

## Open Water



Stone Mother on Pyramid Lake, Washoe County, with waterbirds in the foreground.  
Photo by Elisabeth Ammon.

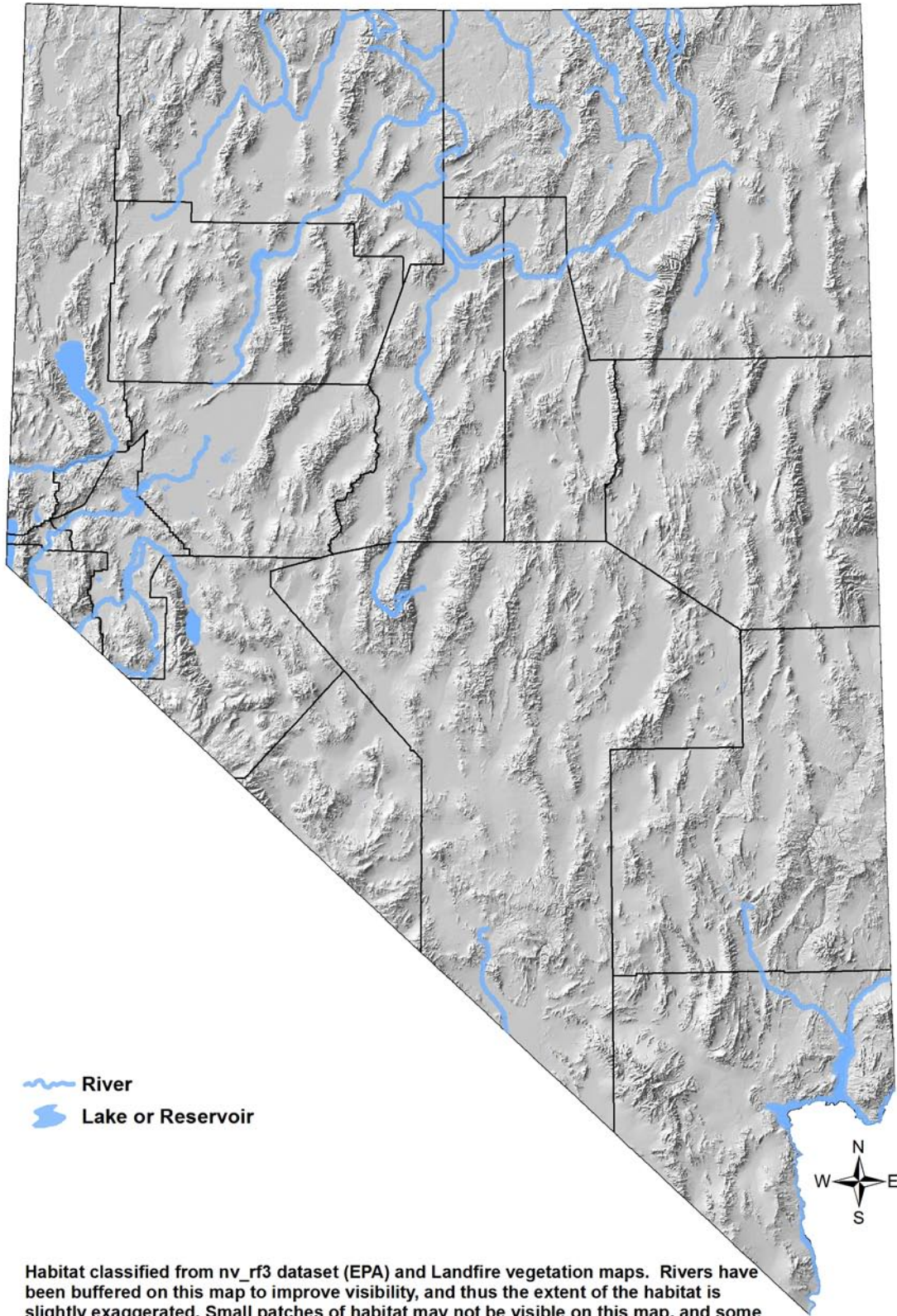
### Key Bird-Habitat Attributes

Aquatic Habitats	A variety of water depths ranging from shallow (< 2 m [6 ft]) to deep sections (> 6 m [20 ft]) and an overall bathymetry that allows for ample aquatic vegetation and fish populations; shallow, sparsely-vegetated mudflats (water depth < 15 cm [6 in]) on shorelines benefit shorebirds
Ideal Scale for Conservation Action	Overall waterbody sizes of > 150 ha [370 ac] best for many migrants
Vegetation Cover	Emergent vegetation along shorelines and shallow sections desirable, but should remain a minor component; patches of dense submerged aquatic vegetation desirable
Fish	Fish populations required by several Priority species in various size classes, particularly smaller fish (5 – 20 cm [2 – 8 in])
Other Features	Islands particularly beneficial to colony nesters, both sparsely vegetated upland islands, and densely vegetated wetland islands; ideally, these are located at a distance from the shorelines, with deep water between island and shore

