7.0 BLACKROCK WATERFOWL HABITAT AREA

7.1 WETLANDS AND RIPARIAN HABITATS

7.1.1 Existing Conditions

The Blackrock Waterfowl Habitat Area consists of four separate management units: Drew, Waggoner, Winterton, and Thibaut (Figure 2-15). Ecosystem Sciences (April 2002) estimated the potential area in which flooding could occur under the LORP in each management unit based on: (1) an evaluation of 2-foot contour maps for a portion of the area and maps of the distribution and spreading facilities within the four management units; (2) observations of the locations and elevations of roads, levees, spillgates, culverts, ditches; and (3) observations of the distribution of existing wetland vegetation and open water during winter and spring, when water was relatively abundant and evapotranspiration was low. The evaluation included observations of water released from spillgates and runoff from precipitation to locate watercourses and sinks. The delineation was intended to identify the maximum boundaries within which flooding could occur under the LORP. However, it is not proposed nor expected that the maximum extent would be flooded at any one time. The actual extent of flooding in any unit will be based in part on the extent of total flooding in all units, with the goal being to achieve a total of 500 acres of flooded area (see MOU goals, below). The proposed flooding regime for the first several years of project implementation is described below.

The total area within which flooding could potentially occur within the four units is approximately 1,342 acres (see Table 7-1 and Figure 7-1 through 7-3). Under the MOU, LADWP is required to flood 500 acres out of this 1,342-acre total, except in years when runoff is forecasted to be less than average. In addition, the areas within 300 feet of the flooded areas, called "adjacent zones," are expected to benefit from the flooding and to provide important nesting, resting, and feeding habitat for waterfowl and many other wildlife species that use the Blackrock area. The total area of these adjacent zones in the four Blackrock management units is 1,241 acres (see Figure 2-15). Thus, the Blackrock Waterfowl Habitat Area consists of a total of 2,583 acres within four management units.

Portions of the management units currently include waterfowl habitat in various man-made lakes and seasonally flooded pastures. Over the past 40 years, the Blackrock area has been used for water spreading in high runoff years, grazing, and other activities. For example, when runoff has exceeded the Aqueduct capacity, it has been spread over extensive areas normally used for dry grazing that extend from Blackrock Ditch to Billy Lake. To facilitate spreading, LADWP has constructed miles of dikes, levees, ditches, roads, culverts, and basins. The water-spreading basins are connected by ditches, culverts, and spillgates. Significant areas were recontoured in the past to facilitate spreading and percolation and to reduce the need to release excess water to Owens Lake, which was limited by a court injunction to prevent flooding of mining operations on Owens Lake.

In 1986, LADWP began making continuous water releases to the area now called the Waggoner Unit to supply Goose Lake as an off-river lake and pond component of the Lower Owens River Rewatering Project. At the time, the Waggoner Unit consisted primarily of alkali meadow and saltbush scrub. For many years, the water releases created large expanses of open water, interrupted by islands of rush/sedge meadow and saltbush scrub, which attracted large numbers of resident and migratory waterfowl and shorebirds. After several years of continued flooding, the open water areas began to fill in with cattails and bulrushes until the Waggoner Unit became dominated by emergent vegetation, as it is today. LADWP has observed that once the area became dominated by emergent vegetation, its value to waterfowl and shorebirds was diminished.

In addition to the wetlands created by LADWP's water releases, natural wetlands are present in the Blackrock area at seeps and springs along the 1872 earthquake fault line or in areas with naturally high groundwater. Existing wetlands (both natural and created) in the Blackrock Waterfowl Habitat Area include open water, alkali marsh, rush/sedge meadow, and alkali meadow. The Blackrock area is currently grazed by livestock in various LADWP leases, as described in Section 2.8.

White Horse Associates mapped vegetation types in the Blackrock Habitat Area based on field surveys and aerial photography interpretation in 1997. Their results were documented in Technical Memoranda 4 (1998) and 15 (1998), which were prepared by Ecosystem Sciences. The classification system used in the memoranda represented a variation of the Holland system used in the Cooperative Vegetation Study by LADWP and Inyo County (1990 Green Book). The vegetation types described in the Ecosystem Sciences memoranda are used below. For convenience, the names of the vegetation types have been abbreviated in the text and tables of this section. See Figures 7-1 through 7-3 for the distribution of the vegetation types. A description of each vegetation type by Ecosystem Sciences is presented below.

