# KERN WATER BANK
# WATERBIRD MANAGEMENT PLAN

## INTRODUCTION

The primary water conservation objective of the Kern Water Bank (KWB) is to store water in aquifers in times of surplus for recovery in times of shortage . As a consequence of water recharge operations, waterbird habitat is created. When flexibility exists, KWB's operation may be managed to enhance waterbird habitat.

The Kern Water Bank (KWB) began receiving water for groundwater recharge purposes in 1995. Approximately 3000 acres of previously dry lands were inundated thus creating new temporary wetlands. The new wetlands developing on the KWB have been in existence for such a brief period of time that little information on the biological resources of these areas is available to develop management strategies. What information is available is not sufficient in the quantity and quality to make appropriate long-term management decisions for waterbirds using the KWB. In addition to the lack of biological data on the KWB wetlands, the general unpredictable nature of water availability, quantity, timing and the duration of water delivers to the KWB compounds the problems of managing wetlands for waterbirds. The term "waterbirds" generally applies to geese, swans, and ducks while the designation as "marsh" and "shorebirds" includes birds classified in two families of the order Gruiformes and five families in the order Chradriiformes. Common marsh and shorebirds include rails and coots, plovers, stilts, avocets, sand pipers and their close relatives. For the purpose of this document, the term "waterbirds" will include those species considered under the general descriptors of waterfowl and shorebirds unless otherwise specified in the text.

Water deliveries are the key factor to the success of this waterbird management plan. Routine prolonged inundation contributes significantly to biodiversity in wetland aquatic systems. The KWB, when operated at its anticipated capacity, has approximately 5,900 acres of recharge basins that can receive water. Although considerable work has already been undertaken on models (based on 70 year water histories) to predict the amounts and timing of recharge waters available for the KWB, its use for recharge will depend on a number of factors including rainfall. Only a small percentage of the water supplies available to the KWB can be regulated. The majority of the water for recharge in the KWB is expected to be available in the early spring and may continue through the summer. This type of water delivery schedule may not be optimal for establishment of a balanced wetland ecosystem. The frequency in which the basins will be used for recharge is projected to vary: 5900 acres are estimated to be flooded infrequently (1 year in 10); 4830 acres are estimated to be flooded on a intermediate basis (2 years in 10); and 2,110 acres are expected to be flooded frequently (5 years in 10). The duration of flooding each year will vary depending on type of water supply (see Map 5, Recharge Frequency Plan).

## PURPOSE

The purpose of this management plan is to suggest strategies that may enhance waterbird habitat when operational flexibility exists. With water only recently introduced to the current systems of recharge basins on the KWB, environmental conditions will change in these recharge basins and the surrounding areas are expected to change dramatically over the years. Management approaches may have to be modified to adapt to the environmental changes. Therefore, the waterbird management plan will be adaptive in nature. The following briefly details the elements of the waterbird management plan for KWB:

- Monitor and assess the population trends of waterbirds, utilizing the KWB.
- Enhance waterbird habitat.
- Minimize adverse impacts to waterbirds resulting from KWB operations and maintenance.
- Provide hunting programs compatible with KWB operations and as approved by the USFWS and CDFG (potential).

### Resource Mapping and Data Collection

The recent introduction of water to the KWB will result in the development of new waterbird habitats. These new habitats will change over time as species that are better adapted to survive in a wetlands environment becomes established on the KWB. It is important to promote habitats that will support a variety of waterbird species. The Kern Water Bank Authority (KWBA) is in the process of developing a Geographic Information System (GIS) of the KWB which can be used to develop management strategies and inventory the wetland resources. The GIS will allow those involved in the management of the natural resources on the KWB to evaluate the effectiveness of management strategies on an area wide basis and over the operational life of the project.

Maps supporting the waterbird management plan should include information on:

Riparian Habitat
Deep Water Habitat
Shallow Water Habitat
Vegetation Community Types
Recharge basin Location
Agriculture

## Riparian Habitat Mapping

The current locations of areas supporting riparian habitats on the KWB are primarily along the Kern River. The larger stands of riparian habitat occur in the City of Bakersfield recharge area in and along the banks of the Kern River. As water is applied to the KWB, it is possible that new areas of riparian habitat will develop. Enhancement of riparian habitat on the KWB will provide habitat for both tree and cavity nesting, roosting, foraging and cover for waterbirds. To assess the changes in riparian habitat, the following activities are suggested:

Map riparian habitat

Promote operations of the KWB that will enhance riparian habitat.

Monitor development of riparian habitat along ditches canals and old sloughs.

## Deep and Shallow Water Wetland Habitats

The recharge basins were constructed by selectively creating levees to impound water while taking into consideration the existing topography of the area. This technique allowed for the recharge basins to be flooded to the contour of the land which resulted in the development of natural islands and peninsulas within many of the recharge basins. Flooding the recharge basins to the contours also promoted the creation of a temporary wetland system that supports a variety of water depths. Wetland systems with a variety of water depths generally support a wider range of plant and animal species.

Shallow water habitats on the KWB range from mud flats to flowing and ponded waters 12 inches deep. These types of habitats provide foraging areas for the majority of waterbirds that occur in the San Joaquin Valley. The recharge basins within the KWB result in the creation of large amounts of shallow water habitat. Deep water habitats for waterbirds are classified as those areas that range from 12 to 24 inches deep or deeper for some species. They are utilized by many waterbirds as areas to rest, raft and serve as foraging areas for dabbling and diving ducks. To assess the variety, quality and quantity of waterbird habitat being established on the KWB, the following information should be collected:

The acreage of deep and shallow water should be estimated and mapped so that areas capable of supporting deep and shallow water habitats, can easily be located. This is important during field investigations to determine habitat characteristics preferred by waterbirds.

