

# Seaplanes - The Facts

## Environment and Wildlife

### **\* Seaplanes leave no trace of their visit \***

In a recent 5 year study on the environmental effects of Seaplanes the U.S. Army Corps of Engineers, who are responsible for the waterways in the U.S.A., concluded <sup>1</sup>:

- Air Quality: no impact
  - Water Quality: no impact
  - Soil Quality: no impact
  - Wildlife: no impact
  - Fisheries: no impact
  - Hydrology: no impact
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- The U.S. Fish & Wildlife Service owns a fleet of Seaplanes that is used for the safe and efficient surveillance and tracking of wildlife.
  - The U.S. National Parks System is one of the biggest users of seaplanes in the World – it considers the seaplane essential for the management of their parks.
  - To list the scores of U.S. National Parks which not only permit seaplane use in their wilderness areas but advertise it as a method of access, please follow the following link and search using “floatplane” or “seaplane” ( <http://www.nps.gov/> ). There are many National Parks in the U.S.A where seaplanes and boats provide the only access.
  - The U.S. National Oceanic and Atmospheric Administration (NOAA) has a fleet of seaplanes which are used extensively for biological work, including sea turtle and mammal surveys. The mission of the NOAA is to describe and predict changes in the Earth’s environment and to conserve and manage the U.S. coastal and marine resources.<sup>2</sup>
  - Seaplanes are used to monitor the activities and resources in the 1,252 square nautical mile Channel Islands Nautical Marine Sanctuary situated in the Santa Barbara channel off the coast of Southern California. The sanctuary’s primary goal is the protection of the natural and cultural resources. The sanctuary is an area of national significance because of its exceptional natural beauty and resources.<sup>3</sup>
  - The Washington State Department of Ecology employs Seaplanes to sample water quality – the Seaplane is the only form of transport (excluding rowing boats and kayaks) that does not contaminate their findings.
  - Seaplanes are one of the few forms of transport allowed on the Great Barrier Reef.
  - A Seaplane’s propeller is entirely above the water and thus does not disturb sediments or marine life, nor does it contribute to marine noise pollution.
  - Seaplanes generate no more than a 2-3 inch wake – not enough to be a factor in shoreline erosion.
  - Seaplanes do not spread non native species. Boats from all over the UK and Europe are launched each year on Loch Lomond.
  - Seaplanes do not store or discharge oily bilge water or sewage.

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<sup>1</sup> <http://www.seaplanes.org/advocacy/environment.pdf> and <http://www.seaplanes.org/advocacy/booklet.pdf>

<sup>2</sup> [http://www.aoc.noaa.gov/aircraft\\_lake.htm](http://www.aoc.noaa.gov/aircraft_lake.htm)

<sup>3</sup> <http://www.publicaffairs.noaa.gov/nr/pdf/oct2002.pdf> and <http://channelislands.noaa.gov/>

- Seaplanes do not discharge gallons of fuel and oil into the water as many other powered watercraft do (as much as three gallons per hour).<sup>4</sup>
- Seaplanes do not discharge the contents of chemical toilets overboard.
- Seaplanes are not treated with toxic anti-fouling paints.
- Unlike boats, the exhaust from a seaplane's engine is discharged into the air well above the water's surface where it can dissipate without impacting water quality.
- Aviation fuel does not contain MTBE - a toxic additive found in automotive and marine fuels.
- In the past couple of years seaplanes over Loch Lomond have identified and reported oil slicks to the relevant authorities.
- Seaplanes are one of the few marine craft which are fully compliant with the Loch Lomond Catchment Management Plan. The plan states, "particular areas of concern include fuel and exhaust emissions from powered craft, disposal of chemical toilet contents ..... and the possible disturbance of aquatic habitats and species".<sup>5</sup> Emissions from motorized watercraft kill zooplankton and the growth of fish larvae in lakes.<sup>6</sup>

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<sup>4</sup> U.S. National Park and Conservation Association

<sup>5</sup> <http://www.sepa.org.uk/pdf/publications/technical/LochLomondCatchmentPlan.pdf>