Open water: This mapping unit represents areas of open water areas in Lacustrine and Palustrine wetlands. Some emergent vegetation is usually present along shorelines and in other shallow areas. Permanently and semi-permanently flooded habitat usually develops emergent vegetation within a short period of time. Many shallower areas are transformed into emergent wetlands such as transmontane marsh (alkali and freshwater) within a few seasons. Open water tends to be temporary habitat that persists in deep water areas, some "hard pan" areas and when water is manipulated to periodically desiccate the area and thus reduce the volume of emergent vegetation. Open water is considered a valuable and very rare "wetland habitat" in the Owens Valley. This mapping type generally corresponds to the Permanent Lakes & Reservoirs (Type 13100) in the Holland (1986) classification scheme. For the EIR/EIS, all areas mapped as open water are not considered vegetated wetlands.

Alkali marsh: This community combines elements of both "Transmontane Alkali Marsh" and "Transmontane Freshwater Marsh". Transmontane marsh occurs in areas of standing, more or less permanent water. The freshwater marsh usually occurs where the water flow provides more freshwater than in the Transmontane Alkali Marsh. The dominant vegetation consists of herbaceous plants, especially cattails (*Typha* spp.), and bulrushes (*Scirpus* spp.). Other common species include yerba mansa (*Anemopsis californica*), salt grass, sedges, rushes and along even drier margins common reed (*Phragmites australis*) saltbush (*Atriplex* spp.) and rubber rabbitbrush (*Chrysothamnus nauseosus*).

In some areas, plant species richness appears to be very low, consisting almost entirely of dense stands of cattail and bulrush. Along low gradient ecotones, this community provides a rich and diverse mixture of wetland types as it merges with wet meadow, alkali meadow, seep, and upland communities. In the Lower Owens Valley, this mapping unit develops very rapidly and tends to dominate areas provided with standing permanent to semi-permanent water with depth less than about 3 to 4 feet. Without some form of hydroperiod manipulation, this vegetation type becomes a very dense monoculture in only a few years. This vegetation type corresponds to Transmontane Alkali Marsh (Type 52320) and Transmontane Freshwater Marsh (Type 52400) in the Holland (1986) vegetation classification system and in the Green Book (LADWP and Inyo County, 1990). In the Blackrock area much of the existing and future marsh habitat should probably be considered freshwater marsh. For the EIR/EIS, all areas mapped as marsh are considered vegetated wetlands.

Rush/sedge meadow: Wet meadows usually have dense growth of perennial grasses (some resulting from the introduction of pasture crops), sedges (*Carex* sp.), and broad-leaved plants. This vegetation type occurs on fine-textured, permanently moist, alkaline soils throughout the study area. On some sites, supplemental irrigation maintains plant growth. Characteristic species include sedge, salt grass, Bermuda

grass (*Cynodon dactylon*), Meadow fescue (*Festuca arundinacea*), rush (*Juncus* sp.), alkali sacaton, common reed (*Phragmites australis*), and nitrophila (*Nitrophila occidentalis*).

Wet meadows are frequently associated with and merge indistinguishably into "Alkali Seeps", "Transmontane Alkali and Freshwater Marsh", "Alkali Meadow" and "Alkali Shrub Meadow" vegetation types. Much of the wet meadow mapping unit in the Blackrock Waterfowl Habitat Area has developed as a result of water spreading and irrigation activities. For this EIR all areas mapped as rush/sedge meadow are considered vegetated wetlands. This vegetation type corresponds to Transmontane Meadow or more specifically a rush/sedge meadow (Type 45330) in the Holland (1986) vegetation classification system and in the Green Book (LADWP and Inyo County, 1990). For the EIR/EIS, all areas mapped as rush/sedge meadow are considered vegetated wetlands.

Alkali meadow: Alkali Meadow consists of dense to fairly open stands of perennial grasses and sedges, sometimes with scattered shrubs. Relatively few plant species form the community and grass species such as alkali sacaton (*Sporobolus airoides*) and saltgrass (*Distichlis spicata*) are consistently dominant. This type is associated with fine-textured, permanently moist, alkaline soils on valley bottoms. This vegetation type corresponds to Transmontane Alkali Meadow (Type 45310) in the Holland (1986) vegetation classification system and in the Green Book (LADWP and Inyo County, 1990). Alkali Meadow is a dominant mapping unit of the Lower Owens River floodplain. For the EIR/EIS, all areas mapped as alkali meadow are considered vegetated wetlands.

