contours are *required* for the assessment.

If DNL or NEF contours are *not* available, the DNL at a site may be estimated in several different ways:
- An FAA Handbook (Reference 1) can be used to estimate DNL contours for sites in general aviation airport vicinities. General aviation airports exclude commercial jet transports but may include business jets.
- A handbook available from EPA (Reference 2 at the back of this Guide) can be used to calculate DNL at individual points.
- A procedure for constructing approximate DNL contours for sites near commercial jet

Figure 1
Example of DNL Contours



Example 2: The illustration in Figure 1 at the top of page 4 shows the NAL's on a map that has DNL contours. We find that NAL number 1 lies between the 65 and 70 dB contours and that NAL number 2 lies outside the 65 dB contour.

We find the DNL at NAL number 1 by interpolation from the distances between the NAL and the 65 and 70 dB contours.

By scaling off the map, we find that the distance from the NAL, measured perpendicularly to the contours, is 800 feet to the 65 dB contour and 2400 feet to the 70 dB contour. The distance between the 65 and 70 dB contours is 2400 + 800 =3200 feet. We find the DNL at the NAL number 1 to be 65 decibels plus 800/3200 x 5 decibels = 66.3 decibels.

Example 3: The illustration in Figure 2 at the bottom of page 5 shows an airport for which DNL or NEF contours are not available. The airport has 10 nighttime and 125 daytime jet operations.

To construct the approximate contours, we determine the effective number of operations as follows:

10 (nighttime) x 10 = 100

Add to this the actual number of daytime operations:

100 + 125 (daytime) = 225

To determine the distances A and B in relation to the runway (see Figure 3, page 5), enter the effective number of operations on the horizontal scales of the charts in Figure 3;

airports without supersonic aircraft is as follows:

Determine the "effective" number of jet operations at the airport by first multiplying the number of nighttime jet operations by 10.

Then add the number of daytime jet operations to obtain an effective total (see Example 3, page 4).

On a map of the area showing the principal runways, mark the location of the site and, using the diagram and charts of Figure 3 on page 5, construct approximate DNL contours of 65, 70, and 75 dB for the major runways and flight paths most likely to affect the site. (see Figure 2, page 5.)

Although a site may be Acceptable for exposure to aircraft noise; exposure to other sources of noise, when combined with the aircraft noise, may make the site Unacceptable. Therefore, if necessary, values of aircraft noise exposure less than 65 dB can be estimated from Table 2. Scale the shortest distance D^2 from the NAL to the flight path, as in Figure 2. Scale the distance D^1 from the 65 dB contour to the flight path. Divide D^2 by D^1 and enter this value into the following table to find the approximate DNL at the NAL.

Table 2

D2/D1	DNL dB
1.00	65
1.12	64
1.26	63
1.41	62
1.58	61
1.78	60
2.00	59
2.24	58
2.51	57
2.82	56
3.16	55

Figure 3
Charts for Estimating DNL for Aircraft Operations

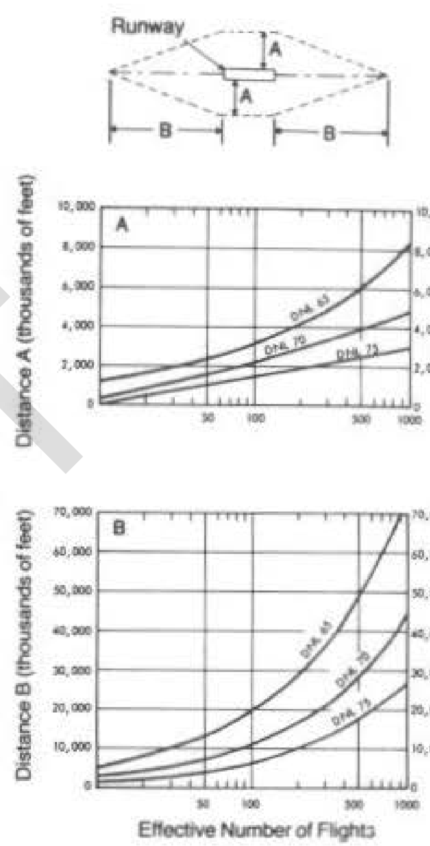
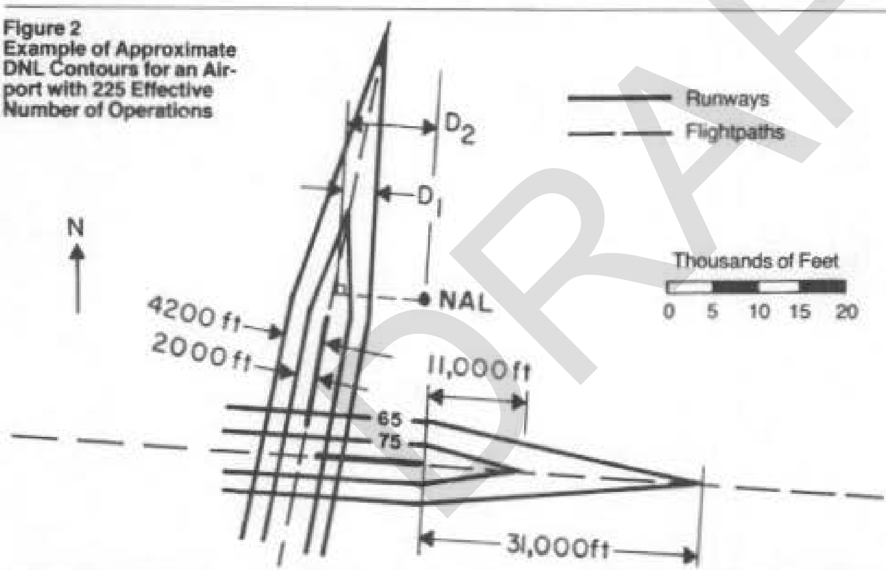


Figure 2
Example of Approximate DNL Contours for an Airport with 225 Effective Number of Operations



read up to the DNL curves; read across the chart to the left to obtain distances A and B from the vertical scales on the charts.

We find from Figure 3, for example, that for 225 effective operations, distance A is 4200 feet for the 65 dB contour and 2000 feet for the 75 dB contour. Distance B is 31,000 feet for the 65 dB contour and 11,000 feet for the 75 dB contour.

Example 4a: The NAL shown in Figure 2 is outside the 65 dB contour. The distance D^2 from the NAL to the flight path is 9700 feet. The distance D^1 from the 65 dB contour to the flight path, measured perpendicularly from the contour, is 3700 feet. The ratio D^2/D^1 is 9700/3700 = 2.62. From Table 2 we find the DNL from the airport to be 56.6 dB. We do not know whether the site is Acceptable or not, however, since we must also assess the contribution of roadway and train noise to the total DNL at the site.

Example 4b: We observe that the perpendicular distance (D^2) from NAL number 2 (Figure 1) to the flight path is more than 3 times the distance (D^1) from the 65 dB contour to the flight path. From Table 2 we find that the contribution of the airport to the DNL at NAL number 2 is less than 55 decibels. We need not consider the airport further in accessing the noise environment at this site.

Roadways

Necessary Information

To evaluate a site's exposure to roadway noise, you will need to consider all roads that might contribute to the site's noise environment; roads farther away than 1000 feet normally may be ignored.

Before beginning the evaluation, determine if roadway noise predictions already exist for roads near the site. Also try to obtain all available information about approved plans for roadway changes (e.g., widening existing roads or building new roads) and about expected changes in road traffic (e.g., will the traffic on this road increase or decrease in the next 10 to 15 years).

If noise predictions have been made, they should be available from the City (County) Highway or Transportation Department. If not, record the following information on page 1 of Worksheet C:

- The distances from the NAL's for the site to the near edge of the nearest lane and the far edge of the farthest lane for each road.
- Distance to stop signs.
- Road gradient, if 2 percent or greater.
- Average speed.
- The total number of automobiles for both directions during an average 24-hour day. Traffic engineers refer to this as ADT, Average Daily Traffic (or sometimes AADT, meaning Annual Average Daily Traffic).
- The number of trucks during an average 24-hour day in each direction.

If possible, separate trucks into "heavy trucks" – those weighing more than 26,000 pounds with three or more axles – and "medium trucks" – those between 10,000 and 26,000 pounds. (Each medium truck is counted as equal to 10 automobiles.) Trucks under 10,000 pounds are counted as automobiles. Count buses capable of carrying more than 15 seated passengers as "heavy" trucks – others, as "medium" trucks. If it is not possible to separate the trucks into those that are heavy and those that are not, treat *all* trucks as though they are "heavy."

Note: If the road has a gradient of 2 percent of more, record the numbers for uphill and downhill traffic separately since these figures will be needed later; otherwise, simply record the total number of trucks. Most often you will have to assume that the uphill and downhill traffic are equally split.

- The fraction of ADT that occurs during nighttime (10 p.m. to 7 a.m.). If this is unknown, assume 0.15 for both trucks and autos.

Evauation of Site Exposure to Roadway Noise

Traffic surveys show that the amount of roadway noise depends on the percentage of trucks in the total traffic volume. To account for this effect, you must evaluate automobile and truck traffic separately and then combine the results.

The noise environment at each site due to traffic noise is determined by utilizing a series of Workcharts to define the contribution of automobiles and trucks from one or more roads at that site. Each noise source yields a separate DNL value.

Workchart 1 provides a graph for assessing a site with respect to the noise from automobiles, light and medium trucks; Workchart 2 provides a similar graph for assessment of heavy truck noise. These values are combined for each road affecting the noise environment at the site to obtain the total contribution of roadway noise. Remember, the noise from aircraft and railways must also be considered before determining the suitability of this site's noise environment.

Effective Distance

Before proceeding with these separate evaluations, however, determine the "effective distance" to each road from the dwelling or outdoor residential activity (the NAL's for the site) by averaging the distances to the nearest edge of the nearest lane and to the farthest edge of the farthest lane of traffic. (See Example 5, page 6, and Figure 4, page 7.)

Note: For roads with the same number of lanes in both directions, the effective distance is the distance to the center of the roadway (or median strip, if present).

Automobile Traffic

Workchart 1 was derived with the following assumptions:

- There is line-of-sight exposure from the site to the road; i.e., there is no barrier which effectively shields the site from the noise of the road.
- There is no stop sign within 600 feet of the site; traffic lights do not count because there is usually traffic moving on one street or the other.
- The average automobile traffic speed is 55 mph.
- The nightime portion of ADT is 0.15.

If each road meets these four conditions, proceed to Workchart 1 for the evaluation. Enter the horizontal axis with the effective distance from the roadway to the NAL; draw a vertical line upward from this point. Enter the vertical axis with the effective automobile ADT; draw a horizontal line across from this point. (The "effective" automobile ADT is the sum of automobiles, light trucks, and 10 times the number of medium trucks in a 24-hour day.) Read the DNL value from Workchart 1 where the vertical and horizontal lines intersect. Record this value in column 16, Worksheet C.

But:

If any of the four conditions is different, make

Example 5: The site shown in Figure 4 is exposed to noise from three major roads: Road No. 1 has four lanes, each 12 feet wide, and a 30-foot wide median strip which accommodates a railroad track. Road No. 2 has four lanes, each 12 feet wide. Road No. 3 has six lanes, each 15 feet wide, and a median strip 30 feet wide.

The distance from NAL No. 1 to the near edge of Road No. 1 is 300 feet. The distance to the far edge of Road No. 1 is 300 feet, plus the number of lanes times the lane width, plus the width of the median strip. Thus, the distance to the farthest edge of the road is:

$300 + (4 \times 12) = 378\ ft$

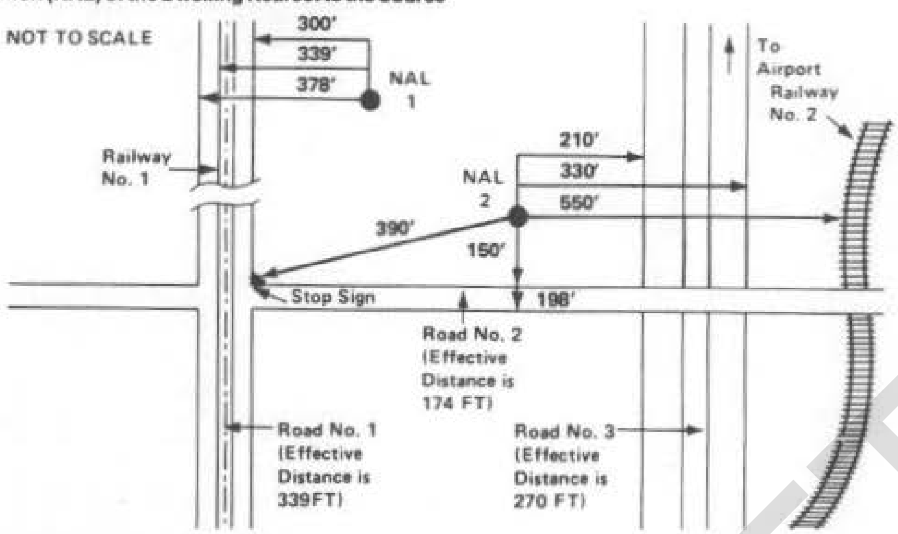
The effective distance is

$\frac{378 + 300}{2} = 339\ ft$

This is the value to be entered on line 1c of Worksheet C. The effective distances from the appropriate NAL's to Road No. 2 and Road No. 3 are found by the same method.

The distances shown in Figure 4 will be used for all roadway examples in this booklet.

Figure 4
Plan View of Site showing How Distance Should Be Measured from the Noise Assessment Location (NAL) of the Dwelling Nearest to the Source

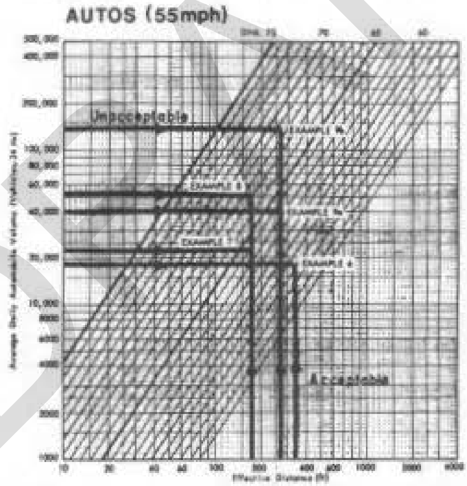


the necessary adjustments (on page 2, Worksheet C) listed below and *then* use Workchart 1 for the final evaluation.

First, a few general words about adjustments as they are applied in these Guidelines. Each Workchart has been derived for a baseline condition which is often found in practical cases. Where conditions differ from the baseline, they are accounted for by a series of one or more adjustment factors.

The adjustment factors are used as multipliers times the average number of vehicles operating during a 24-hour day. If more than one adjustment is required, it is not necessary that each be multiplied times the basic traffic flow separately; all adjustment factors are multiplied together, and them multiplied times the original traffic flow data. This will become clearer as you examine the Worksheets at the back of these Guidelines and work through the examples. After you have become familiar with the Guidelines, you will be able to work examples directly from the worksheets without referring back to the text. To simplify your work, all the adjustment factors are summarized at the back of these Guidelines.

Figure 5
Use of Workchart 1 To Evaluate Automobile Traffic Noise



Adjustments for Automobile Traffic

Stop-and-Go Traffic:
If there is a stop sign (not a traffic signal) within 600 feet of the NAL so that the flow of traffic is completely interrupted on the road under consideration, find the stop-and-go adjustment factor for automobiles from Table 3. Enter this value in column 9 on Worksheet C.

Table 3

Distance from NAL to Stop Sign In Feet	Automobile Stop-and-Go Adjustment Factor
0	0.10
100	0.25
200	0.40
300	0.55
400	0.70
500	0.85
600	1.00

Average Traffic Speed:
If the average automobile speed is other than 55 mph, enter the appropriate adjustment from Table 4 in column 10 of Worksheet C.

Table 4

Average Traffic Speed	Auto Speed Adjustment Factor
20 (mph)	0.13
25	0.21
30	0.30
35	0.40
40	0.53
45	0.67
50	0.83
55	1.00
60	1.19
65	1.40
70	1.62

Example 6: Road No. 1 meets the four conditions that allow for an immediate evaluation. In obtaining the information necessary for this evaluation, it was found that the automobile ADT is 18,000 vehicles (Line 5c of Worksheet C). On Workchart 1 we locate on the vertical scale the point representing 18,000 and on the horizontal scale the point representing 339 feet (see Figure 5). (Note that we must estimate the location of this point.) Using a straight-edge we draw lines to connect these two values and find that the NAL exposure to automobile noise from this road is a DNL of 58 dB, as read from the scale at the top of the graph.

Example 7: Road No. 2 has a stop sign at 390 feet from NAL No. 2. The automobile ADT is reported as being 32,500 vehicles (line 5c of Worksheet C). From Table 3 we interpolate between 300 and 400 feet to find the adjustment factor for stop-and-go traffic to be 0.69. The adjusted traffic ADT is

0.69 × 32,500 = 22,425 vehicles per day

and with an effective distance of 174 feet from NAL No. 2, we find from Workchart 1 that the approximate value of DNL is 64 dB.

Example 8: Suppose that the stop sign on Road No. 2 were replaced by a traffic signal for which no stop-and-go adjustment is made and that the ADT increases to 75,000 vehicles. In addition, assume that the average speed is 45 mph instead of 55 mph. You adjust the new automobile ADT of 75,000 vehicles by the Auto Speed Adjustment Factor from Table 4

0.67 × 75,000 = 50,250 vehicles

and at an effective distance of 174 feet find from Workchart 1 that the approximate value of DNL is 67 dB.

Nightime Adjustment.

DNL values are affected by the proportion of traffic volume that occurs during "daytime" (7 a.m. to 10 p.m.) and "nighttime" (10 p.m. to 7 a.m.). The graph on Workchart 1 assumes that 15 percent of the total ADT occurs during nighttime. If a different proportion of the traffic occurs at night, find the appropriate nighttime adjustment factor from Table 5. Record your answer in column 11 of Worksheet C.

Table 5

Nighttime Fraction of ADT	Nighttime Adjustment Factor
0	0.43
0.01	0.46
0.02	0.50
0.05	0.62
0.10	0.81
0.15	1.00
0.20	1.19
0.25	1.38
0.30	1.57
0.35	1.77
0.40	1.96
0.45	2.15
0.50	2.34

Once you have selected all the appropriate adjustment factors and entered them on page 2 of Worksheet C, multiply all the factors together, then multiply by the automobile ADT (column 12) for 24 hours, found on page 1 of Worksheet C. The resulting adjusted ADT should be entered in column 13. This is the ADT value to be used, in conjunction with the effective distance from the NAL to the road, to find the DNL value from Workchart 1. Enter this DNL value in column 14 of Worksheet C. Remember this is the DNL from automobile (as well as light and medium truck) noise; you must still find the DNL contribution from heavy truck noise in order to obtain the total DNL produced by the roadway you are assessing.

Attenuation of Noise by Barriers:

This adjustment reduces the noise produced by automobiles and trucks on the same road. Instructions for this adjustment appear after the noise assessment for truck traffic below.

Truck Traffic

Wherever possible, separate the average daily volume of trucks into heavy trucks (more than 26,000 pounds vehicle weight and three or more axles); medium trucks (less than 26,000 pounds but greater than 10,000 pounds), light trucks (counted as if they are automobiles). You should already have accounted for medium and light trucks in your automobile evaluation. Do not forget that buses that can carry more than 15 seated passengers are counted as heavy trucks. Heavy trucks (including buses) must be analyzed separately because they have quite different noise characteristics. If it is not possible to separate the trucks into those that are heavy and those that are not, treat *all* trucks as though they are "heavy."

Workchart 2, which is used to evaluate the site's exposure to heavy truck noise, was derived with the following assumptions:

- There is line-of-sight exposure from the site to the road; i.e., there is no barrier which effectively shields the site from the road noise.
- The road gradient is less than 2 percent.
- There is no stop sign (traffic signals are permissible) within 600 feet of the site.
- The average truck traffic speed is 55 mph.
- The nighttime fraction of ADT is 0.15.

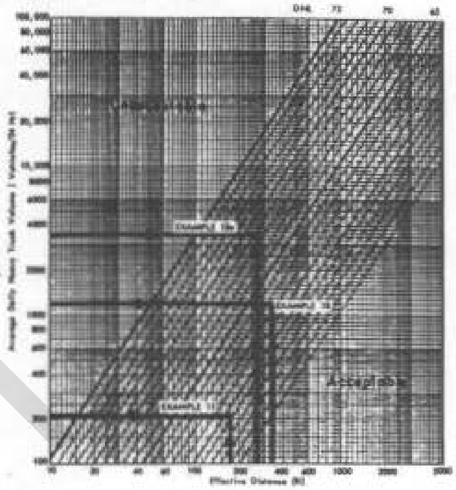
If the road meets these five conditions, proceed to Workchart 2 for an immediate evaluation of the site's exposure to heavy truck noise from that road.

But:

If any of the conditions is different, make the necessary adjustment(s) listed below and *then* use Workchart 2 for the evaluation.

Figure 6.
Use of Workchart 2 to Evaluate Heavy Truck Noise

Heavy Trucks (55 mph)



Adjustments for Heavy Trucks

Road Gradient:

If there is a gradient of 2 percent or more, find the appropriate adjustment factor, for heavy trucks going uphill only, as shown in Table 6. List this factor in column 17 of Worksheet C.

Table 6

Percent of Gradient	Adjustment Factor
2	1.4
3	1.7
4	2.0
5	2.3
6 or more	2.5

Example 9a: Road No. 3 is a limited access highway with no stop signs and the average speed is 55 mph. Current traffic data indicate an automobile ADT of 40,000 vehicles of which 15 percent occurs during nighttime hours (10 p.m. to 7 a.m.). With an effective distance of 270 feet to NAL No. 2, Workchart 1 is used to show that the DNL for existing automobile traffic is between 63 and 64 dB. Round off to 64 dB.

Example 9b: However, traffic projections estimate that in 10 years the ADT will increase to 100,000 vehicles at an average speed of 55 mph and nighttime usage will increase to 25 percent. For future traffic, you must adjust the future ADT of 100,000 for the effect of increased nighttime use. From Table 5, you find an adjustment factor of 1.38. The adjusted ADT is

$$1.38 \times 100{,}000 = 138{,}000$$

and at an effective distance of 270 feet you find from Workchart 1 that the DNL will increase to 69 dB; therefore, provision for extra noise control measures should be explored. We will examine in Example 13 the effect of terrain as a shielding barrier that provides sound attenuation.

Example 10: Road No. 1 on Figure 4 meets the four conditions that allow for an immediate evaluation. The ADT for heavy truck flow is 1200 vehicles. Workchart 2 shows that the exposure to truck noise from this road at an effective distance of 339 feet is a DNL of 63 dB at NAL No. 1.

Average Traffic Speed:

Make this adjustment if the average speed differs from 55 mph. If the average truck speed differs with direction, treat the uphill and downhill traffic separately. Select the appropriate adjustment factors from Table 7 below, entering them in column 18 of Worksheet C.

Table 7

Average Traffic Speed MPH	Heavy Truck Speed Adjustment Factor
50 or less	0.81
55	1.00
60	1.17
65	1.38

Once you have found the speed adjustment factor, you can combine the uphill and downhill traffic. For uphill traffic, multiply the gradient factor times the speed adjustment factor times uphill traffic volume (truck ADT column 19) (assuming one half the total 24-hour average number of trucks unless specific information to the contrary exists), entering the product in column 20. Multiply the speed adjustment factor for downhill traffic times the downhill traffic volume (truck ADT/2 column 19). Add the values for uphill and downhill traffic, entering this sum in column 21. You may now complete the assessment of heavy truck noise without regard to uphill and downhill traffic separation.

Stop-and-Go Traffic:

If there is a stop sign (remember, not a traffic signal) within 600 feet of an NAL for the site on the road being assessed, find the adjustment factor determined according to Table 8. Enter it in Column 22 of Worksheet C.

Table 8

Heavy Truck Traffic Volume per Day	Heavy Truck Stop-and-Go Adjustment Factor
Less than 1200	1.8
1201 to 2400	2.0
2401 to 4800	2.3
4801 to 9600	2.8
9601 to 19,200	3.8
More than 19,200	4.5

Nighttime Adjustment

After all the above adjustments are made, do not forget to adjust for nighttime operations if they are not 15 percent of the total ADT, using the factors obtained from Table 5 just as for automobiles. Enter this value in column 23 of Worksheet C.

At this point, multiply the adjustment factors for nighttime and stop-and-go traffic times the heavy truck traffic volume in column 21 to find the adjusted heavy truck ADT, entering the product in column 24. Use this value and the effective distance from the NAL to the road to find the truck DNL from Workchart 2, entering your answer in column 25 of Worksheet C. If no shielding barriers are to be considered, combine the DNL from heavy trucks with the DNL from automobiles (column 14). The result is the DNL from the road being assessed and should be entered on Worksheet C.

But:

If a shielding barrier is to be considered for the site, make the analysis described below separately for automobiles and then for heavy trucks *before* combining the DNL values. This step is necessary since barriers are far more effective for automobiles than for heavy trucks. Once you have found the amount of attenuation provided by the barrier for automobiles, enter it in column 15. Find the value of barrier attenuation for heavy trucks and enter it in column 25. Subtract these attenuation values from the DNL values obtained previously (columns 14 and 24), entering the reduced DNL values in columns 16 and 27. Combine the automobile and heavy truck DNL values, reduced by the attenuation provided by the barrier, to find the final DNL produced by the roadway at the site.

Remember to combine the contributions to DNL of *all* roads that affect the noise environment at each NAL for the site to obtain the total DNL from all roadways. Enter this DNL on both Worksheet C and the summary Worksheet A.

Attenuation of Noise by Barriers

Noise barriers are useful for shielding sensitive locations from ground level noise sources. For example, a barrier may be the best way to deal with housing sites at which the noise exposure is not acceptable because of nearby roadway traffic.

A barrier may be formed by the road profile, by a solid wall or embankment, by a continuous row of noise-compatible buildings, or by the terrain itself. To be an *effective* shield, however, the barrier must block all residential levels from line of sight to the road; it must not have any gaps that would allow noise to leak through.

Some Preliminary Matters:

In evaluating noise barrier performance, you will be working with different kinds of "distances" between the sound source, the observer, and the barrier.

Actual Distance – the existing distance that would be measured using a tape measure with no corrections or adjustments. This may mean one of two things, *depending on the application;* either the:

- *slant distance* – the actual distance,

Example 11: Road No. 2 has a stop sign at 390 feet from NAL No. 2. There is also a road gradient of 4 percent. No heavy trucks are allowed on this road, but a schedule shows an average of 12 large buses pass along the road per hour between 7 a.m. and 10 p.m., although no buses are scheduled during the remaining nighttime period. The buses are equally divided in each direction along the road. (Remember large buses, those that carry over 15 seated passengers, count as heavy trucks.)
We find the ADT for the "heavy trucks" (the buses in this case) by multiplying the average number of vehicles per hour by the number of hours between 7 a.m. and 10 p.m. That is, 12 x 15 = 180, or 90 vehicles in each direction. We find from Table 6 that the gradient adjustment factor for uphill traffic is 2.0. We find the truck volume adjusted for gradient is

uphill:	*90 x 2.0*	*= 180*
downhill:		*= 90*
total (column 21)		*= 270 vehicles*

From Table 8, we find the adjustment factor for stop-and-go traffic to be 1.8.

We also remember that we have no buses in the nighttime period and find the factor in Table 5 on page 8 for zero nighttime operations to be 0.43.

Our final adjusted ADT is (column 24)

1.8 x 0.43 x 270 = 209 Vehicles

From Workchart 2, with an effective distance of 174 feet, we find a DNL of 59 dB.

Example 12a: Road No. 3 is a depressed highway and the profile shields all residential levels of the housing from line of sight to the traffic. The average truck speed is 50 mph. The ADT for heavy trucks is 4400 vehicles. We adjust for average speed (from Table 7)

4400 x 0.81 = 3564

and find from Workchart 2 that, with an effective distance of 270 feet, the DNL from truck noise would be 69 dB if no barrier existed. We proceed to analyze the barrier attenuation.

measured along the line of sight between two points; or the

- *map distance* – the actual distance, measured on a horizontal plane, between the two points, as on a map or on the project plan.

For an observer high in an apartment tower, the slant distance to the road may be much longer than the map distance.

Barrier effectiveness is expressed in terms of noise attenuation in decibels (dB), determined with the aid of Workchart 6. This numerical value is subtracted from the previously calculated DNL in order to find the resultant DNL at the Noise Assessment Location.

Note: A noise barrier can be considered as a means of protecting a site from noise even if it cannot wrap around the site to shield from view practically all of the source of noise at every sensitive location on the site. It must be recognized, however, that such a barrier is much less effective than an ideal barrier. (See Workchart 7 and Step 6 below.)

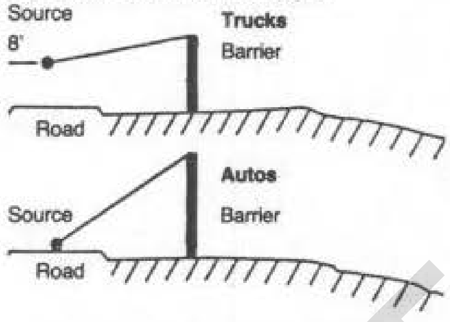
Barriers of reasonable height cannot be expected to protect housing more than a few stories above ground level. Barriers will generally protect the ground and the first two or three floors, but not the higher floors. If there are to be frequently occupied balconies on the upper levels, one solution is to move the building farther from the noise source and face the sensitive areas away from the noise.

Steps to Evaluate a Barrier

1. For the observer's position, use the mid-height of the highest residential level. For the source position, use the following heights (see Figure 7):

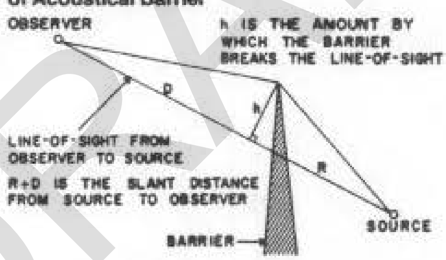
- autos, medium trucks, railway cars – the road or railway surface height
- heavy trucks – 8 feet above the road surface
- diesel locomotives or trains using horns or whistles at grade crossings – 15 feet above the rails.

Figure 7.
Source Heights to Be Used in Roadway Barrier Designs



Get accurate values for the following quantities: h, the shortest distance from the barrier top to the line of sight from source to observer; R and D, the slant distances along the line of sight from the barrier to the source and observer, respectively (see Figure 8).

Figure 8.
Generalized Geometry of Acoustical Barrier



Specifically, R and D are the two segments into which h breaks the line of sight. Note that h is *not* the height of the barrier above the ground but the distance from the barrier top to the line of sight.

2. Enter at the top of Workchart 6 with the value of h on the left-hand scale; move right to intersect the curve corresponding to R (or D, whichever is *smaller*).

3. Move down to intersect the curve corresponding to the value of D/R (or R/D, whichever is *smaller)*.

4. Move right to intersect the vertical scale in order to find the barrier shielding value A in decibels.

5. Interruption of the line of sight with a barrier between the noise source and an observer reduces the amount of sound attenuation provided by the ground. Find the amount of this loss B from the table on Workchart 6 by entering the table with the value of D/R. Find the barrier attenuation value S corresponding to an ideal barrier that completely hides the noise source from view by subtracting B from the value of A obtained in Step 4.

6. If the barrier exists along only a part of the road so that unshielded sections of the road would be visible from the site, the barrier is less effective than an ideal barrier. On a plan view of the site, locate the two ends of the barrier and draw lines from these points to the Noise Assessment Location. Use a protractor to measure the angle formed at the NAL by the two lines. Enter the horizontal scale of Workchart 7 with the values of this angle; read up to the curve having the value of S determined from Step 5 (interpolating if necessary); read left across to the vertical scale labeled "actual barrier performance" to find the value of FS to use for the actual barrier in question.

7. Subtract the barrier attenuation value S (or FS if adjusted for finite barrier length according to Workchart 7) from the value of DNL previously determined to reevaluate the site with the noise barrier in place.

Example 12b: (Refer to Figure 9.) Six stories are planned for the housing where the site has an elevation of 130 feet. The effective elevation for the highest story is found by multiplying the number of stories by 10 feet, adding the site elevation, and subtracting 5 feet.

(6 × 10) + 130 - 5 = 185 feet

The barrier, which in this case is formed by the road profile, has no "height" other than the elevation of the natural terrain above the noise sources traveling on the roadway. The important dimensions are indicated in Figure 9.

Some people with a technical background will be able to fit the geometric diagram to the site situation readily, working from the project drawings and a scratch sheet.

But if you are *not* confident of your geometry, Workchart 5 gets you the values of R, D, and h from the map distances and elevations of the site. We illustrate that procedure in this example.

First, enter the elevations of the source (S), the observer (O), and the top of the barrier (H), as well as the map distances from the barrier to the source (R') and observer (D'), at the top right of Workchart 5. Then, follow the steps on that Workchart to derive the values of h, R, and D that are needed in using Workchart 6.

Entering Workchart 6 at the upper left with the value of h (5.5 feet), we move horizontally

Figure 9.
Detail of Site Showing Measurements Necessary for a Barrier Adjustment

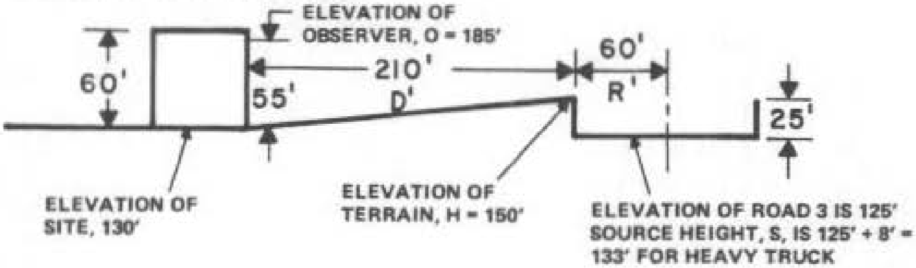
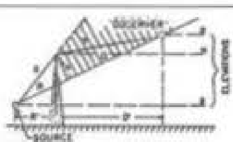


Figure 10.
Use of Workchart 5 to Determine Barrier Dimensions in Example 12b

Workchart 5
Noise Barrier
To find R, D and h from Site Elevations and Distances

Enter the values for:
H= 150 R'= 60
S= 133 D'= 210
O= 185

Fill out the following worksheet (all quantities are in feet):



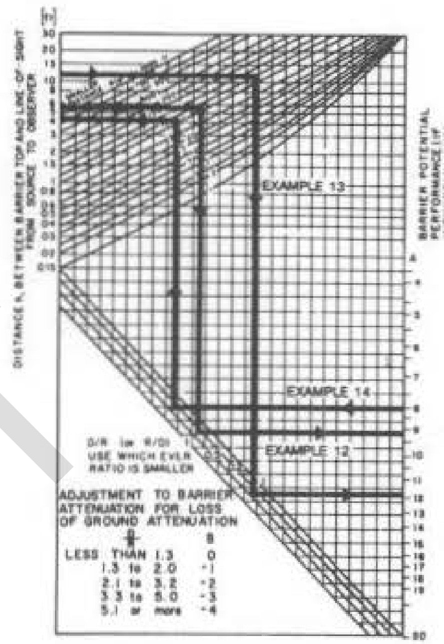
1. Elevation of barrier top minus elevation of source	[H 150]	−	[S 133]	=	[1 17]		
2. Elevation of observer minus elevation of source	[O 185]	−	[S 133]	=	[2 52]		
3. Map distance between source and observer (R' + D')					[3 270]		
4. Map distance between barrier and source (R')					[4 60]		
5. Line 2 divided by line 3	[2 52]	÷	[3 270]	=	[5 0.19]		
6. Square the quantity on line 5 (i.e., multiply it by itself); always positive	[5 0.19]	×	[5 0.19]	=	[6 0.04]		
7. 40% of line 6	[0.4]	×	[6 0.04]	=	[7 0.016]		
8. One minus line 7	[1.0]	−	[7 0.016]	=	[8 0.984]		
9. Line 5 times line 4 (will be negative if line 2 is negative)	[5 0.19]	×	[4 60]	=	[9 11.4]		
10. Line 1 minus line 9	[1 17]	−	[9 11.4]	=	[10 5.6]		
11. Line 10 times line 8	[10 5.6]	×	[8 0.984]	=	[11 5.5]	=	h
12. Line 5 times line 10	[5 0.19]	×	[10 5.6]	=	[12 1.06]		
13. Line 4 divided by line 8	[4 60]	÷	[8 0.984]	=	[13 61]		
14. Line 13 plus line 12	[13 61]	+	[12 1.06]	=	[14 62]	=	R
15. Line 3 minus line 4	[3 270]	−	[4 60]	=	[15 210]		
16. Line 15 divided by line 8	[15 210]	÷	[8 0.984]	=	[16 213]		
17. Line 16 minus line 12	[16 213]	−	[12 1.06]	=	[17 212]	=	D

(Note: the value on line 2 may be negative, in which case so will the values on lines 5, 9, and 12; line 1 may also be negative. Remember, then, in lines 10, 14, and 17, that adding a negative number is the same as subtracting: x + (−y) = x − y. And subtracting a negative number is like adding: X − (−y) = x + y.)

Round off R and D to nearest integer, h to one decimal place.

Figure 11.
Use of Workchart 6 to Evaluate Barrier in Examples 12b, 13 and 14

Noise Barrier **Workchart 6**



to the right until we meet the value of R or D, whichever is smaller: in this example, R = 62 feet. From that point we drop vertically downward until we meet the value of R/D or D/R, whichever is smaller: in this case, R/D = 0.29. From that point, move horizontally to the right to find the value for A = 9 dB. Entering the table for determining loss of ground attenuation effect due to the barrier with a value for D/R of 3.5, the reduction in attenuation (B) is found to be 3 dB. Substracting 3 dB from 9 dB provides a net attenuation of 6 dB. With 6 dB of attenuation, the original DNL of 69 dB (Example 12a) is reduced to 63 dB.

Example 13: An alternative approach, which is somewhat more direct, is illustrated here for the noise of automobiles on Road No. 3.

A preliminary step is to make an accurately scaled sketch of the general geometry introduced on page 8. It must include the positions of the source (this time at the road surface), the observer, and the top of the barrier; and will show the distances h, R, and D. Such a sketch is shown superimposed on the profile of the road and its neighborhood in Figure 12.

If we carefully scale the dimensions directly from this sketch, we find the following values for h, R, and D:

R=63 feet

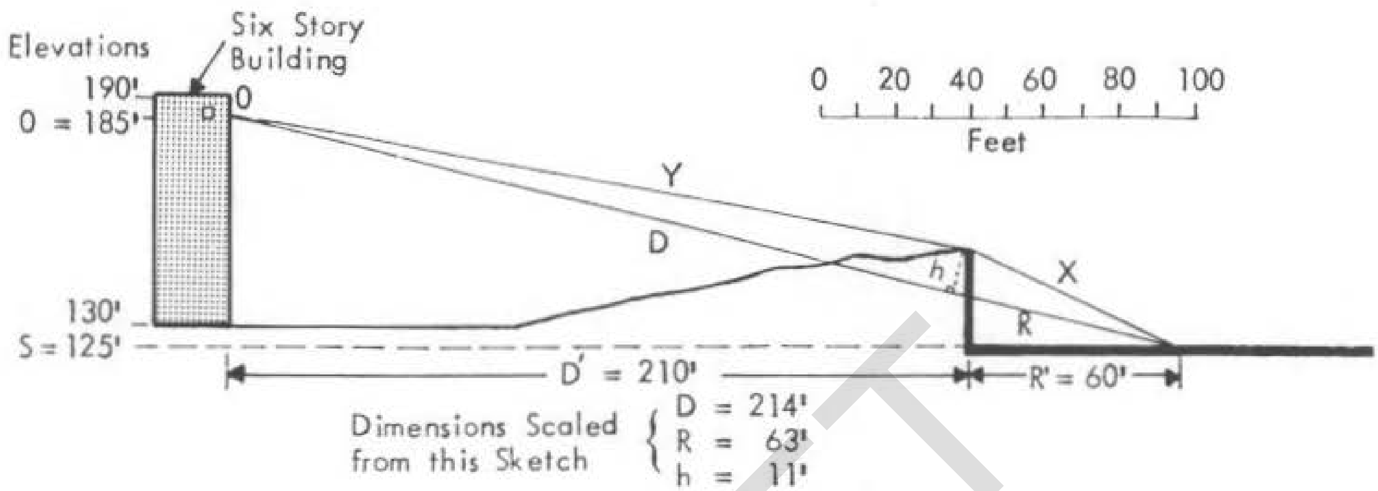
R/D=0.3

D=214 feet

h=11 feet

The barrier attenuation is found, by entering Workchart 6 with these values, to be A=12 dB. It is larger than that found for trucks because the noise source is lower and is, therefore, better shielded by the barrier. The loss from ground attenuation is again B=3 dB for a net attenuation of 12 - 3 = 9 dB. In Example 9b, we found that the DNL

Figure 12.
Sketch Showing Dimensions for Example 13



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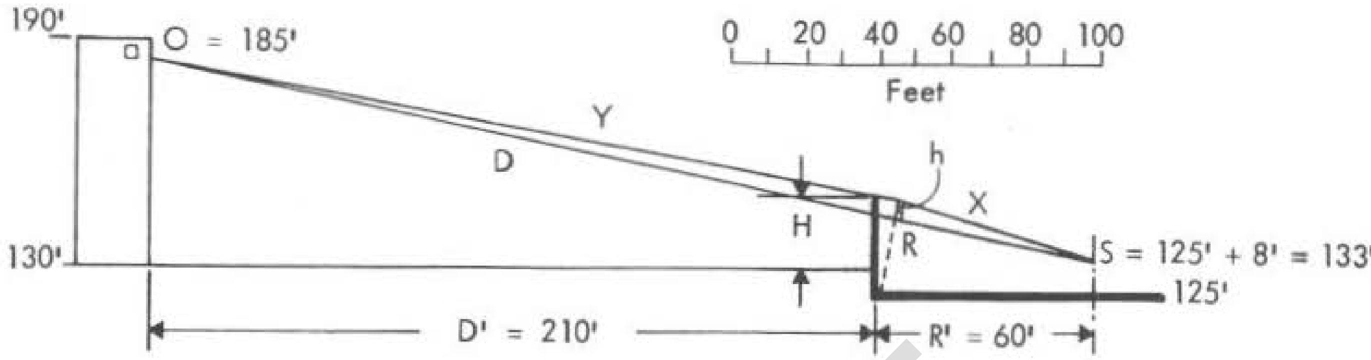
for the projected traffic volume of 100,000 vehicles per day was 69 dB if no consideration was given the shielding provided by the terrain. Subtracting the 9 dB attenuation from 69, we find the partial DNL for automobiles is 60 dB.