<sup>6</sup> University of Miami

## Safety

- Loch Lomond Seaplanes was issued with an Air Operators Certificate (AOC) and an Airline License by the Civil Aviation Authority in May of 2004. The issue of an AOC only occurs after the CAA has satisfied itself that all aspects of the company's operation meets and exceeds their exacting safety criteria – we are considered to be a small airline and, as such, are held to the highest standards.
- Several departments within the Civil Aviation Authority (CAA), one of the World's foremost safety regulation agencies, conduct regular safety audits on all aspects of our operation. The CAA is heavily involved in the training and testing of our highly experienced Airline Transport pilots – in addition, the pilots have to undergo a strict medical every six months to renew their licenses. Seamanship also forms a large part of the license requirements.
- Seaplane operation on the water is governed by Rule 18 of the International Regulations for Prevention of Collisions at Sea – “A seaplane on the water shall, in general, keep well clear of all vessels and avoid impeding their navigation. In circumstances, however, where risk of collision exists, she shall comply with the rules of this Part”. In practice this means that a seaplane would not land or take-off if there was any chance of a conflict with any other watercraft. From the air our bird's eye view ensures that we can monitor all traffic before landing – we do not expect boaters to be aware of the aircraft.
- [On Loch Lomond](#), even on the busiest summer days, there are always many square miles of water free of boat traffic – even if it appears crowded when on the surface.
- Seaplane operations are infrequent and statistically insignificant compared to motorboat operations. In addition, they do not spend significant time on the water, or travel significant distances at high speed. The seaplane take-off distance is around 500 metres and the landing distance is approximately 200 metres.
- In October 2003 a seaplane was first on the scene when a boater on Loch Lomond was forced into the water following an explosion on his cruiser.

## The statistics

- 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.<sup>7</sup>
- In the same 13 year study period there were over 12,000 fatalities involving boats.<sup>8</sup>
- During a recent 5 year period boats collided with other vessels 11,174 times.<sup>9</sup>
- Statistically, it is considered that Boat/Seaplane accidents are nearly non-existent

## Seaplane Compatibility - Case Studies

Seaplanes operate amongst other water traffic in many busy lakes, harbours and rivers worldwide, for example, they can be found in Vancouver, Seattle, Sydney, Lake Como, Maldives, Fiji, Hawaii, Norwegian Fjords, Alaska, Arctic circle and also on the Great Barrier Reef.

### Lake Union - Seattle

Lake Union is a small 580 acre lake in downtown Seattle and is home to considerably more boats than can be found on Loch Lomond's 18,000 acres. The lake is a popular recreation spot for sailboats, motorboats, kayaks, and personal watercraft, as well as a busy public transport link between Lake Washington and Puget Sound.

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<sup>7</sup> National Transportation Safety Board (NTSB) accident review 1982-1995

<sup>8</sup> U.S. Coastguard data

<sup>9</sup> U.S. Coastguard data

Kenmore Air Harbour, the largest seaplane operator in North America, has been based on the lake since 1946 and although there are some 30,000 take-offs and landings each year there has not been a single accident since operations began 59 years ago. There are no markings or special use areas established on the lake. In addition, boaters do not receive any training and are not licensed.<sup>10</sup>

#### British Columbia - Canada

Vancouver and Victoria Harbours in British Columbia each have around 40,000 seaplane movements per year and there have been no accidents.

Victoria is a very small harbour being almost as narrow as the River Clyde is as it flows through the city centre of Glasgow. In summer it has over 1,000 boat movements and 100 seaplane movements per day.<sup>11</sup> The boat movements include large cruise ships, large car ferries, motorboats, yachts, very large ribs used by whale watching companies, very small cross harbour ferries, and kayaks.<sup>12</sup>

#### The River Clyde

Clydeport is the authority responsible for the operation of marine traffic on the river and the Harbour Master, after consultation, has given Loch Lomond seaplanes permission to use various areas for take-off and landing.

The Harbour Master also recently provided Loch Lomond Seaplanes with permission to conduct a trial on the River Clyde which involved take-offs and landings in the city centre of Glasgow at the SECC and Braehead.