Greasewood scrub: This vegetation type includes sandy habitat dominated by alkali tolerant, facultative wetland shrub and herbaceous species. The shrub stratum typically includes Parry saltbush (*Atriplex parryi*) and Torrey seepweed (*Suada moquinii*); Torrey saltbush (*Atriplex lentiformis ssp. torreyi*), shrubby alkali aster (*Macoranthera carnosa*) and greasewood (*Sarcobatus vermiculatus*) are also common. Saltgrass is typically present, but with low cover. This vegetation corresponds to Desert Sink Scrub (Type 36120) in the Holland (1986) vegetation classification system and in the Green Book (LADWP and Inyo County, 1990). For the EIR/EIS, all areas mapped as greasewood scrub are considered uplands.

Tamarisk shrub: Tamarisk or salt cedar (*Tamarix ramosissima* and *T. chhinensis*) is the dominant species along with some scattered narrow leaf willow (*Salix exigua*), dusky willow (*S. melanopsis*) and occasionally Russian olive (*Elaeagnus angustifolia*), red willow (*Salix laevigata*) and wood rose (*Rosa woodsii* var. *ultramontana*). This mapping unit generally occurs in open scattered stands except localized very dense clumps of willow and rose. Stands are usually less than two to three meters in height, but at a few locations such as along the margins of permanent water, trees occur. In the Blackrock Habitat Area, much of this mapping unit is associated with roadsides, levees, old ditches, basins and other water spreading facilities. Tamarisk appears to be associated with soil manipulation and certain flooding (hydrologic) regimes. This mapping type corresponds to Tamarisk scrub (Type 63810) in the Holland (1986) classification system and in the Green Book (LADWP and Inyo County, 1990). For the EIR/EIS, all areas mapped as tamarisk shrub are considered uplands.

Alkali shrub meadow or Saltbush Scrub: Mixture of a low shrub overstory including saltbush (*Atriplex* spp. including allscale, fourwing saltbush, shadscale, etc.), rubber rabbitbrush (*Chrysothamnus nauseosus*) and some greasewood (Sarcobatus vermiculatus), with a perennial grass understory. Usually occurs on fine-textured alkaline or saline soils. Much of this mapping unit occurs between and adjacent to alkali marsh and alkali meadow or upland areas such as desert sink shrub. This mapping type generally corresponds to Transmontane Alkali Meadow (Type 45310) in the Holland (1986) vegetation classification system and in the Green Book (LADWP and Inyo County, 1990). For the EIR/EIS, all areas mapped as alkali shrub meadow are considered uplands.

Desert sink scrub: Desert sink scrub is a low very open shrub mapping unit with scattered grasses and forbs. Shrub species include saltbush (*Atriplex* sp.), greasewood, iodine bush (*Allenrolfea occidentalis*), as well as some alkali sacaton, salt grass, and others. Soils range from poorly drained to more course textured and drier soils and generally high alkalinity or salinity. Some of this mapping unit has a fairly dense shrub overstory and sparse understory. Shrubs are locally dominant and generally include a mixture of greasewood (*Sarcobatus vermiculatus*) and shadscale (*Atriplex confertifolia*), with other saltbush species scattered throughout. The herbaceous understory consists of clumps of widely scattered individual perennial and annual grasses and succulent shrubs and forbs. This vegetation type appears to be strongly influenced by land management practices especially construction and maintenance of extensive water spreading facilities. This vegetation corresponds to Desert Sink Scrub (Type 36120) in the Holland (1986) vegetation classification system and in the Green Book (LADWP and Inyo County, 1990). For the EIR/EIS, all areas mapped as desert sink scrub are considered uplands.

Great Basin scrub: This unit is restricted to the coarse to moderately coarse textured soils located in the northeastern portion of the mapping area (Figure 7-3). Characteristic species of this low, open shrub community include shadscale (Atriplex confertifolia), A. canescens, A. polycarpa, Nevada ephedra (*Ephedra nevdensis*), Mojave dalea (*Psorothamnus arborescens* var. *minutifolius*), and cottonhorn (*Tetradymia axillaris*). Great basin scrub generally corresponds to Great Basin Mixed Scrub (Type 32199) in the Holland (1986) vegetation system. For the EIR/EIS, all areas mapped as Great Basin scrub are considered uplands.