In order to find the combined truck and automobile noise for Road No. 3, we combine the 63 dB of truck noise with the 60 dB of automobile noise using Table 1. We find that 1.8 should be added to 63 dB, for a combined DNL of 64.8 dB, or 65 dB when rounded to the nearest whole number.

Example 14: Where no natural barrier exists, Workchart 6 can be used in reverse to estimate the height of a barrier needed to obtain a required attenuation. In example 9b we found that, without any attenuation from terrain or a barrier, the automobile traffic produced a DNL of 69 dB, and in Example 12a the heavy truck traffic produced a DNL of 69 dB. When combined, the total DNL is 72 dB. Suppose the terrain were not rising between NAL and Road No. 3, as shown in Figure 12, but instead was level between the NAL and the edge of the road, as shown in Figure 13. We want to find out how high a wall, infinite in length, would be required at the edge of the road to reduce the combined truck and automobile noise to less than 65 dB. We have found in the previous examples that a barrier of a given height will provide more attenuation for automobiles than it will for trucks. As a first step in our analysis, we will find the height of a wall that will reduce the truck noise to just below 65 dB, say 64 dB, and then find out whether the additional attenuation it provides for automobile noise will be sufficient to reduce the combined truck and automobile noise to less than 65 dB. We begin by finding the height of wall that will provide 5 dB attenuation for truck noise.

We estimate that the ratio of R/D is about the same as R'/D', the ratio of horizontal distance in Figure 13, which is equal to 0.29. Before entering Workchart 6, we find from the loss of ground attenuation table that for D/R = 3.4 we will lose 3 dB attenuation from an ideal barrier. In order to have a net attenua-

Figure 13.
Sketch Showing Dimensions for Example 14



tion of 5 dB, we must have an ideal barrier that provides 5 + 3 = 8 dB attenuation.

Entering Workchart 6 on the right side scale A at 8 decibels, we move across to the diagonal lines, finding 0.29 by interpolating between the lines marked at 0.2 and 0.5. Moving directly up to a point midway between the R lines of 50 and 70, we find our estimated R of approximately 60. Moving across to the left we find that the line of sight between the observer and the truck source height must be broken by a value of h equal to 4.5 feet.

We can determine the height of the wall H in several ways. By drawing h=4.5 feet to scale on Figure 13, we can scale the total wall height H to be approximately 20 feet. Those who feel comfortable with geometry can calculate H by using the similar triangle relationships in Figure 13 to determine that H is 19.1 feet.

Now we must find how much a wall 19 feet high will attenuate automobile noise, remembering that the source height for automobiles is at the road surface elevation of 125 feet. By scaling the drawing, or by geometry, we determine that the line of sight between the observer position and the automobile source is broken by a value of h that is approximately 13 feet. Entering Workchart 6 at 13 feet we find, for R=60 feet and R/D=0.29, that the potential barrier attenuation is 12dB. We must reduce this by 3 dB for loss of ground attenuation to find the actual shielding of automobile noise to be 9 dB. The original 69 dB of automobile noise is reduced to 69 - 9 = 60 dB.

Finally, we combine the heavy truck noise, attenuated by the wall to 69 - 5 = 64 dB, with the automobile noise reduced to 60 dB, to find a combined DNL of 65.5 dB, or 66 dB when rounded upward. Remember, however, that this is for an infinite wall. Further adjustments would have to be made once the actual length was known.

Railways

Necessary Information

To evaluate a site's exposure to railway noise, you will need to consider all rapid transit lines and railroads within 3000 feet of the site (except totally covered subways). The information required for this evaluation is listed below under headings that indicate the most likely source.

Before beginning the evaluation, you should record the following information on Worksheet D:

From the area map and/or the (County) Engineer:

- The distance from the appropriate NAL on the site to the center of the railway track carrying most of the traffic.

From the Supervisor of Customer Relations for the railway:

- The number of diesel trains and the number of electrified trains in both directions during an average 24-hour day.
- The fraction of trains that operate during nighttime (10 p.m. - 7 a.m.) If this is unknown, assume 0.15.
- The average number of diesel locomotives per train. If this is unknown, assume 2.
- The average number of railway cars per diesel train and per electrified train. If this is unknown, assume 50 for diesel trains and 8 for electrified trains.
- The average train speed. If this is unknown, assume 30 mph.
- Is the track made from welded or bolted rails?

From the Engineering Department of the railway:

- Is the site near a grade crossing that requires prolonged use of the train's horn or whistle? If so, where are the whistle posts located? (Whistle posts are signposts which tell the engineer to start blowing the horn or whistle. Every grade crossing has whistle posts and they are listed on the railroad's "track charts." If traffic on the track is one-way, there will be only one whistle post. The grade crossing itself is the other "whistle post."

Electrified rapid transit and commuter trains that do not use diesel engines should be treated the same as railway cars.

Note: Buildings closer than 100 feet to a railroad track are often subject to excessive vibration transmitted through the ground. Construction at such sites is discouraged.

Evaluation of Site Exposure to Railway Noise

Railway noise is produced by the combination of diesel engine noise and railway car noise. These Guidelines provide for the separate evaluation of diesel locomotives and railroad cars, and then the combination of the two, in order to obtain the DNL from trains. When rapid transit or electrified trains that do *not* use diesel engines are the only trains passing near a site go directly to the second part of the evaluation since these trains are treated in the same manner as railway cars.

Diesel Locomotives

Workchart 3 was derived with the following assumptions:

- A clear line of sight exists between the railway track and the Noise Assessment Location.
- There are two diesel locomotives per train.
- The average train speed is 30 mph.
- Nighttime operations are 0.15 of the 24-hour total.
- The site is not near a grade crossing requiring prolonged use of the train's horn or whistle.

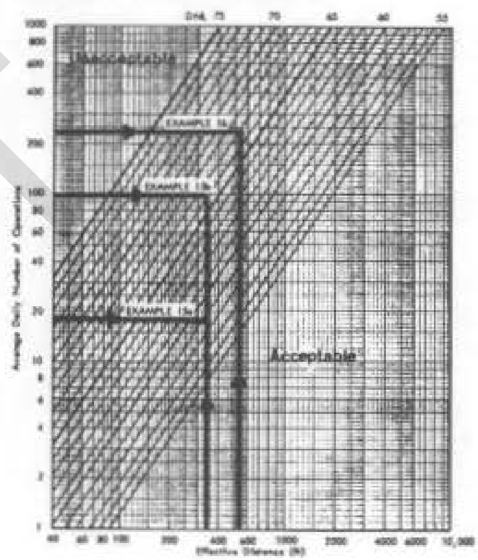
If the situation meets these conditions, proceed to Workchart 3 for an immediate evaluation of diesel locomotive noise.

But:

If any of the conditions is different, make the necessary adjustments listed below and *then* use Workchart 3 for the evaluation.

Figure 14.
Use of Workchart 3 to Evaluate Diesel Locomotive Noise

Railroads – Diesel Locomotives



Adjustments for Diesel Locomotives

Number of Locomotives:

If the average number of diesel locomotives per train is not 2, divide the average number by 2. Enter this value in column 9 of Worksheet D.

Example 15a: The distance from NAL number 1 to Railway Number 1 is 339 feet. Two percent of the 35 daily operations occur at night; there is clear line of sight between the tracks and the NAL, and no horns or whistles are used. No information is available on train size or speed, therefore we will assume 2 engines per train and a speed of 30 mph.

Since the percentage of nighttime operations is different from 15 percent, we must adjust the actual number of daily operations, multiplying by 0.50 according to Table 5.

0.50 x 35 = 17.5 = 18

Entering Workchart 3 with 18 daily operations and a distance of 339 feet, we find that the contribution of diesel engine noise is a DNL of 59 dB (see Figure 14).

In order to find the total contribution of the trains to the total DNL, we must also find the noise level produced by the train's cars. Entering Workchart 4 (see Figure 15) with 18 daily operations and a distance of 339 feet, we find the DNL is below 50 on the chart, or more than 10 decibels lower than the noise level produced by the engines. Based on the chart for decibel addition, the combination of the noise from the engines and the cars adds less than 0.5 decibels to the DNL value for the engines alone, 59 dB.

Example 15b: Suppose that a forecast of train operations for Railway 1 indicates that there will still be 35 trains per day, but now 50 percent of the operations will occur at night, the average train will have 4 engines and 75 cars, and the average speed will be 50 mph.

We first find the contribution to DNL made by diesel locomotives by using the following adjustment factors:

- number of engines adjustment: 2
- speed adjustment: 0.60
- day/night adjustment: 2.34

We multiply these adjustments together with the number of trains:

2 X 0.60 X 2.34 X 35 = 98

Entering Workchart 3 (see Figure 14) with 98 daily operations and a distance of 339

Average Train Speed:

If the average train speed is different from 30 mph, find the appropriate adjustment factor from Table 9 and list in column 10 of Worksheet D.

Table 9

Average Speed (mph)	Speed Adjustment Factor
10	3.00
20	1.50
30	1.00
40	0.75
50	0.60
60	0.50
70	0.43

Horns or Whistles:

If the NAL is perpendicular to any point on the track between the whistle posts for the grade crossing, enter the number 10 in column 11, Worksheet D.

Nighttime Adjustment:

Remember to adjust for nightime operations, if different from 0.15 of the total, by selecting the appropriate adjustment factor from Table 5 on page 8. Enter in column 12, Worksheet D.

Multiply the adjustment factors together, times the number of diesel trains per day (you have listed this number previously on line 2a, page 1, of Worksheet D, and should enter this number again in column 13) to obtain the adjusted number of trains per day. Enter the adjusted number of diesel trains per day in column 14. Use this value, in conjunction with the distance from the NAL to the track (line 1, page 1, of Worksheet D), to find from Workchart 3 the DNL produced by diesel locomotives. List in column 15 of Worksheet D.

Railway Cars and Rapid Transit Systems

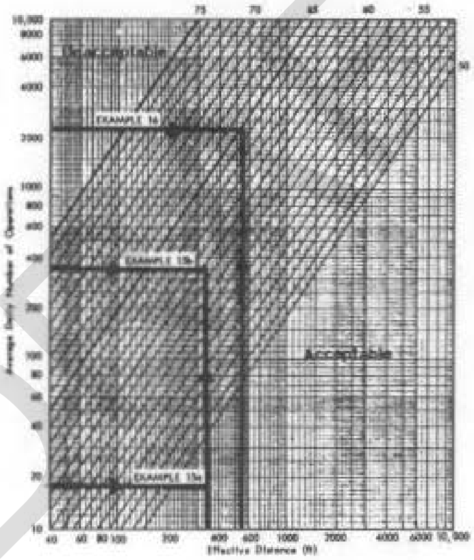
Workchart 4 was derived with the following assumptions:

- A clear line of sight exists between the railway and the NAL.
- There are 50 cars per train.
- The average train speed is 30 mph.
- Nighttime operations are 0.15 of the 24-hour total.
- Rails are welded together.

If the situation meets these conditions, proceed to Workchart 4 for an immediate evaluation of railway car noise. Again, if any of the conditions is different, make the necessary adjustments listed below and then use Workchart 4 for the evaluation.

Figure 15.
Use of Workchart 4 to Evaluate Railway Car Noise

Railroads – Cars and Rapid Transit



Adjustments for Railway Cars and Rapid Transit Trains

Number of Cars:

Divide the average number of cars by 50 and enter this number in column 18 of Workchart D.

Average Speed:

Make this adjustment, if the average speed is not 30 mph, by selecting the appropriate value from Table 10, entering it in column 19 of Worksheet D.

Table 10

Average Speed (mph)	Speed Adjustment Factor
10	0.11
20	0.44
30	1.00
40	1.78
50	2.78
60	4.00
70	5.44
80	7.11
90	9.00
100	11.11

Bolted Rails:

Enter the number 4 in column 20 of Worksheet D.

Nighttime Adjustment:

Enter the appropriate adjustment factor from Table 5 in column 21 of Worksheet D.

feet, we find that the site has an engine noise contribution to DNL of 66 dB.

We next obtain the adjustment factors for the noise produced by the cars:

- number of cars adjustment: 1.50
- speed adjustment: 2.78
- day/night adjustment: 2.34

Multiplying the adjustment factors times the average daily number of trains:

1.5 X 2.78 X 2.34 X 35 = 342

Entering Workchart 4 (see Figure 15) with 342 operations and a distance of 339 feet, we find the contribution of the cars to the DNL is 60 dB. Using Table 1 for combining levels, we find that the 6 dB difference between engine noise at 66 and car noise at 60 gives a combined DNL of 67 dB for these trains.

Example 16: The distance from NAL number 2 to Railroad Number 2 is 550 feet; there are 100 operations per day, of which 30 percent occur at night. A clear line of sight exists between the site and the railroad, and no horns or whistles are used nearby. An average train on this track uses 4 engines, has 100 cars, the average speed is 40 miles per hour, and the track has bolted, not welded, rails.

We first find the adjustment factors for the diesel engines:

- number of engines adjustment: 2
- speed adjustment: 0.75
- day/night adjustment: 1.57

Multiplying the adjustments together, times the number of trains:

2 X 0.75 X 1.57 X 100 = 236

Entering Workchart 3 (see Figure 14) with 236 operations at a distance of 550 feet, we find the DNL contribution from engine noise to be 67 dB.

Next we find the adjustment factors for the railroad cars:

- number of cars adjustment: 2
- speed adjustment: 1.78
- bolted track adjustment: 4
- day/night adjustment: 1.57

Multiplying the adjustments together, times the number of trains:

2 X 1.78 X 4 X 1.57 X 100 = 2236

Entering Workchart 4 (see Figure 15) with

(Continued next page)

Figure 16.
Sketch Showing Dimensions for Example 16

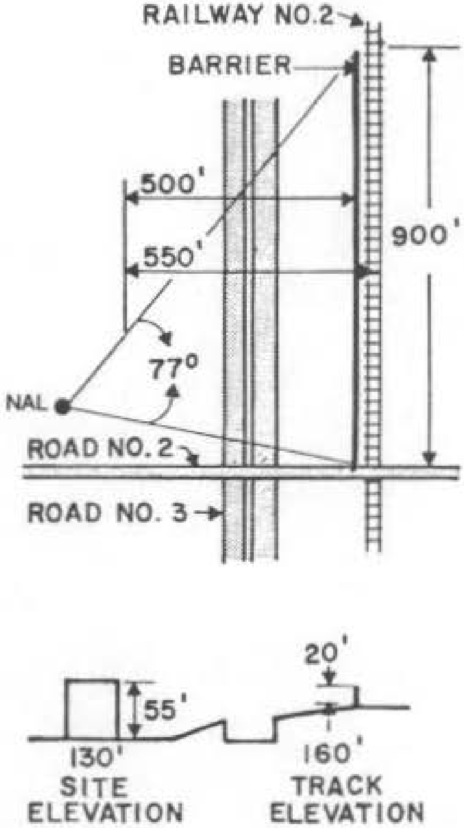


Figure 17.
Use of Workchart 6 in Example 16

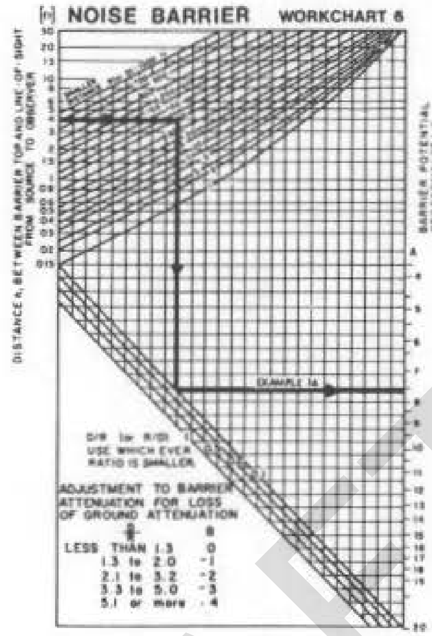
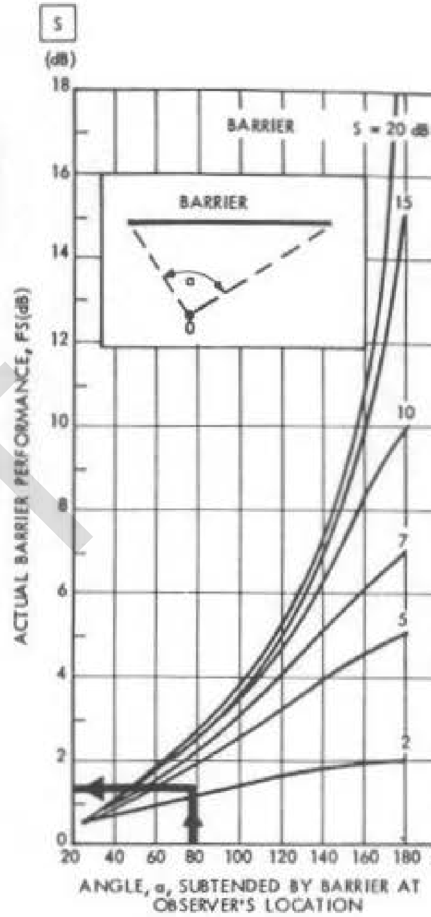


Figure 18.
Use of Workchart 7 in Example 16



2236 operations at a distance of 550 feet, we find the DNL contribution from the railroad cars to be 65 dB. Combining the engine sound levels with the car sound levels we find the total DNL from the trains to be 69 dB.

It would be possible to erect a 20-foot noise barrier, running parallel to the track at a distance of 50 feet; it could start at Road Number 2 and run 900 feet north toward the airport, as shown in Figure 16. Both the railroad track and the ground level at the barrier location are at an elevation of 160 feet. Thus, we have the following values with which to calculate the potential reduction in engine noise (using Workchart 5). (Because the distances involved are so unequal, this situation does not lend itself to direct scaling of the distances.)

H = 180 feet (20' above the ground)

S = 175 feet (15' above the track, see page 19)

0 = 285 feet (from Example 11 in the section on roadway noise)

R' = 50 feet

D' = 500 feet

We find from Worksheet 5 that the values of R and D are no different (within the accuracy of the calculation) from R' and D', a situation that will always occur when the differences in elevation are so much smaller than the distances from the site to the noise source. The value of h is 4 feet; R/D = 0.1

We can now use these numbers to enter Workchart 6 to find the *potential* barrier performance (that is, the barrier adjustment factor that would apply in the case of an infinitely long barrier). Entering Workchart 6 at h = 4 feet, with R/D = 0.1, we find the basic attenuation of the barrier to be 7.5 dB. However, with D/R = 10, we find from the table of loss-of-ground-effect attenuation that we must subtract 4 dB from the 7.5, or a net effect of 3.5 dB. However, the situation is even worse, since the barrier is finite in length.

To find the actual attenuation for this *finite* barrier, we must first find the angle subtended by the barrier to the NAL. Referring to Figure 16, we draw lines from the NAL each end of the barrier. With

References

1. D.E. Bishop, A.P. Hays, "Handbook for Developing Noise Exposure Contours for General Aviation Airports," FAA-AS-75-1, December 1975 (NTIS No. AD-A023429).

2. D.E. Bishop, et al., "Calculation of Day-Night Levels Resulting From Civil Aircraft Operations," BBN Report 3157 for Environmental Protection Agency, March 1976 (NTIS No. PB 266 165).

3. B.A. Kugler, D.E. Commins, W.J. Galloway, "Highway Noise – A Design Guide for Prediction and Control," NCHRP Report 174, Transportation Research Board, National Research Council, 1976.

4. T.J. Schultz, W.J. Galloway, "Noise Assessment Guidelines – Technical Background," Office of Policy Development and Research, U.S. Department of Housing and Urban Development," 1980.

5. M.A. Simpson, "Noise Barrier Design Handbook," FHWA-RD-76-58, Federal Highway Administration, February 1976 (NTIS No. PB 266 378).

a protractor we measure the angle between the two lines to be 77 degrees. Locate the curve on Workchart 7 corresponding to the potential barrier attenuation of 3.5 dB; it lies midway between the two lowest curves (see Figure 18). The point on this curve corresponding to a subtended angle of 77 degrees indicates that the actual barrier performance would be only 1.5 dB. With only 1.5 dB of attenuation, the barrier is clearly not cost-effective. In order to achieve a usable attenuation from the barrier, it would have to be extended beyond the other side of Road Number 2 to obtain a larger subtended angle. This extension, however, would still not be cost-effective unless the height of the barrier were increased substantially.

Summary of Adjustment Factors

Combination of Sound Levels

Table 1

Difference in Sound Level	Add to Larger Level
0	3.0
1	2.5
2	2.1
3	1.8
4	1.5
5	1.2
6	1.0
7	0.8
8	0.6
9	0.5
10	0.4
12	0.3
14	0.2
16	0.1
greater than 16	0.

Aircraft

Table 2 DNL Outside 65 dB Contour

D^1=distance from 65 dB contour to flight path
D^2=distance from site to flight path

D2 / D1	DNL dB
1.0	65
1.12	64
1.26	63
1.41	62
1.58	61
1.78	60
2.00	59
2.24	58
2.51	57
2.82	56
3.16	55

Automobile Traffic

Table 3 Stop-and-go

Distance from Site to Stop Sign feet	Automobile Stop-and-go Adjustment Factor
0	0.10
100	0.25
200	0.40
300	0.55
400	0.70
500	0.85
600	1.00

Table 4 Average Traffic Speed

Average Traffic Speed	Adjustment Factor
20 (mph)	0.13
25	0.21
30	0.30
35	0.40
40	0.53
45	0.67
50	0.83
55	1.00
60	1.19
65	1.40
70	1.62

Table 5 Nighttime (applies to all sources)

Nighttime Fraction of ADT	Nighttime Adjustment Factor
0	0.43
0.01	0.46
0.02	0.50
0.05	0.62
0.10	0.81
0.15	1.00
0.20	1.19
0.25	1.38
0.30	1.57
0.35	1.78
0.40	1.96
0.45	2.15
0.50	2.34

Medium Trucks

(less than 26,000 pounds, greater than 10,000 pounds)

Multiply adjusted automobile traffic by 10.

Heavy Trucks

Table 6 Road Gradient

Percent of Gradient	Adjustment Factor
2	1.4
3	1.7
4	2.0
5	2.2
6 or more	2.5

Table 7 Average Speed

Average Traffic Speed (mph)	Truck Speed Adjustment Factor
50 or less	0.81
55	1.00
60	1.17
65	1.38

Table 8 Stop-and-go

Heavy Truck Traffic Volume per Day	Heavy Truck Stop-and-Go Adjustment Factor
Less than 1200	1.8
1201 to 2400	2.0
2401 to 4800	2.3
4801 to 9600	2.8
9601 to 19,200	3.8
More than 19,200	4.5

Railroads - Diesel Engines

Number of Engines per Train
The number of engines divided by 2.

Table 9 Average Train Speed

Average Speed (mph)	Speed Adjustment Factor
10	3.00
20	1.50
30	1.00
40	0.75
50	0.60
60	0.50
70	0.43

Whistles or horns
Multiply number of trains by 10.

Railroads - Cars and Rapid Transit

Numbers of cars.
Number of cars per train divided by 50.

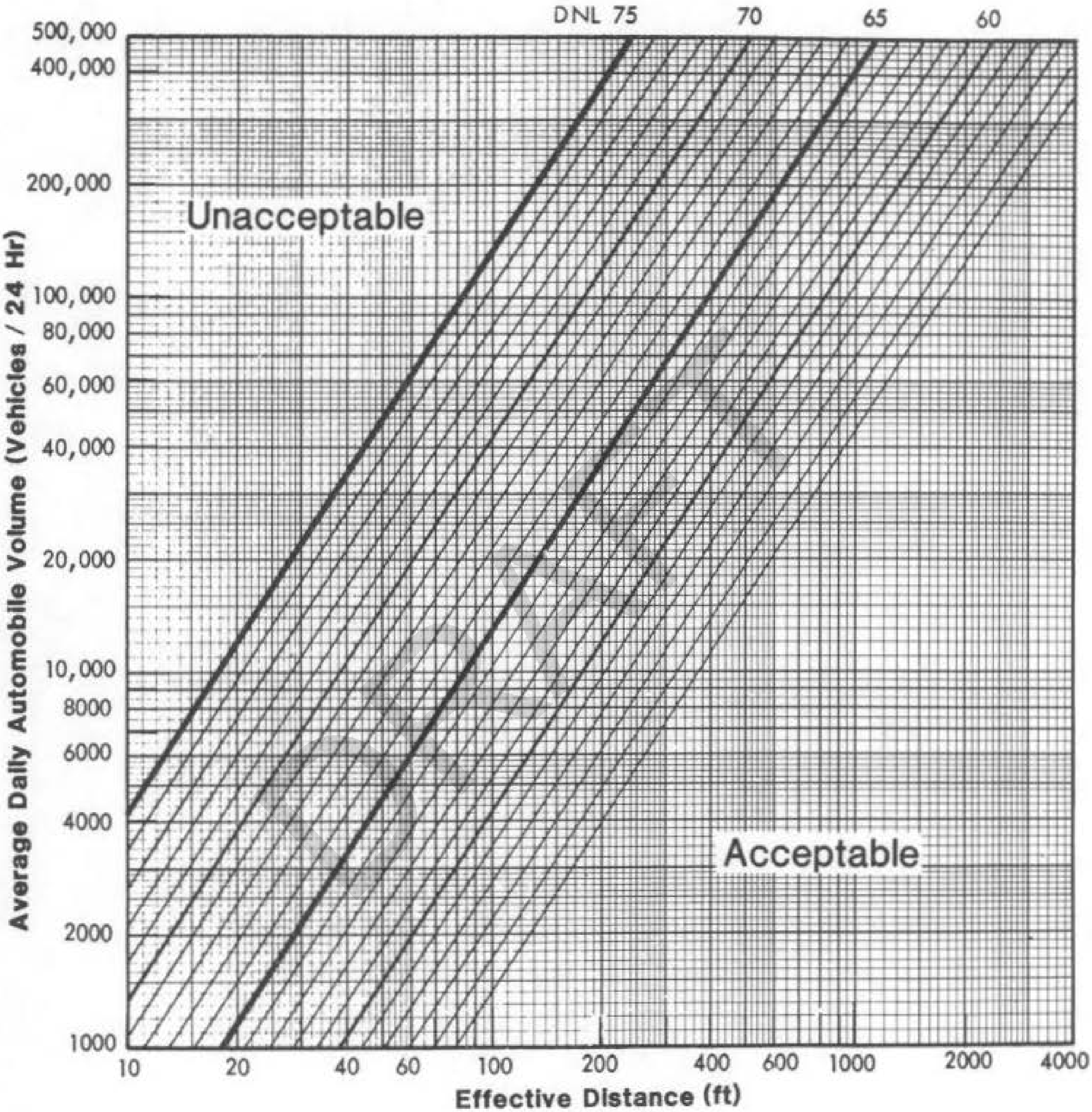
Table 10 Average Train Speed

Average Speed (mph)	Speed Adjustment Factor
10	0.11
20	0.44
30	1.00
40	1.78
50	2.78
60	4.00
70	5.44
80	7.11
90	9.00
100	11.11

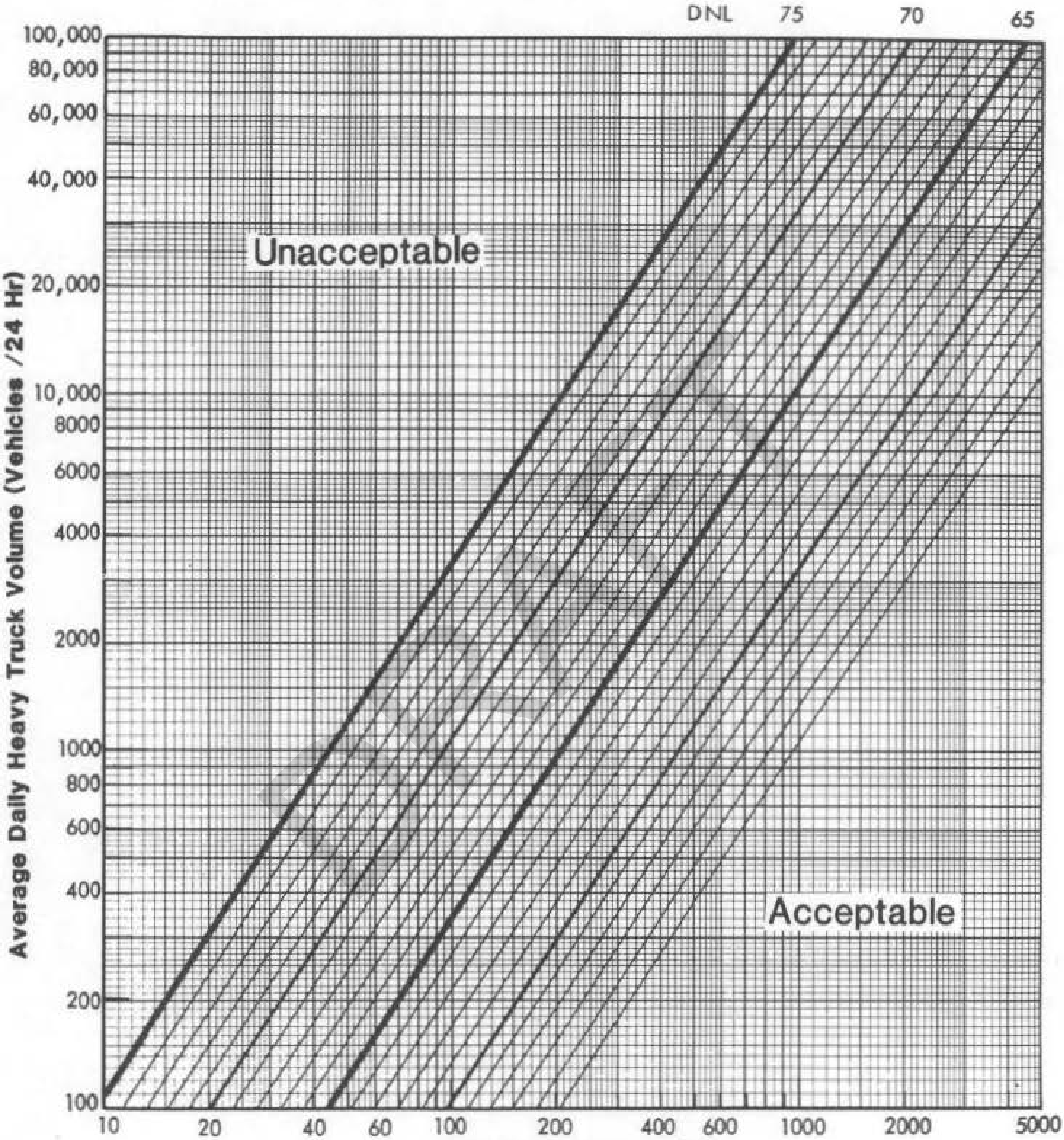
Bolted Rails
Multiply number of trains by 4.

Whistles or Horns
Multiply number of trains by 100.

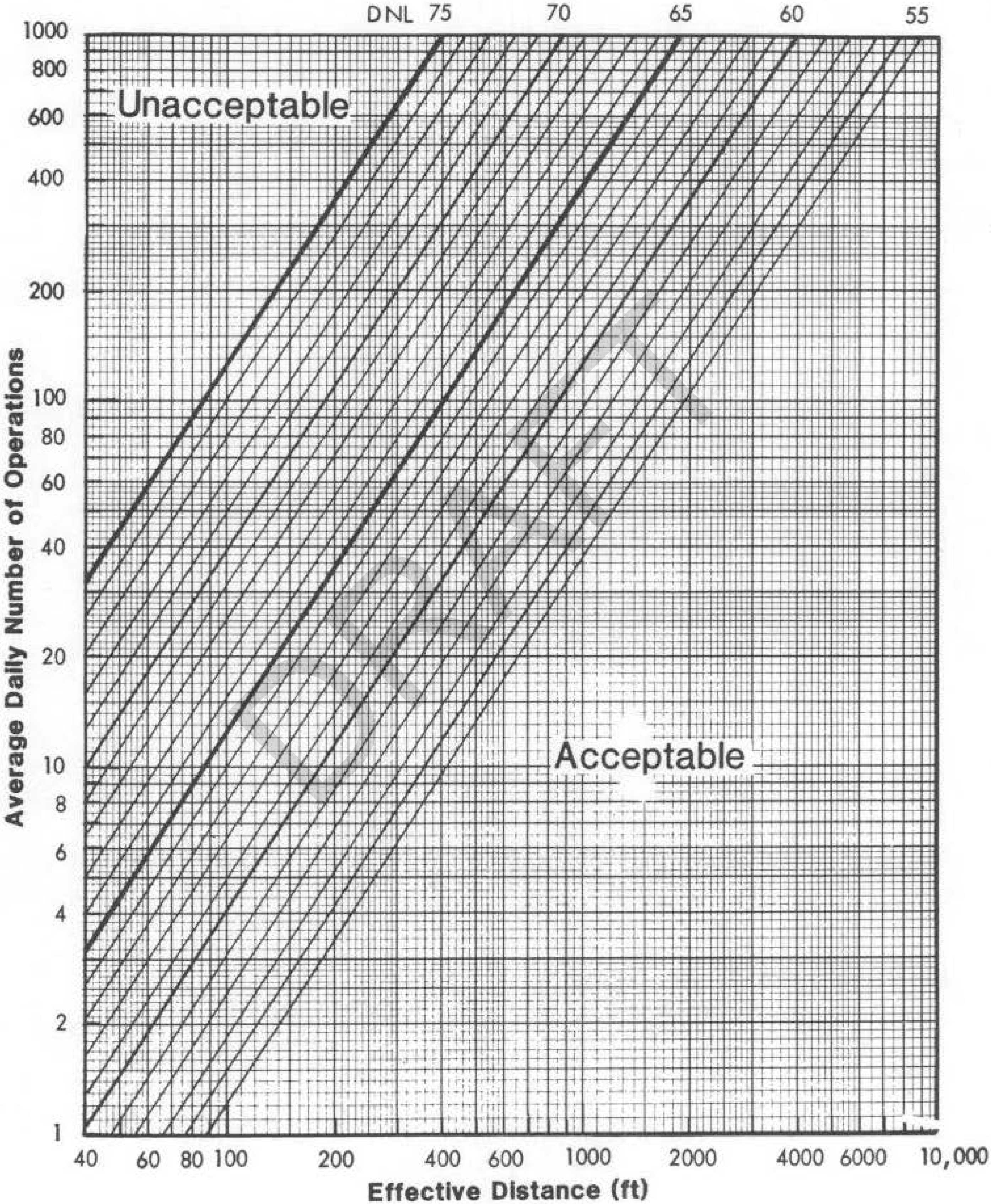
Workchart 1
Autos (55 mph)



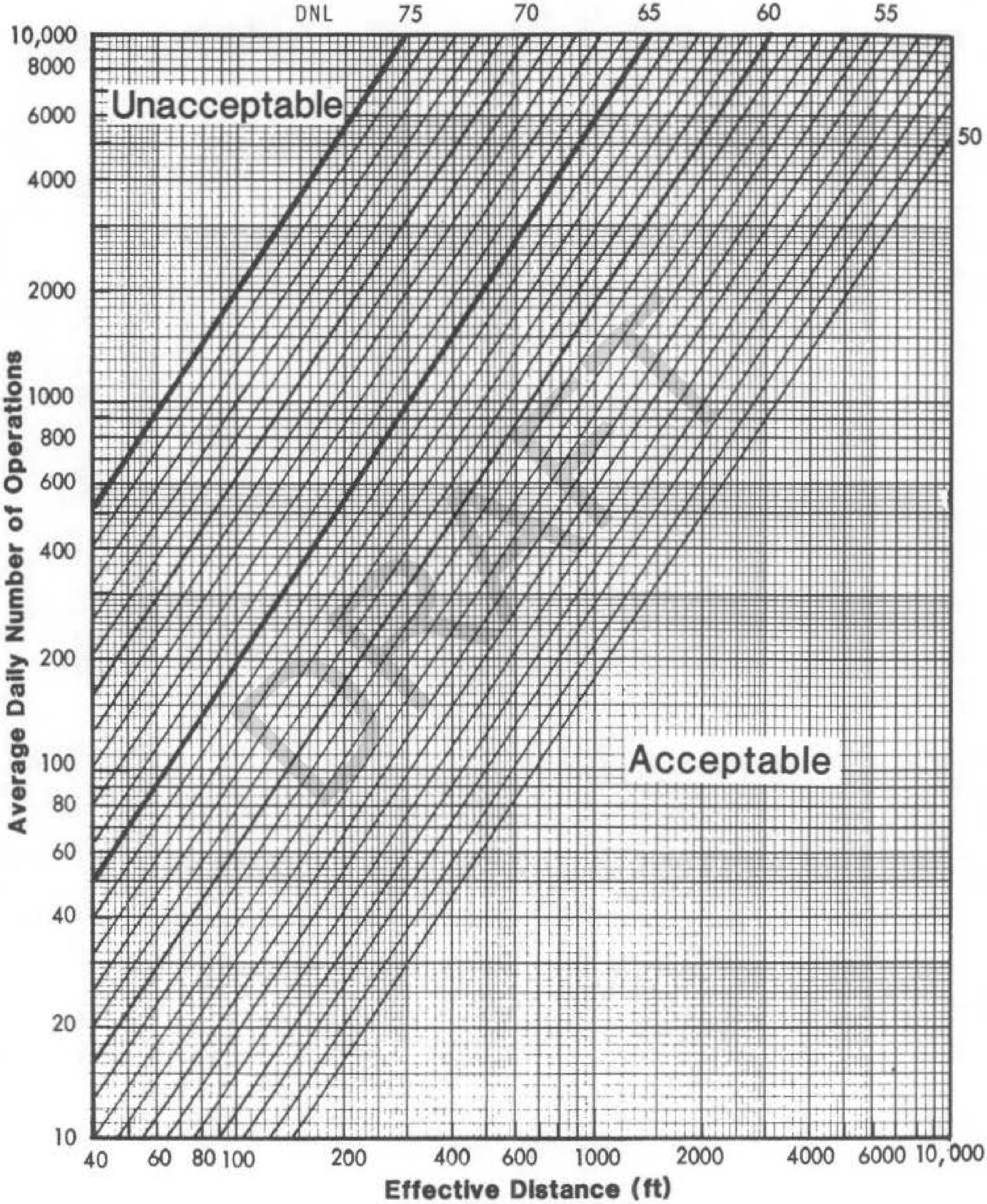
Workchart 2
Heavy Trucks (55 mph)



Workchart 3
Railroads - Diesel Locomotives



Workchart 4
Railroads - Cars and Rapid Transit



Workchart 5
Noise Barrier

To find R, D and h from Site Elevations and Distances

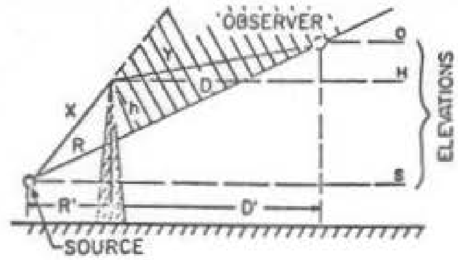
Fill out the following worksheet (all quantities are in feet):

Enter the values for:

H= ______________ R'= ______________

S= ______________ D'= ______________

O= ______________

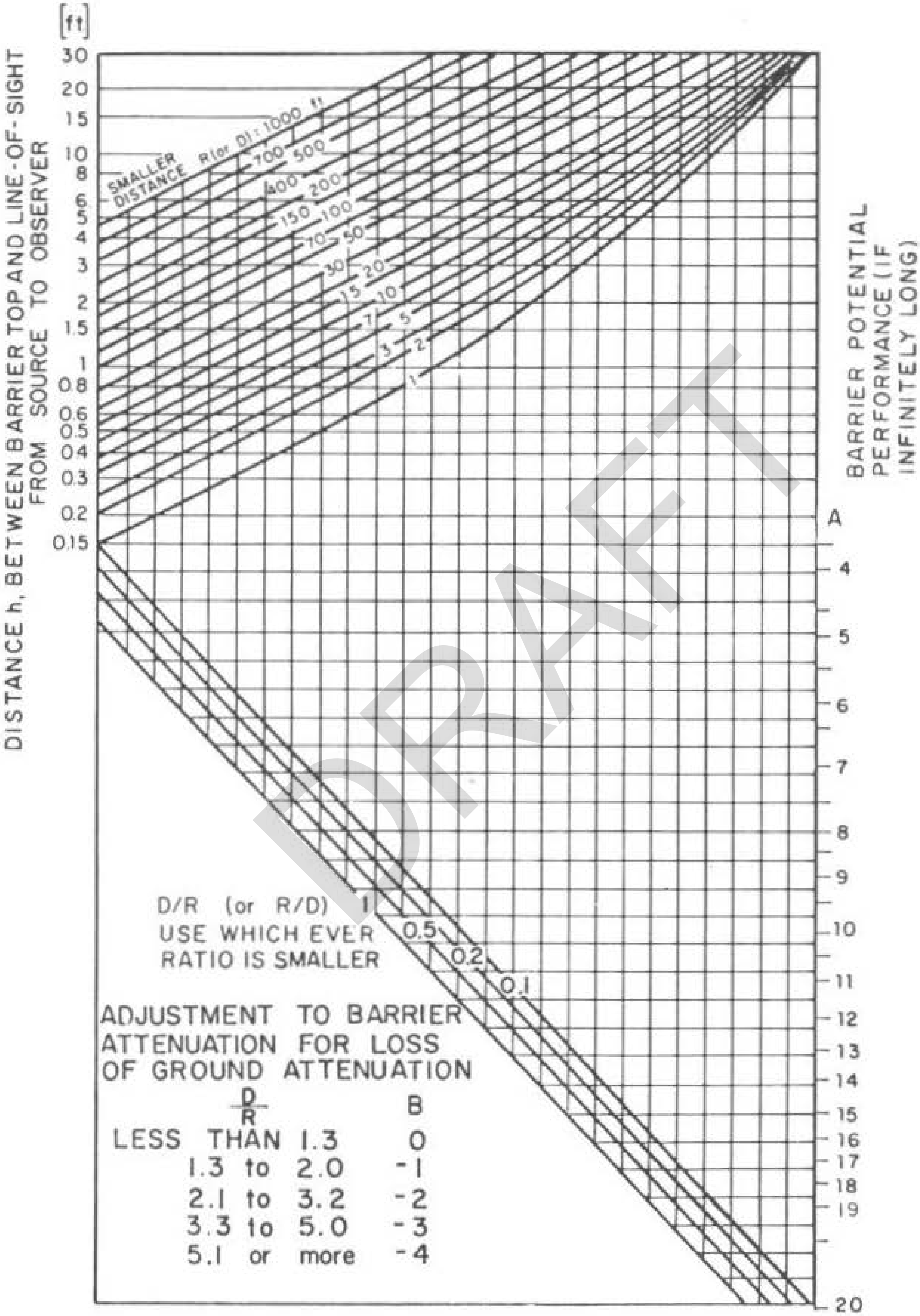


1. Elevation of barrier top minus elevation of source	[H]	−	[S]	=	[1]	
2. Elevation of observer minus elevation of source	[O]	−	[S]	=	[2]	
3. Map distance between source and observer (R' + D')					[3]	
4. Map distance between barrier and source (R')					[4]	
5. Line 2 divided by line 3	[2]	÷	[3]	=	[5]	
6. Square the quantity on line 5 (i.e., multiply it by itself); always positive	[5]	×	[5]	=	[6]	
7. 40% of line 6	[0.4]	×	[6]	=	[7]	
8. One minus line 7	[1.0]	−	[7]	=	[8]	
9. Line 5 times line 4 (will be negative if line 2 is negative)	[5]	×	[4]	=	[9]	
10. Line 1 minus line 9	[1]	−	[9]	=	[10]	
11. Line 10 times line 8	[10]	×	[8]	=	[11]	= h
12. Line 5 times line 10	[5]	×	[10]	=	[12]	
13. Line 4 divided by line 8	[4]	÷	[8]	=	[13]	
14. Line 13 plus line 12	[13]	+	[12]	=	[14]	= R
15. Line 3 minus line 4	[3]	−	[4]	=	[15]	
16. Line 15 divided by line 8	[15]	÷	[8]	=	[16]	
17. Line 16 minus line 12	[16]	−	[12]	=	[17]	= D

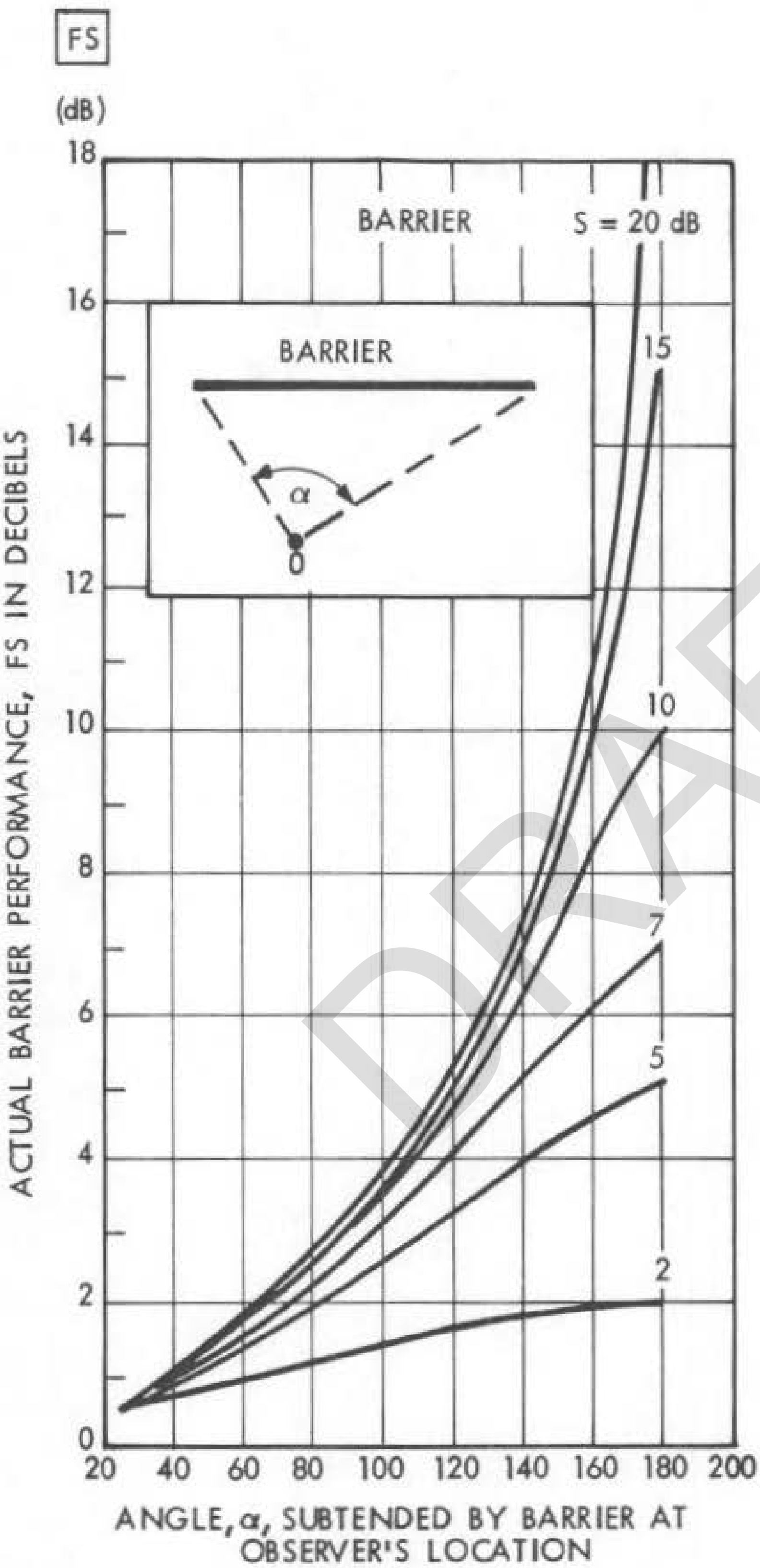
[**Note:** the value on line 2 may be negative, in which case so will the values on lines 5,9, and 12; line 1 may also be negative. Remember, then, in lines 10, 14, and 17, that adding a negative number is the same as subtracting: x+(-y)=x-y. And subtracting a negative number is like adding: x-(-y)=x+y.

