

8.0 OFF RIVER LAKES AND PONDS

8.1 BACKGROUND INFORMATION

As described in Section 2.6, LADWP will maintain the existing water supply to the following lakes: Upper and Lower Twin Lakes, Goose Lake, and Billy Lake. The management objectives for the off-river lakes and ponds are as follows:

- Upper and Lower Twin Lakes: Existing staff gauges will be maintained between 1.5 and 3.0, which represents maintenance of existing conditions.
- Goose Lake: Goose Lake must be kept full in order to spill over and provide a continuous flow to the river. Therefore, Goose Lake will always be full. Typical staff gage readings reflecting Goose Lake at full capacity are between 1.5 and 3.0.
- Billy Lake: Billy Lake will remain full in order to maintain a continuous spill to the river. A staff gage was never placed in Billy Lake because it has always been operated at a spillover level.
- Thibaut Ponds: One or more gaging stations will be installed to monitor pond levels. The Thibaut Ponds, which are delineated on Figure 2-15, will be kept full.

Water from the Aqueduct would be provided through the existing network of spillgates and ditches. Lake levels will be maintained by either maintaining existing flows, or by controlling lake levels at the outlet weirs. Flows to all but Upper Twin Lake and Thibaut Ponds will be part of the riverine-riparian enhancement program in which corridors will be established for non-native game fish between the river and off-river lakes and ponds.

8.2 FISH AND WILDLIFE

Several off-river lakes and ponds are connected by canals that have been enhanced to improve recreational opportunities in the area. Many of these lie along the earthquake fault running through the valley. It has been hypothesized that off-channel lakes and ponds were historically spring-fed and not connected to the river. Many decades ago, warmwater game fish were introduced to these waters to provide recreational angling. During some years, these lakes and ponds would dry up and eliminate the game fishery until they were restocked by CDFG (P. Pister, pers. comm. 2000). Over the last few decades, LADWP has provided water from the Aqueduct to these lakes and ponds to maintain the fishery.

Introduced fish planted by CDFG have now colonized the connecting corridors between lakes and ponds. Fish are also introduced into the area from the Aqueduct via the spillgates. There are no known populations of native fish in the off-river lakes and ponds (GANDA, 2000a; D. Sadler, pers. comm. 2000).

The off-river lakes and ponds provide habitat for introduced warmwater fish, especially largemouth bass, bluegill, brown bullhead, carp and channel catfish. Brown trout and smallmouth bass inhabit some of the corridor ditches, which provide conditions more typical of a stream environment. These latter species are not as common in the lake and pond environments. Information on the fish assemblage in the off-channel lakes and ponds has been gathered from CDFG (1959, 1967); Ecosystem Sciences (1999); Lone Pine Warmwater Fishing Association (2000); and GANDA (2000b). Six fish species can be positively identified as inhabiting the off-channel lakes and ponds (Table 8-1).

Information on fish distribution and relative abundance for select off-channel lakes and ponds was obtained from the Lone Pine Warmwater Fishing Association (2000). According to this information, largemouth bass are in high abundance at Upper and Lower Twin Lakes, Blackrock Ditch, Coyote-Grass Lake, Goose Lake and Billy Lake. Smallmouth bass are found in low abundance in both Upper and Lower Twin Lakes. Bluegill are in high abundance in Upper and Lower Twin Lakes, Goose Lake and Billy Lake and in moderate abundance in Long Pond. Catfish are in moderate abundance at Upper and Lower Twin lakes, Goose Lake and Billy Lake and are in low abundance in Coyote-Grass Lake and Long Pond. Brown trout are present in low abundance in Blackrock Ditch. Mosquitofish are in moderate abundance throughout the off-channel lakes and ponds surveyed by fishermen.

Off-channel lakes and ponds are characterized by dense stands of tules along the perimeters, with depths of 6 to 12 feet. Saltcedar is present at several sites. Although summer water temperatures are within the range for warmwater fishes, winter conditions are relatively cold for warmwater fish.

**TABLE 8-1
FISH IN OFF-RIVER LAKES AND PONDS**

	Large-mouth Bass	Small-mouth Bass	Bluegill	Catfish	Brown Trout	Carp	Mosquitofish
Upper Twin Lake	H	L	H	M	N	H	M
Lower Twin Lake	H	L	H	M	N	H	M
Coyote-Grass Lake	H	N	L	L	N	H	M
Goose Lake	H	N	H	M	N	H	M
Long Pond	M	N	M	L	N	H	M
Billy Lake	H	N	H	M	N	H	M
Blackrock Ditch	H	H	H	M	L	N	M
Locust Ditch	M	H	H	L	L	H	M

N = Species not present, L = Species in low abundance, M = Species in moderate abundance, H = Species in high abundance. Source: GANDA (2000b) based on data from Ecosystem Sciences, local anglers, CDFG, and field observations in 2000.