Playa: Areas mapped as playa usually occurs in relatively low laying areas on poorly drained soils with high salinity and/or alkalinity. Alkali playa often has a surface salt crust and very sparse open vegetation cover. Playas generally lack drainage and often accumulate and hold water for short periods following summer rainstorms. Dominants are usually low, small-leaved shrubs with wide spacing between them and includes iodine bush (*Allenrolfea occidentalis*), salt grass (*Distichlis spicata ssp. Stricta*), shadscale (*Atriplex confertifolia*), Parry's saltbush (*A. parryi*), and greasewood (*Sarcobatus vermiculatus*). Playa generally corresponds to Alkali Playa Community (Type 46000) in the Holland (1986) vegetation system. For the EIR/EIS, all areas mapped as playa are considered uplands.

Alkali weed: This mapping unit represents a mixture of areas that have been disturbed and now support mostly non-native vegetation although some areas are dominated by native species. Vegetation cover and composition is variable and includes greasewood (*Sarcobatus vermiculatus*), shadscale (*Atriplex confertifolia*), fourwing saltbush (*Atriplex canescens*), common reed (*Phragmites australis*), alkali sacaton (*Sporobolus airoides*), saltgrass (*Distichlis spicata*), ashy wild rye (*Leymus cinereus*), bermudagrass (*Cynodon dactylon*), meadow fescue (*Festuca arundinacea*), wheatgrass (*Agropyron intermedium*), various clovers (*Trifolium* sp.), bird's foot trefoil (Lotus corniculatus) Russian thistle (*Salsola kali var. tenuifolia*), bassia (*Bassia hyssopifolia*), ragweed (*Ambrosia acanthicarpa*), white bursage (*Ambrosia dumosa*), ink weed (*Suaeda torreyana*), and annual sunflower (*Helianthus annuus*). Alkali weed is a one of several mapping types located in disturbed areas and is included in the modified Holland (1986) "Non-Native Vegetation and Miscellaneous Lands" (Type 10000) classification system and in the Green Book (LADWP and Inyo County, 1990). For the EIR/EIS, all areas mapped as alkali weed are considered uplands.

Levee: Vegetation on levees is not floristically diverse. Many of the roads in the Blackrock Area are located on top of levees and included into this mapping unit. Levees are included in the modified Holland (1986) "Non-Native Vegetation and Miscellaneous Lands" (Type 10000) classification system and in the Green Book (LADWP and Inyo County, 1990). For the EIR/EIS, all areas mapped as levee are considered uplands.

Ditch: Ditches are water conveyance structures with fairly diverse plant species richness and composition. Inactive ditches generally support introduced annuals and are similar to the "Alkali weed" type above. Active ditches have fairly high plant species richness and variable composition although only a small portions the ditch support vegetation cover. Active ditches support parsnip, cut-leaf water (*Berula erecta*), water-hemlock (*Cicuta douglasii*), water-parsnip, hemlock (*Sium suave*), fern, fern-like mosquito (*Azolla filiculoides*), and several species of cattail (*Typha* sp), duckweed (*Lemna* sp), water-weed (*Eloea* sp), rabbit-foot (*Polypogon* sp), pond weed (*Potamogeton* sp), flatsedge (*Cyperus* sp), sedge (*Carex* sp), spikerush (*Eleocharis* sp), bulrush (*Scirpus* sp), horsetail (*Equisetum* sp), and rush (*Juncus* sp). The ditch mapping unit is included in the modified Holland (1986) "Non-Native Vegetation and Miscellaneous Lands" (Type 10000) classification system and in the Green Book (LADWP and Inyo County, 1990). For the EIR/EIS, all areas mapped as ditch are considered uplands.

Table 7-1 provides a summary of the vegetation types within the potential flooding areas and the adjacent habitat zones within 300 feet of the areas of potential flooding in the four management units (the "adjacent habitat areas" defined above). The extent of the potential flooding area in each unit approximates the largest extent that could reasonably be flooded under LORP management. This maximum extent of flooding is limited by the constraints as provided in the MOU (i.e., requiring approximately 500 acres to be flooded during average and above average runoff years), the water supply, and topography.

The relative values of wetland habitats in the Blackrock area are based on habitat characteristics and how they relate to the needs of the MOU indicator species. Based on these standards, wetland and water habitats in the Blackrock area are listed in order of their value to the MOU indicator species: open water, alkali marsh, rush/sedge meadow, and alkali meadow.