Round off R and D to nearest integer, h to one decimal place.

Workchart 6
Noise Barrier



Workchart 7



Correction to be applied to barrier potential in order to find the actual performance of the barrier of the same construction but of finite length.

Worksheet A
Site Evaluation

Site Location

Program

Project Name

Locality

File Number

Sponsor's Name | Phone

Street Address | City, State

	Acceptability Category	DNL	Predicted for Operations in Year
1. Roadway Noise			
2. Aircraft Noise			
3. Railway Noise			

Value of DNL for all noise sources: (see page 3 for combination procedure)

Final Site Evaluation (circle one)

Acceptable

Normally Unacceptable

Unacceptable

Signature ______ Date ______

Clip this worksheet to the top of a package containing Worksheets B-E and Workcharts 1-7 that are used in the site evaluations

Worksheet B
Aircraft Noise

List all airports within 15 miles of the site:

1. ______________________________

2. ______________________________

3. ______________________________

Necessary Information:	**Airport 1**	**Airport 2**	**Airport 3**
1. Are DNL, NEF or CNR contours available? (yes/no)	______	______	______
2. Any supersonic aircraft operations? (yes/no)	______	______	______
3. Estimating approximate contours from Figure 3:			
a. number of nighttime jet operations	______	______	______
b. number of daytime jet operations	______	______	______
c. effective number of operations (10 times a + b)	______	______	______
d. distance A for 65 dB	______	______	______
70dB	______	______	______
75 dB	______	______	______
e. distance B for 65 dB	______	______	______
70 dB	______	______	______
75 dB	______	______	______
4. Estimating DNL from Table 2:			
a. distance from 65 dB contour to flight path, D^1	______	______	______
b. distance from NAL to flight path, D^2	______	______	______
c. D^2 divided by D^1	______	______	______
d. DNL	______	______	______
5. Operations projected for what year?	______	______	______
6. Total DNL from all airports		______	

Signed ______________________________ Date ______________________________

List all major roads within 1000 feet of the site:

1. ______________________________

2. ______________________________

3. ______________________________

4. ______________________________

Necessary Information	Road 1	Road 2	Road 3	Road 4
1. Distance in feet from the NAL to the edge of the road				
a. nearest lane	______	______	______	______
b. farthest lane	______	______	______	______
c. average (effective distance)	______	______	______	______
2. Distance to stop sign	______	______	______	______
3. Road gradient in percent	______	______	______	______
4. Average speed in mph				
a. Automobiles	______	______	______	______
b. heavy trucks - uphill	______	______	______	______
c. heavy trucks - downhill	______	______	______	______
5. 24 hour average number of automobiles and medium trucks in both directions (ADT)				
a. automobiles	______	______	______	______
b. medium trucks	______	______	______	______
c. effective ADT (a + (10xb))	______	______	______	______
6. 24 hour average number of heavy trucks				
a. uphill	______	______	______	______
b. downhill	______	______	______	______
c. total	______	______	______	______
7. Fraction of nighttime traffic (10 p.m. to 7 a.m.)	______	______	______	______
8. Traffic projected for what year?	______	______	______	______

Worksheet C
Roadway Noise

Page 2

Adjustments for Automobile Traffic

	9 Stop and-go Table 3	10 Average Speed Table 4	11 Night-Time Table 5	12 Auto ADT (line 5c)	13 Adjusted Auto ADT	14 DNL (Workchart 1)	15 Barrier Attenuation	16 Partial DNL
Road No. 1	___	X ___	X ___	X ___	= ___	___	– ___	= ___
Road No. 2	___	X ___	X ___	x ___	= ___	___	– ___	= ___
Road No. 3	___	X ___	X ___	X ___	= ___	___	– ___	= ___
Road No. 4	___	X ___	X ___	X ___	= ___	___	– ___	= ___

Adjustments for Heavy Truck Traffic

	17 Gradient Table 6	18 Average Speed Table 7	19 Truck $\frac{ADT}{2}$	20	21	22 Stop and-go Table 8	23 Night-Time Table 5	24 Adjusted Truck ADT	25 DNL (Work-chart 2)	26 Barrier Attn.	27 Partial DNL
Uphill	___	X ___	X ___	= ___							
Road No. 1					Add ___	X ___	X ___	= ___	___	– ___	= ___
Downhill		___	X ___	= ___							
Uphill	___	X ___	X ___	= ___							
Road No. 2					Add ___	X ___	X ___	= ___	___	– ___	= ___
Downhill		___	X ___	= ___							
Uphill	___	X ___	X ___	= ___							
Road No. 3					Add ___	X ___	X ___	= ___	___	– ___	= ___
Downhill		___	X ___	= ___							
Uphill	___	X ___	X ___	= ___							
Road No. 4					Add ___	X ___	X ___	= ___	___	– ___	= ___
Downhill		___	X ___	= ___							

Combined Automobile & Heavy Truck DNL

Road No. 1 ________ Road No. 2 ________ Road No. 3 ________ Road No. 4 ________ Total DNL for All Roads ____________

Signature ______________________________ Date ______________

List All Railways within 3000 feet of the site:

1. ____________________

2. ____________________

3. ____________________

Necessary Information:	Railway No. 1	Railway No. 2	Railway No. 3
1. Distance in feet from the NAL to the railway track:			
2. Number of trains in 24 hours:			
a. diesel			
b. electrified			
3. Fraction of operations occuring at night (10 p.m. – 7 a.m.):			
4. Number of diesel locomotives per train:			
5. Number of rail cars per train:			
a. diesel trains			
b. electrified trains			
6. Average train speed:			
7. Is track welded or bolted?			
8. Are whistles or horns required for grade crossings?			

Adjustments for Diesel Locomotives

	9 No. of Locomotives / 2		10 Average Speed Table 9		11 Horns (enter 10)		12 Night-time Table 5		13 No. of Trains (line 2a)		14 Adj. No. of Opns.	15 DNL Workchart 3		16 Barrier Attn.		17 Partial DNL
Railway No. 1	______	X	______	X	______	X	______	X	______	=	______	______	–	______	=	______
Railway No. 2	______	X	______	X	______	X	______	X	______	=	______	______	–	______	=	______
Railway No. 3	______	X	______	X	______	X	______	X	______	=	______	______	–	______	=	______

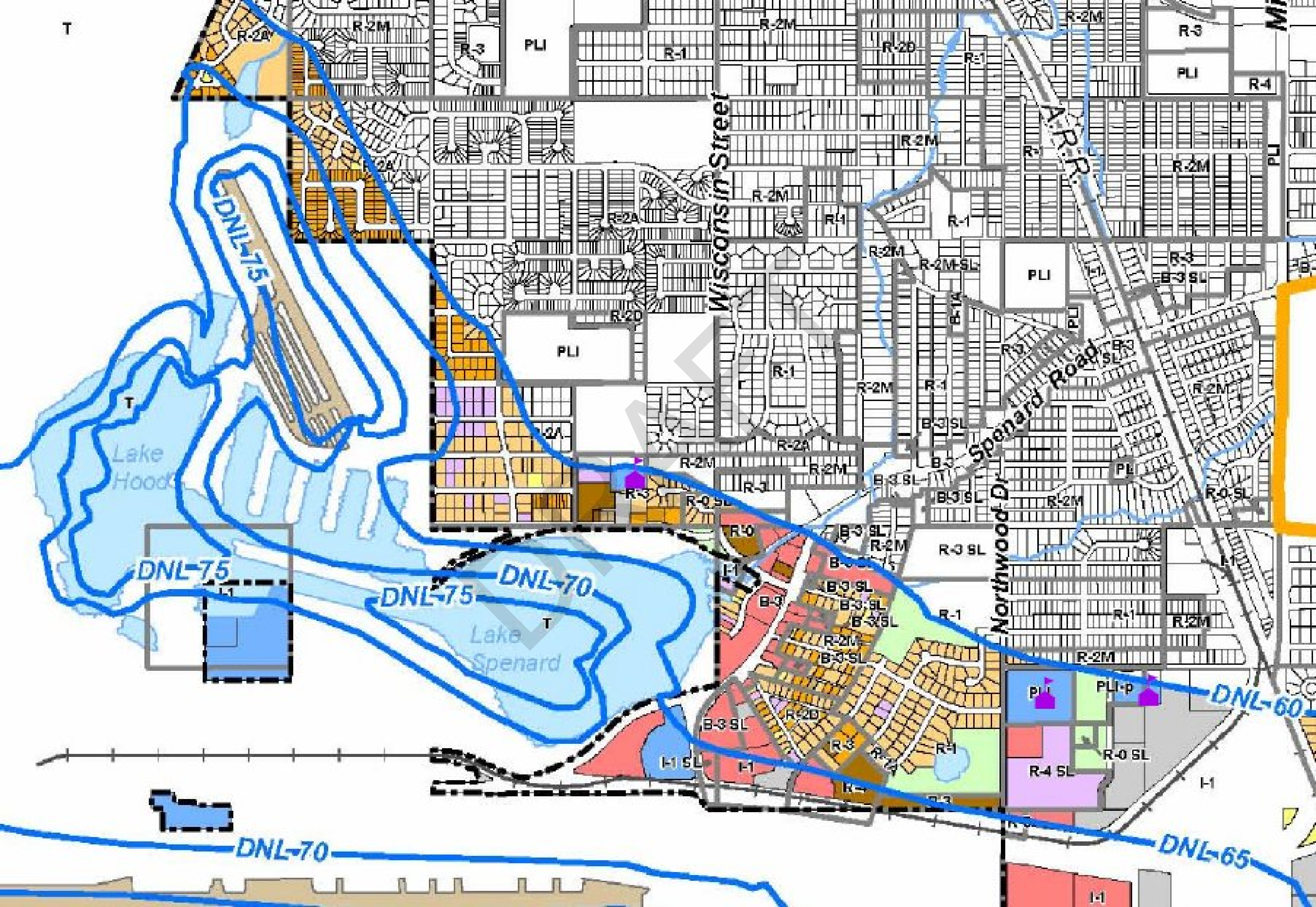
Adjustments for Railway Cars or Rapid Transit Trains

	18 Number of cars / 50		19 Average Speed Table 10		20 Bolted Rails (enter 4)		21 Night-time Table 5		22 No. of Trains (Line 2a or 2b)		23 Adj. No. of Opns.	24 DNL Work-chart 4		25 Barrier Attn.		26 Partial DNL
Railway No. 1	______	X	______	X	______	X	______	X	______	=	______	______	–	______	=	______
Railway No. 2	______	X	______	X	______	X	______	X	______	=	______	______	–	______	=	______
Railway No. 3	______	X	______	X	______	X	______	X	______	=	______	______	–	______	=	______

Combined Locomotive and Railway Car DNL

Railway No. 1 ______ Railway No. 2 ______ Railway No. 3 ______ Total DNL for all Railways ______

Signature ______________________________ Date ______________



DNL-75
DNL-70
DNL-75
DNL-75
DNL-60
DNL-65
DNL-70
Lake Hood
Lake Spenard
Wisconsin Street
Spenard Road
Northwood Dr
A.R.R.
T
R-2A
R-2M
R-3
PLI
R-1
R-2D
R-4
R-2M SL
B-3 SL
R-1A
R-0 SL
R-3 SL
R-0
I-1
B-3
R-2A
PLI-p
R-4 SL
I-1 SL

APPENDIX L

Licensing Requirements for Pilot Certificates

Please refer to FAA Regulations found at: https://www.faa.gov/licenses_certificates/

APPENDIX M

USACE Project Visitation Data

Visitation comparison,

Lake Sidney Lanier vs Lake Allatoona

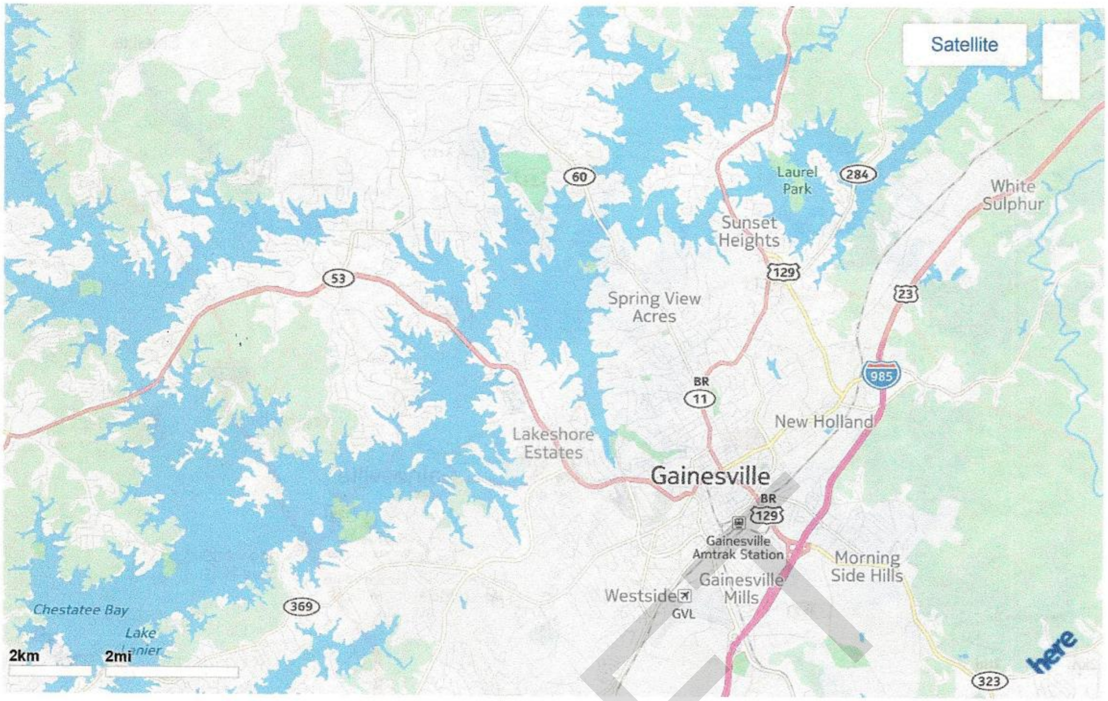
Lake Sydney Lanier is a unique reservoir compared to others operated by the Corps in the Mobile District. It is the most utilized recreation project in the Mobile District.

The following visitation numbers show an average difference of only 1,003,288 visitors to each lake. When adjusted for visitors per acre, reveals Allatoona at approximately 11860 acres supports 499.73 visitors per acre whereas Lake Lanier at 38,000 acres only supports 182.37 visitors per acre.

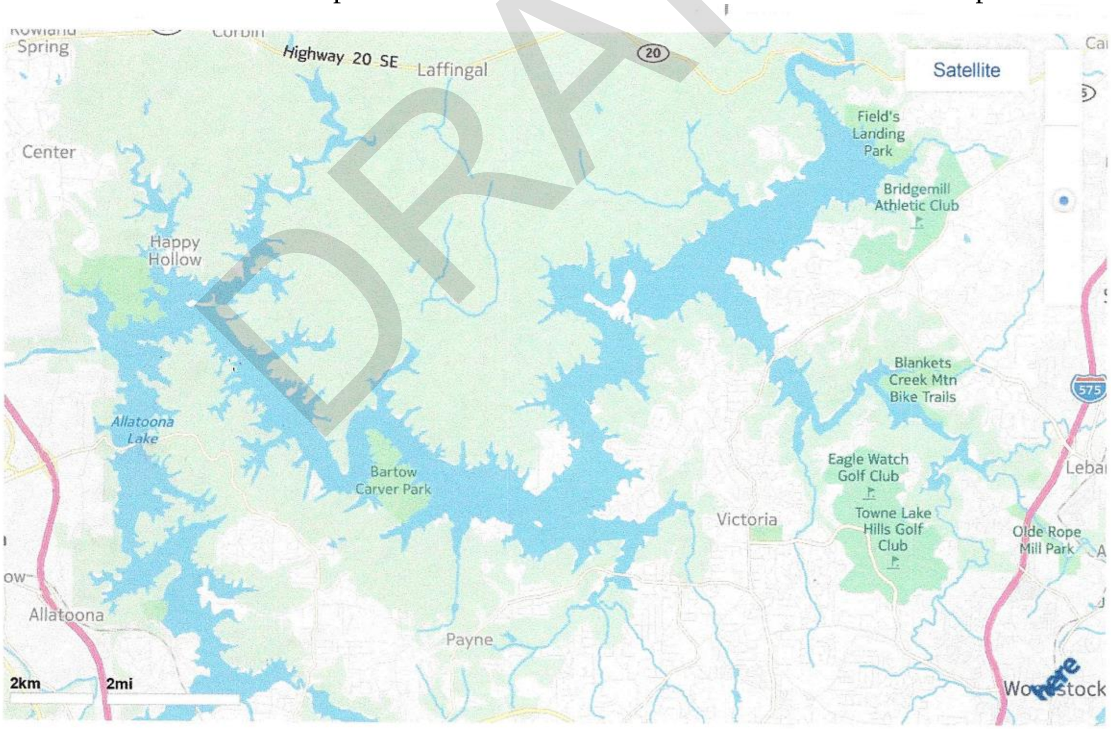
Lake Allatoona along with the other USACE project lakes in Georgia, are and have been open to seaplane operations for some time.

Fiscal Year	Allatoona Lake	Lake Sidney Lanier
FY 09	5,281,347	6,863,752
FY 10	6,245,913	7,112,961
FY 11	6,004,769	7,195,417
FY 12	6,175,062	6,548,130
Average #	5,926,777	6.930,065

These numbers shows that on average, lake Allatoona carries only 1,003,288 visitors less than Lanier in an area comparable to that portion of lake Lanier north of highway Ga 369



Lake Lanier 182 visitors per acre. Lake Allatoona 499 visitors per acre.



In a message dated 11/18/2015 9:46:57 A.M. Eastern Standard Time,
Kenneth.Day@usace.army.mil writes:
Mr. Winter

As requested, please see attached visitation figures.

Kenneth Day, R.F.
Kenneth.day@usace.army.mil
Desk: 251-694-3724
Cell: 251-689-2962

Natural Resources
Management Section (OP-TR)
109 St. Joseph St. (36602)
P. O. Box 2288
Mobile, AL 36628-0001

-----Original Message-----
From: jlwin37@aol.com [mailto:jlwin37@aol.com]
Sent: Tuesday, November 17, 2015 7:32 PM
To: webcontent SAM <webcontent@usace.army.mil>; Robbins, Ervin P SAM
<Ervin.P.Robbins@usace.army.mil>
Subject: [EXTERNAL] Mobile District Contact Form: Lake project visitations

This message was sent from the Mobile District website.

Message From: Jerry Winter

Email: jlwin37@aol.com

Response requested: Yes

Message:

Is it possible to get a list of the number of visitors to Lake Allatoona and Lake Lanier for the last 5 years?

VISITATION BY PROJECT

01-JAN-2007 to 31-DEC-2007

Project Site Name	Visitor Hours	Visits	Dispersed Visitor Hours
DIVISION SOUTH ATLANTIC DIVISION			
DISTRICT MOBILE			
ALLATOONA LAKE	86794044	6346103	2422978
CARTERS LAKE	3297744	512593	98010
JIM WOODRUFF LOCK AND DAM - LAKE SEMINOLE	12734774	1238269	568174
WALTER F GEORGE LOCK AND DAM	40168726	3782459	6623979
WEST POINT LAKE	27112121	3120185	3391416

VISITATION BY PROJECT

01-JAN-2008 to 31-DEC-2008

Project Site Name	Visitor Hours	Visits	Dispersed Visitor Hours
DIVISION SOUTH ATLANTIC DIVISION			
DISTRICT MOBILE			
ALLATOONA LAKE	105732590	6690551	2485809
CARTERS LAKE	2807698	464453	57067
JIM WOODRUFF LOCK AND DAM - LAKE SEMINOLE	13098289	1181355	627454
WALTER F GEORGE LOCK AND DAM	42151400	3908902	6872196
WEST POINT LAKE	19122662	2264561	3123623

VISITATION BY PROJECT
01-JAN-2009 to 31-DEC-2009

Project Site Name	Visitor Hours	Visits	Dispersed Visitor Hours
DIVISION SOUTH ATLANTIC DIVISION			
DISTRICT MOBILE			
ALLATOONA LAKE	71561608	5220145	1998067
CARTERS LAKE	3570878	584102	65474
JIM WOODRUFF LOCK AND DAM - LAKE SEMINOLE	12509079	1197129	654822
WALTER F GEORGE LOCK AND DAM	37314436	3637069	7117295
WEST POINT LAKE	20755072	2278970	3079874

PUBLIC VISITATION

Fiscal Year	OP-AL Allatoona Lake	OP-SL Lake Sidney Lanier
FY 09	5,281,347	6,863,752
FY 10	6,245,913	7,112,961
FY 11	6,004,769	7,195,417
FY 12	6,175,062	6,548,130
FY 13*		
FY 14*		
FY 15*		

* Due to the national transition (moderization) underway to a new Visitation Estimating and Reporting System (VERS), the official visitation for selected years is still considered FY12 numbers. Projects are currently entering visitation numbers into the new VERS and ERDC advises that once all issues are corrected nationally, visitation for each subsequent FY will be available.

Thu, Feb 23, 2017 2:14 pm
RE: [EXTERNAL] visitation numbers for lakes Alatoona and Lanier

From Cobb-Williams, Amy L CIV USARMY CESAM (US) (US) Amy.L.Cobb-Williams@usace.army.milhide details

To jlwin37 jlwin37@aol.com

Cc Day, Kenneth CIV USARMY CESAM (US) (US) Kenneth.Day@usace.army.mil

Mr. Winter,

The Corps of Engineers is going through a modernization effort for our visitation estimation system, so the 2012 visitation data is the most current data available at this time. We hope to have an update soon, but unfortunately I do not know a date of when it will be released.

Once it has been released, the information should be reported on our Value to the Nation website which you can find at the link below. Feel free to contact me if you have any other questions.

http://www.corpsresults.us/recreation/recfastfacts.cfm

Amy Cobb
Program Manager
Natural Resource Management Section
Mobile District
251-690-3004 (desk)
251-581-4084 (cell)

-----Original Message-----
From: Day, Kenneth CIV USARMY CESAM (US)
Sent: Thursday, February 23, 2017 12:35 PM
To: Cobb-Williams, Amy L CIV USARMY CESAM (US) <Amy.L.Cobb-Williams@usace.army.mil>
Subject: FW: [EXTERNAL] visitation numbers for lakes Alatoona and Lanier

For response.

Ken Day
Kenneth.day@usace.army.mil
Desk: 251-694-3724
Cell: 251-689-2962

-----Original Message-----
From: jlwin37@aol.com [mailto:jlwin37@aol.com]
Sent: Thursday, February 23, 2017 11:13 AM
To: Day, Kenneth CIV USARMY CESAM (US) <Kenneth.Day@usace.army.mil>
Subject: [EXTERNAL] visitation numbers for lakes Alatoona and Lanier

Mr Day,

Does the Corps of Engineers have any visitation numbers for Lake Lanier and Lake Alatonna available and more current than 2012 ?

Regards

Jerry Winter

APPENDIX N

Lake Hood and Tavares Economic Impact

Economic Benefits of Lake Hood Seaplane Base

Prepared for:

Anchorage Economic Development Corporation
and
Ted Stevens Anchorage International Airport

McDowell Group
Research-Based Consulting
Juneau
Anchorage

September 2013

Table of Contents

Executive Summary

Anchorage Economic Development Corporation (AEDC) and Ted Stevens Anchorage International Airport (ANC) contracted with McDowell Group to conduct an assessment of the economic impact of Lake Hood Seaplane Base. Lake Hood Seaplane Base is recognized as the busiest seaplane base in the world.

In 2012, Lake Hood Seaplane Base saw 67,000 flight operations (take-offs and landings). In June 2012, the busiest month of the year, there were 13,159 operations, averaging 439 operations per day.

The value of Lake Hood Seaplane Base to the Anchorage aviation community is evident in the long waiting list (over 300 names) to secure a float plane slip. Applicants at the bottom of the waiting list can expect a ten-year wait.

The economic impact of Lake Hood Seaplane Base includes jobs and payroll with the many businesses and organizations that operate at Lake Hood. It also includes commercial, industrial, and community activities that are supported by Lake Hood-based air taxi and charter operators.

Key findings from the economic impact analysis are summarized below.

- Including direct, indirect and induced employment, Lake Hood Seaplane Base accounted for an estimated 230 jobs in 2012, with peak season employment effects of about 300 jobs.
- Lake Hood-related employment accounted for approximately $14 million in labor income in 2012, including direct, indirect and induced effects.
- Total 2012 output (a measure of total economic activity) related to Lake Hood Seaplane Base is estimated at $42 million.

Table ES1. Economic Impacts of Lake Hood Operations, 2012

	Direct	Indirect/ Induced	Total
Employment (annual average equivalent)	130	100	230
Labor Income (millions)	$8.5	$5.5	$14.0
Output (millions)	$25.0	$17.0	$42.0

Source: McDowell Group estimates.

- In addition to the jobs and income reported above, Lake Hood supports additional economic activity with the many businesses and communities that rely on the flight services provided by Lake Hood air charter operators.
- A large number of fishing, hunting, and wildlife viewing lodges are either entirely or partially dependent on flight service from Lake Hood. Research conducted for purposes of this study identified 25 remote lodges that are served by Lake Hood-based charter operators.
- Lake Hood served the majority of the 23,200 non-resident Alaska visitors who purchased a flightseeing tour during their visit to Anchorage in the May 2011 through April 2012 period.
- Lake Hood also supports resource development activities. Mining exploration activity in Southwest, Southcentral and Interior Alaska, as well as Cook Inlet oil and gas production is supported out of Lake Hood. Lake Hood flight operations also support private sector and government environmental research programs, often related to resource or infrastructure development.
- In addition to supporting business and industry, Lake Hood-based flight services occasionally or regularly support the air transportation needs of communities throughout Southcentral Alaska, as well as Prince William Sound and Southwest Alaska.
- There are a number of government offices that conduct business at Lake Hood, including Alaska Department of Transportation and Public Facilities Central Region, U.S. Department of the Interior, Office of Aviation Services (OAS), Alaska State Troopers, U.S. Air Force Civil Air Patrol, and Federal Aviation Administration.

Lake Hood Seaplane Base (LHD) plays an essential role in moving people and goods within Alaska. Eight in ten Alaska communities have no road access to regional service and supply hubs and aviation is critical to reach many of these communities. Nationally, annual enplanements are about double the country's population, while in Alaska annual enplanements are seven times the state's population.[1] With a flight area of over 3 million square miles, Alaska has the largest aviation system in the nation.[2]

To serve Alaska's 700,000 residents, there are:

- 700 FAA registered airports and 1,200 airstrips[3].
- 1.3 active pilots per 100 Alaska residents (Montana and Colorado are ranked second and third with approximately 0.4 active pilots per 100 residents)
- 271 certified air carriers (commercial operators)
- 835,000 total commercial flight hours annually (including 420,000 scheduled flight hours and 415,000 unscheduled flight hours)
- 10,947 registered Alaska-based aircraft (40 percent in Anchorage (2011))
- 8,272 active pilots (2011), including 1,068 students, 3,107 private, 1,916 commercial, 2,134 airline transport, 47 miscellaneous, and 1,313 flight instructors[4]
- 1,096 pounds of air freight per capita annually -- 39 times more than the freight load for rural communities in the next highest state (Oregon) (2008)[5]

This level of aviation-related activity translates into substantial economic impact in Alaska. In fact, as of 2007 (the most recent estimates), aviation annually accounted for $3.5 billion in economic activity in Alaska, and 47,000 jobs, including direct, indirect and induced employment effects. That amounted to 10 percent of all employment in Alaska.[6]

[1] FAA fact Sheet (Feb. 2011)
[2] http://www.alaskaaircarriers.org/
[3] http://www.alaskaasp.com/
[4] (FAA) US Civil Airmen Statistics 2011
[5] "The Economic Contribution of the Aviation Industry to Alaska's Economy," Northern Economics, 2009. Prepared for Alaska Department of Transportation and Public Facilities, p. ix.
[6] *Ibid.*

The scale and diversity of aviation activity in Alaska is remarkable. At one end of the spectrum is Ted Stevens Anchorage International Airport (ANC), the fourth busiest airport in the world after Hong Kong, Memphis, and Shanghai in terms of air cargo volume moved to or through the airport. A total of 5.4 billion pounds of air cargo moved though ANC in 2012, along with 5 million passengers. At the other end of the spectrum are the dozens of very small, remote Alaska communities almost entirely dependent on a daily single-engine plane arrival for mail, groceries and passenger travel.

LHD is a vital and active part of ANC, playing a special role in Alaska's aviation infrastructure. First, LHD is generally recognized as the world's busiest seaplane base. But more important, Lake Hood serves a number of important aviation-related roles, such as:

- Lake Hood is the only public seaplane facility serving Anchorage, Alaska's largest city, with a population of 300,000 residents. The ten-year wait to secure a floatplane slip attests to critical role the facility plays in the local aviation community.
- Lake Hood supports year-around flying, serving float operations in the summer and ski operations in the winter. LHD's gravel strip is open to wheeled aircraft in all seasons.
- Lake Hood connects Anchorage to dozens of remote recreation lodges and rural villages that rely on floatplane and small aircraft services to support their operations, moving customers/residents and supplies continuously throughout the year, especially during the busy summer visitor season. Ski equipped aircraft use Lake Hood during the winter.
- Lake Hood serves as a base for a wide variety of aviation-related services, ranging from aircraft repairs and maintenance to flight training.

The purpose of this study is to measure the economic contribution of Lake Hood Seaplane Base. While Lake Hood is widely recognized as a busy center of general aviation activity, especially seaplane activity, less is understood about the economic impact of the commercial and agency activity at Lake Hood that, as described in this report, includes millions of dollars in payroll and spending on goods and services.

This report begins, in Chapter 1, with an overview of the history of Lake Hood. Chapter 2 provides an overview of aviation and aviation-related activity at Lake Hood. Finally, in Chapter 3, the direct and indirect economic impacts of Lake Hood are described. An appendix is included that lists the names of people and businesses interviewed during the course of this study.

Chapter 1: History of Lake Hood Seaplane Base

Infrastructure Development

While the first seaplane activity at Lake Hood occurred about 90 years ago, Lake Hood's evolution into the busiest seaplane base in the world began almost 75 years ago.[7] In 1938, a channel connecting two natural lakes, Lake Hood and Lake Spenard, was constructed, along with a 2,200-foot gravel runway along the south side of the lake. Development of runways and a terminal at what would become Ted Stevens Anchorage International Airport (ANC) did not begin until about ten years later, when Congress approved $13 million for airport construction in Anchorage and Fairbanks.

By the 1940s and 1950s, the first generation of aircraft providing seaplane services in Alaska (and at Lake Hood) emerged, including an assortment of Lockheed Vega, Grumman Goose, DeHavilland Beaver and Otters, Cessnas, Super Cubs, and other aircraft. Many of these aircraft remain a mainstay in Alaska's aviation inventory.

Further development occurred at Lake Hood in the 1950s, when the floatplane complex was enlarged and additional floatplane parking constructed. In 1954 an air traffic control tower was constructed.

The 1970s brought significant changes to Lake Hood. In 1972, the airstrip on the south side of Lake Spenard was closed, and a new 2,200-foot north-south gravel airstrip was constructed on the north side of the lake. In 1975, an east/west channel between Lake Hood and Lake Spenard was dredged just north of the original channel. This channel was developed to provide a safe, slow-speed taxi-way between the two lakes. At that time five float plane tie-down channels were also constructed. The Lake Hood air traffic control tower was decommissioned in 1977 with air traffic control for Lake Hood transferred to the new ANC control tower.

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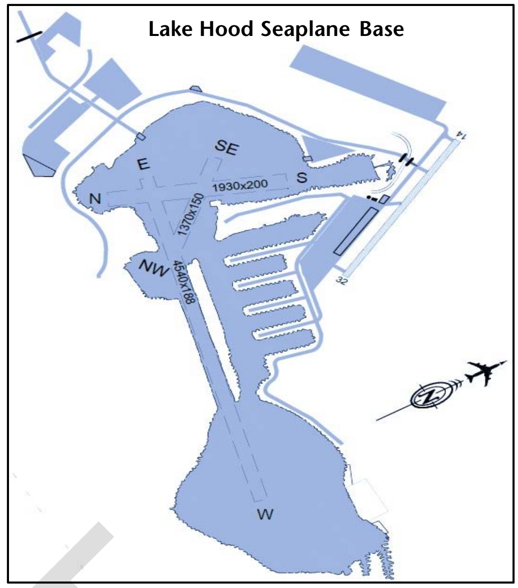
[7] http://dot.alaska.gov/anc/about/history.shtml

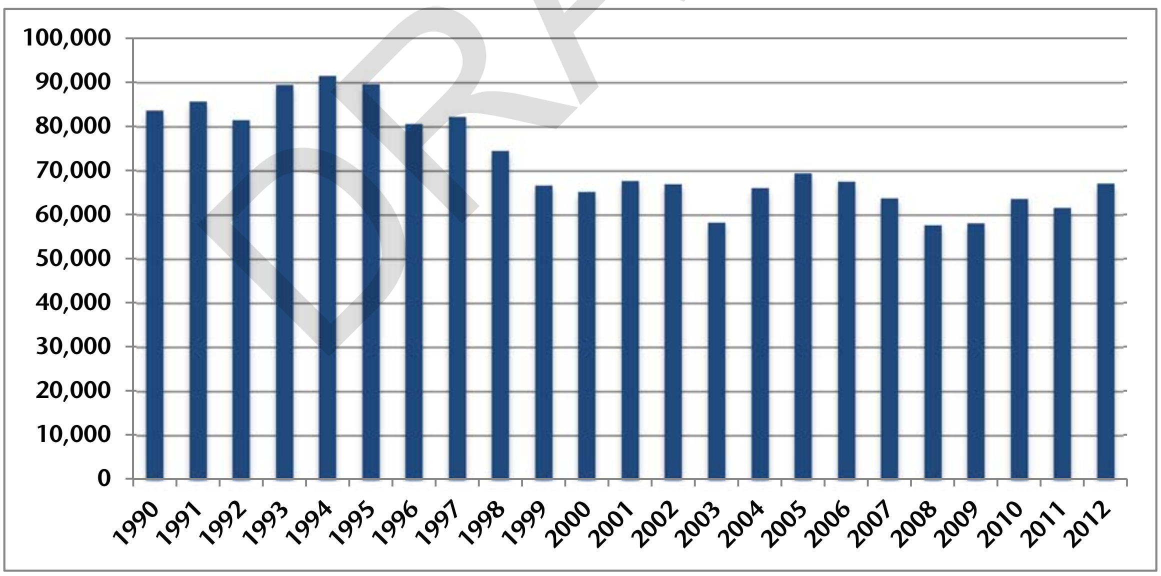
Today, Lake Hood Seaplane Base includes a 4,540-foot by 188-foot east/west waterway, a 1,930-foot by 200-foot north/south waterway, and a 1,370-foot by 150-foot northwest/southeast waterway. Lake Hood has 500 slips for floatplanes and 500 tie-downs at the gravel strip. In addition several areas are designated as ski-plane parking areas.[8] Transient aircraft parking includes 26 spaces for wheeled aircraft and eight spaces for float planes. A full range of services are available for aircraft operators at Lake Hood, which are described in some detail in Chapter 2.



Historical Flight Activity

Over the past two decades, Lake Hood flight operations activity peaked in 1994 with just over 90,000 take-offs and landings. Activity declined steadily for the next several years before generally leveling off in 2000 and then fluctuating between 58,000 and 70,000 operations annually between 2001 and 2012. Traffic in 2012 totaled 67,000 operations.

Figure 1. Lake Hood Flight Operations, 1990 to 2012
(Number of Take-offs and Landings)



Source: Lake Hood Master Plan, 2006, AIAS Draft Technical Forecast Report, 2012, ANC 2103.