The seaplane has had no operational problems mixing with nuclear submarines, Navy frigates, large ocean going vessels, the paddle steamer Waverley, the Pride of the Clyde passenger ferry, yachts and an assortment of other river traffic.

#### River Clyde – Rhu Marina

The marina management reviewed our company procedures and issued permission for the seaplane to pick up passengers at a purpose built dock inside the marina. No difficulties of any kind were encountered manoeuvring the seaplane in close proximity to nearby boats.

#### Royal Naval Dockyard - Gare Loch (Faslane)

The Queens Harbour Master has given Loch Lomond Seaplanes permission to use the Gare Loch and its approaches for take-off and landing. These areas are normally reserved for nuclear submarine use.

#### Loch Lomond

Loch Lomond Seaplanes has now been operating for 10 months on the loch and has operated from various locations such as the lagoon at Lomond Shores, the pontoon by the Maid of the Loch and the marina at Cameron House.

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<sup>10</sup> <http://www.seaplanes.org/advocacy/booklet.pdf>

<sup>11</sup> [http://www.victoriaharbour.org/Harbour\\_News\\_Fall\\_04.pdf](http://www.victoriaharbour.org/Harbour_News_Fall_04.pdf) Article on page 2 - “Traffic, what harbour traffic, she says”.

<sup>12</sup> <http://www.victoriaharbour.org/pdf/vhts.pdf>

## **Noise in National Parks**

In order to produce a report on the effects of aircraft over-flights for the U.S. Congress<sup>13</sup> a large survey was conducted by the U.S. National Parks System. Managers and visitors were asked their opinions and the results were presented to Congress in 1994.

To ensure that visitor memories were still fresh exit polls were conducted and the following statistics were recorded:

- Only 1.9% of visitors said that aircraft noise interfered with their enjoyment.
- Only 1.6% of visitors said that they were annoyed by hearing aircraft.
- Only 2.8% of visitors said the natural quiet was disturbed.
- **The visitors who complained were mainly “backcountry visitors”** - backcountry visitors may spend a much longer period of time in the park, thus increasing their opportunities to hear aircraft – they also typically spend a greater portion of their visit away from crowds, traffic, noise, etc., in locations where aircraft sounds may be more intrusive.

**Note :** The figures are even more surprising when you know that these parks are “wilderness areas” - there are no cars, no roads, no boats, no towns, no buildings and generally no facilities of any kind. Tourists require permits to enter and backcountry visitors, who want to venture deeper into the core of the park, might have to wait six months or more for permission.

The following statements and conclusions are made by the National Park System (NPS) management and have been extracted from the report:

- Generally, visitors did not agree with NPS Management views that aircraft noise interfered with the enjoyment or appreciation of the Park.
- NPS managers believe that aviation is essential to the management of many national parks. Parks and visitors benefit from the administrative use of aircraft for search and rescue, science and resource management, firefighting, law enforcement, maintenance, etc.
- Studies have shown that visitor judgment of the importance of natural quiet varies, probably as a function of the type of visitor activity, and hence, from the visitor perspective, natural quiet is not equally important in all locations or for all visitor activities.
- Sites that are more easily accessible seem to be visited by a population of visitors that are less sensitive to aircraft sounds; conversely, the less accessible sites, where visitors must walk some distance, may attract more sensitive groups of visitors.
- Air tour passengers also benefit from aviation. Passengers find their experiences to be very rewarding, both in terms of overall enjoyment as well as in providing an enhanced appreciation for the park.
- Health reasons, physical disabilities, unique perspective and time constraints were the most important reasons for taking flights over parks.
- As a result of the flight, over 95% (of tour flight passengers) stated that their appreciation of the park had increased by a “moderate” to an “extreme” degree.
- In the Grand Canyon 90% of passengers taking the air tour also toured on the ground.
- 10% of Park managers surveyed felt they had a noise problem due to people talking in the park.

**Note :** Once again, please bear in mind that the comments and conclusions above are made by the U.S. National Park System management and refer to “wilderness areas”.