TABLE 7-1
EXISTING VEGETATION TYPES IN THE MANAGEMENT UNITES OF THE BLACKROCK WATERFOWL HABITAT AREA

Vegetation Type	Potential Flooding Area (area within which 500 acres would be flooded at any one time) and Adjacent Habitat Zones (see Figures 7-1 to 7-3)									
	Drew		Waggoner		Winterton		Thibaut		Total	
	Flood	Adjacent Area	Flood	Adjacent Area	Flood	Adjacent Area	Flood	Adjacent Area	Flood	Adjacent Area
Open water*	0	0	10	2	11	1	14	7	35	10
Alkali marsh*	34	4	107	65	6	0	7	0	154	69
Rush/sedge meadow*	0	0	0	7	53	5	75	43	128	55
Alkali meadow*	14	0	6	12	6	3	19	14	45	29
Greasewood scrub	0	0	0	1	6	93	10	35	16	129
Saltbush scrub	33	101	12	91	10	15	14	34	69	241
Desert sink scrub	23	5	4	57	0	62	62	123	89	247
Great Basin scrub	0	2	0	1	0	0	0	0	0	3
Tamarisk scrub	0	0	0	0	0	0	0	3	0	3
Alkali weed	0	1	8	4	72	61	107	0	187	66
Abandoned agriculture*	131	6	0	0	0	0	0	0	131	6
Playa	0	0	0	0	0	1	45	68	45	69
Levee	5	1	0	1	0	0	0	4	5	2
Ditch	6	0	0	0	0	0	0	44	6	0
Total open water	0	0	10	2	11	1	14	7	35	10
Total (all vegetated wetlands)*	48	4	113	84	65	8	101	57	327	153
Total (all open waters and wetlands noted * above)	48	4	123	86	76	9	115	64	362	163
TOTAL ACREAGE OF ALL MAPPING UNITS =	246	120	147	241	164	241	353	375	910	977

* Abandoned agriculture in the Drew management unit was classified as alkali meadow in the previous version of Table 7-1 presented in the Draft EIR/EIS.
Source: Ecosystem Sciences.

The dominant vegetation type within the potential flooded area in the four management units of the Blackrock Waterfowl Habitat Area is alkali weed, which is a primarily dry vegetation type, accounting for about 20 percent of the total potential flooded area. This vegetation type is dominated by non-native vegetation, with some native species. The next most abundant vegetation types are alkali marsh, alkali meadow, and rush/sedge meadow, which are all wetland types. Together, these three types account for over 40 percent of the potential flooded area.

The Drew and Waggoner management units currently exhibit the highest relative percent of wetlands, accounting for more than two-thirds of the potential flooded area of these units (Table 7-1). The Thibaut and Winterton management units contain the lowest percentage of wetlands within the area of potential flooding (about 24 and 30 percent, respectively). Riparian scrub is scarce in the Blackrock Waterfowl Habitat Area, as the Owens River does not pass through the area, and the drainages in the area are primarily man-made ditches and channels with minimal woody riparian vegetation. Playa vegetation is only present in quantity in the Thibaut Management Unit, where there is a large expanse of poorly drained alkaline soils with a salt crust near the Thibaut Ponds. (Note: Thibaut Ponds are considered part of the off-river lakes and ponds of the LORP and are discussed in Section 8.0). The potential flooded area within each management unit of the Blackrock Waterfowl Habitat Area is shown on Figures 7-1 to 7-3.

7.1.2 Proposed Project

MOU Goals

The MOU states:

"Approximately 500 acres of the habitat area will be flooded at any given time in a year when the runoff to the Owens River watershed is forecasted to be average or above average. In years when the runoff is forecasted to be less than average, the water supply to the area will be reduced in general proportion to the forecasted runoff in the watershed. (The runoff forecast for each year will be DWP's runoff year forecast for the Owens River Basin, which is based upon the results of its annual April 1 snow survey of the watershed.) Even in the driest years, available water will be used in the most efficient manner to maintain the habitat. The Wildlife and Wetlands Management Plan element of the LORP Plan will recommend the water supply to be made available under various runoff conditions and will recommend how to best use the available water in dry years. The amount of acreage to be flooded in years when the runoff is forecasted to be less than average will be set by the Standing Committee based upon the recommendations of the Wildlife and Wetlands Management Plan and in consultation with DFG."