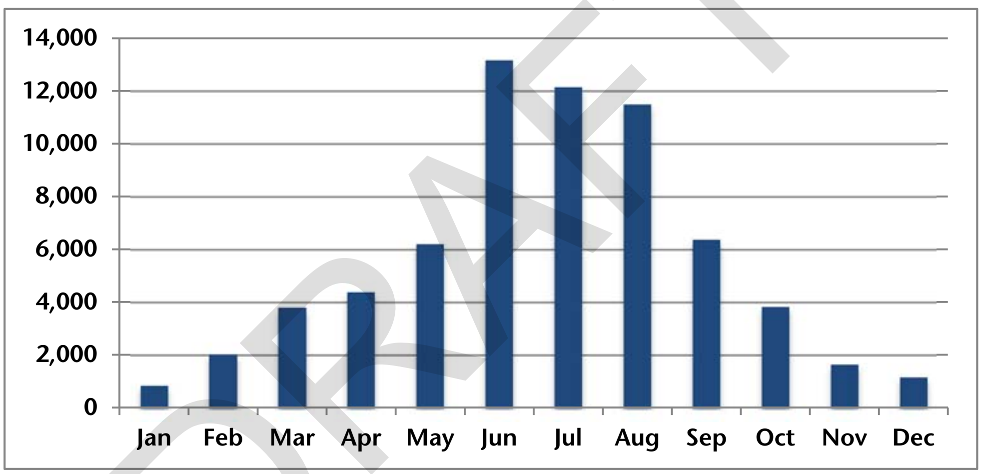
[8] http://dot.alaska.gov/anc/business/generalAviation/history.shtml

Chapter 2: Overview of Current Activity at Lake Hood Seaplane Base

Recent Flight Activity

In 2012, Lake Hood operations totaled 67,101 take-offs and landings at the lake and airstrip combined. While flight operations occur year-round, activity is highly seasonal, with over half (55 percent) of flight operations occurring during the busy summer months of June, July, and August. In 2012, June was the peak traffic month, with a total of 13,159 operations, averaging 439 per day. January was the slowest month of the year, with 839 total operations, an average of 24 per day.

Figure 2. Lake Hood Flight Operations, by Month, 2012
(Number of Take-offs and Landings)



Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
839	2,027	3,803	4,397	6,213	13,159	12,155	11,506	6,381	3,825	1,643	1,153

Source: ANC.

On an annual basis, approximately two-thirds of the flight traffic at Lake Hood is local general aviation, one-third is air taxi (commercial), and a small fraction is transient general aviation. An estimated 760 single-engine aircraft are based at Lake Hood, along with 21 multi-engine planes.[9]

While there is a relatively low volume of winter-time flight operation activity (compared to summer), approximately 100 ski-equipped airplanes use Lake Hood. For lake ice operations, floatplane owners replace their floats with skis while wheeled aircraft operators add skis to their landing gear. Lake ice operations are permitted for aircraft up to 12,500 pounds.

[9] http://www.AirNav.com

The demand for floatplane slips is very high, with approximately 300 active pilots on the waiting list. Those at the bottom of the list can expect to wait about ten years for a slip.[10]

Business and Organizational Activity

A variety of businesses and organizations are active at Lake Hood, providing a broad range of services and supplies, including:

- Aircraft charters, air taxis, and scheduled flights for passengers and freight
- Flightseeing tours
- Aviation gas sales
- Aircraft sales (such as aircraft, parts, floats)
- Aircraft maintenance and repair (including custom modifications, rebuilds, overhauls, and avionics)
- Aircraft hangar facilities and other storage (private and commercial)
- Flight training and FAA examinations
- Aircraft appraisal services
- Weather observation services and facilities
- Government-related and non-profit services and activities.

Aviation-related operations at Lake Hood support a range of commercial and non-commercial activity in the Anchorage area and throughout Alaska, described in more detail below.

Visitor Industry

Lake Hood is an important part of Alaska's visitor industry infrastructure, serving aircraft operators that provide flightseeing opportunities and move visitors to destinations throughout Southcentral Alaska, Prince William Sound, and Southwest Alaska.

Lake Hood operations are also critical to remote lodges that are entirely or partially dependent on floatplane service. Some of these lodges operate their own aircraft while others use the services of charter operators to move passengers and freight. Research conducted for purposes of this study identified 25 lodges that are served by Lake Hood-based charter operators. These lodges are located on Lake Clark, in Katmai National Park, Susitna River drainages (such as the Alexander, Yentna, and Talachulitna), west side of Cook Inlet, the Denali region, and various locations in Prince William Sound.

[10] http://dot.alaska.gov/anc/business/generalAviation/index.shtml

While a full accounting of flightseeing passenger traffic is not available, available data and interviews with commercial operators suggest that over 15,000 customers (both residents and visitors) experience a flightseeing adventure from Lake Hood.

According to Alaska Visitor Statistics Program (AVSP) data, during the summer (May through September) of 2011, 22,000 non-resident Alaska visitors purchased a flightseeing tour during their visit to Anchorage.[11] Another 1,200 purchased a flightseeing excursion during the fall and winter.[12] Most of this flightseeing service was provided out of Lake Hood (with the balance provided from Merrill Field).

Lake Hood-based flightseeing operations include trips ranging in duration from 30 minutes to full-day customized trips. The short flight excursions feature Turnagain Arm and the Chugach Mountains, while longer flights take in the Knik or Triumvirate Glaciers, or the Prince William Sound area. It is a 3-hour trip to tour Denali. Other popular flightseeing opportunities include the Iditarod Sled Dog race during the winter season.

Bear viewing is also a particularly popular visitor activity supported by Lake Hood flight services. From Lake Hood, visitors fly to one of several destinations for a day of bear viewing, including Redoubt Bay, Lake Clark National Park, Katmai National Park, and other destinations.

Lake Hood air charter companies also support guided and unguided sportfishing, river raft trips, guided and unguided hunting, trekking, and other recreational activities (such as skiing) on Alaska's numerous lakes, rivers, and other areas not accessible by road.

Support for Other Industry and Commercial Activities

While visitor industry-related activity is LHD's most visible and significant basic industry contribution, the flight services based at Lake Hood also serve the needs of a variety of other commercial and industrial activities. Mining exploration activity in Southwest, Southcentral and Interior Alaska, as well as Cook Inlet oil and gas production, is supported out of LHD. For example, charter services move technicians, professionals (such as geologists, engineers, and biologists) and other personnel (camp support staff, etc.), equipment (surveyor equipment, environmental monitoring devices, drills), supplies (lumber, replacement parts, foodstuffs, etc.), and drill core samples. LHD flight operations also support private sector and government environmental research programs.

Community Support

Wheeled aircraft using the Lake Hood strip serve the communities throughout Southcentral Alaska. This includes the Kenai Peninsula communities of Kenai, Soldotna, Seward, Homer, and Port Graham; Cook Inlet destinations such as Beluga, Tyonek, Drift River, Trading Bay, and Nikolai Creek; Copper River area communities of Gulkana, Chitna and McCarthy; Prince William Sound communities of Valdez, Cordova, Tatitlek and Chenega; and Lake Clark/Iliamna Lake communities of Iliamna, Nondalton, Pedro Bay, Kokhanok and Igiugig (many of these

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[11] McDowell Group, Alaska Visitor Statistics Program (VI) Summer 2011. Prepared for the Alaska Department of Commerce, Community and Economic Development.

[12] McDowell Group, Alaska Visitor Statistics Program (VI) Fall/Winter 2011-12. Prepared for the Alaska Department of Commerce, Community and Economic Development.

communities are also served out of Merrill Field). Residents, visitors, service providers (such as electricians, teachers, health aides), supplies (from foodstuffs to fuel), mail, and equipment are moved each day.

Government and Non-Profit Organization Activity

Extensive government and other non-profit related aviation activity is based at Lake Hood.

U.S. Department of Interior

The Department of Interior (DOI) maintains a service facility for aircraft utilized by the U.S. Fish and Wildlife Service, Bureau of Indian Affairs, Bureau of Land Management, and the National Park Service. Staff at the facility are responsible for 58 aircraft used to support DOI operations across the state, including five planes that are stationed at the Lake Hood hangar (float planes, skis/wheels). The DOI Alaska Region Aircraft Maintenance Division's Lake Hood facility is a FAA Certified Repair Station performing maintenance, inspection, overhaul and modification of DOI Alaska Fleet aircraft. According to the DOI website, the facility is staffed by a Supervisor, Shop Inspector, Parts Specialist and five FAA Certified Mechanics.[13]

Alaska Department of Public Safety

The State of Alaska operates a Lake Hood aircraft maintenance and training base for Alaska State Troopers and Alaska Wildlife Troopers. The Alaska Department of Public Safety – Aircraft Section employs 14 workers at Lake Hood. The facility's maintenance crew maintains 40 department-owned aircraft, performing routine maintenance, as well as engine and airframe overhauls and rebuilds.[14]

Alaska Wing Civil Air Patrol

The Alaska Wing Civil Air Patrol has a statewide maintenance facility at Lake Hood, servicing 30 aircraft in support of the organizations search, rescue and training mission, employing four workers year-round.

Alaska Airmen's Association

The Alaska Airmen's Association, a non-profit organization representing 2,500 members, is headquartered at Lake Hood. The Association's mission is to "promote and preserve" aviation in Alaska.[15] Its annual tradeshow, held at the FedEx hangar, attracted 21,000 attendees in 2012 and 800 exhibitors.[16] Many attendees are from out-of-town, and create local economic activity with spending at hotels, restaurants, car rental agencies, and other businesses.

Alaska Aviation Museum

Lake Hood is home to the Alaska Aviation Museum. The museum provides visitors with the opportunity to learn about Alaska's rich

[13] http://oas.doi.gov/akro/akmaint/index.htm

[14] http://www.dps.state.ak.us/AWT/aircraft.aspx

[15] http://www.alaskaairmen.org

[16] http://www.greatalaskaaviationgathering.org/index.html

aviation history, with displays of a number of aircraft. The museum leads efforts to restore historically significant aircraft and operates a retail facility. Approximately 20,000 people visit the museum annually.

"IDITAROD AIR FORCE"

It should also be noted that Lake Hood is a base of operations for the "Iditarod Air Force." The Iditarod Air Force includes 31 volunteer pilots who move hundreds of dropped or scratched dogs, over 120,000 pounds of dog food, hundreds of bales of straw/hay (for dog bedding) and a variety of other material needed to support the 1,049-mile sled dog race.[17] The Iditarod Air Force flies hundreds of volunteers who provide essential services to the race, including the large team of veterinarians who monitor the health of the sled dogs throughout the race. They also fly the communications volunteers and their equipment to and from checkpoints along the race route, race judges, logistics personnel, media, photographers, and many others who play some role in the race.

Personal Use Aviation

While difficult to describe in economic terms, an important role Lake Hood plays is in serving the personal needs of the local general aviation (non-commercial) community. No statistics are available on personal use flight operations at Lake Hood, but it is generally recognized as accounting for a significant portion of flight activity and most tie-down space and hangar usage. While not considered a basic industry, pilots will attest to the fact that there is significant economic activity associated with airplane ownership. The magnitude of the economic is described in the next chapter of this report.

Business Travel

Not only do people fly for personal pleasure, owners of private aircraft also commonly use their planes for business travel, flying themselves to jobsites or "commuting" to places of business outside of Anchorage. Additionally, pilots use LHD when coming to Anchorage to conduct business. With its central location, LHD is convenient to catch follow-on flights at ANC and access other services, such as car rentals or hotels.

[17] http://www.iditarodairforce.com

Chapter 3: Economic Impact of Lake Hood Seaplane Base

The economic impact of the ANC is substantial and well documented. According to a 2011 McDowell Group study, the airport and related activities account for over 15,500 jobs and a billion dollars in personal income in the Anchorage area. One in ten Anchorage area jobs is directly or indirectly tied to ANC. The economic impacts of Lake Hood, however, are only partially captured in these estimates which are based primarily on airport employment within the secured area at ANC. Lake Hood operations lie outside the area where all employees are required to have security clearance to access planes, cargo facilities, and airline operations.

To measure the economic activity that occurs at Lake Hood, 25 representatives of businesses, agencies and other organizations were interviewed. These representatives were asked about employment within their organizations, their local purchase of goods and services, and overall annual budgets.

Direct Spending and Employment

Based on these interviews and other secondary data research, it is estimated that direct economic activity supported by Lake Hood totals approximately $25 million annually. This is a measure of total spending, including payroll and non-payroll expenditures.

Employment at Lake Hood is a variable mix of year-round, seasonal and temporary employment. The interview process identified a total of approximately 130 year-round workers and peak season employment of 210 workers engaged in aviation-related activity at Lake Hood in 2012. It is estimated these workers received about $8.5 million in annual payroll in 2012.

Total Economic Impact

This measure of direct spending and employment does not capture all the jobs in the Anchorage area that are affected by Lake Hood activity. As Lake Hood businesses and other organizations purchase goods and services in the Anchorage area, a multiplier effect is created, where additional jobs and income are supported. These jobs may be in the aviation sector; for example, avionics technicians who provide their services to aircraft owners based at Lake Hood, or the jobs may be outside the aviation sector; with accounting firms, for example, that work with Lake Hood businesses. Jobs and income that are generated as a result of business spending on goods and services are termed "indirect." Jobs and income are also created when workers employed by Lake Hood-based firms spend their payroll dollars in the local economy. This "induced" employment and income occurs throughout the economy; wherever residents spend their income on household necessities, transportation, recreation, health care, other personal services, etc.

Economic impact models can be used to estimate the multiplier effects of Lake Hood operations. Air transportation services activity in Alaska has an output multiplier of 1.7, according to IMPLAN, a widely-used model for measuring the multiplier effects of commercial and industrial activity. That means that $25 million in direct economic output would have total direct, indirect and induced output of approximately $42 million. While IMPLAN's employment, labor income and output multipliers for air transportation services are an imperfect proxy for Lake Hood operations – IMPLAN multipliers include large commercial air transportation activity, as well as the air taxi and charter operations typical of Lake Hood and Lake Hood aviation activity likely includes a higher proportion of aircraft maintenance services than the Alaska air transportation sector overall – IMPLAN multipliers for the air transportation sector provide a reasonable approximation of the multiplier effects associated with Lake Hood activity.

Including direct, indirect and induced effects, the total economic impacts of Lake Hood operations are estimated at 230 jobs (annual average equivalent), $14 million in labor income, and $42 million in output.

Table 1. Economic Impacts of Lake Hood Operations, 2012

	Direct	Indirect/ Induced	Total
Employment (annual average equivalent)	130	100	230
Labor Income (millions)	$8.5	$5.5	$14.0
Output (millions)	$25.0	$17.0	$42.0

Source: McDowell Group estimates.

Comparing Lake Hood to other Alaska airports places this level of economic activity in perspective. For example, the $42 million in total Lake Hood economic activity is significantly higher than very important regional air hubs, such as Kotzebue's airport ($24 million in output in 2009), Kodiak ($17 million), and Iliamna ($11.7 million). Lake Hood's economic impact is also greater than other key Southcentral general aviation airports such as Talkeetna ($5.6 million in total output). Talkeetna is the aviation gateway to Denali National Park. Economic output associated with the airport in Wasilla is $3.7 million. Lake Hood's economic output is about equal to the Bethel airport (another critical regional aviation hub, with $45 million in output).[18]

Other Economic Impacts

It is important to recognize that these measures of Lake Hood-related jobs and income do not capture all of the economic activity connected with Lake Hood. Jobs and income associated with remote business activity supported fully or partially by float plane operations out of Lake Hood are not included in these estimates. If they were, the overall economic impact of Lake Hood would be substantially above what has been quantified in this study.

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[18] A series of airport impact assessments, prepared for the Alaska Department of Transportation and Public Facilities, are posted at http://www.alaskaasp.com/Documents.aspx

Support of Alaska's Visitor Industry

While these measurements of economic impact include flightseeing, they do not fully capture the importance of Lake Hood in Anchorage's visitor industry. The opportunity to go on a wildlife viewing flight or see a glacier from the air is a prominent aspect of the city's marketing program. From the Visit Anchorage website: "…visitors to Anchorage can pack in a lot of adventure. Flightsee over vast, snow-covered mountains…" and "All three species of North American bears flourish in Alaska, and are a popular attraction for visitors….Fly-in adventures begin right in Anchorage."[19]

The visitor industry is an important part of the Southcentral Alaska economy. In the 12-month period from May 2011 through April 2012, visitors (non-Alaska residents) spent $1.07 billion in Southcentral Alaska. That spending created 13,400 jobs and $392 million in labor income. Including multiplier effects, the industry accounted for a total of 18,900 jobs and $580 million in labor income in Southcentral Alaska. Anchorage's air transportation infrastructure (including Lake Hood) is a central component of that economic activity. Visitors travelling through Anchorage to outlying lodges and other destinations served by Lake Hood flight service operators spend money on lodging (including lodging establishments located on Lake Hood, such as the Millennium Alaskan Hotel and Coast International Inn), food, souvenirs, and activities.

Finally, as the world's busiest seaplane base, Lake Hood is an attraction itself, drawing thousands of visitors each year who watch fight operations, walk the path around the lake, or visit the aviation museum. At least three tour companies include Lake Hood in their bus tour of Anchorage (Anchorage City Trolley Tours, Salmonberry Travel & Tours, and Alaska Tour & Travel).

Spending in Support of Personal Use Aviation

As described previously, personal use aviation accounts for a significant portion of flight activity and most tie-down space and hangar usage at Lake Hood. There is significant local economic activity connected with the fixed and variable costs of airplane ownership, maintenance, and operation, such as spending on:

- Fuel and oil
- Annual inspections and maintenance
- Engine overhauls
- Tie-down fees and/or hangar rentals
- Insurance
- Aircraft accessories, such as headsets, engine covers, etc.

The cost of aircraft ownership varies widely with the type of plane, its age, and how intensively it is used. It is difficult to make generalizations about the cost to own, maintain, and operate the many types of aircraft based at Lake Hood. However, if it is assumed that those costs range between $15,000 and $20,000 annually, spending in support of the approximately 780 aircraft based at Lake Hood would total between $11.7 million

[19] http://www.anchorage.net/ak/summer

and $17.6 million annually. Only a portion of the economic activity associated with this spending is captured in the numbers presented in Table 1.

Maintenance of personal use aircraft is a key component of the aircraft-related maintenance sector in Anchorage. According to Alaska Department of Labor and Workforce Development data, in 2011, 769 people worked as Aircraft Mechanics and Service Technicians in Anchorage. Employment averaged 619 over the year, and workers earned a total of $37 million in wages. While some of these people work at Merrill Field or Birchwood Airport, many of these people are employed at Lake Hood.

Government Spending and Capital Investment in Lake Hood

The economic impact figures presented in Table 1 (page 13) do not include all economic activity associated with state and federal government expenditures in support of Lake Hood. Maintenance, operations and capital expenditures in support of Lake Hood also created economic activity. While only two ANC employees are dedicated exclusively to management of Lake Hood (the Lake Hood manager and a leasing specialist) a large number of ANC employees serve the Lake Hood facility, ranging from air traffic controllers to snow removal equipment operators to facility maintenance personnel. It is not possible to measure the number of jobs (or payroll) associated in part with Lake Hood operations because those jobs have airport-wide responsibilities.

Additionally, personnel and non-personnel spending in support of Lake Hood operations is partially offset by operating revenues. In FY 2012, Lake Hood revenues included $570,000 in tie-down and float plane space fees, $120,000 in aeronautical-related land rental, and $70,000 in non-aeronautical-related land rental, for total operating revenue of $760,000.

The federal government has funded (with state matching support) a variety of capital projects at Lake Hood over the past two decades. Following (*next page*) is a list of projects funded through the Federal Aviation Administration (FAA) Airport Improvement Program (AIP) between 1989 and 2011.

Table 2. Lake Hood Capital Improvements, 1989- 2011

Year	Improvement	Total Expenditure
1989	General Aviation Environmental Assessment/Design	$190,378
1991	Lake Hood UST Removal/Upgrade	1,782,297
1991	Lake Hood UST Removal/Upgrade	1,051,753
1995	General Aviation Improvements	1,378,456
1995	Storm Water Drain	739,469
1996	Lake Hood Water/Sewer Improvements	2,650,345
1997	Lake Hood Boathouse Well Facility	177,079
2000	Lake Hood Bank Stabilization, Erosion, and Lighting	1,388,076
2001	Lake Hood Lake Shore Taxiway Reconstruction	675,497
2002	Lake Hood Upgrades	136,715
2003	Lake Hood Master Plan	450,858
2003	Lake Hood Strip Reconstruction	778,439
2003/2004	Lake Hood Echo Parking	4,137,673
2004	Lake Hood Lake Shore Taxiway Separation	2,648,222
2006	Lake Hood Echo Parking Phase 2	4,771,302
2006	Lake Hood Lake Shore Taxiway Separation	265,562
2008	Lake Hood CCTV	142,198
2010	Lake Hood Strip Improvements	689,272
2010	Lake Hood Lake Spenard Lake Acquisition	1,423,310
2010/2011	Lake Hood Bank Stabilization	3,870,122
2011	Lake Hood Runway Protection Zone Land Acquisition	4,323,312
2011	Lake Hood Strip Improvements Phase 2 (Lighting)	760,812
2011	Lake Hood Web Cameras	146,406
2012	Lake Hood Wayfinding	152,852
2013	Lake Hood Office Cabin Remodel	160,187
TOTAL		**$34,890,592**

Source: ANC.

These capital expenditures total approximately $34.9 million. The economic impact of this capital spending depends on the nature of the project, but often has the greatest impact in the construction sector.

Summary

As described in this report, Lake Hood seaplane base is an important part of the Anchorage and Southcentral Alaska air transportation infrastructure. Commercial, government, business and personal use flight operations and related aviation activities creates a diverse array of economic impacts. Including direct, indirect and induced effects, Lake Hood accounts for approximately 230 jobs, $14.0 million in payroll and $42 million in annual economic output.

In addition, Lake Hood supports jobs at the many remote lodges that depend on the float plane charter operators based at Lake Hood. In addition to serving outlying lodges, flightseeing services offered at Lake Hood are an important attraction for many of the nearly one million nonresidents who visit Anchorage each year. ANC operations and maintenance spending in support of Lake Hood operations, along with capital project expenditures to maintain and enhance Lake Hood facilities, complete the picture of a small (relative to ANC) but important economic engine in Anchorage.

Appendix: List of Interviewees & Photo Sources

INTERVIEWEES

- Dick Armstrong, ACE Hangars and Fuel
- Steven Williams, ACME Cub Training
- Jack Barber, Alaska Air Taxi
- Joyce Zerkel, Alaska Aircraft Sales, Inc.
- Dee Hansen, Alaska Airmen's Association
- Sherry Hart, Alaska Aviation Museum
- Sherry Hassell, Alaska Department of Public Safety – Aircraft Section
- Diane Callaway, Alaska Weather Operations
- Mel Sheppard, Alaska Wing Civil Air Patrol
- Richard Guthrie, Arctic Air Transport
- Duke Bertke, Chelatna Lake Lodge
- Brian Gillette
- John Ellison, Ellison Air
- Brian Reist, Flyteck
- Cory Clark, Grant Aviation
- Raymond Peterson, Katmai Air/Lodge
- Dave Matthews, Northern Aviation Maintenance and Repair
- Michael Reeve, Reeve Air Alaska
- Tony Batinock and Mike Laughlin, Regal Air
- Todd Rust, Rust's Flying Service
- Jeff Walker, Seaplanes North -- Floats Alaska
- Ken Kozlowski, Ski's Aircraft Service
- Joe Schuster, Sportsman's Air Service
- Loree Jensen, Trail Ridge Air
- Andrea Larson, Trans Northern
- Rob Heckmann, Turbo North Aviation
- Pamela Hennigan, U.S. Department of Interior, Office of Aviation Services
- William Farmer, White Wing Aircraft Services
- Chuck Gretzke, Wings

PHOTO SOURCES

Page 1: http://commons.wikimedia.org/wiki/File:Lake_Hood_Seaplane_Base_and_Gravel_Strip.jpg
Page 3: http://www.flickr.com/photos/64177193@N00/2851328675
Page 4: Alaska Department of Transportation http://dot.alaska.gov/anc/business/generalAviation/
Page 5: Alaska Aviation Museum, http://www.alaskaairmuseum.org
Page 6: http://web.archive.org/web/20050119175046/http://www.alaska.faa.gov/fai/images/ARPT_DIAGRAMS/LHD.gif
Page 8: Chelatna Lake Lodge, http://www.chelatna.com
Page 10: Alaska Aviation Museum, http://www.alaskaairmuseum.org
Page 11: http://www.alaskadispatch.com/article/iditarod-air-force, photo courtesy of Alaska Airlines.
Page 12: Photo by Pat Wellenbach, in http://bangordailynews.com/2011/06/22/
Page 13: http://www.flyrusts.com/alaska-flightseeing.html

Tavares seaplane base sparks downtown renaissance

A seaplane touches down on one runner in front of markers in Lake… (Stephen M. Dowell, Orlando…)
8:02 p.m. EST, April 28, 2012|

By Ludmilla Lelis, Orlando Sentinel

TAVARES — Two years ago, this Lake County city took an $8 million plunge to become "America's Seaplane City," hoping that a new airport catering to seaplanes would resuscitate its dying downtown.

Skeptics thought it was crazy to spend that kind of money in the depths of a recession. But the gamble has landed the city of 14,000 economic prosperity, with new businesses opening, construction under way and a boom in tourism.

"Every little facet of this project has drawn different people to our downtown," Mayor Bob Wolfe said. "It has been surprising to see how it's paid off. … Those naysayers now tell me they're glad we took the risk."

On Saturday, Tavares marked the second anniversary of the base opening with a Seaplane Fly-In that brought visitors to the Lake Dora waterfront to watch pilots take part in skill contests including dropping grapefruit from the air at a buoy target.

"This is cool, this is cool," said Lou Blows, 81, of The Villages, a retired electronics engineer. He was part of a crowd of roughly 500, including U.S Rep. Daniel Webster, R-Winter Garden, who turned out to watch seaplanes land and take off.

The event attracted about 30 seaplanes, said city officials, who were thrilled with the turnout.

Officials have had much to celebrate since the base opened in April 2010. More than 3,400 seaplanes have visited, more than what had been predicted. Located at Wooton Park, the base has become a regular haunt for Florida pilots and a rest stop for planes trekking from as far as Mexico, Italy and France, officials said.

"Having 3,400 seaplanes is unheard of," said Steve McCaughey, executive director of the Seaplane Pilots Association, based in Lakeland. "People were just hungry for a new destination.

"Seaplane pilots are always looking for weekend adventures and destinations that will cater to them, so those areas and businesses that do cater to them will see a tremendous amount of economic benefit," he said. "Tavares has become a destination."

The city has welcomed 26 new businesses, including eight successful restaurants, Tavares economic development director Bill Neron said.

Two boutique hotels are under construction, and the city now holds a busy schedule of boat races, fishing tournaments and aviation-themed events — all aimed at building a reputation as a haven for waterfront events, he said.

"This all happened in the toughest of economic times," Neron said. "We are the contrarians. When times were booming before 2007, Tavares had empty storefronts."

Back then, city leaders hosted visioning sessions, hoping to find ways to revive the nearly vacant downtown. A new city administrator, John Drury, had recently come aboard, bringing his experience as a pilot, innkeeper and airport administrator.

Drury remembered watching a pair of seaplanes land and the pilots trudge through the muck for a hamburger at O'Keefe's Irish Pub & Restaurant.

"It became apparent to me that the waterfront was an underutilized asset," Drury said. "With my background in business and aviation, it was clear to me we could make this a seaplane mecca."

With an $8.3 million investment, funded largely by a utility bond, the city set up the new airport, with a 3,000-foot virtual runway on the lake, a ramp and tarmac, marina docks and an aviation-fueling station. Tavares also revamped Wooton Park, opening a splash park for children, upgrading the grounds and electrical facilities for festivals, and opening a shop with souvenirs and drinks.

The city won an important designation from the Federal Aviation Administration to mark the base on navigational charts. The U.S. has 498 seaplane bases and Tavares' is among the newest, according to the FAA. The base is home to Jones Brothers & Co., a seaplane business offering tours and flight training. The seaplane connection also helped the city lure a manufacturing business, Progressive Aerodyne Inc., which makes the Searey amphibian aircraft.

"This is civic entrepreneurialship, where entrepreneurial spirit intersects with government operation," Drury said. "If you can take calculated risk on a niche and 'wow' project, you're either going to be successful or a failure, nothing in between."

By all measures, including aviation-fuel sales, splash-park attendance and aircraft landings, the seaplane base has exceeded expectations, Neron said. City leaders expect the operation will break even or be profitable in a few years. Residents support even more downtown improvements, with approval last month of a $3.3 million bond issue to buy land that will expand Wooton Park.

The only lingering complaint has been flight noise.

"I can hear the airplanes circle, landing and taking off," said Bob Moder, who lives about a mile from the lake. "They're pretty low when they land and when they buzz around."

Drury said there have been only a handful of complaints. The advantage of a seaplane base is that it operates only in daylight, so flights don't disturb the sleep of nearby residents, he said.

More importantly, the seaplanes have countless fans, including the scores of visitors who dine in Tavares to watch landings and takeoffs, said Rodger Kooser, whose company has opened three restaurants and is building two hotels in the downtown corridor.

"People are coming from all over to have lunch and watch seaplanes," Kooser said. "It's entertainment for them."

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APPENDIX O

Model Aircraft Guidelines (AC-91-57A)

U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject: **Model Aircraft Operating Standards**

Date: **September 2, 2015**
Initiated by: AJV-115

AC No. 91-57A

1. PURPOSE. This advisory circular (AC) provides guidance to persons operating Unmanned Aircraft (UA) for hobby or recreation purposes meeting the statutory definition of "model aircraft" contained in Section 336 of Public Law 112-95, the *FAA Modernization and Reform Act of 2012*. This AC describes means by which model aircraft may be operated safely in the National Airspace System (NAS). Nothing in this AC changes the requirement to comply with the statute or any applicable regulations.

2. APPLICABILITY. This AC provides information for any person who engages in model aircraft operations using model aircraft as defined by statute. (See paragraph 6.)

3. REFERENCES. Title 49 U.S.C. § 40101; P.L. 112-95 (126 Stat. 77 *et seq*.).

4. RELATED MATERIAL (current editions).

- Subtitle VII of Title 49, United States Code (49 USC)
- Title 14 of the Code of Federal Regulations (14 CFR)
- Subtitle B of Public Law 112-95 (Feb. 14, 2012)
- *Aeronautical Information Manual* (AIM)
- Temporary Flight Restriction (TFR) listing: http://tfr.faa.gov/tfr2/list.html
- Aeronautical Navigation Products (Charts): http://www.faa.gov/air_traffic/flight_info/aeronav/
- Notices to Airman: https://www.faa.gov/air_traffic/publications/notices/

5. CANCELLATION. AC 91-57, *Model Aircraft Operating Standards*, dated June 9, 1981, is cancelled.

6. MODEL AIRCRAFT OPERATIONS.

a. Terminology.

(1) 49 USC § 40102 defines an aircraft as "any contrivance invented, used, or designed to navigate, or fly in, the air." 14 CFR § 1.1 defines an aircraft as "a device that is used or intended to be used for flight in the air."

(2) Public Law 112-95 defines unmanned aircraft as an aircraft that is operated without the possibility of direct human intervention from within or on the aircraft.
(3) Section 336 of P.L. 112-95 defines a model aircraft as an unmanned aircraft that is capable of sustained flight in the atmosphere, flown within visual line of sight of the person operating the aircraft, and flown only for hobby or recreational purposes.

b. Model Aircraft Hazards in the NAS. While aero-modelers generally are concerned about safety and exercise good judgment when flying model aircraft for the hobby and recreational purposes for which they are intended, they may share the airspace in which manned aircraft are operating. Unmanned aircraft, including model aircraft, may pose a hazard to manned aircraft in flight and to persons and property on the surface if not operated safely. Model aircraft operations that endanger the safety of the National Airspace System, particularly careless or reckless operations or those that interfere with or fail to give way to any manned aircraft may be subject to FAA enforcement action.

c. Determination of "Model Aircraft" Status. Whether a given unmanned aircraft operation may be considered a "model aircraft operation" is determined with reference to section 336 of Public Law 112-95:

(1) The aircraft is flown strictly for hobby or recreational use;

(2) The aircraft operates in accordance with a community-based set of safety guidelines and within the programming of a nationwide community-based organization (CBO);

(3) The aircraft is limited to not more than 55 pounds, unless otherwise certified through a design, construction, inspection, flight test, and operational safety program administered by a CBO;

(4) The aircraft operates in a manner that does not interfere with, and gives way to, any manned aircraft; and

(5) When flown within 5 miles of an airport, the operator of the model aircraft provides the airport operator or the airport air traffic control tower (when an air traffic facility is located at the airport) with prior notice of the operation. Model aircraft operators flying from a permanent location within 5 miles of an airport should establish a mutually agreed upon operating procedure with the airport operator and the airport air traffic control tower (when an air traffic facility is located at the airport).

d. Public Law 112-95 recognizes the authority of the Administrator to pursue enforcement action against persons operating model aircraft who endanger the safety of the National Airspace System. Accordingly, model aircraft operators must comply with any Temporary Flight Restrictions (TFR). TFRs are issued over specific locations due to disasters, or for reasons of national security; or when determined necessary for the management of air traffic in the vicinity of aerial demonstrations or major sporting events. Do not operate model aircraft in designated areas until the TFR is no longer in force.

Model aircraft must not operate in Prohibited Areas, Special Flight Rule Areas or, the Washington National Capital Region Flight Restricted Zone, without specific authorization. Such areas are depicted on charts available at http://www.faa.gov/air_traffic/flight_info/aeronav/. Additionally, model aircraft operators should be aware of other Notices to Airmen (NOTAMS) which address operations near locations such as military or other federal facilities, certain stadiums, power plants, electric substations, dams, oil refineries, national parks, emergency, services and other industrial complexes. In addition to the previously mentioned link, information regarding published NOTAMS can be found at: https://www.faa.gov/air_traffic/publications/notices/.

The requirement to not fly within TFRs, or other circumstances where prohibited, would apply to operation of model aircraft that would otherwise comply with section 336 of Public Law 112-95.

e. Model aircraft operators should follow best practices including limiting operations to 400 feet above ground level (AGL).

f. All other operators and for additional information on Unmanned Aircraft Systems please visit: http://www.faa.gov/uas/ .

Elizabeth L. Ray
Vice President, Mission Support Services
Air Traffic Organization

APPENDIX P

National Bald Eagle Management Guidelines

NATIONAL BALD EAGLE MANAGEMENT GUIDELINES

U.S. Fish and Wildlife Service

May 2007

TABLE OF CONTENTS

INTRODUCTION

The bald eagle (*Haliaeetus leucocephalus*) is protected by the Bald and Golden Eagle Protection Act (Eagle Act) and the Migratory Bird Treaty Act (MBTA). The MBTA and the Eagle Act protect bald eagles from a variety of harmful actions and impacts. The U.S. Fish and Wildlife Service (Service) developed these National Bald Eagle Management Guidelines to advise landowners, land managers, and others who share public and private lands with bald eagles when and under what circumstances the protective provisions of the Eagle Act may apply to their activities. A variety of human activities can potentially interfere with bald eagles, affecting their ability to forage, nest, roost, breed, or raise young. The Guidelines are intended to help people minimize such impacts to bald eagles, particularly where they may constitute "disturbance," which is prohibited by the Eagle Act.

The Guidelines are intended to:

(1) Publicize the provisions of the Eagle Act that continue to protect bald eagles, in order to reduce the possibility that people will violate the law,

(2) Advise landowners, land managers and the general public of the potential for various human activities to disturb bald eagles, and

(3) Encourage additional nonbinding land management practices that benefit bald eagles (see Additional Recommendations section).

While the Guidelines include general recommendations for land management practices that will benefit bald eagles, the document is intended primarily as a tool for landowners and planners who seek information and recommendations regarding how to avoid disturbing bald eagles. Many States and some tribal entities have developed state-specific management plans, regulations, and/or guidance for landowners and land managers to protect and enhance bald eagle habitat, and we encourage the continued development and use of these planning tools to benefit bald eagles.

Adherence to the Guidelines herein will benefit individuals, agencies, organizations, and companies by helping them avoid violations of the law. However, the Guidelines themselves are not law. Rather, they are recommendations based on several decades of behavioral observations, science, and conservation measures to avoid or minimize adverse impacts to bald eagles.

The U.S. Fish and Wildlife Service strongly encourages adherence to these guidelines to ensure that bald and golden eagle populations will continue to be sustained. The Service realizes there may be impacts to some birds even if all reasonable measures are taken to avoid such impacts. Although it is not possible to absolve individuals and entities from liability under the Eagle Act or the MBTA, the Service exercises enforcement discretion to focus on those individuals, companies, or agencies that take migratory birds without regard for the consequences of their actions and the law, especially when conservation measures, such as these Guidelines, are available, but have not been implemented. The Service will prioritize its enforcement efforts to focus on those individuals or entities who take bald eagles or their parts, eggs, or nests without implementing appropriate measures recommended by the Guidelines.

The Service intends to pursue the development of regulations that would authorize, under limited circumstances, the use of permits if "take" of an eagle is anticipated but unavoidable. Additionally, if the bald eagle is delisted, the Service intends to provide a regulatory mechanism to honor existing (take) authorizations under the Endangered Species Act (ESA).

During the interim period until the Service completes a rulemaking for permits under the Eagle Act, the Service does not intend to refer for prosecution the incidental "*take*" of any bald eagle under the MBTA or Eagle Act, if such take is in full compliance with the terms and conditions of an incidental take statement issued to the action agency or applicant under the authority of section 7(b)(4) of the ESA or a permit issued under the authority of section 10(a)(1)(B) of the ESA.

The Guidelines are applicable throughout the United States, including Alaska. The primary purpose of these Guidelines is to provide information that will minimize or prevent violations only of *Federal* laws governing bald eagles. In addition to Federal laws, many states and some smaller jurisdictions and tribes have additional laws and regulations protecting bald eagles. In some cases those laws and regulations may be more protective (restrictive) than these Federal guidelines. If you are planning activities that may affect bald eagles, we therefore recommend that you contact both your nearest U.S. Fish and Wildlife Service Field Office (see the contact information on p.16) and your state wildlife agency for assistance.

LEGAL PROTECTIONS FOR THE BALD EAGLE

The Bald and Golden Eagle Protection Act

The Eagle Act (16 U.S.C. 668-668c), enacted in 1940, and amended several times since then, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal and civil penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." "Disturb'' means:

> "Disturb means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle=s return, such alterations agitate or bother an eagle to a degree that injures an eagle or substantially interferes with normal breeding, feeding, or sheltering habits and causes, or is likely to cause, a loss of productivity or nest abandonment.

A violation of the Act can result in a criminal fine of $100,000 ($200,000 for organizations), imprisonment for one year, or both, for a first offense. Penalties increase substantially for additional offenses, and a second violation of this Act is a felony.

The Migratory Bird Treaty Act

The MBTA (16 U.S.C. 703-712), prohibits the taking of any migratory bird or any part, nest, or egg, except as permitted by regulation. The MBTA was enacted in 1918; a 1972 agreement supplementing one of the bilateral treaties underlying the MBTA had the effect of expanding the scope of the Act to cover bald eagles and other raptors. Implementing regulations define “take” under the MBTA as “pursue, hunt, shoot, wound, kill, trap, capture, possess, or collect.”

Copies of the Eagle Act and the MBTA are available at: http://permits.fws.gov/ltr/ltr.shtml.

State laws and regulations

Most states have their own regulations and/or guidelines for bald eagle management. Some states may continue to list the bald eagle as endangered, threatened, or of special concern. If you plan activities that may affect bald eagles, we urge you to familiarize yourself with the regulations and/or guidelines that apply to bald eagles in your state. Your adherence to the Guidelines herein does not ensure that you are in compliance with state laws and regulations because state regulations can be more specific and/or restrictive than these Guidelines.

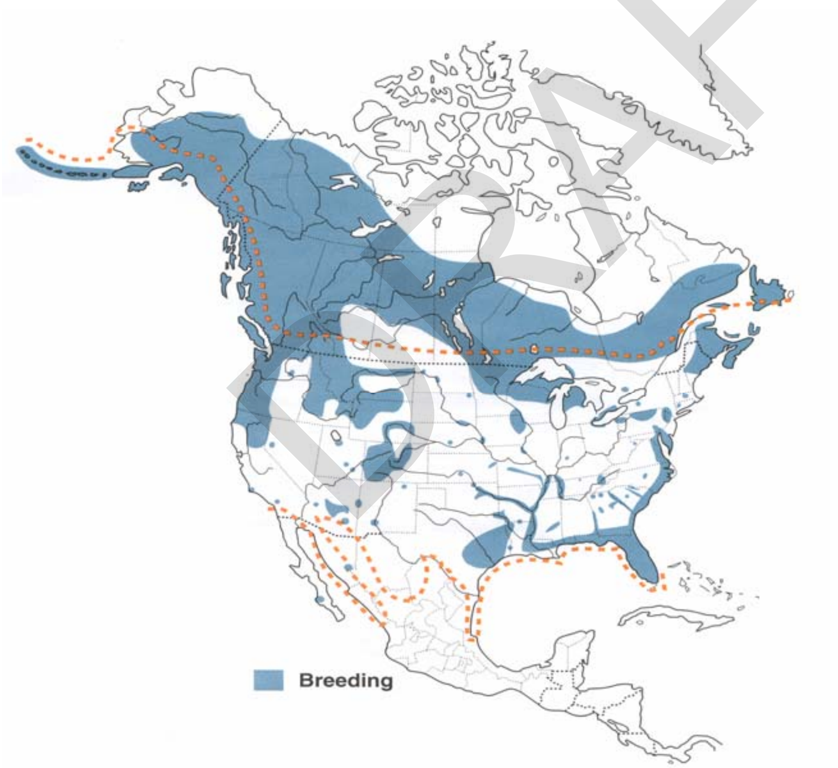
NATURAL HISTORY OF THE BALD EAGLE

Bald eagles are a North American species that historically occurred throughout the contiguous United States and Alaska. After severely declining in the lower 48 States between the 1870s and the 1970s, bald eagles have rebounded and re-established breeding territories in each of the lower 48 states. The largest North American breeding populations are in Alaska and Canada, but there are also significant bald eagle populations in Florida, the Pacific Northwest, the Greater Yellowstone area, the Great Lakes states, and the Chesapeake Bay region. Bald eagle distribution varies seasonally. Bald eagles that nest in southern latitudes frequently move northward in late spring and early summer, often summering as far north as Canada. Most eagles that breed at northern latitudes migrate southward during winter, or to coastal areas where waters remain unfrozen. Migrants frequently concentrate in large numbers at sites where food is abundant and they often roost together communally. In some cases, concentration areas are used year-round: in summer by southern eagles and in winter by northern eagles.

Juvenile bald eagles have mottled brown and white plumage, gradually acquiring their dark brown body and distinctive white head and tail as they mature. Bald eagles generally attain adult plumage by 5 years of age. Most are capable of breeding at 4 or 5 years of age, but in healthy populations they may not start breeding until much older. Bald eagles may live 15 to 25 years in the wild. Adults weigh 8 to 14 pounds (occasionally reaching 16 pounds in Alaska) and have wingspans of 5 to 8 feet. Those in the northern range are larger than those in the south, and females are larger than males.