Local birders and ornithologists have noted that special status bird species that breed in the Off-River Lakes and Ponds area include least bittern (state Species of Special Concern; known to breed at Billy Lake) and northern harrier (state Species of Special Concern; known to breed at nearby Cartago Marsh) (Appendix J, Letter No. 16).

8.3 WATER QUALITY

The water quality of three off-river lakes was characterized by Inyo County Water Department in a study by Jackson (1997). These lakes include South Twin Lake, Goose Lake, and Billy Lake. Five water quality parameters were measured monthly at one or three foot increments to the bottom of each lake – dissolved oxygen, turbidity, electrical conductivity, pH, and temperature. Key results are summarized below.

Dissolved Oxygen

For all three lakes, dissolved oxygen levels decrease slightly with depth, and summer concentrations (about five mg/l) were lower than winter concentrations (seven to eight mg/l). Dissolved oxygen levels are suitable for aquatic life.

Turbidity

In South Twin Lakes and Goose Lake, turbidity decreases slightly with depth in the summer, and increases with depth in the winter. Turbidity is slightly higher in the summer than in the winter. No pattern with depth was discernible at Billy Lake.

pH

The pH values for South Twin Lake ranged between 7.5 and 8.5, with no depth-associated pattern associated with water depth. Goose Lake exhibited a wider range of pH – 7.5 to 10.0, while the range of pH in Billy Lake was 6.6 to 9.0. There was no consistent pattern in pH with season for the three lakes.

Electrical Conductivity

Electrical conductivity (EC) varied with the input from the spillgates feeding the lakes. EC values were converted to estimates of total dissolved solids (TDS) in the study. Low TDS values at South Twin and Goose Lake were around 200 mg/l when water was provided from Blackrock Ditch, and around 300 mg/l during periods of evaporation. Billy Lake exhibited a lower TDS value of 95 mg/l with a similar maximum value.

Temperature

Temperatures in the summer and winter at all three lakes were about 77 degrees F and 45 degrees F, respectively. All three lakes showed a general decrease in temperature with depth, except during mixing periods. South Twin Lake is mixed throughout the year due to wind; hence, the temperature profile varied considerably. Goose Lake is thermally stratified most of the year, except for windy periods in the fall and spring. When stratified, temperature decreased with depth. Billy Lake was thermally mixed most of the time, with little evidence of stratification. In general, temperatures are at the lower range for a warmwater fishery (GANDA, 2000b).

8.4 POTENTIAL IMPACTS

The proposed flows to the off-river lakes and ponds would not result in any adverse hydrologic conditions at the water bodies because the current water levels would be maintained. The lake surface areas would not increase or decrease, and the existing shoreline conditions would be maintained. Hence, the existing angling access points to the lakes and shoreline fishing spots would not be affected.

Continued maintenance of the water in these lakes under the LORP will not alter the increasing problem of cattail and bulrush marsh around the perimeter of the lakes. The increasing abundance of the marsh vegetation could potentially degrade fish habitat, and is currently adversely affecting access to the lake for recreational fishing (access for both shoreline fishing and for boat launching). This impact is not considered a part of the LORP, but instead is a management issue associated with ongoing practices of LADWP.

Under the proposed program for off-river lakes and ponds, water to supply Coyote/Grass Lakes Complex and Goose Lake will now be alternating between the Lower Twin Lakes Diversion and Waggoner Diversion. A description of the impacts of installing new ditches and spillgates, and modifying other spillgates to transfer the point of diversion is provided in Section 7.1.3, and is considered an element of the Blackrock Waterfowl Habitat Area.

Under the proposed program for off-river lakes and ponds, the amount of water provided to Coyote/Grass Lakes Complex and Goose Lake may be greater than under existing conditions due to the need to create flows in the channels downstream of Goose Lake that will connect to the river. There will be an inflow and outflow from these lakes sufficient to sustain the artificial corridor below the lake, but the lake elevations will remain unchanged from current conditions. **The greater inflows and outflows at these lakes may improve water quality and increased turnover rates in the lakes -- a potentially beneficial impact (Class IV).**

The establishment of permanently watered fish corridors between Goose Lake and the river, and Billy Lake and the river, as part of the riverine-riparian enhancement program (Section 2.3) could increase fish production in the lakes by allowing recruitment of fish from the river, as well as providing opportunities for lake and pond fish to feed and reproduce in the ditches between the lakes and the Aqueduct, and between the lakes and the river. **The potential increase in available fish habitat and possible enhanced production of the warmwater fishery in the lakes and ponds are considered beneficial impacts (Class IV).**