General Management Strategy

Specific objectives for the Blackrock Waterfowl Habitat Area include the following: (1) provide a reliable and dependable source of water and wetland habitat that will attract resident and migratory waterfowl and shorebirds and the other MOU indicator species for this project element; (2) maintain a ratio of open water wetlands to emergent wetlands so that emergent wetlands do not exceed 50 percent of the flooded area of any management unit; and (3) create and maintain diverse habitats while minimizing the use, extent and frequency of intervention and manipulation.

The Blackrock Waterfowl Habitat Area will be an artificial wetland that would not exist without a considerable investment of resources. Continued intervention and manipulation of water resources is necessary to properly maintain a variety of wetland habitats. Under the project, portions of the Blackrock Waterfowl Habitat Area will be periodically flooded to increase wetland productivity and diversity. In addition, the water supply to the flooded portions of the area will be controlled to mimic seasonal, annual, and longer-term hydrologic and wetland patterns. To achieve the management goals and acreage

requirements in the MOU, the Blackrock Waterfowl Habitat Area will be managed in the four separate management units: Drew, Waggoner, Winterton, and Thibaut (Figure 2-15). The proposed management of the Blackrock Waterfowl Habitat Area is described in Section 2.5.

During average and above average runoff years, a total of approximately 500 acres would be flooded in one or more management units on an annual average basis (subject to seasonal fluctuations). In below average runoff years, less than 500 acres may be flooded. The exact amount would be determined by the Standing Committee each year in accordance with the MOU. The flooded wetlands in the different units would be in stages of development (wet or active phase) or in stages of decline (dry or inactive phase).

As part of project implementation, LADWP will establish a system of gaging stations in the four Blackrock management units, which will serve as indicators of the area of flooding in each of the units. During the first several years of project implementation and during the initiation of active cycles in the management units, it will be necessary to closely monitor water levels and manage water releases to develop water release schedules to meet the MOU's requirements. To document compliance with the MOU's requirements for this project element, LADWP and the County will monitor water levels at the gaging stations and flows at spillgates and diversions that supply the units. The information will be reported to agency managers so that the flooded area can be evaluated and releases can be adjusted, if necessary, to ensure compliance with the MOU.

Any wetland that is maintained in the same condition over many years will decline in productivity. Impounding water year after year generally results in lower productivity in terms of waterfowl and shorebird use. Periodic disturbance is essential for long-term productivity and wildlife use of managed marshes (Smith and Kadlec, 1986). Disturbances, such as drawdown and fire, are commonly used in managed wetlands to manipulate plant communities in favor of waterfowl use. The Blackrock Habitat Area will be managed similarly by cycling the management units through repeated wet and dry phases.

The management units would be subject to periodic cycles of wetting and drying so that one to three management units would be wholly or partially flooded at any given time. This phase of the management is considered "wet" or "active." Management units not actively managed or flooded are considered "dry" or "inactive." The purpose of the dry phase is to control excessive cattail and bulrush growth, which reduces the value of the wetlands to the MOU indicator species for the Blackrock area. In practice, depending on the quality of habitat provided by each of the management units (e.g., the extent of emergent vegetation that develops in a given unit), some units could remain flooded indefinitely, while others could be left dormant, as long as the MOU requirements are met.

Units will be converted from a wet to a dry phase when the area of emergent vegetation in an active unit reaches approximately 50 percent of the flooded area. LADWP and the County will track the extent of emergent vegetation within the active units using remote sensing imagery, or other appropriate tools, and the estimates of flooded areas calculated from the gaging stations measurements.

Water will be conveyed through the Blackrock Waterfowl Habitat Area through a series of existing channels (Figure 2-15). The water supplied to the area from the Aqueduct will be independent of the releases to the river. Very little water will leave the Blackrock Waterfowl Area and return to the river. Therefore, water losses to the Blackrock Area will mainly be consumptive losses. Various physical improvements will be necessary to facilitate water movement, including replacement or repair of small spillgates, and reshaping of old ditches. These improvements are described below for each management unit. An overview of the areas subject to flooding under the proposed plan is provided on Figure 2-15.

LADWP and the County may also use controlled burns as a tool to manage vegetation in the Blackrock Waterfowl Habitat Area to maintain desired ratios of open water and emergent vegetation. Controlled

burns may be used on a limited basis and only if necessary. Effective water management may reduce the need to use this management tool.

Proposed Flooding Regime

The Blackrock Waterfowl Habitat Area will be implemented in two flooding cycles that will occur during the first 10 to 15 years of the project. At this time, it is intended that the two cycles would be repeated, unless it is determined through adaptive management that the goals of the MOU would be better achieved by modifying the flooding regime. In addition, water releases to the active Blackrock management units will be controlled to induce seasonal fluctuations in water levels.