Where do bald eagles nest?
Breeding bald eagles occupy "territories," areas they will typically defend against intrusion by other eagles. In addition to the active nest, a territory may include one or more alternate nests (nests built or maintained by the eagles but not used for nesting in a given year). The Eagle Act prohibits removal or destruction of both active and alternate bald eagle nests. Bald eagles exhibit high nest site fidelity and nesting territories are often used year after year. Some territories are known to have been used continually for over half a century.

Bald eagles generally nest near coastlines, rivers, large lakes or streams that support an adequate food supply. They often nest in mature or old-growth trees; snags (dead trees); cliffs; rock promontories; rarely on the ground; and with increasing frequency on human-made structures such as power poles and communication towers. In forested areas, bald eagles often select the tallest trees with limbs strong enough to support a nest that can weigh more than 1,000 pounds. Nest sites typically include at least one perch with a clear view of the water where the eagles usually forage. Shoreline trees or snags located in reservoirs provide the visibility and accessibility needed to locate aquatic prey. Eagle nests are constructed with large sticks, and may be lined with moss, grass, plant stalks, lichens, seaweed, or sod. Nests are usually about 4-6 feet in diameter and 3 feet deep, although larger nests exist.



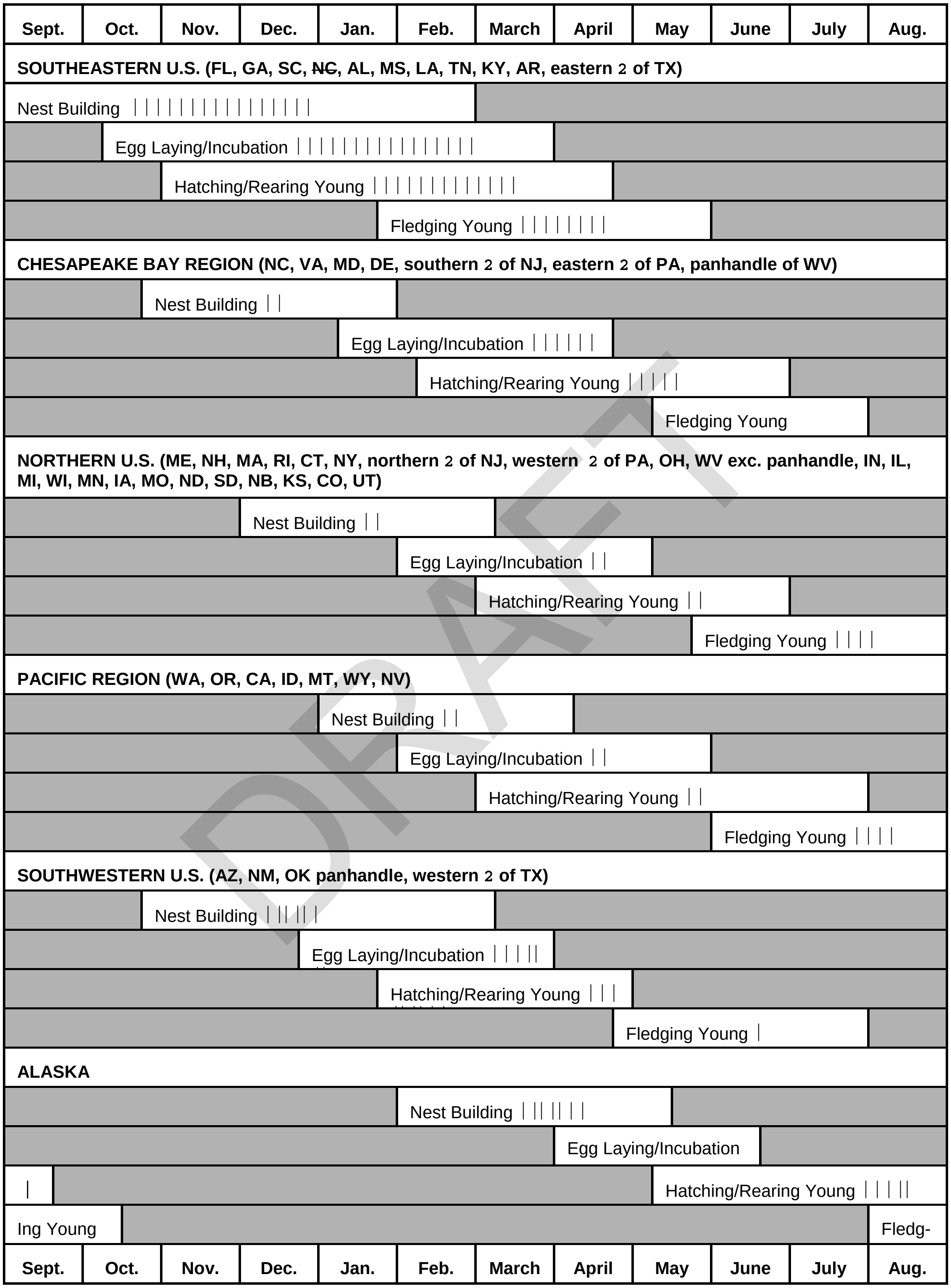
The range of breeding bald eagles in 2000 (shaded areas). This map shows only the larger concentrations of nests; eagles have continued to expand into additional nesting territories in many states. The dotted line represents the bald eagle's wintering range.

When do bald eagles nest?

Nesting activity begins several months before egg-laying. Egg-laying dates vary throughout the U.S., ranging from October in Florida, to late April or even early May in the northern United States. Incubation typically lasts 33-35 days, but can be as long as 40 days. Eaglets make their first unsteady flights about 10 to 12 weeks after hatching, and fledge (leave their nests) within a few days after that first flight. However, young birds usually remain in the vicinity of the nest for several weeks after fledging because they are almost completely dependent on their parents for food until they disperse from the nesting territory approximately 6 weeks later.

The bald eagle breeding season tends to be longer in the southern U.S., and re-nesting following an unsuccessful first nesting attempt is more common there as well. The following table shows the timing of bald eagle breeding seasons in different regions of the country. The table represents the range of time within which the majority of nesting activities occur in each region and does not apply to any specific nesting pair. Because the timing of nesting activities may vary within a given region, you should contact the nearest U.S. Fish and Wildlife Service Field Office (see page 16) and/or your state wildlife conservation agency for more specific information on nesting chronology in your area.

Chronology of typical reproductive activities of bald eagles in the United States.



How many chicks do bald eagles raise?
The number of eagle eggs laid will vary from 1-3, with 1-2 eggs being the most common. Only one eagle egg is laid per day, although not always on successive days. Hatching of young occurs on different days with the result that chicks in the same nest are sometimes of unequal size. The overall national fledging rate is approximately one chick per nest, annually, which results in a healthy expanding population.

What do bald eagles eat?
Bald eagles are opportunistic feeders. Fish comprise much of their diet, but they also eat waterfowl, shorebirds/colonial waterbirds, small mammals, turtles, and carrion. Because they are visual hunters, eagles typically locate their prey from a conspicuous perch, or soaring flight, then swoop down and strike. Wintering bald eagles often congregate in large numbers along streams to feed on spawning salmon or other fish species, and often gather in large numbers in areas below reservoirs, especially hydropower dams, where fish are abundant. Wintering eagles also take birds from rafts of ducks at reservoirs and rivers, and congregate on melting ice shelves to scavenge dead fish from the current or the soft melting ice. Bald eagles will also feed on carcasses along roads, in landfills, and at feedlots.

During the breeding season, adults carry prey to the nest to feed the young. Adults feed their chicks by tearing off pieces of food and holding them to the beaks of the eaglets. After fledging, immature eagles are slow to develop hunting skills, and must learn to locate reliable food sources and master feeding techniques. Young eagles will congregate together, often feeding upon easily acquired food such as carrion and fish found in abundance at the mouths of streams and shallow bays and at landfills.

The impact of human activity on nesting bald eagles
During the breeding season, bald eagles are sensitive to a variety of human activities. However, not all bald eagle pairs react to human activities in the same way. Some pairs nest successfully just dozens of yards from human activity, while others abandon nest sites in response to activities much farther away. This variability may be related to a number of factors, including visibility, duration, noise levels, extent of the area affected by the activity, prior experiences with humans, and tolerance of the individual nesting pair. The relative sensitivity of bald eagles during various stages of the breeding season is outlined in the following table.

Nesting Bald Eagle Sensitivity to Human Activities

Phase	Activity	Sensitivity to Human Activity	Comments
I	Courtship and Nest Building	Most sensitive period; likely to respond negatively	Most critical time period. Disturbance is manifested in nest abandonment. Bald eagles in newly established territories are more prone to abandon nest sites.
II	Egg laying	Very sensitive period	Human activity of even limited duration may cause nest desertion and abandonment of territory for the breeding season.
III	Incubation and early nestling period (up to 4 weeks)	Very sensitive period	Adults are less likely to abandon the nest near and after hatching. However, flushed adults leave eggs and young unattended; eggs are susceptible to cooling, loss of moisture, overheating, and predation; young are vulnerable to elements.
IV	Nestling period, 4 to 8 weeks	Moderately sensitive period	Likelihood of nest abandonment and vulnerability of the nestlings to elements somewhat decreases. However, nestlings may miss feedings, affecting their survival.
V	Nestlings 8 weeks through fledging	Very sensitive period	Gaining flight capability, nestlings 8 weeks and older may flush from the nest prematurely due to disruption and die.

If agitated by human activities, eagles may inadequately construct or repair their nest, may expend energy defending the nest rather than tending to their young, or may abandon the nest altogether. Activities that cause prolonged absences of adults from their nests can jeopardize eggs or young. Depending on weather conditions, eggs may overheat or cool too much and fail to hatch. Unattended eggs and nestlings are subject to predation. Young nestlings are particularly vulnerable because they rely on their parents to provide warmth or shade, without which they may die as a result of hypothermia or heat stress. If food delivery schedules are interrupted, the young may not develop healthy plumage, which can affect their survival. In addition, adults startled while incubating or brooding young may damage eggs or injure their young as they abruptly leave the nest. Older nestlings no longer require constant attention from the adults, but they may be startled by loud or intrusive human activities and prematurely jump from the nest before they are able to fly or care for themselves. Once fledged, juveniles range up to ¼ mile from the nest site, often to a site with minimal human activity. During this period, until about six weeks after departure from the nest, the juveniles still depend on the adults to feed them.

The impact of human activity on foraging and roosting bald eagles

Disruption, destruction, or obstruction of roosting and foraging areas can also negatively affect bald eagles. Disruptive activities in or near eagle foraging areas can interfere with feeding, reducing chances of survival. Interference with feeding can also result in reduced productivity (number of young successfully fledged). Migrating and wintering bald eagles often congregate at specific sites for purposes of feeding and sheltering. Bald eagles rely on established roost sites because of their proximity to sufficient food sources. Roost sites are usually in mature trees where the eagles are somewhat sheltered from the wind and weather. Human activities near or within communal roost sites may prevent eagles from feeding or taking shelter, especially if there are not other undisturbed and productive feeding and roosting sites available. Activities that permanently alter communal roost sites and important foraging areas can altogether eliminate the elements that are essential for feeding and sheltering eagles.

Where a human activity agitates or bothers roosting or foraging bald eagles to the degree that causes injury or substantially interferes with breeding, feeding, or sheltering behavior and causes, or is likely to cause, a loss of productivity or nest abandonment, the conduct of the activity constitutes a violation of the Eagle Act's prohibition against disturbing eagles. The circumstances that might result in such an outcome are difficult to predict without detailed site-specific information. If your activities may disturb roosting or foraging bald eagles, you should contact your local Fish and Wildlife Service Field Office (see page 16) for advice and recommendations for how to avoid such disturbance.

RECOMMENDATIONS FOR AVOIDING DISTURBANCE AT NEST SITES

In developing these Guidelines, we relied on existing state and regional bald eagle guidelines, scientific literature on bald eagle disturbance, and recommendations of state and Federal biologists who monitor the impacts of human activity on eagles. Despite these resources, uncertainties remain regarding the effects of many activities on eagles and how eagles in different situations may or may not respond to certain human activities. The Service recognizes this uncertainty and views the collection of better biological data on the response of eagles to disturbance as a high priority. To the extent that resources allow, the Service will continue to collect data on responses of bald eagles to human activities conducted according to the recommendations within these Guidelines to ensure that adequate protection from disturbance is being afforded, and to identify circumstances where the Guidelines might be modified. These data will be used to make future adjustments to the Guidelines.

To avoid disturbing nesting bald eagles, we recommend (1) keeping a distance between the activity and the nest (distance buffers), (2) maintaining preferably forested (or natural) areas between the activity and around nest trees (landscape buffers), and (3) avoiding certain activities during the breeding season. The buffer areas serve to minimize visual and auditory impacts associated with human activities near nest sites. Ideally, buffers would be large enough to protect existing nest trees and provide for alternative or replacement nest trees.

The size and shape of effective buffers vary depending on the topography and other ecological characteristics surrounding the nest site. In open areas where there are little or no forested or topographical buffers, such as in many western states, distance alone must serve as the buffer. Consequently, in open areas, the distance between the activity and the nest may need to be larger than the distances recommended under Categories A and B of these guidelines (pg. 12) if no landscape buffers are present. The height of the nest above the ground may also ameliorate effects of human activities; eagles at higher nests may be less prone to disturbance.

In addition to the physical features of the landscape and nest site, the appropriate size for the distance buffer may vary according to the historical tolerances of eagles to human activities in particular localities, and may also depend on the location of the nest in relation to feeding and roosting areas used by the eagles. Increased competition for nest sites may lead bald eagles to nest closer to human activity (and other eagles).

Seasonal restrictions can prevent the potential impacts of many shorter-term, obtrusive activities that do not entail landscape alterations (e.g. fireworks, outdoor concerts). In proximity to the nest, these kinds of activities should be conducted only outside the breeding season. For activities that entail both short-term, obtrusive characteristics and more permanent impacts (e.g., building construction), we recommend a combination of both approaches: retaining a landscape buffer *and* observing seasonal restrictions.

For assistance in determining the appropriate size and configuration of buffers or the timing of activities in the vicinity of a bald eagle nest, we encourage you to contact the nearest U.S. Fish and Wildlife Service Field Office (see page 16).

Existing Uses

Eagles are unlikely to be disturbed by routine use of roads, homes, and other facilities where such use pre-dates the eagles' successful nesting activity in a given area. Therefore, in most cases *ongoing* existing uses may proceed with the same intensity with little risk of disturbing bald eagles. However, some *intermittent, occasional, or irregular* uses that pre-date eagle nesting in an area may disturb bald eagles. For example: a pair of eagles may begin nesting in an area and subsequently be disturbed by activities associated with an annual outdoor flea market, even though the flea market has been held annually at the same location. In such situations, human activity should be adjusted or relocated to minimize potential impacts on the nesting pair.

ACTIVITY-SPECIFIC GUIDELINES

The following section provides the Service=s management recommendations for avoiding bald eagle disturbance as a result of new or intermittent activities proposed in the vicinity of bald eagle nests. Activities are separated into 8 categories (A – H) based on the nature and magnitude of impacts to bald eagles that usually result from the type of activity. Activities with similar or comparable impacts are grouped together.

In most cases, impacts will vary based on the visibility of the activity from the eagle nest and the degree to which similar activities are already occurring in proximity to the nest site. Visibility is a factor because, in general, eagles are more prone to disturbance when an activity occurs in full view. For this reason, we recommend that people locate activities farther from the nest structure in areas with open vistas, in contrast to areas where the view is shielded by rolling topography, trees, or other screening factors. The recommendations also take into account the existence of similar activities in the area because the continued presence of nesting bald eagles in the vicinity of the existing activities indicates that the eagles in that area can tolerate a greater degree of human activity than we can generally expect from eagles in areas that experience fewer human impacts. To illustrate how these factors affect the likelihood of disturbing eagles, we have incorporated the recommendations for some activities into a table (categories A and B).

First, determine which category your activity falls into (between categories A – H). If the activity you plan to undertake is not specifically addressed in these guidelines, follow the recommendations for the most similar activity represented.

If your activity is under A or B, our recommendations are in table form. The vertical axis shows the degree of visibility of the activity from the nest. The horizontal axis (header row) represents the degree to which similar activities are ongoing in the vicinity of the nest. Locate the row that best describes how visible your activity will be from the eagle nest. Then, choose the column that best describes the degree to which similar activities are ongoing in the vicinity of the eagle nest. The box where the column and row come together contains our management recommendations for how far you should locate your activity from the nest to avoid disturbing the eagles. The numerical distances shown in the tables are the closest the activity should be conducted relative to the nest. In some cases we have included additional recommendations (other than recommended *distance* from the nest) you should follow to help ensure that your activity will not disturb the eagles.

Alternate nests
For activities that entail permanent landscape alterations that may result in bald eagle disturbance, these recommendations apply to both active and alternate bald eagle nests. Disturbance becomes an issue with regard to alternate nests if eagles return for breeding purposes and react to land use changes that occurred while the nest was inactive. The likelihood that an alternate nest will again become active decreases the longer it goes unused. If you plan activities in the vicinity of an alternate bald eagle nest and have information to show that the nest has not been active during the preceding 5 breeding seasons, the recommendations provided in these guidelines for avoiding disturbance around the nest site may no longer be warranted. The nest itself remains protected by other provisions of the Eagle Act, however, and may not be destroyed.

If special circumstances exist that make it unlikely an inactive nest will be reused before 5 years of disuse have passed, and you believe that the probability of reuse is low enough to warrant disregarding the recommendations for avoiding disturbance, you should be prepared to provide all the reasons for your conclusion, including information regarding past use of the nest site. Without sufficient documentation, you should continue to follow these guidelines when conducting activities around the nest site. If we are able to determine that it is unlikely the nest will be reused, we may advise you that the recommendations provided in these guidelines for avoiding disturbance are no longer necessary around that nest site.

This guidance is intended to minimize disturbance, as defined by Federal regulation. In addition to Federal laws, most states and some tribes and smaller jurisdictions have additional laws and regulations protecting bald eagles. In some cases those laws and regulations may be more protective (restrictive) than these Federal guidelines.

Temporary Impacts
For activities that have temporary impacts, such as the use of loud machinery, fireworks displays, or summer boating activities, we recommend seasonal restrictions. These types of activities can generally be carried out outside of the breeding season without causing disturbance. The recommended restrictions for these types of activities can be lifted for alternate nests within a particular territory, including nests that were attended during the current breeding season but not used to raise young, after eggs laid in another nest within the territory have hatched (depending on the distance between the alternate nest and the active nest).

In general, activities should be kept as far away from nest trees as possible; loud and disruptive activities should be conducted when eagles are not nesting; and activity between the nest and the nearest foraging area should be minimized. If the activity you plan to undertake is not specifically addressed in these guidelines, follow the recommendations for the most similar activity addressed, or contact your local U.S. Fish and Wildlife Service Field Office for additional guidance.

If you believe that special circumstances apply to your situation that increase or diminish the likelihood of bald eagle disturbance, or if it is not possible to adhere to the guidelines, you should contact your local Service Field Office for further guidance.

Category A:
Building construction, 1 or 2 story, with project footprint of ½ acre or less.
Construction of roads, trails, canals, power lines, and other linear utilities.
Agriculture and aquaculture – new or expanded operations.
Alteration of shorelines or wetlands.
Installation of docks or moorings.
Water impoundment.

Category B:
Building construction, 3 or more stories.
Building construction, 1 or 2 story, with project footprint of more than ½ acre.
Installation or expansion of marinas with a capacity of 6 or more boats.
Mining and associated activities.
Oil and natural gas drilling and refining and associated activities.

	If there is no similar activity within 1 mile of the nest	***If there is similar activity closer than 1 mile from the nest***
If the activity will be visible from the nest	660 feet. Landscape buffers are recommended.	660 feet, or as close as existing tolerated activity of similar scope. Landscape buffers are recommended.
If the activity will not be visible from the nest	Category A: 330 feet. Clearing, external construction, and landscaping between 330 feet and 660 feet should be done outside breeding season. Category B: 660 feet.	330 feet, or as close as existing tolerated activity of similar scope. Clearing, external construction and landscaping within 660 feet should be done outside breeding season.

The numerical distances shown in the table are the closest the activity should be conducted relative to the nest.

Category C. Timber Operations and Forestry Practices

- Avoid clear cutting or removal of overstory trees within 330 feet of the nest at any time.

- Avoid timber harvesting operations, including road construction and chain saw and yarding operations, during the breeding season within 660 feet of the nest. The distance may be decreased to 330 feet around alternate nests within a particular territory, including nests that were attended during the current breeding season but not used to raise young, after eggs laid in another nest within the territory have hatched.

- Selective thinning and other silviculture management practices designed to conserve or enhance habitat, including prescribed burning close to the nest tree, should be undertaken outside the breeding season. Precautions such as raking leaves and woody debris from around the nest tree should be taken to prevent crown fire or fire climbing the nest tree. If it is determined that a burn during the breeding season would be beneficial, then, to ensure that no take or disturbance will occur, these activities should be conducted only when neither adult eagles nor young are present at the nest tree (i.e., at the beginning of, or end of, the breeding season, either before the particular nest is active or after the young have fledged from that nest). Appropriate Federal and state biologists should be consulted before any prescribed burning is conducted during the breeding season.

- Avoid construction of log transfer facilities and in-water log storage areas within 330 feet of the nest.

Category D. Off-road vehicle use (including snowmobiles). No buffer is necessary around nest sites outside the breeding season. During the breeding season, do not operate off-road vehicles within 330 feet of the nest. In open areas, where there is increased visibility and exposure to noise, this distance should be extended to 660 feet.

Category E. Motorized Watercraft use (including jet skis/personal watercraft). No buffer is necessary around nest sites outside the breeding season. During the breeding season, within 330 feet of the nest, (1) do not operate jet skis (personal watercraft), and (2) avoid concentrations of noisy vessels (e.g., commercial fishing boats and tour boats), except where eagles have demonstrated tolerance for such activity. Other motorized boat traffic passing within 330 feet of the nest should attempt to minimize trips and avoid stopping in the area where feasible, particularly where eagles are unaccustomed to boat traffic. Buffers for airboats should be larger than 330 feet due to the increased noise they generate, combined with their speed, maneuverability, and visibility.

Category F. Non-motorized recreation and human entry (e.g., hiking, camping, fishing, hunting, birdwatching, kayaking, canoeing). No buffer is necessary around nest sites outside the breeding season. If the activity will be visible or highly audible from the nest, maintain a 330-foot buffer during the breeding season, particularly where eagles are unaccustomed to such activity.

Category G. Helicopters and fixed-wing aircraft.
Except for authorized biologists trained in survey techniques, avoid operating aircraft within 1,000 feet of the nest during the breeding season, except where eagles have demonstrated tolerance for such activity.

Category H. Blasting and other loud, intermittent noises.
Avoid blasting and other activities that produce extremely loud noises within 1/2 mile of active nests, unless greater tolerance to the activity (or similar activity) has been demonstrated by the eagles in the nesting area. This recommendation applies to the use of fireworks classified by the Federal Department of Transportation as Class B explosives, which includes the larger fireworks that are intended for licensed public display.

RECOMMENDATIONS FOR AVOIDING DISTURBANCE AT FORAGING AREAS AND COMMUNAL ROOST SITES

1. Minimize potentially disruptive activities and development in the eagles' direct flight path between their nest and roost sites and important foraging areas.

2. Locate long-term and permanent water-dependent facilities, such as boat ramps and marinas, away from important eagle foraging areas.

3. Avoid recreational and commercial boating and fishing near critical eagle foraging areas during peak feeding times (usually early to mid-morning and late afternoon), except where eagles have demonstrated tolerance to such activity.

4. Do not use explosives within ½ mile (or within 1 mile in open areas) of communal roosts when eagles are congregating, without prior coordination with the U.S. Fish and Wildlife Service and your state wildlife agency.

5. Locate aircraft corridors no closer than 1,000 feet vertical or horizontal distance from communal roost sites.

ADDITIONAL RECOMMENDATIONS TO BENEFIT BALD EAGLES

The following are additional management practices that landowners and planners can exercise for added benefit to bald eagles.

1. Protect and preserve potential roost and nest sites by retaining mature trees and old growth stands, particularly within ½ mile from water.

2. Where nests are blown from trees during storms or are otherwise destroyed by the elements, continue to protect the site in the absence of the nest for up to three (3) complete breeding seasons. Many eagles will rebuild the nest and reoccupy the site.

3. To avoid collisions, site wind turbines, communication towers, and high voltage transmission power lines away from nests, foraging areas, and communal roost sites.

4. Employ industry-accepted best management practices to prevent birds from colliding with or being electrocuted by utility lines, towers, and poles. If possible, bury utility lines in important eagle areas.

5. Where bald eagles are likely to nest in human-made structures (e.g., cell phone towers) and such use could impede operation or maintenance of the structures or jeopardize the safety of the eagles, equip the structures with either (1) devices engineered to discourage bald eagles from building nests, or (2) nesting platforms that will safely accommodate bald eagle nests without interfering with structure performance.

6. Immediately cover carcasses of euthanized animals at landfills to protect eagles from being poisoned.

7. Do not intentionally feed bald eagles. Artificially feeding bald eagles can disrupt their essential behavioral patterns and put them at increased risk from power lines, collision with windows and cars, and other mortality factors.

8. Use pesticides, herbicides, fertilizers, and other chemicals only in accordance with Federal and state laws.

9. Monitor and minimize dispersal of contaminants associated with hazardous waste sites (legal or illegal), permitted releases, and runoff from agricultural areas, especially within watersheds where eagles have shown poor reproduction or where bioaccumulating contaminants have been documented. These factors present a risk of contamination to eagles and their food sources.

CONTACTS

The following U.S. Fish and Wildlife Service Field Offices provide technical assistance on bald eagle management:

Alabama	Daphne	(251) 441-5181
Alaska	Anchorage	(907) 271-2888
	Fairbanks	(907) 456-0203
	Juneau	(907) 780-1160
Arizona	Phoenix	(602) 242-0210
Arkansas	Conway	(501) 513-4470
California	Arcata	(707) 822-7201
	Barstow	(760) 255-8852
	Carlsbad	(760) 431-9440
	Red Bluff	(530) 527-3043
	Sacramento	(916) 414-6000
	Stockton	(209) 946-6400
	Ventura	(805) 644-1766
	Yreka	(530) 842-5763
Colorado	Lakewood	(303) 275-2370
	Grand Junction	(970) 243-2778
Connecticut	(See New Hampshire)	
Delaware	(See Maryland)	
Florida	Panama City	(850) 769-0552
	Vero Beach	(772) 562-3909
	Jacksonville	(904) 232-2580
Georgia	Athens	(706) 613-9493
	Brunswick	(912) 265-9336
	Columbus	(706) 544-6428
Idaho	Boise	(208) 378-5243
	Chubbuck	(208) 237-6975
Illinois/Iowa	Rock Island	(309) 757-5800
Indiana	Bloomington	(812) 334-4261
Kansas	Manhattan	(785) 539-3474
Kentucky	Frankfort	(502) 695-0468
Louisiana	Lafayette	(337) 291-3100
Maine	Old Town	(207) 827-5938
Maryland	Annapolis	(410) 573-4573
Massachusetts	(See New Hampshire)	
Michigan	East Lansing	(517) 351-2555
Minnesota	Bloomington	(612) 725-3548
Mississippi	Jackson	(601) 965-4900
Missouri	Columbia	(573) 234-2132
Montana	Helena	(405) 449-5225
Nebraska	Grand Island	(308) 382-6468
Nevada	Las Vegas	(702) 515-5230
	Reno	(775) 861-6300
New Hampshire	Concord	(603) 223-2541
New Jersey	Pleasantville	(609) 646-9310
New Mexico	Albuquerque	(505) 346-2525
New York	Cortland	(607) 753-9334
	Long Island	(631) 776-1401
North Carolina	Raleigh	(919) 856-4520
	Asheville	(828) 258-3939
North Dakota	Bismarck	(701) 250-4481
Ohio	Reynoldsburg	(614) 469-6923
Oklahoma	Tulsa	(918) 581-7458
Oregon	Bend	(541) 383-7146
	Klamath Falls	(541) 885-8481
	La Grande	(541) 962-8584
	Newport	(541) 867-4558
	Portland	(503) 231-6179
	Roseburg	(541) 957-3474
Pennsylvania	State College	(814) 234-4090
Rhode Island	(See New Hampshire)	
South Carolina	Charleston	(843) 727-4707
South Dakota	Pierre	(605) 224-8693
Tennessee	Cookeville	(931) 528-6481
Texas	Clear Lake	(281) 286-8282
Utah	West Valley City	(801) 975-3330
Vermont	(See New Hampshire)	
Virginia	Gloucester	(804) 693-6694
Washington	Lacey	(306) 753-9440
	Spokane	(509) 891-6839
	Wenatchee	(509) 665-3508
West Virginia	Elkins	(304) 636-6586
Wisconsin	New Franken	(920) 866-1725
Wyoming	Cheyenne	(307) 772-2374
	Cody	(307) 578-5939

National Office
U.S. Fish and Wildlife Service
Division of Migratory Bird Management
4401 North Fairfax Drive, MBSP-4107
Arlington, VA 22203-1610
(703) 358-1714
http://www.fws.gov/migratorybirds

State Agencies

To contact a state wildlife agency, visit the Association of Fish & Wildlife Agencies' website at http://www.fishwildlife.org/where_us.html

GLOSSARY

The definitions below apply to these National Bald Eagle Management Guidelines:

Communal roost sites – Areas where bald eagles gather and perch overnight – and sometimes during the day in the event of inclement weather. Communal roost sites are usually in large trees (live or dead) that are relatively sheltered from wind and are generally in close proximity to foraging areas. These roosts may also serve a social purpose for pair bond formation and communication among eagles. Many roost sites are used year after year.

Disturb – To agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.

In addition to immediate impacts, this definition also covers impacts that result from human-caused alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle=s return, such alterations agitate or bother an eagle to a degree that injures an eagle or substantially interferes with normal breeding, feeding, or sheltering habits and causes, or is likely to cause, a loss of productivity or nest abandonment.

Fledge – To leave the nest and begin flying. For bald eagles, this normally occurs at 10-12 weeks of age.

Fledgling – A juvenile bald eagle that has taken the first flight from the nest but is not yet independent.

Foraging area – An area where eagles feed, typically near open water such as rivers, lakes, reservoirs, and bays where fish and waterfowl are abundant, or in areas with little or no water (i.e., rangelands, barren land, tundra, suburban areas, etc.) where other prey species (e.g., rabbit, rodents) or carrion (such as at landfills) are abundant.

Landscape buffer – A natural or human-made landscape feature that screens eagles from human activity (e.g., strip of trees, hill, cliff, berm, sound wall).

Nest – A structure built, maintained, or used by bald eagles for the purpose of reproduction. An **active** nest is a nest that is attended (built, maintained or used) by a pair of bald eagles during a given breeding season, whether or not eggs are laid. An **alternate** nest is a nest that is not used for breeding by eagles during a given breeding season.

Nest abandonment – Nest abandonment occurs when adult eagles desert or stop attending a nest and do not subsequently return and successfully raise young in that nest for the duration of a breeding season. Nest abandonment can be caused by altering habitat near a nest, even if the alteration occurs prior to the breeding season. Whether the eagles migrate during the non-breeding season, or remain in the area throughout the non-breeding season, nest abandonment can occur at any point between the time the eagles return to the nesting site for the breeding season and the time when all progeny from the breeding season have dispersed.

Project footprint – The area of land (and water) that will be permanently altered for a development project, including access roads.

Similar scope – In the vicinity of a bald eagle nest, an existing activity is of similar scope to a new activity where the types of impacts to bald eagles are similar in nature, and the impacts of the existing activity are of the same or greater magnitude than the impacts of the potential new activity. Examples: (1) An existing single-story home 200 feet from a nest is similar in scope to an additional single-story home 200 feet from the nest; (2) An existing multi-story, multi-family dwelling 150 feet from a nest has impacts of a greater magnitude than a potential new single-family home 200 feet from the nest; (3) One existing single-family home 200 feet from the nest has impacts of a lesser magnitude than three single-family homes 200 feet from the nest; (4) an existing single-family home 200 feet from a communal roost has impacts of a lesser magnitude than a single-family home 300 feet from the roost but 40 feet from the eagles' foraging area. The existing activities in examples (1) and (2) are of similar scope, while the existing activities in example (3) and (4) are not.

Vegetative buffer – An area surrounding a bald eagle nest that is wholly or largely covered by forest, vegetation, or other natural ecological characteristics, and separates the nest from human activities.

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APPENDIX Q

Aircraft Accident and Incident Reporting (AIM 7-6-2)

7−6−2. Aircraft Accident and Incident Reporting

a. Occurrences Requiring Notification. The operator of an aircraft must immediately, and by the most expeditious means available, notify the nearest National Transportation Safety Board (NTSB) Field Office when:

1. An aircraft accident or any of the following listed incidents occur:
(a) Flight control system malfunction or failure.
(b) Inability of any required flight crew member to perform their normal flight duties as a result of injury or illness.
(c) Failure of structural components of a turbine engine excluding compressor and turbine blades and vanes.
(d) Inflight fire.
(e) Aircraft collide in flight.
(f) Damage to property, other than the aircraft, estimated to exceed $25,000 for repair (including materials and labor) or fair market value in the event of total loss, whichever is less.
(g) For large multi-engine aircraft (more than 12,500 pounds maximum certificated takeoff weight):
(1) Inflight failure of electrical systems which requires the sustained use of an emergency bus powered by a back-up source such as a battery, auxiliary power unit, or air-driven generator to retain flight control or essential instruments;
(2) Inflight failure of hydraulic systems that results in sustained reliance on the sole remaining hydraulic or mechanical system for movement of flight control surfaces;
(3) Sustained loss of the power or thrust produced by two or more engines; and
(4) An evacuation of aircraft in which an emergency egress system is utilized.**2.** An aircraft is overdue and is believed to have been involved in an accident.

b. Manner of Notification.
1. The most expeditious method of notification to the NTSB by the operator will be determined by the circumstances existing at that time. The NTSB has advised that any of the following would be considered examples of the type of notification that would be acceptable:
(a) Direct telephone notification.
(b) Telegraphic notification.
(c) Notification to the FAA who would in turn notify the NTSB by direct communication; i.e., dispatch or telephone.

c. Items to be Included in Notification. The notification required above must contain the following information, if available:
1. Type, nationality, and registration marks of the aircraft.
2. Name of owner and operator of the aircraft.
3. Name of the pilot-in-command.
4. Date and time of the accident, or incident.
5. Last point of departure, and point of intended landing of the aircraft.
6. Position of the aircraft with reference to some easily defined geographical point.
7. Number of persons aboard, number killed, and number seriously injured.
8. Nature of the accident, or incident, the weather, and the extent of damage to the aircraft so far as is known; and
9. A description of any explosives, radioactive materials, or other dangerous articles carried.

d. Follow−up Reports.
1. The operator must file a report on NTSB

Form 6120.1 or 6120.2, available from NTSB Field Offices or from the NTSB, Washington, DC, 20594:
(a) Within 10 days after an accident;
(b) When, after 7 days, an overdue aircraft is still missing;
(c) A report on an incident for which notification is required as described in subparagraph (1) must be filed only as requested by an authorized representative of the NTSB.
2. Each crewmember, if physically able at the time the report is submitted, must attach a statement setting forth the facts, conditions, and circumstances relating to the accident or incident as they appeared. If the crewmember is incapacitated, a statement must be submitted as soon as physically possible.

APPENDIX R

NTSB Seaplane Accident Reports

This space for binding

National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: ANC03LA084	Aircraft Registration Number: N8383Q
	Occurrence Date: 07/21/2003	Most Critical Injury: Serious
	Occurrence Type: Accident	Investigated By: NTSB

Location/Time

Nearest City/Place	State	Zip Code	Local Time	Time Zone
BIG LAKE	AK	99652	1500	AKD

Airport Proximity: Off Airport/Airstrip | Distance From Landing Facility:

Aircraft Information Summary

Aircraft Manufacturer	Model/Series	Type of Aircraft
Cessna	185	Airplane

Revenue Sightseeing Flight: No | Air Medical Transport Flight: No

Narrative

Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:

*** Note: NTSB investigators may not have traveled in support of this investigation and used data provided by various sources to prepare this aircraft accident report. ***

On July 21, 2003, about 1500 Alaska daylight time, a float-equipped Cessna 185 airplane, N8383Q, received minor damage to the right float assembly when it collided with a jet ski during the landing flare/touchdown at Big Lake, Alaska. The airplane was being operated as a visual flight rules (VFR) cross-country personal flight under Title 14, CFR Part 91, when the accident occurred. The airplane was operated by the pilot. The private certificated pilot, the sole occupant, was not injured. The operator of the jet ski received serious injuries. Visual meteorological conditions prevailed. The flight originated at the Lake Hood Seaplane Base, Anchorage, Alaska, about 1445. No flight plan was filed, nor was one required.

During a telephone conversation with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), on July 22, the pilot reported that he planned to land near Hulen Point on Big Lake. He indicated that the airplane's landing lights and strobe lights were on. He said he scanned the landing area from 500 feet as he overflew the lake, and again at 100 feet during the landing approach. As the airplane was in the landing flare, about 2 feet before touchdown, the pilot said he noticed a blurred object on the right side of the airplane, moving perpendicular to his direction of landing. He then felt and heard an impact on the right float. When the airplane settled off step, the pilot turned the airplane and observed a jet ski and rider in the water. He noticed other witnesses coming to the aid of the rider. His airplane began to list as the right float assembly began to fill with water, and he beached the airplane.

The pilot provided repair information for the right float of his airplane. Repairs were performed to the underside of the float, specifically, on the right sister keelson at the step bulkhead, and along the keel area, aft of the step bulkhead.

During a telephone conversation with the NTSB IIC on July 23, the operator of the jet ski reported that she is a member of a jet ski club, and at the time of the accident was practicing for an endurance ride on Big Lake. She said she was riding a stand-up type of ski that utilized a vertical handle, and she was wearing a jet ski helmet and goggles. She said that she had just come abeam Hulen Point, and was headed east about 30 feet from the shore. She indicated that she made sure no one was coming around the point, and began to accelerate. She then saw an airplane coming at her from her left side. The airplane collided with the upper handle portion of her jet ski. She said that the nose of the jet ski was not damaged, and at the time of the collision, the airplane had not touched the water. The operator said the jet ski does not have a speedometer, but she estimated her speed as between 20 to 35 mph. She reported that she sustained multiple breaks of the bones of her left arm, and received a slight concussion, but did not lose consciousness.

A review of the Federal Aviation Administration (FAA) Federal Aviation Regulations (FARs) and the U.S. Coast Guard's Inland Navigation Rules, disclosed no right-of-way regulations pertaining to an airborne seaplane and a vessel on the water.

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: ANC03LA084	
Occurrence Date: 07/21/2003	
Occurrence Type: Accident	

Narrative (Continued)

FAR 91.113, Right-of-Way rules: Except water operations, requires each person operating an aircraft to see and avoid other aircraft. FAR 91.115, Right-of-Way rules: Water operations, applies to right-of-way regulations when an aircraft is operated on the water. The U.S. Coast Guard's Inland Navigation Rules contain a requirement that vessel operators maintain a proper look-out by sight and hearing to make a full appraisal of the risk of collision with other vessels, and to adhere to right-of-way rules for vessels and seaplanes operated on the water.

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National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: ANC03LA084
Occurrence Date: 07/21/2003
Occurrence Type: Accident

Landing Facility/Approach Information

Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
		Ft. MSL			

Runway Surface Type:

Runway Surface Condition:

Approach/Arrival Flown: NONE

VFR Approach/Landing: Full Stop

Aircraft Information

Aircraft Manufacturer	Model/Series	Serial Number
Cessna	185	18503675

Airworthiness Certificate(s): Normal

Landing Gear Type: Float

Amateur Built Acft? No	Number of Seats: 4	Certified Max Gross Wt. 3350 LBS	Number of Engines: 1

Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:
Reciprocating	CONTINENTAL	IO-520-D	300 HP

- Aircraft Inspection Information

Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time
Annual	01/2003	35 Hours	1082 Hours

- Emergency Locator Transmitter (ELT) Information

ELT Installed?/Type Yes /	No	ELT Aided in Locating Accident Site? No

Owner/Operator Information

Registered Aircraft Owner	Street Address		
GORDON THOMPSON	City: ANCHORAGE	State: AK	Zip Code: 99501

Operator of Aircraft	Street Address		
GORDON THOMPSON	City: ANCHORAGE	State: AK	Zip Code: 99501

Operator Does Business As:

Operator Designator Code:

- Type of U.S. Certificate(s) Held: None

Air Carrier Operating Certificate(s):

Operating Certificate:

Operator Certificate:

Regulation Flight Conducted Under: Part 91: General Aviation

Type of Flight Operation Conducted: Personal

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: ANC03LA084

Occurrence Date: 07/21/2003

Occurrence Type: Accident

First Pilot Information

Name	City	State	Date of Birth	Age
On File	On File	On File	On File	59

Sex: M | Seat Occupied: Left | Occupational Pilot? Business | Certificate Number: On File

Certificate(s): Private

Airplane Rating(s): Single-engine Land; Single-engine Sea

Rotorcraft/Glider/LTA: None

Instrument Rating(s): None

Instructor Rating(s): None

Current Biennial Flight Review? 06/2002

Medical Cert.: Class 3 | Medical Cert. Status: Valid Medical--w/ waivers/lim. | Date of Last Medical Exam: 05/2003

- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Mult-Engine	Night	Instrument Actual	Instrument Simulated	Rotorcraft	Glider	Lighter Than Air
Total Time	1669	1600	1669	0	30		10			
Pilot In Command(PIC)	1669	1600	1669	0	30		10			
Instructor										
Instruction Received										
Last 90 Days	25	25	25							
Last 30 Days	15	15	15							
	2	2	2							

Yes Yes No No

Flight Plan/Itinerary

Type of Flight Plan Filed: None

Departure Point	State	Airport Identifier	Departure Time	Time Zone
ANCHORAGE	AK	PALH	1445	ADT

Destination	State	Airport Identifier
Same as Accident/Incident Location		

Type of Clearance: None

Type of Airspace: Class G

Weather Information

Pilot's Source of Wx Information:

No record of briefing

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National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: ANC03LA084

Occurrence Date: 07/21/2003

Occurrence Type: Accident

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
			Ft. MSL	NM	Deg. Mag.