### Conservation Profile

Estimated Cover in Nevada	137,500 ha [340,000 ac] 0.5% of state
Landownership Breakdown	Undesignated waterbodies = 63% NPS = 30% Other = 7%
Priority Bird Species	Trumpeter Swan Tundra Swan Cinnamon Teal Northern Pintail Canvasback Redhead Lesser Scaup Common Loon Eared Grebe Western Grebe Clark's Grebe American White Pelican Bald Eagle Black-necked Stilt American Avocet Marbled Godwit Western Sandpiper Least Sandpiper Long-billed Dowitcher Wilson's Phalarope Red-necked Phalarope Franklin's Gull Black Tern (Snowy Egret) (Snowy Plover)
Indicator Species	None needed
Most Important Conservation Concerns	Surface water diversion, impoundment Climate change (change in precipitation and temperature) Mining Flood control
Habitat Recovery Time	2-5 years
Regions of Greatest Conservation Interest	Pyramid Lake, Walker Lake, Lahontan Valley, Rye Patch Reservoir, East Fork Reservoir, Pahrnagat Valley, Lake Mead, Lake Mohave
Important Bird Areas	Carson River Delta Franklin Lake Lahontan Valley Wetlands Lake Mead Pahrnagat Valley Complex Pyramid Lake Ruby Lake Swan Lake Walker Lake Washoe Valley

# Open Water



Habitat classified from nv\_rf3 dataset (EPA) and Landfire vegetation maps. Rivers have been buffered on this map to improve visibility, and thus the extent of the habitat is slightly exaggerated. Small patches of habitat may not be visible on this map, and some areas may be misclassified.

# Open Water

## Overview

Open Water habitats are far less abundant in Nevada than in many other western states, but they host a very high proportion of our Priority bird species, which are most abundant during migration stopover and wintering periods. Open Water sites include natural lakes, such as Pyramid and Walker, but the majority of our Open Water habitat is provided by reservoirs (including Lahontan and Rye Patch reservoirs and Lakes Mead and Mohave). Nevada's larger rivers are also included in this habitat type, although generally, only the fish-rich rivers support appreciable numbers of waterbirds.

Most Priority species prefer large, ice-free water bodies over small ones, and depending on their foraging strategy (shallow divers/submerged vegetation, deep divers and fish-eaters, dabblers and skimmers), require a variety of water depths and food items during their season of use (Figure Hab-16-1). Islands are extraordinarily valuable, as they not only provide nesting opportunities for colonial species, but are also preferred as roosting and resting sites by many migrants. Isolation from land predators, such as coyotes, appears to be the driving force behind bird use of islands, and even islands near the shore are heavily utilized if the surrounding water is sufficiently deep to discourage predators. For instance, Virginia Lake in Reno is a small artificial water body with a central island that attracts a surprisingly large variety and abundance of aquatic birds during migration periods and in the winter, despite high recreational use of the area and many potential predators (dogs, raccoons, etc.) along its shores.

Although migration and winter is a time of particular abundance of aquatic birds, there are also significant breeding populations of Priority ducks, grebes, and shorebirds associated with open water, most notably American White Pelicans that breed on Anaho Island in Pyramid Lake. Most of these species, when not nesting on protected islands, need at least some vegetation cover at the nest site, which may be located in emergent vegetation along shorelines, on floating mats of vegetation, or in adjacent uplands. There are exceptions, however, including most notably the Snowy Plover, which nests in very sparse vegetation cover. Only two of the open water Priority species regularly use mature trees, the Snowy Egret and the Bald Eagle. Both prefer small groves of older larger trees adjacent to a water body that has abundant fish populations. Shorebirds require a variety of vegetation cover densities, so the emphasis on shoreline management should be to provide, where possible, a mosaic of different patches (emergent vegetation, mudflats, sparse grass cover, dense ground cover, and occasional groves of trees) to accommodate the greatest variety of species (Figure Hab-16-1). Disturbance-free buffers along shorelines are important in areas where nesting of Priority species is confirmed.

