

# **MONITORING AND EVALUATION**

## **MONITORING**

Maintaining habitat quality and quantity are the means of accomplishing Refuge objectives. Monitoring will focus on measuring vegetation diversity and abundance, water quality and quantity, abundance of protein resources such as invertebrates and rodents, and wildlife response to management practices. Progress toward Refuge goals and objectives will be evaluated based on the following monitoring activities. Completion of annual surveys is dependant on staff availability, funding, and logistical restraints such as weather conditions.

### **WILDLIFE POPULATIONS**

The Refuge is only a small piece of the entire Great Salt Lake Ecosystem. Therefore wildlife population monitoring must be coordinated with other State and private land managers. Large scale eagle, goose, duck, swan, and shorebird surveys are conducted in coordination with the Utah Division of Wildlife Resources. Point Reye's Bird Observatory, the National Audubon Society, Utah Division of Wildlife Resources, and the National Wildlife Federation participate on a variety of nongame surveys. Utah State University closely participates in several monitoring and research projects. Expertise and resources from other Federal agencies are frequently utilized.

Several standardized surveys are used to monitor all bird populations on the Refuge. The Weekly Bird Use Survey estimates the numbers of all birds observed on a weekly basis. This data is compiled to determine seasonal and annual use relative to a variety of habitat conditions. Aerial surveys are used on a limited basis to monitor large flocks of staging birds, and birds using otherwise inaccessible parts of the Refuge. The National Audubon Society Christmas Bird Count is traditionally conducted yearly proving an opportunity for public participation. Unusual, first of the year, and other noteworthy sightings are recorded by all staff on a continuous basis.

## **HABITAT**

### **VEGETATION**

Standardized transects, photographic points, aquatic vegetation sampling, nest site vegetation characteristics, and other vegetation surveys will be conducted as part of ongoing wildlife research (e.g. constant effort mist-netting).

### **WATER**

Quantity and quality of water, including flows, depth, chemistry, and temperature, will be monitored continuously using data loggers and a variety of sensors. Data is maintained and analyzed in a central computer system.

## **WEATHER**

Continuous weather data will be collected on the east and west sides of the Refuge using remote weather stations with data loggers.

## **THREATENED AND ENDANGERED SPECIES**

Bald Eagle: Mid-winter Eagle Survey; Raptor Survey

Peregrine Falcon: Raptor Survey

## **CANDIDATE SPECIES**

White-faced Ibis : Documentation of colony locations and size

Black Tern: Documentation of nest site locations and characteristics

Burrowing Owl: Raptor Survey; Document nest site locations and characteristics

Ferruginous Hawk: Raptor Survey; Small Mammal Prey Base Survey

## **MIGRATORY BIRDS - (ALL SPP. SURVEY BY WEEKLY BIRD USE SURVEY)**

Shorebirds: Pacific Flyway Project; Snowy Plover Survey; American Avocet/Black-necked Stilt Production Survey

Dabbling Ducks: Mid-Winter Waterfowl Survey; Brood Count; Upland Netting Survey; Waterfowl Banding

Diving Ducks: Over-water Nesting Survey; Brood Counts; Mid-Winter Waterfowl Survey

Swans: Bi-weekly aerial surveys; weekly ground surveys of tundra and trumpeters (more frequently when needed)

Geese: Canada Goose Banding; Brood Counts; Mid-Winter Waterfowl Survey

Passerines: Constant Effort Mist Netting; Point Counts; Nest Monitoring

Fish-eating Birds: Colonial Nesting Surveys; Western Grebe Survey

Waterbirds: Colonial Nesting Survey

Raptors: Raptor Survey, Small Mammal Prey Base Survey

### ***RESIDENT FISH AND WILDLIFE***

Mammals: Muskrat House Count; Scent Stations; Track Survey; Den Survey; Dummy Nest Study; Night Lighting Survey; Predator Observation Survey; Small Mammal Prey Base Survey

Reptiles and Amphibians: Periodic presence and absence data collected

Fish: No surveys conducted

Invertebrates: Substrate and water column sampling, and a variety of funnel and light traps used to monitor adults and larvae.

### ***PUBLIC USE***

Public Use: A periodic survey of selected uses including those associated with fish and wildlife harvest or requiring "Special Use Permits".

Fish and Wildlife Harvest: Participation rates and harvest rates will be surveyed annually.

### ***CULTURAL RESOURCES***

Cultural resources: Annual report of activities affecting or affected by historical or archaeological resources.

## ***EVALUATION***

Results obtained from monitoring are used to evaluate the effectiveness of specific management to achieve goals and objectives. Step down management plans will be revised based on these evaluations.