Sky/Lowest Cloud Condition: Ft. AGL | Condition of Light: Day

Lowest Ceiling: Overcast 2500 Ft. AGL | Visibility: 20 SM | Altimeter: "Hg

Temperature: 13 °C | Dew Point: °C | Weather Conditions at Accident Site: Visual Conditions

Wind Direction: 130 | Wind Speed: 8 | Wind Gusts:

Visibility (RVR): Ft. | Visibility (RVV) SM

Precip and/or Obscuration:

Accident Information

Aircraft Damage: Minor | Aircraft Fire: None | Aircraft Explosion None

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot				1	1
Second Pilot					
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew					
Passengers					
- TOTAL ABOARD -				1	1
Other Ground		1			1
- GRAND TOTAL -		1		1	2

DRAFT

National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: ANC03LA084
	Occurrence Date: 07/21/2003
	Occurrence Type: Accident

Administrative Information

Investigator-In-Charge (IIC)

SCOTT ERICKSON

Additional Persons Participating in This Accident/Incident Investigation:

WENDELL WILLIAMS
FAA-AL-ANC FSDO 03
ANCHORAGE, AK

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National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: ANC06LA059	Aircraft Registration Number: N1543
	Occurrence Date: 05/22/2006	Most Critical Injury: Serious
	Occurrence Type: Accident	Investigated By: NTSB

Location/Time

Nearest City/Place	State	Zip Code	Local Time	Time Zone
Kodiak	AK	99615	1300	AKD

Airport Proximity: Off Airport/Airstrip | Distance From Landing Facility:

Aircraft Information Summary

Aircraft Manufacturer	Model/Series	Type of Aircraft
de Havilland	DHC-2	Airplane

Revenue Sightseeing Flight: Yes | Air Medical Transport Flight: No

Narrative

Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:

*** Note: NTSB investigators may not have traveled in support of this investigation and used data provided by various sources to prepare this aircraft accident report. ***

On May 22, 2006, about 1300 Alaska daylight time, an amphibious float-equipped de Havilland DHC-2 airplane, N1543, sustained substantial damage when it collided with ocean waves during takeoff-initial climb from Hallo Bay, Alaska, about 65 miles west-northwest of Kodiak, Alaska. The airplane, operated as a visual flight rules (VFR) cross-country air tour flight under Title 14, CFR Part 135, by Andrew Airways, Kodiak, subsequently rolled inverted after an emergency landing on the water. The commercial certificated pilot, a company guide, and one passenger, received minor injures. The remaining three passengers received serious injuries. Visual meteorological conditions prevailed, and company VFR flight following procedures were in effect. The flight originated from Hallo Bay, a remote area of the Alaska Peninsula, and was en route to Kodiak.

During a telephone conversation with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), on May 24, the director of operations for the operator reported that the accident flight was the return portion of a tour to the Katmai National Park. The tour consisted of a flight from Kodiak, a landing on the water at Hallo Bay, and the passengers going ashore with the company guide for two hours of bear viewing, prior to a return flight to Kodiak.

During a telephone conversation with the NTSB IIC on May 25, the pilot reported that after boarding the passengers for the return flight, he began the takeoff run toward the north, about 30 yards from and parallel to the beach. He said the wind was from the north between 15 to 20 knots, which produced a few white caps on the waves. The airplane climbed to about 10 to 15 feet, when the pilot said a windshear was encountered. He said the wind came from the northwest about 30 knots, which pushed the airplane down and toward the east. The airplane's floats struck a wave, missed about 4 to 5 swells, and then struck another wave, which produced a loud "bang." The company guide, seated in the right front seat, told the pilot that the right float assembly was broken and displaced upward. The airplane cleared a few additional swells, and then settled onto the water. Both float assemblies were crushed upward, and the left float began flooding. The guide exited the airplane onto the right float, and made a distress call via a satellite telephone. All occupants donned a life preserver as the airplane began sinking, left side low. The pilot said that after about 15 minutes, the rising water level in the airplane necessitated an evacuation, and all occupants exited into the water via the right door, and held onto the right float as the airplane rolled left. The pilot said he entered the water about 1320. The airplane remained floating from the right float, and was being moved away from shore by wind and wave action. The pilot said that one passenger was washed away from the float within about 5 minutes, and two more passengers followed shortly thereafter. About 1325, the pilot said he lost his grip on the float, and became unconscious after only about 5 minutes in the water. He said he did not remember anything further until regaining consciousness in a hospital. He said he had minor injuries, but was told by medical staff that he had been severely hypothermic.

Narrative (Continued)

One passenger reported that when the airplane landed at Hallo Bay on the flight from Kodiak, the wind conditions were steady, the sea conditions were choppy, with wave heights of about 3 feet. The passenger said the conditions at the time of departure included increased winds, with sea conditions of 4 to 6 feet.

In telephone interviews with the NTSB IIC, several passengers reported their experiences upon entering the water while waiting for rescue. They were consistent in their reporting of quickly losing the ability to grasp the airplane, becoming unconscious within several minutes, and regaining consciousness after rewarming in the hospital.

Company Information

The operator conducts on-demand commercial flight operations, and in the summer months, provides bear watching air tour flights. The tour includes a 1 hour flight to Hallo Bay, 2 hours of bear watching, and a 1 hour return flight. The operator reported that the single-engine airplane was equipped with a turbine engine and amphibious floats. The airplane had inflatable life preservers that were stored in a pouch under each seat. A briefing about their location was provided when the passengers boarded the airplane. The operator does not demonstrate life preserver-donning technique. The airplane was not equipped with an inflatable raft. Operational control of all flight operations is the responsibility of the director of operations.

Search and Rescue Information

U.S. Coast Guard C-130 airplanes were already airborne on a training mission, and diverted to help rescue the occupants. About 1320, the C-130s flew overhead, and began rescue operations by dropping inflatable rafts. The company guide was the only one able to climb into a raft. One Coast Guard helicopter was on a training mission nearby, and a second helicopter was dispatched from Kodiak to the area. Upon arrival at the accident scene, helicopter crews completed the rescue using rescue hoists and rescue swimmers.

The Coast Guard defines cold water as 59 degrees F or less. According to a chart provided by the Coast Guard, the estimated time to a loss of useful consciousness for a person wearing a life preserver in 59 degree water, but without any protective clothing, is about 90 minutes. In 50 degree water, the chart indicated that a loss of useful consciousness is less than 60 minutes, and in 41 degree water, it is about 30 minutes.

Additional Information

The flight from Kodiak Island to Hallo Bay, located on the east shore of the Alaska Peninsula, crosses the ocean waters of Shelikof Strait in the Gulf of Alaska. The shortest distance across the strait is about 25 miles. Under Title 14, CFR Part 135, Federal Aviation Administration (FAA) regulations permit air taxi operations at a minumum altitude of 500 feet agl. When operated over water, landplanes must be operated at an altitude sufficient to reach the nearest shoreline in the event of an engine failure. There is no such altitude requirement for seaplanes. FAA regulations do not require airplanes operated over-water to have a raft unless it is operated 50 miles, or more, from the nearest shoreline. Life preservers are required for operations over water.

The Safety Board has previously investigated ditching accidents involving seaplanes, landplanes, and helicopters. These investigations have highlighted the unplanned nature of ditchings, and the hazards of egress into the water. In 1999, the Safety Board issued recommendations to the FAA to enhance survivability of passengers of single-engine aircraft that are operated over water. These recommendations would require all occupants of single-engine airplanes, and single-engine helicopters operated for hire (air taxi and air tour) to wear life preservers when the aircraft is operated over water, whether float-equipped or not, unless it is operated at an altitude that allows it to reach a suitable landing area in the case of an engine failure. In addition, the Safety Board asked the FAA to require briefings on ditching procedures and the use of required flotation equipment for all air taxi and air tour passenger flights that operate over water at an altitude that would not allow them to reach a suitable landing area, including those that operate less than 50 miles from the shoreline.

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: ANC06LA059

Occurrence Date: 05/22/2006

Occurrence Type: Accident

Narrative (Continued)

The FAA responded to these recommendations in 2000, by stating they were issuing a notice of proposed rule making (NPRM) to require passengers on commercial air tour flights operated over water or beyond any shoreline to wear a life preserver, unless the operator could show that the water over which the aircraft operated was not of such size and depth that wearing a life preserver would be required for the survival of it occupants in the event the flight terminated in that water. The FAA has not issued any rulemaking to require air taxi passengers to wear a life preserver in single-engine aircraft when operated over water. As of 2001, the Safety Board had classified the life preserver recommendation to the FAA as "Open-Unacceptable Response," and the briefing requirement is classified as "Open-Acceptable Response." In 2003, the FAA issued a NPRM on National Air Tour Standards, which is still under review.

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National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: ANC06LA059	
Occurrence Date: 05/22/2006	
Occurrence Type: Accident	

Landing Facility/Approach Information

Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
		Ft. MSL	NA		

Runway Surface Type:

Runway Surface Condition:

Approach/Arrival Flown: NONE

VFR Approach/Landing: None

Aircraft Information

Aircraft Manufacturer	Model/Series	Serial Number
de Havilland	DHC-2	1687TB55

Airworthiness Certificate(s): Normal

Landing Gear Type: Retractable - Amphibian; Float

Amateur Built Acft?	Number of Seats	Certified Max Gross Wt.	Number of Engines
No	9	5000 LBS	1

Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:
Turbo Prop	Pratt & Whitney Canada	PT6-A27	690 HP

- Aircraft Inspection Information

Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time
100 Hour	05/2006	Hours	16360 Hours

- Emergency Locator Transmitter (ELT) Information

ELT Installed?/Type		ELT Aided in Locating Accident Site?
Yes /	Yes	No

Owner/Operator Information

	Street Address	City	State	Zip Code
Registered Aircraft Owner: Andrew Airways Inc.	P.O. Box 1037	Kodiak	AK	99615
Operator of Aircraft: Andrew Airways Inc.	P.O. Box 1037	Kodiak	AK	99615

Operator Does Business As:

Operator Designator Code: D4NA

- Type of U.S. Certificate(s) Held:

Air Carrier Operating Certificate(s): On-demand Air Taxi

Operating Certificate:

Operator Certificate:

Regulation Flight Conducted Under: Part 135: Air Taxi & Commuter

Type of Flight Operation Conducted: Non-scheduled; Domestic; Passenger Only

This space for binding

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: ANC06LA059

Occurrence Date: 05/22/2006

Occurrence Type: Accident

First Pilot Information

Name	City	State	Date of Birth	Age
On File	On File	On File	On File	34

Sex: M	Seat Occupied: Left	Occupational Pilot?	Certificate Number: On File

Certificate(s): Airline Transport; Commercial

Airplane Rating(s): Multi-engine Land; Single-engine Land; Single-engine Sea

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): None

Current Biennial Flight Review? 05/2006

Medical Cert.: Class 2	Medical Cert. Status: With Waivers/Limitations	Date of Last Medical Exam: 03/2006

- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Mult-Engine	Night	Instrument Actual	Instrument Simulated	Rotorcraft	Glider	Lighter Than Air
Total Time	7460	40	5880	2040	450	200	85			
Pilot In Command(PIC)	6814	40	5800	1600						
Instructor										
Instruction Received										
Last 90 Days	120	5	120							
Last 30 Days	50	5	50							
	2	1	2							

Yes Yes No No

Flight Plan/Itinerary

Type of Flight Plan Filed: Company VFR

Departure Point	State	Airport Identifier	Departure Time	Time Zone
Same as Accident/Incident Location			1300	ADT

Destination	State	Airport Identifier
Kodiak	AK	PADQ

Type of Clearance: None

Type of Airspace:

Weather Information

Pilot's Source of Wx Information:

This space for binding

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: ANC06LA059	
Occurrence Date: 05/22/2006	
Occurrence Type: Accident	

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
			Ft. MSL	NM	Deg. Mag.

Sky/Lowest Cloud Condition: Clear Ft. AGL | Condition of Light: Day

Lowest Ceiling: None Ft. AGL | Visibility: 30 SM | Altimeter: 29.92 "Hg

Temperature: 16 °C | Dew Point: °C | Weather Conditions at Accident Site: Visual Conditions

Wind Direction: 360 | Wind Speed: 20 | Wind Gusts:

Visibility (RVR): Ft. | Visibility (RVV) SM

Precip and/or Obscuration:
No Obscuration; No Precipitation

Accident Information

Aircraft Damage: Substantial | Aircraft Fire: None | Aircraft Explosion None

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot			1		1
Second Pilot					
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew					
Passengers		3	2		5
- TOTAL ABOARD -		3	3		6
Other Ground					
- GRAND TOTAL -		3	3		6

Administrative Information

Investigator-In-Charge (IIC)

Scott Erickson

Additional Persons Participating in This Accident/Incident Investigation:

Jack Devlin
FAA-AL-ANC FSDO 03
Anchorage, AK

National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: ATL01LA032	Aircraft Registration Number: N208KW
	Occurrence Date: 01/31/2001	Most Critical Injury: None
	Occurrence Type: Accident	Investigated By: NTSB

Location/Time

Nearest City/Place	State	Zip Code	Local Time	Time Zone
KEY WEST	FL	33045	1040	EST

Airport Proximity: On Airport/Airstrip | Distance From Landing Facility:

Aircraft Information Summary

Aircraft Manufacturer	Model/Series	Type of Aircraft
Cessna	208	Airplane

Revenue Sightseeing Flight: Yes   Air Medical Transport Flight: No

Narrative

Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:

*** Note: NTSB investigators may have traveled in support of this investigation and used data provided by various sources to prepare this aircraft accident report. ***

On January 31, 2001, at 1040 eastern standard time, a Cessna 208, N208KW, collided with water during landing off-shore in the Dry Tortugas National Park near Fort Jefferson, 70 miles west of Key West, Florida. The airplane was operated by Seaplanes of Key West, and flown by the Airline Transport Pilot (ATP) under the provisions of Title 14 CFR Part 135, and visual flight rules. Visual meteorological conditions prevailed and a visual flight rules flight plan was filed for the local sightseeing flight. The pilot and nine passengers were not injured and the airplane sustained substantial damage. The flight originated from Key West, Florida, at 1000.

According to the pilot, while making a normal approach, including a flyby to evaluate landing conditions, he observed that one of the ferryboats was arriving in the south channel. He planned and performed a water landing to avoid any past wake swells created by the ferry boat in the landing area. Approximately 1/2 to 3/4 through the landing slide, with the airplane slowed to approximate 30 - 35 knots, a large swell appeared and launched the airplane 10-15 feet above the water. This swell was completely separated from the boat wake that had been observed earlier. The pilot further stated that, at this point, he was "powerless" to do anything but wait for the airplane to settle. After the airplane settled on the water, the pilot taxied to shallow water where assistance was received from park service in deplaning the airplane.

The examination of the airplane disclosed that the rear float/strut attach point had failed and the strut assembly had penetrated the airframe skin. No mechanical problems with the airplane were reported by the pilot. According to the pilot, the swell that launched the airplane during the landing was not seen until it was too late for him to avoid the collision.

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National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: ATL01LA032
Occurrence Date: 01/31/2001
Occurrence Type: Accident

Landing Facility/Approach Information

Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
Key West International	KEYW	Ft. MSL			

Runway Surface Type: Water

Runway Surface Condition: Water--calm

Approach/Arrival Flown: NONE

VFR Approach/Landing: Full Stop

Aircraft Information

Aircraft Manufacturer	Model/Series	Serial Number
Cessna	208	20800292

Airworthiness Certificate(s): Normal

Landing Gear Type: Amphibian

Amateur Built Acft? No	Number of Seats: 10	Certified Max Gross Wt. 8360 LBS	Number of Engines: 1

Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:
Turbo Prop	P&W	PT8-114A	675 LBS

- Aircraft Inspection Information

Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time
Continuous Airworthiness	01/2001	0.5 Hours	1787 Hours

- Emergency Locator Transmitter (ELT) Information

ELT Installed?/Type Yes /	No	ELT Aided in Locating Accident Site? No

Owner/Operator Information

Registered Aircraft Owner	Street Address		
SEAPLANES OF KEY WEST	3471 SOUTH ROOSEVELT BLVD		
	City	State	Zip Code
	KEY WEST	FL	33040

Operator of Aircraft	Street Address		
SEAPLANES OF KEY WEST	3471 SOUTH ROOSEVELT BLVD		
	City	State	Zip Code
	KEY WEST	FL	33040

Operator Does Business As:

Operator Designator Code: SZ8A

- Type of U.S. Certificate(s) Held:

Air Carrier Operating Certificate(s): On-demand Air Taxi

Operating Certificate:

Operator Certificate:

Regulation Flight Conducted Under: Part 135: Air Taxi & Commuter

Type of Flight Operation Conducted: Non-scheduled; Domestic; Passenger Only

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National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: ATL01LA032 Occurrence Date: 01/31/2001 Occurrence Type: Accident

First Pilot Information

Name	City	State	Date of Birth	Age
On File	On File	On File	On File	45

Sex: M	Seat Occupied: Left	Occupational Pilot? Civilian Pilot	Certificate Number: On File

Certificate(s): Airline Transport

Airplane Rating(s): Single-engine Land; Single-engine Sea

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): None

Current Biennial Flight Review? 12/2000

Medical Cert.: Class 2	Medical Cert. Status: Valid Medical--no waivers/lim.	Date of Last Medical Exam: 03/2000

- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Mult-Engine	Night	Instrument Actual	Instrument Simulated	Rotorcraft	Glider	Lighter Than Air
Total Time	15000	2620			400	100	50			
Pilot In Command(PIC)	14700	2595								
Instructor										
Instruction Received										
Last 90 Days	140	110								
Last 30 Days	65	55								
	0	0								

Yes Yes No No

Flight Plan/Itinerary

Type of Flight Plan Filed: None

Departure Point	State	Airport Identifier	Departure Time	Time Zone
Same as Accident/Incident Location		EYW	1000	EST

Destination	State	Airport Identifier
Local Flight		EYW

Type of Clearance: None

Type of Airspace: Class C

Weather Information

Pilot's Source of Wx Information:

No record of briefing

This space for binding

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: ATL01LA032

Occurrence Date: 01/31/2001

Occurrence Type: Accident

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
MIA	0956	EST	8 Ft. MSL	NM	Deg. Mag.

Sky/Lowest Cloud Condition: Clear Ft. AGL | Condition of Light: Day

Lowest Ceiling: None Ft. AGL | Visibility: 10 SM | Altimeter: 30.10 "Hg

Temperature: 23 °C | Dew Point: 19 °C | Weather Conditions at Accident Site: Visual Conditions

Wind Direction: 150 | Wind Speed: 8 | Wind Gusts:

Visibility (RVR): Ft. | Visibility (RVV) SM

Precip and/or Obscuration:

DRAFT

Accident Information

Aircraft Damage: Substantial | Aircraft Fire: None | Aircraft Explosion None

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot				1	1
Second Pilot					
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew					
Passengers				9	9
- TOTAL ABOARD -				10	10
Other Ground					
- GRAND TOTAL -				10	10

National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: ATL01LA032	
	Occurrence Date: 01/31/2001	
	Occurrence Type: Accident	

Administrative Information

Investigator-In-Charge (IIC)

BUTCH WILSON

Additional Persons Participating in This Accident/Incident Investigation:

Ron Bird
MIAMI FSDO
MIAMI, FL

National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: CEN10LA427	Aircraft Registration Number: N7812K
	Occurrence Date: 07/24/2010	Most Critical Injury: Fatal
	Occurrence Type: Accident	Investigated By: NTSB

Location/Time

Nearest City/Place	State	Zip Code	Local Time	Time Zone
Davant	LA	70040	1035	CDT

Airport Proximity: Off Airport/Airstrip | Distance From Landing Facility:

Aircraft Information Summary

Aircraft Manufacturer	Model/Series	Type of Aircraft
CESSNA	180/J	Airplane

Revenue Sightseeing Flight: No | Air Medical Transport Flight: No

Narrative

Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:

*** Note: NTSB investigators may not have traveled in support of this investigation and used data provided by various sources to prepare this aircraft accident report. ***

HISTORY OF FLIGHT

On July 24, 2010, about 1035 central daylight time, a Cessna 180J single engine airplane, N7812K, was substantially damaged during a water landing in the vicinity of Davant, Louisiana. The pilot receiving instruction was fatally injured and the certified flight instructor (CFI) was not injured. The airplane was registered to and operated by Southern Aviation, LLC, under the provisions of 14 Code of Federal Regulations Part 91 as an instructional flight. Day visual meteorological conditions prevailed and no flight plan was filed. The local flight originated about 1020 from Southern Seaplane Airport (65LA), Belle Chase, Louisiana.

A review of the flight track from New Orleans Approach Control radar data revealed the airplane departed 65LA and flew south bound at an altitude that varied between 1,000 feet to 1,600 feet mean sea level (msl), until 10:30:33. The airplane started a descent down to 1,400 feet msl and initiated a left turn down at 10:33:32. The last radar return was at 10:34: 44 when the airplane was at 300 feet msl, west of the accident location and northeast of Davant, Louisiana.

The CFI was seated in the right seat and the pilot receiving instruction was seated in the left seat. The CFI stated that neither he nor the pilot were using the shoulder harnesses because they restricted their full range of motion. The pilot receiving instruction was flying the airplane and was making a straight in water landing to a bayou that the CFI estimated was about 150-feet wide. The CFI stated, "I had my hands in front of the control yoke as a common practice to prevent the nose from going forward. The approach seemed normal. Upon touchdown the nose appeared to be slightly nose forward or flat. It was not far enough forward to deem the landing unsafe. As we landed, the aircraft seemed to decelerate rapidly. I cannot recall if the yoke hit my hands, but at this time I applied corrective pressure to pull back the yoke. As I pulled back on the yoke the aircraft had begun to flip over slowly."

According to the CFI, during the landing neither he nor the pilot used a gentle back pressure on the elevator control to compensate for any tendency for the nose to drop, or to close the throttle when the airplane was on the water to maintain the touchdown attitude until the airplane began to come off the step.

After the airplane came to rest inverted and partially submerged, the CFI exited the airplane through the right cabin door. The pilot did not exit the airplane. The CFI was unsuccessful in retrieving the pilot and waved down two fishermen in a boat. After several attempts the non-responsive pilot was pulled from the airplane after he had been in the water for an estimated 5 to 10 minutes.

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: CEN10LA427

Occurrence Date: 07/24/2010

Occurrence Type: Accident

Narrative (Continued)

The fisherman who pulled the pilot out of the cockpit said the pilot's seatbelt was already unfastened.

PERSONNEL INFORMATION

The 39-year-old pilot receiving instruction for an-add on rating in seaplanes, held an ATP certificate with a rating for rotorcraft-helicopter including privileges for helicopter-instrument. In addition, he held commercial pilot privileges with ratings for airplane single and multiengine land and instrument airplane. The pilot's ATP certificate was reissued on April 28, 2008, after the original certificate was reported as lost or stolen. The pilot held a CFI certificate with ratings for airplane single and multiengine airplane, helicopter, instrument airplane and instrument helicopter, which was issued on February 25, 2010. He also held an airframe and powerplant mechanic certificate issued on April 28, 2008. The pilot held a first-class medical certificate issued on February 2, 2009, without limitations.

According to his employer's company records, the pilot had 3,800 total flight hours with more than 3,400 hours in helicopters. The pilot's only previous experience in seaplanes was 2.9 hours of instruction in a "Super Cub", and the 15 minutes of instruction in the accident airplane on the morning of the accident. The pilot's personal logbook showed he had flown 17.7 hours in the past 7 days, 38.2 hours in the past 14 days, and 62.9 days hours in the past 30 days. The logbook indicated the pilot did not fly from July 16 through July 19, 2010. A review of the pilot's logbook revealed his employer's flight and duty time limits were not exceeded. The pilot's most recent flight review was conducted on January 13, 2010.

The 56-year-old CFI, held an ATP certificate with ratings for airplane single-engine land, single-engine sea, multiengine land, and instrument airplane issued on February 27, 2010. In addition, he held a CFI certificate with ratings for airplane single-engine and instrument airplane. He also held a first-class medical certificate with the restriction, "Holder shall possess glasses for near and intermediate vision." The CFI's most recent flight review was completed on May 11, 2010.

The CFI indicated on the NTSB Pilot/Operator Aircraft Accident/Incident Report that he had 18,663 total flight hours, of which 3,000 plus hours were in the same make and model as the accident airplane. In addition, he had 16,368 hours as pilot-in-command, of which 2,700 plus hours were in the same make and model as the accident airplane. He had flown 2,124 hours as a CFI, of which 1,000 plus hours were in the same make and model as the accident airplane. In the past 90 days, he had flown 168 hours, of which 3 hours were in the same make and model as the accident airplane. In the last 30 days, he had flown 75 hours, of which 2 hours were in the same make and model as the accident airplane. In the last 24 hours before the accident, he had flown 30 minutes, which were in the same make and model as the accident airplane.

AIRCRAFT INFORMATION:

The Cessna 180J single-engine airplane, serial number 18052746, was a high wing, semimonocoque design airplane, with a fixed float landing gear, and was configured for a maximum of four occupants. The airplane was manufactured and delivered from Cessna Aircraft Company on August 11, 1976. The airplane was equipped with Edo model 628-2960 floats. The airplane was powered by an air-cooled, horizontally opposed, carbureted, Teledyne Continental Motors O-470-S engine, rated at 230 horsepower, driving a McCauley controllable pitch propeller.

An aircraft maintenance logbook entry stated the original logbooks were lost during Hurricane Katrina in 2005. The registered owner stated the airplane was purchased three months before the accident. A review of the airplane logbooks revealed the last annual inspection was completed on February 2, 2010 at a tachometer time of 154 hours and a total airframe time of 2,690.4 hours. The total airframe hours at the time of the accident were 2,758 hours.

METEOROLOGICAL INFORMATION

The 1055 surface weather observation at New Orleans Naval Air Station Joint Reserve Base (KNBG), New Orleans, Louisiana, located 15 miles northwest miles of the accident site showed the wind was from 040 degrees at 8 knots, visibility 10 miles, few clouds at 3,000 feet, temperature 29 degrees Celsius, dew point temperature 22 degrees Celsius, and altimeter setting of 30.07 inches of Mercury.

Narrative (Continued)

WRECKAGE INFORMATION

The airplane was located inverted and partially submerged in a 150-foot wide bayou channel northeast of Davant, Louisiana. The airplane was briefly examined at the scene before being placed on a barge and transported to 65LA for a postaccident examination.

Examination of the propeller system and propeller blades revealed the propeller remained attached to the propeller crankshaft flange. The propeller blades and propeller spinner were not damaged. The lower left engine cowling was damaged. The left windshield support bar was bent aft.

The instrument panel remained in place. The throttle was observed to be out 3/4 inch, the propeller control was out 1/2 inch, and the mixture setting was full rich. The water rudders were up and the flaps were extended to 20 degrees. The fuel selector valve was in the both position. Continuity of the flight controls was confirmed aft to all flight control surfaces. A global positioning system (GPS) receiver was removed and sent to the NTSB Vehicle Recorders Laboratory for download. The data download showed that no track recording information was available.

The airplane was equipped with bagged inflatable life vests, which were still in their sealed bags and were not in use at the time of the accident. The left cabin door remained attached and the door was in the closed position. The door handle was in the unlocked position. Both forward cabin seats were on their respective seat tracks and locked in position. When tested, the seats moved on their tracks without binding.

The installed left and right forward seatbelts and shoulder harness were approved after-market equipment manufactured by Aircraft Belts, Inc. The seatbelts were part number GKA 432654-EG-810, manufacturing date 04/09, with a rated strength of 3000 pounds. The installed shoulder harnesses were a fixed (non-inertial reel) type, part number GKA 432654-EG-810, manufacturing date 04/09, with a rated strength of 2500 pounds.

During a postaccident exam of the left seatbelt, when latched it would not unlatch. The seatbelt was forwarded to the NTSB Materials Laboratory for further analysis. Examination of deformation of the left seatbelt assembly indicated that excessive force was applied after the buckle was latched and tension on the belt prevented the rotation of the locking mechanism.

The rear bench seat remained attached to the cabin floor. The original landing gear struts had been removed from the airplane and were replaced with fixed float landing gear. The Edo 628-2960 floats remained attached to the fuselage and were not damaged.

The right wing remained attached at the wing root. The leading edge of the right wing was bent down and aft about 77 inches outboard of the wing root. The remaining section of the wing, extending outboard to the wing tip sustained damaged and the upper wing skin was wrinkled. The right wing fuel cap was intact with a tight seal. The right wing fuel tank was not ruptured and fuel was present in the right wing fuel tank. The right aileron was damaged and remained attached at all attachment points. The right flap remained attached at all attachment points and was extended. The right wing strut remained attached at the wing and the fuselage attachment point.

The empennage, vertical fin, rudder, left and right horizontal stabilizers, and elevators were not damaged.

The left wing remained attached at the wing root. The leading edge of the left wing was bent aft about 18 inches inboard of the wing tip. The upper wing skin surface was displaced downward on the upper wing surface of the left wing, about 77 inches outboard of the wing root and extended outboard to the wing tip. The left wing fuel cap was intact with a tight seal. The left wing fuel tank was not ruptured and fuel was present in the fuel tank. The left aileron was damaged and remained attached at all attachment points. The left flap remained attached at all attachment points and was extended.

Narrative (Continued)

The left wing strut remained attached at the wing and the fuselage attachment point.

Examination of the engine assembly revealed the engine assembly and all accessories remained attached to the engine mounts and the firewall was not damaged. The bottom sparkplugs were removed and the electrodes were normal when compared to the Champion Aviation Check-A Plug Chart. The carburetor filter was free of debris.

No preaccident mechanical malfunctions or failures of the airplane or the engine were found that would have precluded normal operation.

MEDICAL AND PATHOLOGICAL INFORMATION

The Jefferson Parrish Forensic Pathologist, Harvey, Louisiana, conducted the autopsy on the pilot receiving instruction on July 26, 2010. The cause of death was asphyxia due to drowning associated with small airplane crash.

The Bioaeronautical Research Science Laboratory, FAA, Oklahoma City, Oklahoma performed a postmortem toxicology of specimens from the pilot. The report stated no carbon monoxide and no cyanide were detected in the blood. No ethanol was detected in the urine. Chlorpheniramine of an unspecified quantity was detected in the blood and urine.

ADDITIONAL INFORMATION:

Review of the FAA Seaplane, Skiplane, and Float/Ski Equipped Helicopter Operations Handbook states in Chapter 6, Seaplane Operations-Landings, "NORMAL LANDING…As the seaplane approaches the water's surface smoothly raise the nose to the appropriate pitch attitude for touchdown. As the floats contact the water, use gentle back pressure on the elevator control to compensate for any tendency of the nose to drop. When the seaplane is definitely on the water, close the throttle and maintain the touchdown attitude until the airplane begins to come off the step. Once it begins to settle into the plowing attitude, apply full up elevator to keep the nose as high as possible and minimize spray hitting the propeller."
Updated on Oct 4 2012 1:10PM

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National Transportation Safety Board
FACTUAL REPORT AVIATION

NTSB ID: CEN10LA427

Occurrence Date: 07/24/2010

Occurrence Type: Accident

Landing Facility/Approach Information

Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
		Ft. MSL	N/A		

Runway Surface Type:

Runway Surface Condition:

Approach/Arrival Flown:

VFR Approach/Landing:

Aircraft Information

Aircraft Manufacturer	Model/Series	Serial Number
CESSNA	180/J	18052746

Airworthiness Certificate(s): Normal

Landing Gear Type: Float;

Amateur Built Acft? No	Number of Seats: 4	Certified Max Gross Wt. 2950 LBS	Number of Engines: 1

Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:
Reciprocating	CONTINENTAL	O470	230 HP

- Aircraft Inspection Information

Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time
Annual	02/2010	68 Hours	2758 Hours

- Emergency Locator Transmitter (ELT) Information

ELT Installed?/Type Yes / C91-A		ELT Aided in Locating Accident Site? No

Owner/Operator Information

	Street Address			
Registered Aircraft Owner: SOUTHERN AVIATION LLC	8594 HIGHWAY 23			
	City: BELLE CHASSE	State: LA	Zip Code: 70037-2533	
Operator of Aircraft: SOUTHERN AVIATION LLC	Street Address: 8594 HIGHWAY 23			
	City: BELLE CHASSE	State: LA	Zip Code: 70037-2533	

Operator Does Business As: Southern Seaplane Inc

Operator Designator Code: SSCA

- Type of U.S. Certificate(s) Held:

Air Carrier Operating Certificate(s): On-demand Air Taxi

Operating Certificate:

Operator Certificate:

Regulation Flight Conducted Under: Part 91: General Aviation

Type of Flight Operation Conducted: Instructional

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: CEN10LA427

Occurrence Date: 07/24/2010

Occurrence Type: Accident

First Pilot Information

Name	City	State	Date of Birth	Age
On File	On File	On File	On File	56

Sex: M | Seat Occupied: Right | Occupational Pilot? Yes | Certificate Number: On File

Certificate(s): Airline Transport

Airplane Rating(s): Multi-engine Land; Single-engine Land

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): Airplane Single-engine

Current Biennial Flight Review? 05/2010

Medical Cert.: Class 1 | Medical Cert. Status: Without Waivers/Limitations | Date of Last Medical Exam: 04/2010

- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Mult-Engine	Night	Instrument Actual	Instrument Simulated	Rotorcraft	Glider	Lighter Than Air
Total Time	18663	3000	17318	1344	652	407	171	0	0	0
Pilot In Command(PIC)	16368	2700	15024	1344	652	407	171			
Instructor	2124	1000	2124	0	100	0	150			
Instruction Received										
Last 90 Days	168	3	158	10	13	3	0			
Last 30 Days	75	3	156	2	7	1	0			
	1	1	1		0	0	0			

Yes No No Yes

Flight Plan/Itinerary

Type of Flight Plan Filed: None

Departure Point	State	Airport Identifier	Departure Time	Time Zone
Belle Chase	LA	65LA	1020	CDT

Destination	State	Airport Identifier
Local Flight	LA	65LA

Type of Clearance: None

Type of Airspace:

Weather Information

Pilot's Source of Wx Information:

Unknown

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: CEN10LA427

Occurrence Date: 07/24/2010

Occurrence Type: Accident

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
KNBG	1055	CDT	2 Ft. MSL	15 NM	317 Deg. Mag.

Sky/Lowest Cloud Condition: Few 3000 Ft. AGL | Condition of Light: Day

Lowest Ceiling: Broken 8000 Ft. AGL | Visibility: 10 SM | Altimeter: 30.07 "Hg

Temperature: 29 °C | Dew Point: 22 °C | Weather Conditions at Accident Site: Visual Conditions

Wind Direction: 40 | Wind Speed: 8 | Wind Gusts:

Visibility (RVR): Ft. | Visibility (RVV) SM

Precip and/or Obscuration:
No Obscuration; No Precipitation

Accident Information

Aircraft Damage: Substantial | Aircraft Fire: None | Aircraft Explosion None

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot					
Second Pilot	1				1
Student Pilot					
Flight Instructor				1	1
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew					
Passengers					
- TOTAL ABOARD -	1			1	2
Other Ground					
- GRAND TOTAL -	1			1	2

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National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: CEN10LA427 Occurrence Date: 07/24/2010 Occurrence Type: Accident

Administrative Information

Investigator-In-Charge (IIC)

Thomas Latson

Additional Persons Participating in This Accident/Incident Investigation:

Michael E Waldron
FAA Baton Rouge FSDO
Baton Rouge, LA

Steven Rauch
Department of the Interior
Boise, ID

Richard Kemp
Department of the Interior, National Park Service
Fairbanks, AK

Tom Moody
Cessna Airplane Company
Wichita, KS

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National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: ERA10LA390	Aircraft Registration Number: N369E
	Occurrence Date: 08/01/2010	Most Critical Injury: Fatal
	Occurrence Type: Accident	Investigated By: NTSB

Location/Time

Nearest City/Place	State	Zip Code	Local Time	Time Zone
Rockwood	ME	04478	1115	EDT

Airport Proximity: Off Airport/Airstrip | Distance From Landing Facility:

Aircraft Information Summary

Aircraft Manufacturer	Model/Series	Type of Aircraft
CESSNA	A185F	Airplane

Revenue Sightseeing Flight: No | Air Medical Transport Flight: No

Narrative

Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:

*** Note: NTSB investigators may not have traveled in support of this investigation and used data provided by various sources to prepare this aircraft accident report. ***

HISTORY OF FLIGHT

On August 1, 2010, about 1115 eastern daylight time, a float equipped Cessna A185F, N369E, nosed over while landing on Moosehead Lake near Rockwood, Maine. The airplane had departed the Steven A. Bean Municipal Airport (8B0), Rangeley, Maine. Visual meteorological conditions prevailed and no flight plan had been filed. The certificated airline transport pilot was fatally injured and the passenger was uninjured. The airplane received substantial damage, The personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91.

According to a statement given by the passenger to a Federal Aviation Administration (FAA) inspector and the Maine State Police, just prior to the airplane making contact with the water, the pilot made a verbal expression and immediately after making contact with the water, the airplane went to the left and nosed over. She also informed the FAA inspector that they departed a paved surface at 8B0. The passenger reported to the Maine State Police that on the morning of the accident, the pilot "wasn't feeling well;" however, after breakfast "he was feeling much better and felt he was fine to fly." She also reported that "they had a normal flight" and the area of the accident was "the same area he always lands."

PERSONNEL INFORMATION

The pilot, age 64, held an airline transport pilot certificate with a rating for airplane multiengine land and type ratings for the Douglas DC 3, Grumman 1159, HS-125, and N-265. He also held a commercial pilot certificate, with ratings for airplane single-engine land, airplane single-engine sea, airplane multiengine sea, and rotorcraft-helicopter. His most recent FAA second-class medical certificate was issued on May 13, 2010, and at that time the pilot indicated 23,390 total hours of flight experience.

AIRPLANE INFORMATION

The airplane was manufactured in 1980 and was issued an FAA airworthiness certificate on February 6, 1980. The airplane's most recent annual/100-hour inspection was accomplished on January 14, 2010, at the time of the inspection the airplane had accrued 5,610.1 total hours and had indicated a tachometer time of 685.3 hours.

The airplane was an all-metal, high-wing design with a Whipaire amphibious landing gear system installed. It was equipped with a Continental IO-520-D engine. According to aircraft logbook entries and FAA records, the amphibious landing gear system was installed on the airplane on May 23, 2000.

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: ERA10LA390

Occurrence Date: 08/01/2010

Occurrence Type: Accident

Narrative (Continued)

The airplane would be equipped with either the Whipline 3450 amphibious floats or skis depending on the time of year and the amphibious floats were re-installed on the airplane on June 23, 2010. A main landing gear and a nose landing gear were installed in each float. The gear system was hydraulically actuated and driven by two electric hydraulic pumps. The selection of gear up or gear down was accomplished with a cockpit mounted selector handle. Gear position indicator lights were located on a panel beside the selector handle. There were four blue indicator lights, one for each gear, which illuminated when the landing gear was retracted for a water landing. There were four green indicator lights, one for each gear, which illuminated when the landing gear was extended for a runway landing.

Additionally, the airplane was equipped with a Lake and Air Amphibian Landing Gear Position Advisory System. The system consisted of an air data computer and an annunciator light/pushbutton mounted on the instrument panel. It sensed landing gear position and airspeed and provided advisories to the pilot visually through the amber "GEAR ADVISORY" annunciator light and aurally through the airplane audio system. The system is designed to turned on automatically upon receiving normal electrical power.

METEORLOGICAL INFORMATION

The 1056 recorded weather observation at the Greenville Municipal Airport (3B1), Greenville, Maine, located approximately 15 miles to the southeast of the accident location, included calm wind, temperature 20 degrees C, dew point 11 degrees C; altimeter 30.09 inches of mercury.

WRECKAGE AND IMPACT

The accident airplane was examined by an FAA inspector at the accident site. According to pictures provided by the FAA, the outboard section of the left wing beginning about mid-span was bent in the positive direction approximately 15 degrees. The floats remained attached at all fittings; no punctures or damage was observed to the floats. The left float was buckled, and all four of the landing gear wheels were in the down or extended position.

According to an FAA inspector and a representative from Cessna Aircraft, the engine and cylinders were drained, the magnetos were removed and reinstalled, and the damaged left wing was removed, by a local mechanic. The mechanic stated that the engine had been ran using the right fuel tank and it ran well all the way to full power. The mechanic also stated that the electric landing gear motor was not functional, but he was able to pump the gear up and down using the hydraulic hand pump. Power was re-applied to the aircraft after all non-gear warning system circuit breakers and switches were pulled or turned off. Four green lights were observed on the landing gear control panel indicating the gear was down and locked. The yellow illuminated "Gear Advisory" warning annunciator was pushed and held in for at least 5 seconds in unsuccessful attempts to initiate a system self test. According to Wipaire, Inc., the test should provide audio voices, but only static could be heard through the over-head speaker, headphones, and internal audio panel speaker. Eventually, the audio panel circuit breaker tripped, which concluded further testing using aircraft power.

The gear advisory warning box was removed from the pilot's side kick panel and the potentiometer controlling the airspeed at which the audible gear warning is heard was set to the number 8 setting which corresponds to 78 KIAS. The gear warning box cover was removed to facilitate photo documenting the position of the potentiometer and corrosion was noted to two of the power transistors and a diode on the circuit board. The gear advisory system that was installed on the airplane was designed to function without input from the pilot. During takeoff and climb, as the airspeed of the airplane increased through a predetermined threshold value, the system would arm automatically. As the airplane slowed for landing and the airspeed decreased through the same predetermined threshold value, the annunciator light would have began blinking and one of the following messages would have been heard over the audio system "GEAR IS UP FOR WATER LANDING," " GEAR IS DOWN FOR RUNWAY LANDING," or "CHECK GEAR." These advisories are designed to continue until the pilot canceled them by pressing the annunciator light.

MEDICAL AND PATHOLOGICAL INFORMATION

A postmortem examination of the pilot was performed by the State of Maine, Office of the Chief Medical Examiner.

Narrative (Continued)

The cause of death was reported as drowning.

The FAA's Civil Aerospace Medical Institute performed forensic toxicology on specimens from the pilot. The report stated that no carbon monoxide, cyanide, or ethanol was detected. 170.28 ug/ml, ug/g Acetaminophen was detected in the urine and 9.503 ug/ml, ug/g was detected in the blood, 0.05 ug/ml, ug/g Dihydrocodeine was detected in the urine, Diphenhydramine was detected in the urine and 0.091 ug/ml, ug/g was detected in blood, 0.138 ug/ml, ug/g Hydrocodone was detected in urine, 0.074 ug/ml, ug/g hydromorphone was detected in urine, Losartan, Norprophoxyphene, were detected in the blood, Losartan, Quinine, and 0.131 ug/ml, ug/g Norpropoxyphene were detected in the urine.