Water bodies in Nevada receive very different levels of bird monitoring depending on their ownership status. Lake Mead for instance, is regularly monitored by the US Park Service, and lakes with significant fish populations and/or migratory bird populations are monitored by NDOW and the USFWS. However, as a rule, non-game bird species that cannot be easily surveyed by aircraft receive notable incomplete statewide monitoring coverage at the present time. The effects of recreational activities, such as jet-skiing, boating, and shoreline camping, have not been comprehensively studied for possible impacts during sensitive periods.

# Open Water

## Main Concerns and Challenges

The following top five conservation concerns were identified in our planning sessions for Open Water habitats in Nevada:

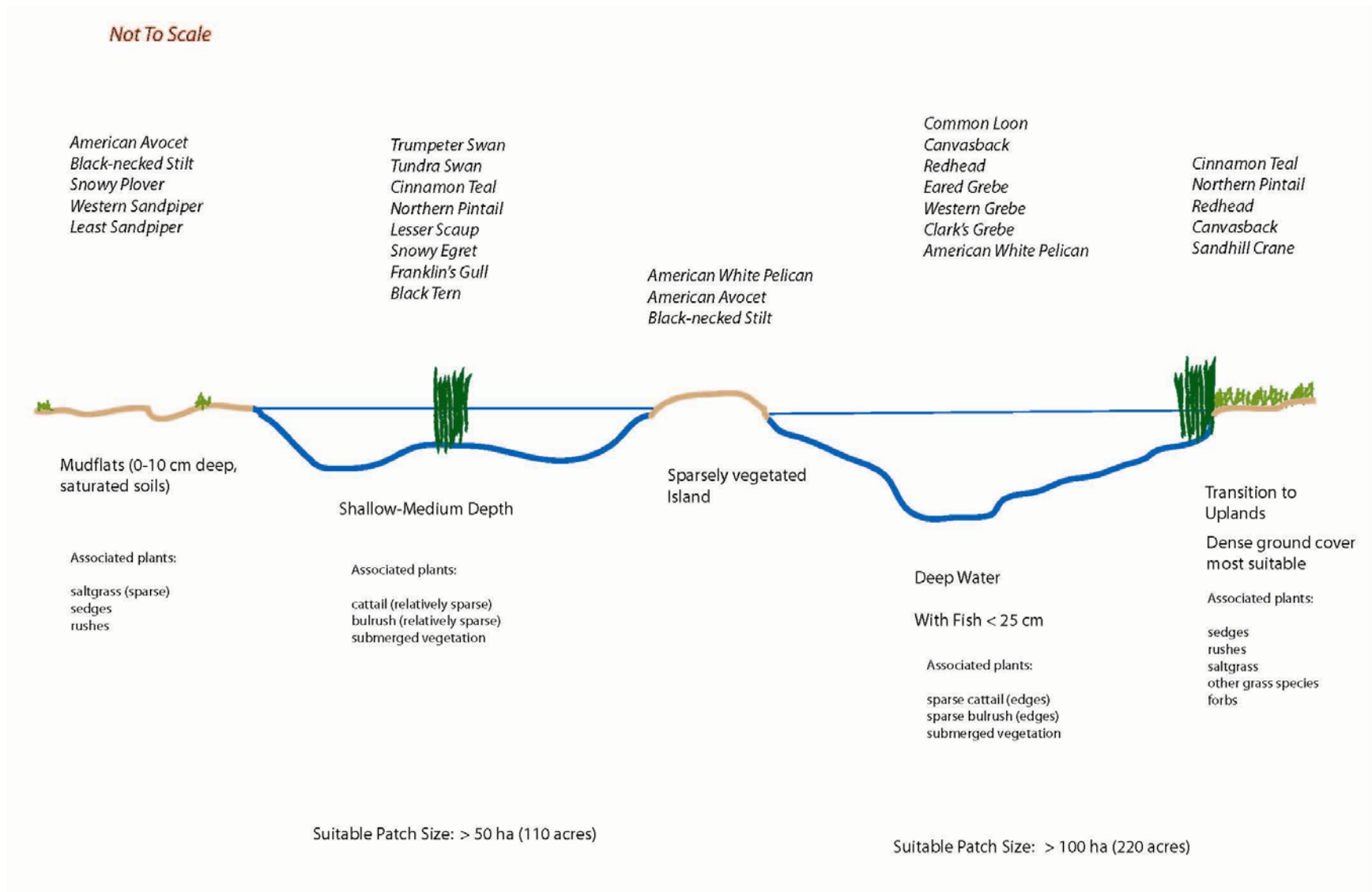
- Surface water diversion and impoundment
- Change in precipitation and snowmelt related to climate change
- Change in temperature related to climate change
- Mining
- Flood control