## Waterbird Population Monitoring

During the first three years, a survey to determine relative densities of waterbirds on the KWB shall be conducted monthly during flooding. A simple technique for conducting this type of survey involves walking or driving the levees and roadways

surrounding the recharge basins. Those recharge basin systems that have limited access by roads should be walked. The following data should be collected during these surveys.

Approximate number and species of waterbirds encountered
Location
Weather conditions during the survey
Season (date)
Area flooded

**Breeding Bird Surveys**

To determine the productivity and distribution of nesting waterbirds, breeding bird surveys should be conducted monthly during the nesting season if recharge occurs during that nesting season. These surveys will assist in determining where areas of preferred nesting habitat exists. In many cases, waterbirds will return to the same nesting neighborhoods year after year. Management practices to minimize disturbance to these areas once they are located can then be instituted.

Breeding bird surveys will be done in accordance with a protocol approved by the Resource Agencies. The locations of waterbirds displaying breeding behavior and brood counts will be noted on maps of the KWB.

**Impact Avoidance Measures**

Nesting activity for the majority of duck species that occur in the Southern San Joaquin Valley begins in early March and progresses through May. Shorebirds in the southern San Joaquin Valley begin nesting in early April and continue through July. Many of the waterbird species that nest in the San Joaquin Valley nest on the ground. The preferred nesting habitat of shorebirds found on the KWB (American avocet, black-necked stilt, killdeer) is sparsely vegetated gentle slopes and flats adjacent to recharge basin areas with little vegetation. The fact that these birds generally nest in fairly open habitats, and are generally easily visible, makes detection of their nests relatively easy. Ducks generally construct their nests in more secluded areas of heavier vegetation making their detection more difficult. Other species of waterbirds that may nest at the KWB create nests in trees or in cavities in trees, while others such as grebes and mud hens will create nests built on rafts of emergent vegetation.

Recharge basin operations and maintenance have the potential to impact waterbirds adversely. These activities include but are not limited to roadway maintenance, ditch construction, maintenance of water control facilities, vegetation control, mosquito abatement and the periodic flooding and drying of the recharge basin. The greatest impacts to waterbirds from these activities is likely to occur during nesting season. While it is recognized that some waterbird species may be impacted by KWB operations, no additional mitigation is required since the KWB operations are expected to provide a substantial net benefit for these species. When and where appropriate, the following measures will be implemented to help reduce disturbance:

Identify areas of preferred nesting habitat. In many cases waterbirds will return to the same nesting neighborhoods year after year. Management practices may be developed to minimize disturbance to these areas.

Spraying of herbicides and pesticides should be limited. All applications of herbicides and pesticides shall follow manufacturers the management practices set forth in the KWBA Vegetation Management Plan and Operations Manual.

If possible, construction of new facilities near existing recharge basins should occur outside the nesting season.

If possible, water levels should be maintained during the nesting season on recharge basins supporting nesting populations of waterbirds and shorebirds.

If possible, the application of all pesticides and herbicides should be postponed on the KWB until after the completion of waterbird nesting season.

**Botulism Control and Avian Disease**

Although wetland habitat is viewed as beneficial for waterbirds, created wetlands may produce detrimental effects on waterbirds. These effects can include the introduction of pathogenic (i.e., disease-producing) microorganisms, infectious disease outbreaks, transmission of diseases to other populations and potential heavy metals or other toxic substance contamination. Heavy metals and toxic substances are not anticipated to be a problem at the KWB facilities, because the sources of water are not likely to have high concentrations of dissolved metals or toxic substances.

The diseases of greatest concern are salmonella (*Salmonella* spp.), avian cholera (*Pasteurella mutocida*), and botulism (*Coltridium botulinum*). It must be emphasized that these diseases or the pathogens that carry them do not originate in the water per se, but are introduced to recharge basins by the birds themselves or other environmental factors. The potential for avian diseases to infect recharge basins is a result of the amount of nutrients in the water, eutrophic and stagnant conditions, and the amount of seasonal bird use. Particularly in light of the disappearance of natural wetland habitats along the Pacific Flyway, once a recharge basin becomes infected, there is potential for the infection to spread due to the gregarious behavior of many waterbird species and their mobility.

Water deliveries to the KWB are not suspected to promote avian diseases because of high infiltration rates which result in rapid water turnover and because of the cool temperatures of the recharge water. The following measures are recommended to help minimize the risk of exposure of waterbirds to disease:

Provide CDFG with reasonable access to recharge basins to provide for continued evaluation of the habitat values and problems associated with them.

Provide appropriate access to all recharge basins.

Monitor the recharge basins for sick or dead birds. Sick and dead birds should be removed disposed of properly.

Discourage the heavy build up of dead or rotting vegetation in the recharge basins.

Farming and other land uses adjacent to areas with high waterbird use can be planned and managed to coincidentally benefit waterbirds.

## Hunting Programs

Hunting is included as permitted activity under the HCP, subject to further approvals by the Resource Agencies. The KWB has a strong potential to provide high quality waterbird and upland hunting. A highly successful Mourning Dove food plot and public hunting program has been operated for two years in collaboration with CDFG. Public or private hunting programs may be developed as part of the waterbird management plan. A number of issues need to be investigated and resolved to propose a hunting program. These include:

Waterbird use patterns and other biological information as described in the waterbird management plan,

Regional waterbird distribution patterns and coordination with other public and private hunting programs,

Liability, costs, revenues, and general feasibility in the context of KWB operations,

Specific planning and implementation.

Public or private hunting programs will be developed only in collaboration with the CDFG and/or USFWS.