According to medical records obtained by the Safety Board, on July 19, 2010, the pilot had a biopsy completed on several small ulcers and was diagnosed with stomach cancer. On July 30, 2010 he had a scan performed and no metastatic disease was found and that surgery would be scheduled. Earlier in the month the pilot had been hospitalized for pancreatitis and had an electrocardiography (EKG) completed, with normal results. Other medical records indicated that the pilot had been experiencing back pain.

SURVIVAL ASPECTS

The seat belts were examined by an FAA inspector and a representative from Cessna Aircraft, in an attempt to determine if the pilot was utilizing his restraint. Crease marks were observed in the belt webbing at the location of the buckle on the passenger's seat belt. Crease marks were observed in the same location on the pilot's seat belt in addition to lengthwise creasing of the shoulder harness and stretching of the webbing near an area of abrasion on the lap belt. Both seats remained intact and attached to the seat rails and could be moved freely along the rails after fully disengaging the locking pins. The pilot's seat was equipped with an auto-tensioning belt style secondary seat stop and the unit functioned normally as the pilot's seat was moved fore and aft along the seat rail.

Both doors operated normally and could be latched and re-opened. No impact damage was noted to the glareshield or instrument panel with the exception of the landing gear switch.

The tubular steel cross braces that run diagonally across the windshield were intact and no impact damaged was noted; however, the pilot's side cross brace was bent aft approximately mid position, approximately where one might place a hand to help reposition the seat or pull themselves forward or upward.

ADDITIONAL INFORMATION

According to the FAA Seaplane, Skiplane, and Float/Ski Equipped Helicopter Operations Handbook, FAA-H-8083-23 (Chapter 6, Seaplane Operations-Landings), "In Seaplanes equipped with retractable landing gear (amphibians), it is extremely important to make certain that the wheels are retracted when landing on water. Wherever possible, make a visual check of the wheels themselves, in addition to checking the landing gear position indicators. A wheels-down landing on water is almost certain to capsize the seaplane, and is far more serious than landing the seaplane on land with the wheels up..."
Updated on Oct 17 2011 10:52AM

This space for binding

National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: ERA10LA390
	Occurrence Date: 08/01/2010
	Occurrence Type: Accident

Landing Facility/Approach Information

Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
		Ft. MSL			

Runway Surface Type: Water

Runway Surface Condition: Water--calm

Approach/Arrival Flown: NONE

VFR Approach/Landing: Full Stop

Aircraft Information

Aircraft Manufacturer	Model/Series	Serial Number
CESSNA	A185F	18504000

Airworthiness Certificate(s): Normal

Landing Gear Type: Amphibian

Amateur Built Acft? No	Number of Seats: 6	Certified Max Gross Wt. 3320 LBS	Number of Engines: 1

Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:
Reciprocating	CONT MOTOR	IO-520-D	285 HP

- Aircraft Inspection Information

Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time
Annual	01/2010	Hours	5610 Hours

- Emergency Locator Transmitter (ELT) Information

ELT Installed?/Type Yes /		ELT Aided in Locating Accident Site? No

Owner/Operator Information

Registered Aircraft Owner	Street Address		
POINT GROUP LLC	City: BANGOR	State: ME	Zip Code: 04401-4342

Operator of Aircraft	Street Address		
Telford Allen	City: Rockwood	State: ME	Zip Code: 04478

Operator Does Business As:	Operator Designator Code:

- Type of U.S. Certificate(s) Held: None

Air Carrier Operating Certificate(s):

Operating Certificate:	Operator Certificate:

Regulation Flight Conducted Under: Part 91: General Aviation

Type of Flight Operation Conducted: Personal

This space for binding

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: ERA10LA390

Occurrence Date: 08/01/2010

Occurrence Type: Accident

First Pilot Information

Name	City	State	Date of Birth	Age
On File	On File	On File	On File	64

Sex: M | Seat Occupied: Left | Occupational Pilot? No | Certificate Number: On File

Certificate(s): Airline Transport; Commercial

Airplane Rating(s): Multi-engine Land; Multi-engine Sea; Single-engine Land; Single-engine Sea

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane; Helicopter

Instructor Rating(s): None

Current Biennial Flight Review?

Medical Cert.: Class 2 | Medical Cert. Status: With Waivers/Limitations | Date of Last Medical Exam: 05/2010

- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Mult-Engine	Night	Instrument Actual	Instrument Simulated	Rotorcraft	Glider	Lighter Than Air
Total Time	23390									
Pilot In Command(PIC)										
Instructor										
Instruction Received										
Last 90 Days										
Last 30 Days										

Unknown Unknown No

Flight Plan/Itinerary

Type of Flight Plan Filed: None

Departure Point	State	Airport Identifier	Departure Time	Time Zone
Rangeley	ME	8B0		

Destination	State	Airport Identifier
Same as Accident/Incident Location		

Type of Clearance: None

Type of Airspace:

Weather Information

Pilot's Source of Wx Information:

Unknown

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: ERA10LA390
Occurrence Date: 08/01/2010
Occurrence Type: Accident

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
GNR	1056	EDT	1401 Ft. MSL	15 NM	151 Deg. Mag.

Sky/Lowest Cloud Condition: Clear Ft. AGL | Condition of Light: Day

Lowest Ceiling: None Ft. AGL | Visibility: SM | Altimeter: 30.09 "Hg

Temperature: 20 °C | Dew Point: 11 °C | Weather Conditions at Accident Site: Visual Conditions

Wind Direction: | Wind Speed: Calm | Wind Gusts:

Visibility (RVR): Ft. | Visibility (RVV) SM

Precip and/or Obscuration:
No Obscuration; No Precipitation

Accident Information

Aircraft Damage: Substantial | Aircraft Fire: None | Aircraft Explosion None

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot	1				1
Second Pilot					
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew					
Passengers				1	1
- TOTAL ABOARD -	1			1	2
Other Ground					
- GRAND TOTAL -	1			1	2

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: ERA10LA390	
Occurrence Date: 08/01/2010	
Occurrence Type: Accident	

Administrative Information

Investigator-In-Charge (IIC)

Shawn Etcher

Additional Persons Participating in This Accident/Incident Investigation:

Dennis P Tremblay
FAA/FSDO
Portland, ME

This space for binding

National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: ERA10LA391	Aircraft Registration Number: N914SR
	Occurrence Date: 08/02/2010	Most Critical Injury: Fatal
	Occurrence Type: Accident	Investigated By: NTSB

Location/Time

Nearest City/Place	State	Zip Code	Local Time	Time Zone
Winter Haven	FL	33881	1115	EDT

Airport Proximity: Off Airport/Airstrip | Distance From Landing Facility:

Aircraft Information Summary

Aircraft Manufacturer	Model/Series	Type of Aircraft
TURCK G L/DUFLO J T	SEA REY	Airplane

Revenue Sightseeing Flight: No | Air Medical Transport Flight: No

Narrative

Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:

*** Note: NTSB investigators may not have traveled in support of this investigation and used data provided by various sources to prepare this aircraft accident report. ***

HISTORY OF FLIGHT

On August 2, 2010, at 1115 eastern daylight time, an experimental amateur-built Duflo Sea Rey, N914SR, experienced a loss of control during an approach for landing at Jack Brown's Seaplane Base (F57) Winter Haven, Florida. Visual meteorological conditions prevailed and no flight plan was filed. The personal flight was operated in accordance with 14 Code of Federal Regulations Part 91. The certificated private pilot was killed. The flight originated at F57 about 1113.

One witness stated that he was helping to get seaplanes into Lake Jessie when he observed the accident seaplane on a very slow climb out, with a high angle of attack from the lake. It appeared to the witness as if the pilot was "hanging the aircraft on the prop." The seaplane barely cleared the trees at the edge of the lake and made a left climbing turn as if the pilot was trying to gain altitude. The witness walked towards an office and observed the seaplane on what appeared to be a base leg for landing. He was not sure if the seaplane was going to land on the runway or in the lake. The seaplane made a steep left turn and entered a left spin. The seaplane rotated about one complete turn before it impacted the lake in a nose-down attitude.

Another witness was on final approach to runway 5 at F57 while conducting an instructional flight with a student. The instructor pilot heard the accident pilot report a left base on the common traffic advisory frequency. The instructor looked back over his shoulder and observed the Sea Rey at his 8 o'clock position about 400 feet above the ground. The landing gear was not extended and the nose of the Sea Rey was pitched up extremely high. The airplane was observed to stall, enter a spin to the left and impacted the lake in a 90-degree nose down attitude.

PERSONNEL INFORMATION

The pilot, age 64, held a private pilot certificate issued on April 10, 2010, with ratings for airplane single-engine land, multiengine land, and instrument airplane. The pilot did not have a single-engine sea rating. The pilot held a Federal Aviation Administration (FAA) third-class medical certificate issued on July 25, 2008, with the restriction, "must have available glasses for near vision." The pilot indicated on his application for the medical certificate that he had 3,000 total flight hours. The pilot's logbook was not located. His total flight time and last flight review could not be determined.

AIRCRAFT INFORMATION

The two-seat single-engine airplane, serial number 1DK160, was issued a certificate of registration on April 19, 2000. Its maximum gross weight was 1,370 pounds.

Narrative (Continued)

It was powered by a Rotax 914, 115-horsepower engine, with a turbocharger, and was equipped with an Ivo two-bladed magnum fixed propeller. Review of the aircraft logbooks revealed the last condition inspection was conducted on July 10, 2009. The tachometer reading was 147 hours. The tachometer at the crash site indicated 184.9 total hours.

METEOROLOGICAL INFORMATION

The Lakeland Linder Regional Airport, Lakeland, Florida, located 14 miles northwest of the crash site, 1050 surface weather observation was: winds calm, visibility 10 miles, broken clouds at 9,000 feet, temperature 32 degrees Celsius, dew point temperature 22 degrees Celsius, and altimeter 30.02 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The seaplane wreckage was located in Lake Jessie about 300 feet east of the west shoreline of the 900 block of Lake Jessie Drive in Winter Haven, Florida. The Polk County Sheriff's Office Marine Unit, agricultural deputies, and members of the Fish and Game assisted in the recovery of the seaplane from the lake to a seaplane ramp at F57.

The forward nose deck, windshield, and upper canopy were separated from the nose of the hull, extending aft to the forward root support and pylon assembly. The instrument panel was damaged and was separated from the nose deck. The left and right seats were intact and attached to the main bulkhead and the forward support tube. The pilot seatbelt was released by a witness who dove into the lake to assist the pilot.

The hour meter at the accident site indicated 184.9 hours. The throttle was at mid range, and the fuel selector was in the on position.

Continuity of the flight controls was confirmed from the control sticks aft to all flight control surfaces. The fuel tank was not ruptured. Fuel and water was present in the fuel tank. The left and right main landing gear was in the retracted position.

The right wing remained attached to the spar yoke and the root tube assembly. The leading edge of the right wing was damaged about 2 feet outboard of the wing root, and the leading edge spar was bent about 5 degrees. The trailing edge wing spar was bowed about 5 degrees about 4 feet outboard of the wing root attachment. The upper and lower wing fabric was damaged. The forward and aft wing strut remained attached to the fuselage and the wing. The main float support tube with float assembly remained attached to the wing. The right flap and right aileron was not damaged and remained attached to its attachment points. The right flap remained attached to its attachment points and was damaged. The position of the flaps was not determined.

The baggage area and side windows were in position and damaged. The empennage was intact. The vertical fin and rudder assembly was intact and not damaged. The right horizontal stabilizer remained attached to the vertical fin. The fabric was damaged and the trailing edge was bowed upward. The leading edge of the horizontal stabilizer was not damaged.

The right elevator remained attached to all attachment points. The leading edge of the elevator was bowed downward and the trailing edge was not damaged. The left horizontal stabilizer and elevator were not damaged. The stabilizer trim was in the mid trim range which equated to normal flight trim range. The tail support cable was intact and not damaged. The tail wheel was in the retracted position.

The left wing remained attached to the spar yoke and the root tube assembly. The leading edge spar of the left wing was not damaged. The sheet metal cuff was damaged. The trailing edge wing spar was intact and not damaged. The upper and lower wing fabric was damaged. The forward and aft wing strut remained attached to the fuselage and the wing. The main float support tube with float assembly remained attached to the wing. The left flap remained attached to its attachment points and was not damaged. The position of the left flap was not determined.

Narrative (Continued)

The left aileron remained attached to its attachment points and was not damaged.

The airplane was recovered to a hangar maintained by the Winter Haven Police Department and secured pending examination of the engine assembly by the manufacture under the supervision of an FAA inspector.

Examination of the engine was conducted on August 4, 2010. After draining the oil from the block, the lower spark plugs were removed and the cylinders were drained of water. With the spark plugs removed the engine was rotated by hand by turning the propeller. Compression and suction was obtained on all cylinders and water was ejected from the cylinders with force. Continuity of the crankshaft was confirmed to the rear accessory gears and to the valve train.

Oil was inserted into each cylinder for preservation of the engine. The sparkplugs were reinstalled to prevent loss or further contamination. The visual examination revealed no anomalies that prevented the engine from being removed for a test run. The engine was removed and transported to an authorized repair center for an engine run on August 17, 2010.

The engine exhibited damage to the electronic waste gate control to the servo motor and the waste gate cable. The inlet air hose from the turbo and the air box were removed as well as the electronic control wiring. The turbocharger was free of damage and had residual water and oil accumulated in the inlet air section which was removed by syringe. The turbo shaft was free and would spin without any contact with the housing. The waste gate lever was free and without jamming or sticking.

The engine was connected to the engine test bed and all required components were connected. The engine was started using the electric starter motor. The idle was maintained at 2,000 rpm or more to warm the oil and to maintain a visual lookout for leakage of any fuel, water, water, or oil. Once the engine reached an oil operational temperature of 120 degrees Fahrenheit, the engine was shut down for visual inspection before initiating a power run.

The engine was restarted and ran at 4,000 rpm. The oil pressure was normal at 45 to 50 psi. A magneto test was performed on system A and the magneto dropped 1,000 rpm. The magneto test was repeated on system A and B and varied between 150 to 300 rpm. When on both ignitions the engine ran as normal. The engine was increased from 4,000 rpm to 4, 500 rpm, but failed to reach 5,000 rpm, stopping at 4,900 rpm. There were no mechanical or electrical problems with the engine noted during the engine run or examination.

MEDICAL AND PATHOLOGICAL INFORMATION

The Florida District 10 Medical Examiner's Office, Winter Haven, Florida, performed a postmortem examination of the pilot on August 3, 2010. The cause of death was determined to be "blunt impact to head and torso." The Bioaeronautical Research Sciences Laboratory, FAA, Oklahoma City, Oklahoma, performed postmortem toxicology testing of specimens from the pilot. The specimens were negative for carbon monoxide, cyanide, ethanol, basic, acidic, and neutral drugs.

ADDITIONAL INFORMATION

Review of the Sea Rey Performance and Specifications indicated that with a Rotax 914 engine installed, with one pilot, the stall speed was 38 mph. Sea Ray stated in a notice, "The above performance specifications were derived from flight testing in several factory built Sea Reyes which were expertly built and rigged and were flown in perfect conditions by a highly experienced Sea Rey pilot."
Updated on Apr 7 2011 12:01PM

This space for binding

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: ERA10LA391

Occurrence Date: 08/02/2010

Occurrence Type: Accident

Landing Facility/Approach Information

Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
Jack Brown Seaplane Base	F57	140 Ft. MSL	N/A		

Runway Surface Type:

Runway Surface Condition:

Approach/Arrival Flown: NONE

VFR Approach/Landing: Traffic Pattern

Aircraft Information

Aircraft Manufacturer	Model/Series	Serial Number
TURCK G L/DUFLO J T	SEA REY	1DK160

Airworthiness Certificate(s): Experimental (Special)

Landing Gear Type: Retractable - Tailwheel

Amateur Built Acft?	Number of Seats	Certified Max Gross Wt.	Number of Engines
Yes	2	1400 LBS	1

Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:
Reciprocating	Rotax	914	115 HP

- Aircraft Inspection Information

Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time
Conditional	07/2009	38 Hours	185 Hours

- Emergency Locator Transmitter (ELT) Information

ELT Installed?/Type		ELT Aided in Locating Accident Site?
Yes / C91	No	No

Owner/Operator Information

Registered Aircraft Owner	Street Address	City	State	Zip Code
Delmer B. Taylor		Okeechobee	FL	

Operator of Aircraft	Street Address	City	State	Zip Code
Delmer B. Taylor		Okeechobee	FL	

Operator Does Business As:

Operator Designator Code:

- Type of U.S. Certificate(s) Held: None

Air Carrier Operating Certificate(s):

Operating Certificate:

Operator Certificate:

Regulation Flight Conducted Under: Part 91: General Aviation

Type of Flight Operation Conducted: Personal

This space for binding

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: ERA10LA391

Occurrence Date: 08/02/2010

Occurrence Type: Accident

First Pilot Information

Name	City	State	Date of Birth	Age
On File	On File	On File	On File	64

Sex: M | Seat Occupied: Left | Occupational Pilot? No | Certificate Number: On File

Certificate(s): Private

Airplane Rating(s): Multi-engine Land; Single-engine Land

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): None

Current Biennial Flight Review?

Medical Cert.: Class 3 | Medical Cert. Status: With Waivers/Limitations | Date of Last Medical Exam: 07/2008

- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Mult-Engine	Night	Instrument Actual	Instrument Simulated	Rotorcraft	Glider	Lighter Than Air
Total Time	3000	0								
Pilot In Command(PIC)										
Instructor										
Instruction Received										
Last 90 Days										
Last 30 Days										

Yes Yes Yes No

Flight Plan/Itinerary

Type of Flight Plan Filed: None

Departure Point	State	Airport Identifier	Departure Time	Time Zone
Same as Accident/Incident Location		F57	1113	EDT

Destination	State	Airport Identifier
Local Flight	FL	F57

Type of Clearance: None

Type of Airspace: Class G

Weather Information

Pilot's Source of Wx Information:

National Weather Service

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: ERA10LA391

Occurrence Date: 08/02/2010

Occurrence Type: Accident

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
LAL	1050	EDT	142 Ft. MSL	14 NM	253 Deg. Mag.

Sky/Lowest Cloud Condition: Scattered 9000 Ft. AGL

Condition of Light: Dawn

Lowest Ceiling: None Ft. AGL

Visibility: 10 SM

Altimeter: 30.02 "Hg

Temperature: 32 °C

Dew Point: 22 °C

Weather Conditions at Accident Site: Visual Conditions

Wind Direction:

Wind Speed: Calm

Wind Gusts:

Visibility (RVR): Ft.

Visibility (RVV) SM

Precip and/or Obscuration:
No Obscuration; No Precipitation

Accident Information

Aircraft Damage: Substantial

Aircraft Fire: None

Aircraft Explosion None

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot	1				1
Second Pilot					
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew					
Passengers					
- TOTAL ABOARD -	1				1
Other Ground					
- GRAND TOTAL -	1				1

This space for binding

National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: ERA10LA391 Occurrence Date: 08/02/2010 Occurrence Type: Accident

Administrative Information

Investigator-In-Charge (IIC)

Carrol A. Smith

Additional Persons Participating in This Accident/Incident Investigation:

David King
FAA/FSDO
Orlando, FL

Eric Tucker
Rotax Flying and Safety Club

This space for binding

National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: ERA11LA451	Aircraft Registration Number: N8737Q
	Occurrence Date: 08/12/2011	Most Critical Injury: Minor
	Occurrence Type: Accident	Investigated By: NTSB

Location/Time

Nearest City/Place	State	Zip Code	Local Time	Time Zone
Arcadia	FL	34266	1440	EDT

Airport Proximity: Off Airport/Airstrip | Distance From Landing Facility:

Aircraft Information Summary

Aircraft Manufacturer	Model/Series	Type of Aircraft
CESSNA	U206F	Airplane

Revenue Sightseeing Flight: Yes | Air Medical Transport Flight: No

Narrative

Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:

*** Note: NTSB investigators may not have traveled in support of this investigation and used data provided by various sources to prepare this aircraft accident report. ***

On August 12, 2011, at 1440 eastern daylight time, a Cessna U206F, N8737Q, registered to Coastal Aero LLC and operated by Key West Seaplanes, collided with trees during a forced landing in the vicinity of Arcadia, Florida. The airplane sustained structural damage to the wings, fuselage, and a post-crash fire ensued. Visual meteorological conditions prevailed and no flight plan was filed. The sightseeing flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. The certificated commercial pilot sustained minor injuries and the four passengers were not injured. The flight was originating at the time of the accident.

The pilot stated that during the water takeoff he used 10 degrees of flaps to get the airplane on "plane." Once the airplane began to climb, he added another 10 degrees of flaps to climb out. He said that the airplane climbed to approximately 400 feet and would not maintain altitude. He said that the engine rpm remained high but the airplane began to descend. He initiated a forced landing into a wooded area and the airplane collided with trees. The pilot did not report any flight control anomalies prior to the accident.

The airplane came to rest in a wooded area. Trees along the crash debris line exhibited evidence of propeller slant cuts. Examination of the wreckage by a Federal Aviation Administration inspector revealed the engine assembly was separated from the firewall. The forward cabin area sustained extensive fire damage. Continuity of the flight controls was confirmed from the cabin area aft to all flight control surfaces.

The engine was recovered to an authorized repair facility for an engine examination. The engine was started and the throttle was gradually increased to full throttle. The engine produced 2,400 rpm, with manifold pressure at 29 inches, and the oil pressure was at 60 PSI. The engine throttle was reduced to near idle. The throttle was rapidly accelerated to full power twice and the engine performed without any hesitation, stumbling, or interruption in power. After approximately eight and a half minutes of run time, the engine power was reduced to near idle, and the engine idled smoothly until being shut down. There were no anomalies noted during the engine run that would have prevented normal operation. The logbooks were not recovered for review. According to the pilot, the logbooks were in the airplane at the time of the accident and were destroyed in the post crash fire.

The airplane had a certificated takeoff gross weight of 3,800 pounds, according to the Supplemental Type Certificate (STC) (SA01185CH), with an associated center of gravity between +40.0 to +47.4 inches. Utilizing the most recent weight and balance record, and the weights of the pilot and passengers, 45 gallons of fuel, engine oil, and baggage, the estimated weight of the airplane was at least 3,855 pounds with an associated center of gravity of 45.10 inches.

Narrative (Continued)

The pilot indicated in a statement that the maximum gross weight of the airplane was 3,800 pounds. He reported that the takeoff weight at the time of the accident was 3,695 pounds, with an associated center of gravity of 44.94 inches. The passenger and baggage weights that the pilot provided were estimated. A review of the supplement flight manual section on weight and balance warns that it is the responsibility of the pilot to ensure that the amphibian is loaded properly. Operation outside of prescribed weight and balance limitations could result in an accident and serious or fatal injury.

A review of recorded data from the Punta Gorda Airport (PGD) automated weather observation station revealed that six minutes after the accident, conditions were calm wind, visibility of 10 miles, cloud conditions few at 8,000 feet above ground level, temperature 31 degrees Celsius, dew point 19 degrees Celsius, and altimeter 29.87 inches of mercury. PGD is located about 26 miles northwest of the accident site. The density altitude at the time of the accident was approximately 2,297 feet. Review of the performance chart for an airplane with the same STC modification revealed that the airplane, in a clean configuration at a maximum gross weight of 3,800 pounds, should have been able to maintain a rate of climb of 600 feet per minute at approximately 65 knots. High density altitude and increased gross weight both adversely affect an airplane's climb performance. The presence of either or both conditions requires pilot vigilance to maintain adequate airspeed during takeoff and climb.

A review of the Federal Aviation Administration Accident Prevention Program for Density Altitude states that even at lower elevations, aircraft performance can become marginal and it may be necessary to reduce aircraft gross weight for safe operations. Therefore, it is advisable, when performance is in question, to schedule operations during the cool hours of the day, early morning or late afternoon, when forecast temperatures are expected to rise above normal. Early morning and late evening are sometimes more ideal for both departure and arrival.
Updated on Aug 12 2013 5:04PM

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National Transportation Safety Board **FACTUAL REPORT** **AVIATION**	NTSB ID: ERA11LA451 Occurrence Date: 08/12/2011 Occurrence Type: Accident

Landing Facility/Approach Information

Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
		Ft. MSL	N/A		

Runway Surface Type:

Runway Surface Condition:

Approach/Arrival Flown: NONE

VFR Approach/Landing: Forced Landing

Aircraft Information

Aircraft Manufacturer	Model/Series	Serial Number
CESSNA	U206F	U20603490

Airworthiness Certificate(s): Normal

Landing Gear Type: Amphibian;

Amateur Built Acft? No	Number of Seats: 6	Certified Max Gross Wt. 3800 LBS	Number of Engines: 1

Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:
Reciprocating	CONT MOTOR	IO 520 SERIES	285 HP

- Aircraft Inspection Information

Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time
Annual	06/2011	1 Hours	2420 Hours

- Emergency Locator Transmitter (ELT) Information

ELT Installed?/Type Yes / C91	No	ELT Aided in Locating Accident Site? No

Owner/Operator Information

Registered Aircraft Owner	Street Address		
COASTAL AERO LLC	2784 N ROOSEVELT BLVD		
	City	State	Zip Code
	KEY WEST	FL	33040-3904

Operator of Aircraft	Street Address		
Key West Seaplanes	717 Waddell Ave.		
	City	State	Zip Code
	Key		33040

Operator Does Business As:	Operator Designator Code:

- Type of U.S. Certificate(s) Held: None

Air Carrier Operating Certificate(s):

Operating Certificate:	Operator Certificate:

Regulation Flight Conducted Under: Part 91: General Aviation

Type of Flight Operation Conducted: Other Work Use

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: ERA11LA451

Occurrence Date: 08/12/2011

Occurrence Type: Accident

First Pilot Information

Name	City	State	Date of Birth	Age
On File	On File	On File	On File	44

Sex: M | Seat Occupied: Left | Occupational Pilot? Yes | Certificate Number: On File

Certificate(s): Commercial

Airplane Rating(s): Multi-engine Land; Multi-engine Sea; Single-engine Land; Single-engine Sea

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): Airplane Multi-engine; Airplane Single-engine; Instrument Airplane

Current Biennial Flight Review? 08/2011

Medical Cert.: Class 1 | Medical Cert. Status: With Waivers/Limitations | Date of Last Medical Exam: 06/2011

- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Mult-Engine	Night	Instrument Actual	Instrument Simulated	Rotorcraft	Glider	Lighter Than Air
Total Time	14000	3500	10000	4000	1000	3000	100			
Pilot In Command(PIC)	13900	3500	10000	4000	1000	3000				
Instructor	4800	200	4500	300	100	100				
Instruction Received					50	50				
Last 90 Days	160	130	160		10					
Last 30 Days	50	45	50		5					
	1	1	1							

Yes Yes No No

Flight Plan/Itinerary

Type of Flight Plan Filed: None

Departure Point	State	Airport Identifier	Departure Time	Time Zone
Arcadia	FL		1440	EDT

Destination	State	Airport Identifier
Local Flight	FL	

Type of Clearance: None

Type of Airspace:

Weather Information

Pilot's Source of Wx Information:

Internet

National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: ERA11LA451
	Occurrence Date: 08/12/2011
	Occurrence Type: Accident

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
PGD	1446	EDT	26 Ft. MSL	10 NM	45 Deg. Mag.

Sky/Lowest Cloud Condition: Clear Ft. AGL | Condition of Light: Day

Lowest Ceiling: Broken 4300 Ft. AGL | Visibility: 10 SM | Altimeter: 29.97 "Hg

Temperature: 32 °C | Dew Point: 23 °C | Weather Conditions at Accident Site: Visual Conditions

Wind Direction: 250 | Wind Speed: 10 | Wind Gusts:

Visibility (RVR): Ft. | Visibility (RVV) SM

Precip and/or Obscuration:
No Obscuration; No Precipitation

Accident Information

Aircraft Damage: Substantial | Aircraft Fire: Ground | Aircraft Explosion None

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot			1		1
Second Pilot					
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew					
Passengers				4	4
- TOTAL ABOARD -			1	4	5
Other Ground					
- GRAND TOTAL -			1	4	5

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National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: ERA11LA451	
	Occurrence Date: 08/12/2011	
	Occurrence Type: Accident	

Administrative Information

Investigator-In-Charge (IIC)

Eric Alleyne

Additional Persons Participating in This Accident/Incident Investigation:

Linda M Nevin
FAA/FSDO
Tampa, FL

Chris Lang
Continental Motors Inc.
Mobile, AL

National Transportation Safety Board
Factual Data Collection Report of Accident

ERA14CA021

Aircraft Reg No: N93037
Most Critial Injury: Minor

Location/Time		Aircraft Information	
Nearest City/Place:	Northeast Carry, ME	Type of Aircraft:	Airplane (not Homebuilt)
Occurrence Date:	10/19/2013	Make/Model:	Cessna / A185F
Occurrence Time:	1830 EST	Serial Number:	18503168
		Landing Gear:	Float
Flight Itinerary		Engine Type:	Reciprocating
		Engine Make/Model:	Continental / IO-520
Last Depart. Point:	Same as Accident/Incident Location	Aircraft Damage:	Substantial
Destination:	Same as Accident/Incident Location	Aircraft Fire:	None

Operator Information		Weather	
Registered Acft Owner:	COLEMAN SARAH B DBA	Condition of Light:	Night/Bright
Operator of Aircraft:	Thomas Coleman	Wx Cond. at Site:	Visual Conditions
Operator Address:	West Forks, ME		
Reg. Flt. Conducted Under:	Part 91: General Aviation		

First Pilot Information

Private; Single-engine Land; Single-engine Sea

Instrument Ratings:	None	Total All Aircraft:	277
Medical Cert:	Class 3	Total Make/Model:	109
Date of Last Med. Exam:	10/2011		

Injury Summary

	Fatal	Serious	Minor/None
Crew	0	0	1
Pass	0	0	1

Narrative

*** This investigation is based on information furnished by the Pilot/Operator. Additional details may be found in the Form 6120.1***

*** Note: NTSB investigators used data provided by various entities, including, but not limited to, the Federal Aviation Administration and/or the operator and did not travel in support of this investigation to prepare this aircraft accident report. ***

According to the pilot, night was approaching when he landed the seaplane on a lake and taxied to shore to find out he was at the wrong destination. The pilot then began to taxi along the shore, but then decided to take off again to regain his bearings and land at his intended destination. At the time of the takeoff, night had already fallen, the moon was full, there were no clouds and lighting was flat. Surface conditions were "full glass" with no ripples, and the airplane's navigation lights and landing lights were illuminated. The pilot flew the airplane out over the lake, intending to make a 180-degree turn and land back towards a dock. During the final turn, he lost "visual height reference," and after leveling the wings, he set up for a low-sink-rate, glassy water landing. He thought the airplane was about 100 feet above the water when it was only "mere feet" above the surface, which the airplane impacted at a high speed and a high sink rate. Upon impact, the floats tore off the airplane, which then nosed over. Both occupants exited, and as they were swimming to shore, they were picked up by a boat. The pilot did not note any preexisting mechanical anomalies that would have precluded normal operation. Federal Aviation Administration publication FAA-H-023 states, "night landings in seaplanes on open water are extremely dangerous with a high possibility of damage or loss of the seaplane. A night landing should only be performed in an extreme emergency when no other options are available." It also notes that glassy water conditions can make accurate depth perception very difficult, even for experienced pilots.
Updated on Feb 13 2014 12:24PM

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National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: FTW02LA156	Aircraft Registration Number: N1298L
	Occurrence Date: 05/19/2002	Most Critical Injury: None
	Occurrence Type: Accident	Investigated By: NTSB

Location/Time

Nearest City/Place	State	Zip Code	Local Time	Time Zone
Frankston	TX	75763	1230	CDT

Airport Proximity: Off Airport/Airstrip | Distance From Landing Facility:

Aircraft Information Summary

Aircraft Manufacturer	Model/Series	Type of Aircraft
Lake	LA4-200	Airplane

Revenue Sightseeing Flight: No | Air Medical Transport Flight: No

Narrative

Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:

*** Note: NTSB investigators may not have traveled in support of this investigation and used data provided by various sources to prepare this aircraft accident report. ***

On May 19, 2002, approximately 1230 central daylight time, a Lake LA4-200 amphibious airplane, N1298L, registered to and operated by a private individual, was substantially damaged during a water landing on Lake Palestine, near Frankston, Texas. The instrument rated commercial pilot and his passenger were not injured. Visual meteorological conditions prevailed and a flight plan was not filed for the Title 14 Code of Federal Regulations Part 91 personal flight. The local flight originated from the Aero Estates private airstrip near Frankston, Texas, at 1200.

The commercial pilot reported that he was considering buying the aircraft, and the purpose of the flight was to evaluate the airplane. The pilot added that after a 30-minute flight in the local area he elected to perform a water landing on Lake Palestine. While landing to the east, as the airplane touched down on the water, "a gust of wind caught the right wing and lifted it very quickly." The left wing sponson (float) then "caught the water" and the airplane "pulled" around resulting in damage to the engine support, wings, and fuselage.

The pilot estimated that the winds at the time of the accident were from the east at 08 knots.

In the NTSB Pilot/Operator Aircraft Accident Report, the pilot reported that he had accumulated over 1,100 flight hours in seaplanes and he had been a seaplane flight instructor for over 12 years. He further reported that "no action could have been taken to avoid this problem except not being there at that time."

Examination of the airplane after the accident revealed that the left float was separated from the wing and the left side of the fuselage was buckled.

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National Transportation Safety Board
FACTUAL REPORT AVIATION

NTSB ID:	FTW02LA156
Occurrence Date:	05/19/2002
Occurrence Type:	Accident

Landing Facility/Approach Information

Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
		Ft. MSL			

Runway Surface Type: Water

Runway Surface Condition: Water--calm

Approach/Arrival Flown: NONE

VFR Approach/Landing: Full Stop

Aircraft Information

Aircraft Manufacturer	Model/Series	Serial Number
Lake	LA4-200	761

Airworthiness Certificate(s): Normal

Landing Gear Type: Retractable - Amphibian

Amateur Built Acft?	Number of Seats:	Certified Max Gross Wt.	Number of Engines:
No	4	2400 LBS	1

Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:
Reciprocating	Lycoming	IO-360	200 HP

- Aircraft Inspection Information

Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time
Annual		Hours	Hours

- Emergency Locator Transmitter (ELT) Information

ELT Installed?/Type		ELT Aided in Locating Accident Site?
Yes /	Yes	No

Owner/Operator Information

Registered Aircraft Owner	Street Address		
Raymond E. Burch	651 County Road 1313		
	City	State	Zip Code
	Grand Saline	TX	75140

Operator of Aircraft	Street Address		
Danny L. Dugan	11640 Tailspin Trail		
	City	State	Zip Code
	Frankston	TX	75763

Operator Does Business As:

Operator Designator Code:

- Type of U.S. Certificate(s) Held: None

Air Carrier Operating Certificate(s):

Operating Certificate:

Operator Certificate:

Regulation Flight Conducted Under: Part 91: General Aviation

Type of Flight Operation Conducted: Personal

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National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: FTW02LA156
	Occurrence Date: 05/19/2002
	Occurrence Type: Accident

First Pilot Information

Name	City	State	Date of Birth	Age
On File	On File	On File	On File	52

Sex: M | Seat Occupied: Left | Occupational Pilot? Business | Certificate Number: On File

Certificate(s): Flight Instructor; Commercial

Airplane Rating(s): Multi-engine Land; Single-engine Land; Single-engine Sea

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): Airplane Single-engine; Instrument Airplane

Current Biennial Flight Review? 01/2002

Medical Cert.: Class 2 | Medical Cert. Status: Valid Medical--w/ waivers/lim. | Date of Last Medical Exam: 05/2001

- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Mult-Engine	Night	Instrument Actual	Instrument Simulated	Rotorcraft	Glider	Lighter Than Air
Total Time	2950	65	1790	7	211	64	124			
Pilot In Command(PIC)	2650	65	1790		200	30	50			
Instructor	1130	43	1130		50	64	76			
Instruction Received										
Last 90 Days	65	0	65							
Last 30 Days	21	7	21							
	3	1	3							

Yes | Yes | No | No

DRAFT

Flight Plan/Itinerary

Type of Flight Plan Filed: None

Departure Point	State	Airport Identifier	Departure Time	Time Zone
Same as Accident/Incident Location		NONE	1200	CDT

Destination	State	Airport Identifier
Local Flight		NONE

Type of Clearance: None

Type of Airspace: Class E

Weather Information

Pilot's Source of Wx Information:

Flight Service Station

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: FTW02LA156

Occurrence Date: 05/19/2002

Occurrence Type: Accident

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
			Ft. MSL	NM	Deg. Mag.

Sky/Lowest Cloud Condition: Clear Ft. AGL

Condition of Light: Day

Lowest Ceiling: None Ft. AGL

Visibility: 10 SM

Altimeter: 30.29 "Hg

Temperature: 19 °C

Dew Point: 7 °C

Weather Conditions at Accident Site: Visual Conditions

Wind Direction: 90

Wind Speed: 8

Wind Gusts:

Visibility (RVR): Ft.

Visibility (RVV) SM

Precip and/or Obscuration:

Accident Information

Aircraft Damage: Substantial

Aircraft Fire: None

Aircraft Explosion None

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot				1	1
Second Pilot					
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew					
Passengers				1	1
- TOTAL ABOARD -				2	2
Other Ground					
- GRAND TOTAL -				2	2

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National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: FTW02LA156 Occurrence Date: 05/19/2002 Occurrence Type: Accident	

Administrative Information

Investigator-In-Charge (IIC)

Alexander Lemishko

Additional Persons Participating in This Accident/Incident Investigation:

Alan Steinke
FAA
Dallas, TX

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: LAX04FA300	Aircraft Registration Number: N1238L
Occurrence Date: 08/21/2004	Most Critical Injury: Fatal
Occurrence Type: Accident	Investigated By: NTSB

Location/Time

Nearest City/Place	State	Zip Code	Local Time	Time Zone
Oroville	CA	95965	1145	PDT

Airport Proximity: Off Airport/Airstrip | Distance From Landing Facility:

Aircraft Information Summary

Aircraft Manufacturer	Model/Series	Type of Aircraft
Consolidated Aeronautics, Inc	Lake LA-4-200	Airplane

Revenue Sightseeing Flight: No | Air Medical Transport Flight: No

Narrative

Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:

*** Note: NTSB investigators either traveled in support of this investigation or conducted a significant amount of investigative work without any travel, and used data obtained from various sources to prepare this aircraft accident report. ***

HISTORY OF FLIGHT

On August 21, 2004, at 1145 Pacific daylight time, a Consolidated Aeronautics, Inc. Lake LA-4-200, N1238L, drug a pontoon during low-flight and descended into a lake about 4 miles southwest of Oroville Municipal Airport, Oroville, California. The airplane sank and was submerged in 15 feet of water. The private pilot was operating the airplane, registered to Take Flight, Inc., under the provisions of 14 CFR Part 91. The airplane was destroyed. The pilot and one passenger sustained fatal injuries. Visual meteorological conditions prevailed for the local area flight that departed from Live Oak earlier that day. No flight plan had been filed, nor was one required.

According to a family member of the pilot, the pilot and passenger were old friends. The purpose of the flight was for pleasure and they were intending to fly around the local area.

A witness, who was on a jet ski in the Thermalito Afterbay of Oroville Lake, noticed the airplane flying overhead. Due to the uniqueness of the airplane, he noticed it immediately. The airplane made one landing, took off again, then circled the area and landed again. The airplane taxied around to the boat area, and then someone in the airplane closed the cockpit door. The airplane started building speed, traveling southbound. As it lifted from the glassy-surfaced water, the airplane was about 20 feet above it, traveling about 70 miles per hour. Then, it "kissed" the surface of the water. It abruptly headed up to about 50 feet above the water. The airplane fell straight down and sank immediately. The witness could not recall what the attitude was of the airplane upon impact with the surface of the water.

An additional witness reported that he was sailing his boat in the afterbay. He saw the airplane make several touch-and-go landings on the water. As the airplane was headed in a southerly direction, it appeared to be attempting to land. The witness stated in part, "It seemed as though it hit the water too hard and the airplane bounced into the air, listing to starboard, lost lift, and when the tail hit the water the aircraft flipped end over end and crashed." The witness was about 150 yards from the accident site.

PERSONNEL INFORMATION

A review of the Federal Aviation Administration (FAA) airman records from Oklahoma City, Oklahoma, revealed that the pilot held a private pilot certificate for airplane single and multiengine land, single engine sea, and instrument. He held a third-class medical certificate that was issued on July 22, 2004. A review of copies of the pilot's personal logbook indicated that the pilot recorded a total flight time of 1,923 hours as of August 8, 2004.

Narrative (Continued)

He had accumulated about 278 hours in seaplanes prior to the accident. According to the logbook, the pilot had not flown the accident airplane since June 15, 2004. The last landings logged as "water landings" were logged on June 5. He had flown 12 hours in single and multiengine land airplanes from June 28 until August 8.

AIRPLANE INFORMATION

The amphibious, single engine, pusher propeller airplane was a Consolidated Aeronautics, Inc., Lake LA-4-200, commonly known as a Lake Buccaneer. The airplane was manufactured in 1976, serial number 737. The last annual was completed on the airplane on September 5, 2003. The total airframe and engine time was 1,112 hours.

METEOROLOGICAL INFORMATION

An automated surface weather observation (METAR) was issued for Oroville, California, at 1153. The wind was variable at 3 knots; there was 10 statute miles visibility with clear skies; and the altimeter read 29.89 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The Butte County Sheriff's Department personnel initially responded to the accident scene. The FAA coordinator responded later that day to oversee the recovery efforts. The accident site was located in the Thermolito Afterbay of Oroville Lake. The afterbay has agricultural and recreational uses. According to a Butte County Sheriff deputy, the useful landing area of the bay is about 3 miles. The wreckage site was located about halfway through the usable landing area.

After impact, local recreational boaters attempted to move the airplane closer to shore during a rescue effort and the attempts were unsuccessful. The airplane moved about 200 yards from its original impact point before becoming lodged in silt. The approximate global positioning satellite coordinates of 39 degrees 27.824 minutes north by 121 degrees 40.719 minutes west are those of the airplane after it was moved. The elevation was about 192 feet mean sea level. The airplane was covered in an estimated depth of 15 feet of water.

