Audubon CALIFORNIA

EDF ENVIRONMENTAL DEFENSE FUND
Finding the ways that work

Point Blue Conservation Science

Sustainable Conservation

Building multibenefit recharge basins

As California faces an unpredictable water future, policy makers and water managers across the state are seeking solutions to build resilience into our water supply system. Groundwater recharge is an excellent tool to replenish depleted aquifers and bank water for future use. In addition to helping water managers balance their water budget, groundwater recharge also provides an opportunity to create habitat for wildlife. This guide highlights recharge basin management strategies that create wildlife habitat and provide operational benefits to basin managers.

Operational Benefits

Reduce sediment and clogging

Sediment buildup and pore clogging can greatly diminish the efficiency of basin recharge. Creating multiple subbasins within a series can allow for the first receiving basin to act as a settling area, enabling the successive basins to recharge more efficiently over time. Settling basins filter fine sediment in the water and minimize clogging of successive recharge ponds. Creating basins with a sloped floor will result in sediment accumulation in a smaller area, reducing the operational cost of removing sediment buildup.

Planting vegetation on basin bottoms during dry spells can also help maintain recharge rates over time as roots create channels for water to infiltrate the soil.

Stabilize basins

Planting vegetation along the sides of basins will help prevent erosion and stabilize berms. These plantings can also inhibit the establishment of nuisance weeds such as Russian thistle. Installing perching structures for hawks can help control burrowing rodents that can compromise berms.

Funding Sources

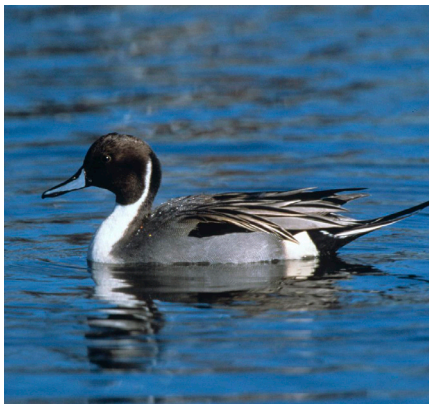
Potential federal, state and local funding sources for multibenefit recharge projects that create waterbird habitat include:

- Wildlife Conservation Board Pacific Flyway Program
- U.S. Fish and Wildlife Service Partners for Fish and Wildlife Program
- Natural Resources Conservation Service Environmental Quality Incentives Program
- California Department of Fish and Wildlife California Waterfowl Habitat Program

WILDLIFE TARGET

Shorebirds

- Legs are often long and thin.
- Bills thin. If long, then used to probe in the soil. If short, then used to peck food off the surface of the ground.
- Eat various bugs, worms and other invertebrates.
- 13 species use the Central Valley regularly.
- Some populations are declining; others are stable.



Waterfowl

- Ducks, geese and swans
- Most have flat bills that filter plants, seeds and invertebrates from the water and mud for food.
- Webbed feet make them strong swimmers.
- Some populations are declining; others are stable.

Pollinators

- More than 1,000 species of honey bees, native bees, butterflies and beetles.
- Wide range of sizes and colors, from tiny sweat bees less than ¼" long to monarch butterflies larger than 3".
- Nearly all populations are declining.

HABITAT CHARACTERISTICS

- Open mudflats or shallowly flooded environments.
- Some short, sparse vegetation is OK.
- Less than 40% vegetation cover is recommended.
- Remaining vegetation should be smashed or incorporated.

- Open water is generally preferred for feeding.
- Some species like vegetation (cattails/tules) to hide in.
- Some dry land (berms or islands) is important for resting areas.
- Vegetation on resting areas should not be very dense. However, some species that breed in Central Valley would use denser vegetation for nesting.
- Forage plants for waterfowl (watergrass, smartweed and swamp timothy) will provide food during winter.

- Prefer a diversity of native vegetation that flowers (providing food and cover) throughout the year.
- Plant vegetation along the sides and throughout the basin bottom.
- Drier areas should remain undisturbed (no disking) to provide nesting habitat in soil.

WATER MANAGEMENT

Timing

- Shorebirds are present in the Central Valley year-round.
- Migration is a critical period when habitat is needed: spring (March to May) and fall (July to September).

Depth

- Saturated mudflat to 6 inches deep.
- Variable water depth is ideal and will benefit a wider diversity of shorebirds and other waterbirds

Timing

- Winter (October to March) is the most important time to provide habitat for waterfowl in the Central Valley.
- Some species breed in the Central Valley from March to mid-July.

Depth

- Water depths from 6 inches to 18 inches are recommended.
- Some species will use depths greater than 18 inches.
- Forage plants may require additional irrigation in dry periods.

Timing

- Water should not inundate vegetation for long periods in areas designated as a dry zone because it can kill the plants and drowns the burrowing insects

Depth

- Plant in zones related to how much water each will likely receive. Some will only get winter rain, some flooded only occasionally, others flooded regularly.

This document highlights best practices as understood by wildlife experts and practitioners as of February 2020.
If you are interested in participating in a pilot project or providing feedback, please contact **recharge@pointblue.org**.