There are many airways crossing the Loch Lomond and Trossachs National Park, in addition, the airspace allocated to the airports of Glasgow, Edinburgh and Prestwick extends over the park. Aircraft

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<sup>13</sup> **REPORT TO CONGRESS - REPORT ON EFFECTS OF AIRCRAFT OVERFLIGHTS ON THE NATIONAL PARK SYSTEM - September 12, 1994 - <http://www.nonoise.org/library/npreport/intro.htm>**

can be heard at all times of the day – from transatlantic 747s turboprops flying to the Highlands and Islands.

In addition, throughout the National Park we have numerous military fighter jets, helicopters (including those chartered by the National Park) and light aircraft over-flying.

One point that should be made is that pilots avoid areas where other aircraft are active and it is to be expected that over-flight aircraft noise may be reduced due to the seaplane presence on Loch Lomond.

### Noise

**Loch Lomond Seaplanes operates an amphibious Cessna T206H aircraft which is almost twice as quiet as the strictest noise regulations in the World demand (Swiss and German).<sup>14</sup>**

It is interesting to note that during an unannounced operational trial during 2002/3, which involved over 500 take-off and landings on Loch Lomond, no complaints or adverse comments were received by the Park authority. Indeed, it was not until Loch Lomond Seaplanes publicized its service that some complaints were made.

High ambient background noise levels can be found in many areas of the Loch Lomond and Trossachs National Park. Some of the noise producers contributing to this background noise are listed below:

- Jet skis
- Speedboats
- Military jets
- Helicopters (charter, Rescue, military, sightseeing, police). The National Park regularly charts helicopters for use in the park.
- Construction – e.g. hotel and golf courses
- Farm machinery
- Logging – chain saws
- Road Noise – A82, Duck Bay, Luss, Firkin point
- Boat launching areas – Drumkinnon bay, Mallarochy bay
- Grass Cutters – industrial golf course machinery
- Overflying airline traffic into/out of the central belt airports.
- Glasgow airport's local flying training area has been located over the park for the last 60 years. Balloch is the entry/exit point for Glasgow airport's airspace.
- Shooting
- Trains

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<sup>14</sup> [www.lba.de/deutsch/technik/laerm listen/liste4.pdf](http://www.lba.de/deutsch/technik/laerm listen/liste4.pdf) - page 74 - Cessna T206H/Gomolzig data

## Noise comparison

<u>Noise</u>	<u>dBA</u>	<u>Example</u>
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 only @ 1,000' (20 secs)
Inside car – 30 mph	73	
Normal conversation	65	
* 8 db difference is when humans perceive a halving or doubling of sound *		

<sup>15</sup> / <sup>16</sup>

It is very important to understand that the 75 dBA at 1,000' stated above is measured at **MAXIMUM 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.

Seaplane noise is very directional. The most noise can be heard to the side of the aircraft – perpendicular to the direction of travel. The noise is constant – there is no whining and it is brief and transitory – it disappears in a few seconds as the aircraft departs the area at 150 mph. There is almost no noise on landing or taxi.

To put the amount of noise into perspective we have calculated that the seaplane on Loch Lomond will generate around **7 minutes of noise per week** or 28 minutes per month during our high season. Yearly, we have calculated the amount of noise to be just over 2.5 hours - less noise energy in one year than a military jet produces in one minute.

In our submissions to the National Park Committee in early 2003 we put forward the following operational steps that we would implement to ensure that our neighbours were not impacted:

- No-fly zones will be observed over sensitive areas in the park
- Noise abatement routes will be used
- Route variation will be employed to ensure that no one area is traversed continuously
- High transit altitudes will be flown
- Operational times will be limited
- Routings and the daily ambient conditions will be logged to ensure that any complaint can be dealt with immediately and effectively (it may well be that our aircraft is not to blame)
- During the period October – March almost no flying is scheduled

Generally, the aircraft will be unheard as it operates below the high ambient noise levels as they are found in the Park.

<sup>15</sup> [www.nonoise.org/library/household/index.htm](http://www.nonoise.org/library/household/index.htm) - Typical Noise Levels

<sup>16</sup> [www.safetyline.wa.gov.au/pagebin/farmhazd0014.htm](http://www.safetyline.wa.gov.au/pagebin/farmhazd0014.htm) - Farm Noise