Airplane recovery photos were viewed by the National Transportation Safety Board Investigator-in-Charge (IIC). The vertical stabilizer was above the water level. The remainder of the airplane was submerged. As the airplane was pulled from the water, the right wing remained attached to the fuselage. The left wing was partially attached to the fuselage. The empennage section was attached to the fuselage. The nose of the airplane from the instrument panel, forward, was recovered separately.

MEDICAL AND PATHOLOGICAL INFORMATION

The Butte County Coroner completed an autopsy on the pilot. The medical examiner concluded that the pilot died as the result of injuries sustained in the accident sequence. The passenger's death was attributed to drowning. The FAA Bioaeronautical Sciences Research Laboratory performed toxicological testing of specimens of the pilot and the passenger. The pilot's and passenger's results were both positive for ephedrine and pseudoephedrine.

TESTS AND RESEARCH

The wreckage was examined on August 23, 2004, by the Safety Board IIC, the FAA coordinator, and a representative from the engine manufacturer. The main fuselage structure was extensively crushed aft. The nose section was separated from remaining airplane structure. The right wing was attached to the fuselage, which ran back to include the empennage section. The left wing was partially attached to the fuselage but was completely removed during the airplane's recovery.

Aft of the aft cabin bulkhead, the fuselage was circumferentially buckled. The left side was significantly more compressed than the right. The empennage section aft of the buckling was bent 30 degrees to the left.

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: LAX04FA300

Occurrence Date: 08/21/2004

Occurrence Type: Accident

Narrative (Continued)

The section of the nose, forward of the instrument panel, was examined. Two distinct damage patterns were evident. The forward right side exhibited a crush line of 30 degrees to the longitudinal axis of the airplane from aft lower to forward upper. The left side was buckled with the crush folds oriented vertically, and the entire nose section was noticeably curved to the left.

The examination of the instrument panel disclosed a tachometer time of 1,152.61. The flap and landing gear selector levers were found in the up positions. The propeller control was in a full forward position; the mixture control was in a full rich position.

The cockpit canopy was made up of two frames hinged to a center post with the doors opening out and up. The center post is rigidly attached to the nose structure forward of the glare shield and the cabin roof. The center post and canopy framework was separated from the structure as a unit. The right side frame was deformed along the forward lower edge. The right upper aft frame was bent away from the center post. The left side frame was not distorted. The majority of the Plexiglass windows were missing from both sides; however, Plexiglass shards remained within the framework.

Each side of the canopy had operating handles and locking mechanisms. The canopy latching bracket that the tang hooks into was deformed on the left side. The latching bracket on the right side was not deformed. The hooked tang extending from the latching handle on the right side was broken at a 45-degree angle at its end. The throttle control was located on the canopy center frame and was in a "FULL OPEN" position.

The airplane's seats were not recovered.

The left wing separated from the airplane structure during the airplane's recovery. A 4-foot outboard leading edge section of the wing was accordioned at an angle about 30 degrees to the lateral axis of the airplane from forward inboard, to aft outboard, with the tip end displaced about 5 inches aft. The fiberglass wing tip structure remained attached to the tip rib. A 3-inch section of the wingtip leading edge from the tip rib to the outboard edge was missing and subsequently located in the floating debris field.

The main spar's upper cap was fractured and the face of the fracture was at 45 degrees just outboard of the carry through attach point. The fracture on the lower cap was in a flatter plane and the spar cap outboard of the fracture was torn from the web and bent downward about 120 degrees. The aileron remained attached to the wing.

The flap was attached by its center hangar hinge attach bracket; the inboard and outboard hangar hinge attach brackets were separated from the wing structure. All three brackets were bent in an inboard direction. The rivets that attach the hangar bracket to the wing structure were pulled out. About 10 inches inboard from the flap inboard edge, the skin was bent upward 4 inches.

The left aileron control surface was crushed on its inboard section and the profile of the crush was an airfoil shape. The aileron crush was dimensionally similar to the outboard edge of the flap. The crushed surface of the aileron was matched with the outboard section of the flap. The surfaces would only match up with the aileron near the full down deflection and the flap was in the fully retracted position.

The right aileron control surface was undamaged. The right flap was undamaged and appeared to be in an up position. The right flap could not be moved.

The right wing remained attached to the main fuselage structure. An 18-inch outboard section encompassing the wing tip and about 10 inches inboard from the tip rib was completely separated from the remainder of the wing. A 6-foot outboard leading edge section of the wing was accordioned at an angle of about 20 degrees to the lateral axis of the airplane from forward inboard, to aft outboard, with the tip end displaced about 10 inches aft. A 6-inch inboard root rib was buckled outboard, the adjacent fuselage sidewall was wrapped around it.

Narrative (Continued)

The airplane was equipped with pontoons on each wing. The pontoons were made up of upper and lower bulkheads, to which the skins were attached. The pontoons were secured to the wings using two forward brackets and a smaller aft attachment.

The left pontoon was torn from the wing and located in the floating debris field. Approximately 10 rivet holes along the right portion of the pontoon upper bulkhead appeared pulled in an aft and outboard direction. The rivets along the left side upper bulkhead remained attached. The bottom front section of the pontoon was crushed upward. The pontoon was pulled from the attachment brackets; the brackets were not deformed. The pontoon sidewall doubler was pulled vertically through the pontoon sidewall.

The right wing pontoon's aft attachment secured it to the wing; however, the pontoon had rotated from its installation position approximately 270 degrees and was lying with its right side flush against the bottom surface of the wing. The pontoon attach brackets remained on the wing structure and were bent in an inboard direction.

The vertical and right horizontal stabilizers remained attached to the empennage. The rudder remained attached to the vertical by its hinges. The right elevator remained attached to the horizontal stabilizer by its hinges. The right horizontal stabilizer was attached to the stub carry through bracket; however, the bracket was fractured.

The left horizontal stabilizer was separated from the empennage attach points and its associated elevator remained attached via the hinges. The bolts that secured the elevator to the torque tube flange remained on the flange and had pulled out of the elevator. The bolts remained attached to the flange.

The airplane's control system is made up of a series of push-pull tubes and cables. The ailerons are controlled through cables that run from the control yoke, aft down the sides of the fuselage to a bellcrank and balance bar. The bellcrank is attached to a series of push-pull tubes and follower bellcranks that extend out to the ailerons.

The elevator control tube series extends the length of the fuselage. At the empennage section, a tube runs diagonally upward and attaches to a fitting, which in turn secures a braced tube attached to the elevators.

The rudder is controlled through two push-pull tubes that are connected from the pedals to a mixing bellcrank under the cockpit floor. From this bellcrank, one push-pull tube extends aft into the empennage. The tube is attached to a follower assembly and from there runs up to the rudder.

The aileron control cables were found on their respective pulleys where they attach to the yoke. The cables were separated at the separation point of the nose and fuselage sections. The cable ends had a "broomstrawed" appearance. The rear sections of the cable were attached to their respective bellcranks. The right elevator control tube was attached to the bellcrank and was continuous out to the aileron bellcrank.

The left side contained a stub section of the push-pull tube and its rod end, which was attached to the bellcrank. The left aileron control tubes were continuous within the wing structure and the control tubes moved when the ailerons and control tubes were manually operated. The left aileron control tube was sheared near the root rib lightening hole and bent downward, consistent with the wing separation point.

The hydraulically actuated flap bellcrank and rod arm assemblies were examined in the main landing gear wheel wells of each wing. The bellcrank are for each flap visually appeared to be the same approximate position and measured approximately 75 degrees to the lateral axis of the airplane. The flap actuator measured 2.8 inches from the center of the bolt to the shoulder of the actuator. The actuator rod was extended approximately 0.75 inches from the shoulder out to the edge of the threaded portion.

The elevator control tube was detached from the control yoke.

Narrative (Continued)

The threaded portion of the rod end of the control tube's attachment was fractured at a 45-degree angle. The section of push-pull tube running from this rod end, aft, was located in the wreckage. The other end was cut by recovery personnel. From the cut portion, the tube ran aft through the fuselage and a series of followers. The aft portion of the tube approximately mid-fuselage was bent to the left. The elevator control tube moved when the control surface and the tube were manually operated.

The rudder pedals remained attached to their design location. The passenger side right rudder pedal had fallen aft. The two control tubes extended aft to the mixing bellcrank. One tube ran aft from the mixing bellcrank down the length of the fuselage to the empennage section. The aft portion of the tube was bent to the left at the same location as the elevator control tube. The rod end attachment at the elevator control surface was bent upward. The control tube and rudder control surface moved when they were manually operated.

A hydraulically actuated trim system was installed in the empennage section. The actuator connected to a 0.25-inch diameter control tube that ran the span of the horizontal to the outboard tips. The push-pull tube that extended to the trim was severed at the bushing that passes through the vertical stabilizer skin. When the trim surfaces were moved, hydraulic fluid pumped out of the hydraulic lines and the control tube moved.

The landing gear was examined. The left main landing gear was not stowed. The landing gear was not damaged and the linkages appeared intact. The right main landing gear was stowed and its uplock was hooked. The nose landing gear was stowed and was just out of the uplocks.

The emergency locator transmitter (ELT) was removed from the airplane. It was manufactured by Narco Avionics, model number TSO-C91. The battery expiration date was October 2005. The switch was in the "armed" position.

The engine was examined. The bottom spark plugs were removed. The spark plugs from cylinder numbers two and four were gray colored, which was consistent with a normal operation when compared to a Champion Check-A-Plug chart. The spark plugs from cylinder numbers one and three were oily. All of the electrodes were elliptical in shape and had similar gapping. The spark plugs did not exceed the erosion parameters of the Champion CT-482 Erosion Gauge. Thumb compression was obtained on all four cylinders and the valves produced the same amount of lift, in firing order.

The engine was borescoped. The cylinder walls did not display any evidence of foreign object ingestion and the coloration was tan. The valves were intact. Cylinder numbers one and three contained oil.

The fuel flow divider contained a residual amount of fuel. The diaphragm was intact and the fuel lines were unobstructed. The fuel injector servo was removed and examined. The diaphragm was intact and the servo screen was clean and unobstructed.

The oil filter was removed. It was stamped with a date of June 9, 2004, at a tachometer time of 1134.6. The filter contained flakes of shiny material, consistent with normal engine operation according to the Lycoming representative.

The exhaust system on the airplane does not include a muffler. The exhaust stacks were examined and were clean in appearance.

The induction system of the airplane was clean and free of obstruction.

The left magneto contained the impulse coupling and all four posts produced spark when hand rotated. The right magneto produced spark on three out of the four posts when hand rotated. The coloration of the magnetos was normal and there was no evidence of carbon arcing or heat damage.

The magneto timing on the left magneto was 25 degrees; the magneto timing on the right magneto was 23 degrees.

Narrative (Continued)

The pusher-propeller was examined. The propeller was attached to the engine and appeared minimally damaged during the impact sequence. Blade A had light scratching along its tip on convex side. Blade B displayed light scratches at its tip on the convex side. The bends of the blades were similar.

Two GPS units were recovered from the wreckage. No usable data was obtained from either unit.

ADDITIONAL INFORMATION

According to the Airplane Flying Handbook (FAA-H-8083-3), Chapter 16, "...water can exert a tremendous force. This force, a result of resistance, produces drag as the water flows around or under an object being propelled throughout or on its surface." It also noted the following:"Glassy water presents a uniform mirrorlike appearance from above, and without visual references to judge height, it can be extremely deceptive. Also, if waves are decaying and setting up certain patterns, or if clouds are reflected from the water surface, distortions result that are even more confusing for inexperienced, as well as experienced pilots."

The airplane was released to Plain Parts, Pleasant Grove, California, on September 7, 2004. A Garmin GNC 300XL was released to Plain Parts on September 9, 2004. A Lowrance GPS was released to the pilot's representative on December 28, 2004. No parts or pieces were retained.

National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: LAX04FA300
	Occurrence Date: 08/21/2004
	Occurrence Type: Accident

Landing Facility/Approach Information

Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
		Ft. MSL	NA		

Runway Surface Type: Water

Runway Surface Condition: Water--calm

Approach/Arrival Flown: NONE

VFR Approach/Landing: None

Aircraft Information

Aircraft Manufacturer	Model/Series	Serial Number
Consolidated Aeronautics, Inc	Lake LA-4-200	737

Airworthiness Certificate(s): Normal

Landing Gear Type: Retractable - Amphibian; Tricycle

Amateur Built Acft?	Number of Seats	Certified Max Gross Wt.	Number of Engines
No	2	2600 LBS	1

Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:
Reciprocating	Textron Lycoming	IO-360-A1B	200 HP

- Aircraft Inspection Information

Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time
Annual	09/2003	40.6 Hours	1112 Hours

- Emergency Locator Transmitter (ELT) Information

ELT Installed?/Type		ELT Aided in Locating Accident Site?
Yes /	No	No

Owner/Operator Information

Registered Aircraft Owner	Street Address	City	State	Zip Code
Take Flight, Inc.	3303 Aviation Way	Brenham	TX	77833

Operator of Aircraft	Street Address	City	State	Zip Code
Weldon Hord	On File	Brenham	TX	77833

Operator Does Business As:

Operator Designator Code:

- Type of U.S. Certificate(s) Held: None

Air Carrier Operating Certificate(s):

Operating Certificate:

Operator Certificate:

Regulation Flight Conducted Under: Part 91: General Aviation

Type of Flight Operation Conducted: Personal

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: LAX04FA300
Occurrence Date: 08/21/2004
Occurrence Type: Accident

First Pilot Information

Name	City	State	Date of Birth	Age
On File	On File	On File	On File	50

Sex: M | Seat Occupied: Left | Occupational Pilot? | Certificate Number: On File

Certificate(s): Private

Airplane Rating(s): Multi-engine Land; Single-engine Land; Single-engine Sea

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): None

Current Biennial Flight Review? 09/2003

Medical Cert.: Class 3 | Medical Cert. Status: Valid Medical--no waivers/lim. | Date of Last Medical Exam: 06/2004

- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Mult-Engine	Night	Instrument Actual	Instrument Simulated	Rotorcraft	Glider	Lighter Than Air
Total Time	1923	278		139						
Pilot In Command(PIC)	1781									
Instructor										
Instruction Received										
Last 90 Days										
Last 30 Days										
	2									

Yes Yes No

Flight Plan/Itinerary

Type of Flight Plan Filed: None

Departure Point	State	Airport Identifier	Departure Time	Time Zone
Same as Accident/Incident Location			1129	PDT

Destination	State	Airport Identifier
Local Flight		

Type of Clearance: None

Type of Airspace: Class G

Weather Information

Pilot's Source of Wx Information:

Unknown

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: LAX04FA300

Occurrence Date: 08/21/2004

Occurrence Type: Accident

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
ORV	1153	PDT	192 Ft. MSL	4 NM	40 Deg. Mag.

Sky/Lowest Cloud Condition: Clear Ft. AGL | Condition of Light: Day

Lowest Ceiling: None Ft. AGL | Visibility: 10 SM | Altimeter: 29.89 "Hg

Temperature: 26 °C | Dew Point: 13 °C | Weather Conditions at Accident Site: Visual Conditions

Wind Direction: Variable | Wind Speed: 3 | Wind Gusts:

Visibility (RVR): Ft. | Visibility (RVV) SM

Precip and/or Obscuration:
No Obscuration; No Precipitation

Accident Information

Aircraft Damage: Destroyed | Aircraft Fire: None | Aircraft Explosion None

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot	1				1
Second Pilot					
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew					
Passengers	1				1
- TOTAL ABOARD -	2				2
Other Ground					
- GRAND TOTAL -	2				2

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB ID: LAX04FA300	
Occurrence Date: 08/21/2004	
Occurrence Type: Accident	

Administrative Information

Investigator-In-Charge (IIC)

Kristi Dunks

Additional Persons Participating in This Accident/Incident Investigation:

Gary Jestice
Federal Aviation Administration
Sacramento, CA

Mark Platt
Textron Lycoming
Williamsport, PA

APPENDIX S

Seaplane Safety (AIM 7-5-8)

7−5−8. Seaplane Safety

a. Acquiring a seaplane class rating affords access to many areas not available to landplane pilots. Adding a seaplane class rating to your pilot certificate can be relatively uncomplicated and inexpensive. However, more effort is required to become a safe, efficient, competent “bush” pilot. The natural hazards of the backwoods have given way to modern man-made hazards. Except for the far north, the available bodies of water are no longer the exclusive domain of the airman. Seaplane pilots must be vigilant for hazards such as electric power lines, power, sail and rowboats, rafts, mooring lines, water skiers, swimmers, etc. ***FIG 7−5−1***

b. Seaplane pilots must have a thorough understanding of the right-of-way rules as they apply to aircraft versus other vessels. Seaplane pilots are expected to know and adhere to both the U.S. Coast Guard’s (USCG) Navigation Rules, International−Inland, and 14 CFR Section 91.115, Right−of−Way Rules; Water Operations. The navigation rules of the road are a set of collision avoidance rules as they apply to aircraft on the water. A seaplane is considered a vessel when on the water for the purposes of these collision avoidance rules. In general, a seaplane on the water must keep well clear of all vessels and avoid impeding their navigation. The CFR requires, in part, that aircraft operating on the water “. . . shall, insofar as possible, keep clear of all vessels and avoid impeding their navigation, and shall give way to any vessel or other aircraft that is given the right−of−way . . . .” This means that a seaplane should avoid boats and commercial shipping when on the water. If on a collision course, the seaplane should slow, stop, or maneuver to the right, away from the bow of the oncoming vessel. Also, while on the surface with an engine running, an aircraft must give way to all non-powered vessels. Since a seaplane in the water may not be as maneuverable as one in the air, the aircraft on the water has right-of-way over one in the air, and one taking off has right-of-way over one landing. A seaplane is exempt from the USCG safety equipment requirements, including the requirements for Personal Flotation Devices (PFD). Requiring seaplanes on the water to comply with USCG equipment requirements in addition to the FAA equipment requirements would be an unnecessary burden on Seaplane owners and operators.

c. Unless they are under Federal jurisdiction, navigable bodies of water are under the jurisdiction of the state, or in a few cases, privately owned. Unless they are specifically restricted, aircraft have as much right to operate on these bodies of water as other vessels. To avoid problems, check with Federal or local officials in advance of operating on unfamiliar waters. In addition to the agencies listed in TBL 7−5−1, the nearest Flight Standards District Office can usually offer some practical suggestions as well as regulatory information. If you land on a restricted body of water because of an inflight emergency, or in ignorance of the restrictions you have violated, report as quickly as practical to the nearest local official having jurisdiction and explain your situation.

d. When operating a seaplane over or into remote areas, appropriate attention should be given to survival gear. Minimum kits are recommended for summer and winter, and are required by law for flight into sparsely settled areas of Canada and Alaska. Alaska State Department of Transportation and Canadian Ministry of Transport officials can provide specific information on survival gear requirements. The kit should be assembled in one container and be easily reachable and preferably floatable. 4/3/14 AIM Potential Flight Hazards

7−5−7 ***TBL 7−5−1***

Jurisdictions Controlling Navigable Bodies of Water

Authority to Consult For Use of a Body of Water

Location Authority Contact

Wilderness Area U.S. Department of Agriculture,
Forest Service Local forest ranger

National Forest USDA Forest Service
Local forest ranger

National Park U.S. Department of the Interior,
National Park Service
Local park ranger

Indian Reservation USDI, Bureau of Indian Affairs
Local Bureau office

State Park State government or state forestry or park service
Local state aviation office for further information

Canadian National and Provincial Parks
Supervised and restricted on an individual basis from province to province and by
Different departments of the Canadian government;
consult Canadian Flight Information Manual and/or Water Aerodrome Supplement
Park Superintendent in an emergency

e. The FAA recommends that each seaplane owner or operator provide flotation gear for occupants any time a seaplane operates on or near water. 14 CFR Section 91.205(b)(12) requires approved flotation gear for aircraft operated for hire over water and beyond power-off gliding distance from shore. FAA-approved gear differs from that required fornavigable waterways under USCG rules. FAA-approved life vests are inflatable designs as compared to the USCG's noninflatable PFD's that may consist of solid, bulky material. Such USCG PFDs are impractical for seaplanes and other aircraft because they may block passage through the relatively narrow exits available to pilots and passengers. Life vests approved under Technical Standard Order (TSO) TSO−C13E contain fully inflatable compartments. The wearer inflates the compartments (AFTER exiting the aircraft) primarily by independent CO2 cartridges, with an oral inflation tube as a backup. The flotation gear also contains a water-activated, self-illuminating signal light. The fact that pilots and passengers can easily don and wear inflatable life vests (when not inflated) provides maximum effectiveness and allows for unrestricted movement. It is imperative that passengers are briefed on the location and proper use of available PFDs prior to leaving the dock.

f. The FAA recommends that seaplane owners and operators obtain Advisory Circular (AC) 91−69, Seaplane Safety for 14 CFR Part 91 Operations, free from the U.S. Department of Transportation, Subsequent Distribution Office, SVC−121.23, Ardmore East Business Center, 3341 Q 75th Avenue, Landover, MD 20785; fax: (301) 386−5394. The USCG Navigation Rules International−Inland (COMDTINSTM 16672.2B) is available for a fee from the Government Printing Office by facsimile request to (202) 512−2250, and can be ordered using Mastercard or Visa

APPENDIX T

Unmanned Aircraft Systems Rules (AIM 7-5-5)

AIM 7−5−5. Unmanned Aircraft Systems

a. Unmanned Aircraft Systems (UAS), formerly referred to as “Unmanned Aerial Vehicles” (UAVs) or “drones,” are having an increasing operational presence in the NAS. Once the exclusive domain of the military, UAS are now being operated by various entities. Although these aircraft are “unmanned,” UAS are flown by a remotely located pilot and crew. Physical and performance characteristics of unmanned aircraft (UA) vary greatly and unlike model aircraft that typically operate lower than 400 feet AGL, UA may be found operating at virtually any altitude and any speed. Sizes of UA can be as small as several pounds to as large as a commercial transport aircraft. UAS come in various categories including airplane, rotorcraft, powered−lift (tilt−rotor), and lighter−than−air. Propulsion systems of UAS include a broad range of alternatives from piston powered and turbojet engines to battery and solar−powered electric motors.

b. To ensure segregation of UAS operations from other aircraft, the military typically conducts UAS operations within restricted or other special use airspace. However, UAS operations are now being approved in the NAS outside of special use airspace through the use of FAA−issued Certificates of Waiver or Authorization (COA) or through the issuance of a special airworthiness certificate. COA and special airworthiness approvals authorize UAS flight operations to be contained within specific geographic boundaries and altitudes, usually require coordination with an ATC facility, and typically require the issuance of a NOTAM describing the operation to be conducted. UAS approvals also require observers to provide “see−and−avoid” capability to the UAS crew and to provide the necessary compliance with 14 CFR Section 91.113. For UAS operations approved at or above FL180, UAS operate under the same requirements as that of manned aircraft (i.e., flights are operated under instrument flight rules, are in communication with ATC, and are appropriately equipped).

c. UAS operations may be approved at either controlled or uncontrolled airports and are typically disseminated by NOTAM. In all cases, approved UAS operations must comply with all applicable regulations and/or special provisions specified in the COA or in the operating limitations of the special airworthiness certificate. At uncontrolled airports, UAS operations are advised to operate well clear of all known manned aircraft operations. Pilots of manned aircraft are advised to follow normal operating procedures and are urged to monitor the CTAF for any potential UAS activity. At controlled airports, local ATC procedures may be in place to handle UAS operations and should not require any special procedures from manned aircraft entering or departing the traffic pattern or operating in the vicinity of the airport.

d. In addition to approved UAS operations described above, a recently approved agreement between the FAA and the Department of Defense authorizes small UAS operations wholly contained within Class G airspace, and in no instance, greater than 1200 feet AGL over military owned or leased property. These operations do not require any special authorization as long as the UA remains within the lateral boundaries of the military installation as well as other provisions including the issuance of a NOTAM. Unlike special use airspace, these areas may not be depicted on an aeronautical chart.

e. There are several factors a pilot should consider regarding UAS activity in an effort to reduce potential flight hazards. Pilots are urged to exercise increased vigilance when operating in the vicinity of restricted or other special use airspace, military operations areas, and any military installation. Areas with a preponderance of UAS activity are typically noted on sectional charts advising pilots of this activity. Since the size of a UA can be very small, they may be difficult to see and track. If a UA is encountered during flight, as with manned aircraft, never assume that the pilot or crew of the UAS can see you, maintain increased vigilance with the UA and always be prepared for evasive action if necessary. Always check NOTAMs for potential UAS activity along the intended route of flight and exercise increased vigilance in areas specified in the NOTAM.

Overview of Small UAS Notice of Proposed Rulemaking

Summary of Major Provisions of Proposed Part 107 The following provisions are being proposed in the FAA's Small UAS NPRM.	
Operational Limitations	• Unmanned aircraft must weigh less than 55 lbs. (25 kg). • Visual line-of-sight (VLOS) only; the unmanned aircraft must remain within VLOS of the operator or visual observer. • At all times the small unmanned aircraft must remain close enough to the operator for the operator to be capable of seeing the aircraft with vision unaided by any device other than corrective lenses. • Small unmanned aircraft may not operate over any persons not directly involved in the operation. • Daylight-only operations (official sunrise to official sunset, local time). • Must yield right-of-way to other aircraft, manned or unmanned. • May use visual observer (VO) but not required. • First-person view camera cannot satisfy "see-and-avoid" requirement but can be used as long as requirement is satisfied in other ways. • Maximum airspeed of 100 mph (87 knots). • Maximum altitude of 500 feet above ground level. • Minimum weather visibility of 3 miles from control station. • No operations are allowed in Class A (18,000 feet & above) airspace. • Operations in Class B, C, D and E airspace are allowed with the required ATC permission. • Operations in Class G airspace are allowed without ATC permission • No person may act as an operator or VO for more than one unmanned aircraft operation at one time. • No careless or reckless operations. • Requires preflight inspection by the operator. • A person may not operate a small unmanned aircraft if he or she knows or has reason to know of any physical or mental condition that would interfere with the safe operation of a small UAS. • Proposes a microUAS option that would allow operations in Class G airspace, over people not involved in the operation, provided the operator certifies he or she has the requisite aeronautical knowledge to perform the operation.

Operator Certification and Responsibilities	• Pilots of a small UAS would be considered "operators".
	• Operators would be required to:
	  o Pass an initial aeronautical knowledge test at an FAA-approved knowledge testing center.
	  o Be vetted by the Transportation Security Administration.

	- Obtain an unmanned aircraft operator certificate with a small UAS rating (like existing pilot airman certificates, never expires). - Pass a recurrent aeronautical knowledge test every 24 months. - Be at least 17 years old. - Make available to the FAA, upon request, the small UAS for inspection or testing, and any associated documents/records required to be kept under the proposed rule. - Report an accident to the FAA within 10 days of any operation that results in injury or property damage. - Conduct a preflight inspection, to include specific aircraft and control station systems checks, to ensure the small UAS is safe for operation.
Aircraft Requirements	- FAA airworthiness certification not required. However, operator must maintain a small UAS in condition for safe operation and prior to flight must inspect the UAS to ensure that it is in a condition for safe operation. Aircraft Registration required (same requirements that apply to all other aircraft). - Aircraft markings required (same requirements that apply to all other aircraft). If aircraft is too small to display markings in standard size, then the aircraft simply needs to display markings in the largest practicable manner.
Model Aircraft	- Proposed rule would not apply to model aircraft that satisfy all of the criteria specified in Section 336 of Public Law 112-95. - The proposed rule would codify the FAA's enforcement authority in part 101 by prohibiting model aircraft operators from endangering the safety of the NAS.

FAA News

Federal Aviation Administration, Washington, DC 20591

June 21, 2016

SUMMARY OF SMALL UNMANNED AIRCRAFT RULE (PART 107)

Operational Limitations	• Unmanned aircraft must weigh less than 55 lbs. (25 kg). • Visual line-of-sight (VLOS) only; the unmanned aircraft must remain within VLOS of the remote pilot in command and the person manipulating the flight controls of the small UAS. Alternatively, the unmanned aircraft must remain within VLOS of the visual observer. • At all times the small unmanned aircraft must remain close enough to the remote pilot in command and the person manipulating the flight controls of the small UAS for those people to be capable of seeing the aircraft with vision unaided by any device other than corrective lenses. • Small unmanned aircraft may not operate over any persons not directly participating in the operation, not under a covered structure, and not inside a covered stationary vehicle. • Daylight-only operations, or civil twilight (30 minutes before official sunrise to 30 minutes after official sunset, local time) with appropriate anti-collision lighting. • Must yield right of way to other aircraft. • May use visual observer (VO) but not required. • First-person view camera cannot satisfy “see-and-avoid” requirement but can be used as long as requirement is satisfied in other ways. • Maximum groundspeed of 100 mph (87 knots). • Maximum altitude of 400 feet above ground level (AGL) or, if higher than 400 feet AGL, remain within 400 feet of a structure. • Minimum weather visibility of 3 miles from control station. • Operations in Class B, C, D and E airspace are allowed with the required ATC permission. • Operations in Class G airspace are allowed without ATC permission. • No person may act as a remote pilot in command or VO for more than one unmanned aircraft operation at one time. • No operations from a moving aircraft. • No operations from a moving vehicle unless the operation is over a sparsely populated area. • No careless or reckless operations. • No carriage of hazardous materials.

	• Requires preflight inspection by the remote pilot in command.
	• A person may not operate a small unmanned aircraft if he or she knows or has reason to know of any physical or mental condition that would interfere with the safe operation of a small UAS.
	• Foreign-registered small unmanned aircraft are allowed to operate under part 107 if they satisfy the requirements of part 375.
	• External load operations are allowed if the object being carried by the unmanned aircraft is securely attached and does not adversely affect the flight characteristics or controllability of the aircraft.
	• Transportation of property for compensation or hire allowed provided that-
	  o The aircraft, including its attached systems, payload and cargo weigh less than 55 pounds total;
	  o The flight is conducted within visual line of sight and not from a moving vehicle or aircraft; and
	  o The flight occurs wholly within the bounds of a State and does not involve transport between (1) Hawaii and another place in Hawaii through airspace outside Hawaii; (2) the District of Columbia and another place in the District of Columbia; or (3) a territory or possession of the United States and another place in the same territory or possession.
	• Most of the restrictions discussed above are waivable if the applicant demonstrates that his or her operation can safely be conducted under the terms of a certificate of waiver.

Remote Pilot in Command Certification and Responsibilities	• Establishes a remote pilot in command position.
	• A person operating a small UAS must either hold a remote pilot airman certificate with a small UAS rating or be under the direct supervision of a person who does hold a remote pilot certificate (remote pilot in command).
	• To qualify for a remote pilot certificate, a person must:
	  o Demonstrate aeronautical knowledge by either:
	    ▪ Passing an initial aeronautical knowledge test at an FAA-approved knowledge testing center; or
	    ▪ Hold a part 61 pilot certificate other than student pilot, complete a flight review within the previous 24 months, and complete a small UAS online training course provided by the FAA.
	  o Be vetted by the Transportation Security Administration.
	  o Be at least 16 years old.
	• Part 61 pilot certificate holders may obtain a temporary remote pilot certificate immediately upon submission of their application for a permanent certificate. Other applicants will obtain a temporary remote pilot certificate upon successful completion of TSA security vetting. The FAA anticipates that it will be able to issue a temporary remote pilot certificate within 10 business days after receiving a completed remote pilot certificate application.
	• Until international standards are developed, foreign-

	certificated UAS pilots will be required to obtain an FAA-issued remote pilot certificate with a small UAS rating. A remote pilot in command must: • Make available to the FAA, upon request, the small UAS for inspection or testing, and any associated documents/records required to be kept under the rule. • Report to the FAA within 10 days of any operation that results in at least serious injury, loss of consciousness, or property damage of at least $500. • Conduct a preflight inspection, to include specific aircraft and control station systems checks, to ensure the small UAS is in a condition for safe operation. • Ensure that the small unmanned aircraft complies with the existing registration requirements specified in § 91.203(a)(2). A remote pilot in command may deviate from the requirements of this rule in response to an in-flight emergency.
Aircraft Requirements	• FAA airworthiness certification is not required. However, the remote pilot in command must conduct a preflight check of the small UAS to ensure that it is in a condition for safe operation.
Model Aircraft	• Part 107 does not apply to model aircraft that satisfy all of the criteria specified in section 336 of Public Law 112-95. • The rule codifies the FAA's enforcement authority in part 101 by prohibiting model aircraft operators from endangering the safety of the NAS.

APPENDIX U

Shady Grove Harbor

U.S. Department
of Transportation
**Federal Aviation
Administration**

Airports District Office
Campus Building, Suite 2-260
1701 Columbia Avenue
College Park, GA 30337-2747
(404)305-7004 FAX (404)305-7155

November 15, 2013

Mr. Jerry L. Winter
7265 Flowery Branch Road
Cumming, Georgia 33041

Dear Mr. Winter:

We have received your submission of FAA Form 7480-1, "Notice of Landing Area Proposal," dated November 5, 2013, regarding establishment of a private use landing area (seaplane base) in Cumming, Georgia.

We are currently reviewing your submittal and you may expect a response within 4 to 8 weeks from the date of this letter. If you have any questions, please call us (404)305-7004.

Sincerely,

1/20/14 9.42 wks.

Rob Rau
Airport Programs Specialist

U.S. Department
of Transportation
**Federal Aviation
Administration**

Federal Aviation Administration
Atlanta Airports District Office

1701 Columbia Avenue
Campus Building, Suite 2-260
College Park, Georgia 30337
(404) 305-7004 FAX: (404) 305-7155

April 10, 2014

Mr. Jerry L. Winter
Shady Grove Harbor
7265 Flowery Branch Road
Cumming, Georgia 30041

Dear Mr. Winter:

RE: Aeronautical Study 2013-ASO-2092-NRA
Shady Grove Harbor, Cumming, Georgia

We have determined that the proposed private use of public waters landing area, Shady Grove Harbor, to be located at latitude **34°12'40.74"N.**, longitude **84°01'38.04"W.**, (NAD 83) in Cumming, Georgia will not adversely affect the safe and efficient use of the navigable airspace by aircraft, provided:

- All operations are conducted in VFR weather conditions.
- The landing area is limited to private use.

We recommend that:

- A clear 20:1 approach slope be established.
- That the proponent refer to 14 CFR 91.115, Right-of-Way rules; Water operations.
- That the proponent refer to AC 150/5395-1A, "Seaplane Bases," in establishing an acceptable level of safety for seaplane operations at this site.
- A clear 15:1 approach slope be established for runways servicing small aircraft (aircraft weighing less than 12, 500 lbs) with approach speeds less than 50 knots; a clear 20:1 approach slope for runways servicing small aircraft with approach speeds of 50 knots or greater, or large aircraft (aircraft weighing more than 12, 500 lbs). See Table 3-2, Figure 3-2, and Figure 3-3 from FAA Advisory Circular (AC) 150/5300-13A, *Airport Design (copies included), for the location and limits of the approach slopes.* If there are obstructions to the respective approach surfaces they should be removed or lowered. If the penetrating obstructions cannot be removed or lowered, we recommend that the thresholds be displaced and appropriately marked, so as to provide the respective 15:1 or 20:1 approach slope surface to each runway end. **(Clear approaches are essential.)**
- The centerline of an airport runway should have a lateral separation of at least 60 feet from roads and other objects for small aircraft with approach speeds less than 50 knots, 125 feet for small airplanes with approach speeds of 50 knots or greater, and 200 feet for large airplanes.
- The proponent should conduct an annual obstacle analysis of the surrounding area to determine the presence of any new obstacles in accordance with the approach slopes outlined in AC 150/5300-13A. Any new obstacles noted will be forwarded to the Airports District Office, Flight Standards District Office, or Regional Flight Standards Division.

Please note that FAR Part 77 requires that the heights of roads and railroads be increased in elevation to account for traversing mobile objects when determining whether the road or railroad is an obstruction. The elevation of the private road must be increased by the greater of 10 feet or the height of the highest mobile object that normally traverses the road. The elevation of public roads must be increased by 17 feet for Interstate Highways and 15 feet for any other public roads. Simarily, the elevation of railroads must be increased by 23 feet.

This aeronautical study did not consider the interaction of seaplane operation with surface craft traffic that is regulated by 14 CFR 91.115, nor does it give approval for seaplane operations on this body of water. Approval authority is vested with the owner/controlling agency of the body of water.

Please return the enclosed Airport Master Record form to this office when you have operational approval. When the processing of the Airport Master Record form is completed, your landing area will have a site number and a permanent location identifier. Indicate whether or not you would like to have your landing area shown on aeronautical charts. Charting also depends on the amount of "clutter" already on the charts near your site.

In order to avoid placing any unfair restrictions on users of the navigable airspace, this determination is valid until September 26, 2015. Should the facility not be operational by this date, an extension of the determination must be obtained by 15 days prior to the expiration date of this letter.

This determination does not constitute FAA approval or disapproval of the physical development involved in the proposal. It is a determination with respect to the safe and efficient use of navigable airspace by aircraft and with respect to the safety of persons and property on the ground.

In making this determination, the FAA has considered matters such as the effects the proposal would have on existing or planned traffic patterns of neighboring airports, the effects it would have on the existing airspace structures and projected programs of the FAA, the effects it would have on the safety of persons and property on the ground, and the effects that existing or proposed manmade objects (on file with the FAA), and known natural objects within the affected area would have on the airport proposal.

The FAA cannot prevent the construction of structures near an airport. The airport environs can only be protected through such means as local zoning ordinances, acquisitions of property in fee title or aviation easements, letters of agreement, or other means.

This determination does not preempt or waive any ordinance, law, or regulation of any other governmental body or agency.

If you have any questions concerning this determination contact Robert Rau, (404) 305-7004 and/or robert.rau@faa.gov.

Sincerely,

Philip R. Cannon
Manager, Airport Programs

Enclosure

Cc: Nick Baggett, US Army Corps of Engineers
Georgia DOT – Aviation Programs

DOT/Federal Aviation Administration
Southern Region

ONE DOT
Partnering for Excellence

Adalberto (Al) Munet
Principal Ops Inspector

Atlanta Flight Standards District Office
ATL AVS
P.O.Box 20636
Atlanta, GA 30320
Tel: 404-474-5207 FAX: 404-474-5250
Email: adalberto.munet@faa.gov

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

AIRPORT MASTER RECORD

PRINT DATE: 04/08/2014
AFD EFF
Form Approved OMB 2120-0015

> 1 ASSOC CITY: Cumming
> 2 AIRPORT NAME: SHADY GROVE HARBOR
3 CBD TO AIRPORT (NM): 5 W
4 STATE: GA
6 REGION/ADO: ASO/ATL
LOC ID:
5 COUNTY: Forsyth
7 SECT AERO CHT: ATLANTA
FAA SITE NR: 0.

GENERAL

10 OWNERSHIP: PU
11 OWNER:
12 ADDRESS:

13 PHONE NR:
14 MANAGER:
15 ADDRESS:

16 PHONE NR:
17 ATTENDANCE SCHEDULE:
MONTHS DAYS HOURS

18 AIRPORT USE: Private
19 ARPT LAT: 34-12-40.74N
20 ARPT LONG: 84-01-38.04W
21 ARPT ELEV: 1070.0 Estimated
22 ACREAGE: 0
> 23 RIGHT TRAFFIC: 11
24 NON-COMM LANDING:

SERVICES

70 FUEL:

FACILITIES

> 80 ARPT BCN:
> 81 ARPT LGT SKED:
> 82 UNICOM: 0.0
83 WIND INDICATOR:
84 SEGMENTED CIRCLE:
85 CONTROL TWR: NO
86 FSS:
87 FSS ON ARPT: NO
88 FSS PHONE NR:
89 TOLL FREE NR:

BASED AIRCRAFT

90 SINGLE ENG:	0
91 MULTI ENG:	0
92 JET:	0
TOTAL:	0
93 HELICOPTERS:	0
94 GLIDERS:	0
95 MILITARY:	0
96 ULTRA-LIGHT:	0

RUNWAY DATA		
> 30 RUNWAY IDENT:	02/20	11/29
> 31 LENGTH:	4000	4000
> 32 WIDTH:	1000	1000
> 33 SURF TYPE-COND:		
LIGHTING/APCH AIDS		
> 40 EDGE INTENSITY:		
> 42 RWY MARK TYPE-COND:	/	/
OBSTRUCTION DATA		
50 FAR 77 CATEGORY:	A(V) / A(V)	A(V) / A(V)
51 DISPLACED THR:	0 / 0	0 / 0
52 CTLG OBSTN:	/	/
53 OBSTN MARKED/LGTD:	/	/
54 HGT ABOVE RWY END:	/	/
55 DIST FROM RWY END:	/	/

(>) ARPT MGR PLEASE ADVISE FSS IN ITEM 86 WHEN CHANGES OCCUR TO ITEMS PRECEDED BY >

111 OWNER/MANAGER SIGNATURE 113 DATE:

August 20, 2015

Federal Aviation Administration
Atlanta Airports District Office
1701 Columbia Avenue
Campus Building, Suite 2-280
Collage Park, Georgia 30337

Mr. Rau,

The "Aeronautical Study 2013-ASO-2092-NRA" Shady Grove Harbor, determination will expire September 26, 2015 and needs to be extended.

This letter is my request for an extension as the US Army Corps of Engineers has not changed the policy allowing Seaplane landings and takeoffs yet.

Respectfully

Jerry Winter
7265 Flowery Branch Road
Cumming, Georgia 30041

770-889-1837

U.S. Department
of Transportation
Federal Aviation Administration

Airports District Office, FAA
1701 Columbia Avenue, Suite 220
College Park, Georgia 30337-2747
(404) 305-6799 FAX: (404) 305-6798

September 2, 2015

Mr. Jerry Winter
7265 Flowery Branch Road
Cumming, Georgia 30041

Dear Mr. Winter:

RE: Aeronautical Study 2013-ASO-2092-NRA
Shady Grove Harbor, Cumming, Georgia

This is regarding your request for an extension to our airspace determination dated April 10, 2014. An extension has been granted until September 26, 2016. If your landing area is not operational by September 26, 2016, you may request an extension or you may be required to refile FAA Form 7480-1.

The aeronautical study number for this proposal is 2013-ASO-2092-NRA. Please refer to this number on all future correspondence regarding this study.

Sincerely,

Robert Rau
Airport Program Specialist

APPENDIX V

FAA Regulations and Airman's Information Manual

Please refer to FAA Regulations found at:
http://www.faa.gov/regulations_policies/faa_regulations/

Airman's Information Manual
https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/