The main threat to Open Water habitats is reduction or loss of critical inflows to maintain water levels and water quality. This most often occurs because water is diverted to agricultural or municipal use. Walker Lake provides a case study for this dilemma, as discussed in the Common Loon species account (p. Spp-13-1). Reduced inflows lead to decreased lake depth (which is harmful to some fish), reduced lake surface area, increased salinity, which has a host of secondary effects, and altered shoreline profiles that in some cases are unsuitable for shorebirds that prefer broad mud flats. In extreme cases, islands may become accessible to predators by land bridges, which make them unsuitable for roosting and nesting by many species. The increased temperatures and reduced precipitation that are projected as a result of climate change will tend to compound these problems, as will increasing water demands associated with additional residential or agricultural development. Clearly the solutions to these problems involve a large measure of political and societal effort, preferably in a collaborative framework.

Water quality problems in Nevada tend to be localized rather than systemic. Mercury contamination from mining has been documented in a number of water bodies in Nevada, and fish-eating birds can be harmed by repeatedly ingesting contaminated fish. Botulism and avian cholera can cause large die-offs in waterbird populations, typically in smaller water bodies that can become stagnant or warm for extended periods.

Finally, Nevada waters have recently been invaded by exotic mollusks, particularly the quagga mussel (*Dreissena bugensis*) that was first found in the Lake Mead National Recreational Area in 2007. The mussel's population has increased dramatically in Lakes Mead and Mohave, significantly reduced fine algae, and it is easily transmitted to other water bodies through boats. Effects on bird populations are currently unknown.

# Open Water



**Figure Hab-15-1:** Idealized open water landscape to maximize the number of open water dependent priority bird species.

# Open Water

## Conservation Strategies

### Habitat Strategies

- **Manage at the scale of the entire waterbody** and surrounding areas that provide shoreline mudflats or vegetated shores. Most existing waterbodies cannot be easily reshaped, but if new ones are created, **islands and varying water depths** that allow for a **diversity of fish, invertebrates, and submerged vegetation** are important. Fish are desirable, particularly if a diversity of size classes (especially those < 25 cm [10 in]) can be provided
- **Excessive fluctuation and drops of lake levels** should be avoided in managed water bodies to the extent possible, in order to maintain vegetation and fish habitat in relatively shallow areas (< 6 m [20 ft]). If managed lakes need to be dried up for maintenance, this should ideally be done during low-use seasons of the Priority species that regularly use the site
- **Water quality** should be managed to minimize contaminants, sediment disturbance, and stagnant conditions. Prescribed burns along adjacent shorelines are generally well-tolerated by open water birds, although we recommend avoiding all burns of emergent vegetation during the primary breeding season (**May 1 through July 15**)

### Research, Planning, and Monitoring Strategies

- **Expand monitoring coverage** of aquatic birds in under-surveyed areas, particularly for those species that are poorly represented in aerial surveys. The Aquatic Bird Count program provides a framework for this effort, and high priority sites for expanded coverage need to be identified
- When circumstances do not allow for the maintenance of desirable water levels in some water bodies, planning for **mitigation of habitat loss** may be necessary, particularly in **Important Bird Areas**.
- Monitor and research **effects of invasive mollusks** on bird habitat quality and habitat use of open water birds.
- Monitor and research **effects of lake recreational uses** on aquatic birds to be better able to plan for protection of sensitive areas.

### Public Outreach Strategies

- **Promote year-round birding** on important water bodies, such as Walker Lake, Pyramid Lake, East Fork Reservoir, and Rye Patch Reservoir. This may be achieved through promotion of eBird maps that show under-birded areas, active outreach to Audubon chapters, IBA volunteer projects, and production of checklists and brochures for the under-birded areas / seasons.
- **Promote sustainable recreational use** of open water sites, including avoidance of sensitive areas by boaters, providing alternate camping options in areas where shorelines need to be protected, and preventing the spread of quagga mussels.