Cycle 1

1. Existing water releases to the Waggoner Unit will be discontinued and the unit will begin a dry phase to remove the emergent vegetation in this unit. During cycle 1, the open water and vegetated wetland habitat in the Waggoner Unit will be reduced from 268 acres (including the areas of open water and vegetated wetlands in the "adjacent habitat" area. See Table 7-1) to 0 (Table 7-3, cycle 1). Controlled burning may be used if needed to reduce the amount of standing dead cattails and bulrushes.
2. Approximately 354 acres will be flooded in the Thibaut Unit.
3. Approximately 165 acres of the Winterton Unit will be flooded to achieve 500 acres of flooded area.

Cycle 2

When the flooded area of the Winterton Unit develops 50 percent cover of emergent vegetation, cycle 2 will be implemented:

1. Flooding will be discontinued or reduced in the Winterton Unit. The unit is expected to revert to the existing 76 acres of open water and vegetated wetland within the area that will be flooded during cycle 1.
2. Depending on conditions in the Thibaut and Winterton units, between 100 and 150 acres (estimated at 147 acres in Tables 7-2 and 7-3, cycle 2) will be flooded in the Waggoner unit to achieve 500 acres of flooded area.

3. The Thibaut Unit will continue to be flooded at 354 acres, unless the area of emergent vegetation reaches 50 percent of the flooded area, at which time the unit would be shifted to a dry phase and flooded areas in one or more of the other three units would be increased to meet the MOU requirement.

The Drew Unit will not be flooded at any time, unless it is needed to create additional flooded area to achieve the 500-acre MOU requirement or to better meet MOU habitat goals amongst the four management units.

It should be noted that, when a unit is placed in a dry cycle, the water supply will be discontinued and the flooded area in that unit will remain for some time thereafter, slowly disappearing over time. At the same time, the unit transitioning into a wet cycle will receive water to start the flooding process. Thus, during the transitional period it is expected that more than 500 acres will be flooded. In addition, as the water level recedes in a drying unit, the same benefits will occur in the unit as will be provided during the seasonal fluctuations in water levels in active management units described below.

The existing vegetation within the areas to be flooded during the first two cycles of flooding and drying is shown in Table 7-2.

Seasonal Water Level Fluctuations

The extent of the flooded areas in all of the management units will fluctuate with the water supply and on a seasonal basis. Seasonal water level fluctuations are an important attribute of managed wetlands. Water level changes provide substrate for aquatic invertebrates and macrophytes, both of which are essential food resources for many migrant and resident waterbirds, especially brooding young.

The MOU states "approximately 500 acres of the habitat area will be flooded at any given time in a year when the runoff to the Owens River watershed is forecasted to be average or above average." In less than average runoff years, the water supply to the Blackrock area may be reduced in general proportion to the forecasted runoff and will be set by the Standing Committee. LADWP plans to meet the above goal for the Blackrock habitat area by maintaining an average annual flooded acreage of approximately 500 acres during average or above average years, and by maintaining on an annual average basis the acreage set by the Standing Committee for years that have less than average runoff. Within the annual average, the total area flooded at any time during a runoff year will vary seasonally as described below.

TABLE 7-2
EXISTING VEGETATION TYPES IN THE AREAS WITHIN WHICH FLOODING IS PROPOSED DURING THE FIRST TWO CYCLES OF THE LORP

Mapping Types	Waggoner Area Active Cycle 2			Winterton Area Active Cycle 1			Thibaut Area Active Cycle 1 & Cycle 2			TOTAL Cycle 1 & Cycle 2		
	Cycle 2 Flood Area	Adjacent Habitat Zone	Total	Cycle 1 Flood Area	Adjacent Habitat Zone	Total	Cycle 1&2 Flood Area	Adjacent Habitat Zone	Total	Cycle 1&2 Flood Area	Adjacent Habitat Zone	Total
Open water*	10	2	12	11	1	12	14	7	21	36	10	46
Alkali marsh*	107	65	172	6	0	6	7	0	7	119	65	184
Rush/sedge meadow*	0	7	7	53	5	58	75	43	118	129	55	184
Alkali meadow*	6	12	18	6	3	9	19	14	33	30	30	60
Greasewood scrub	0	1	1	6	93	99	10	35	45	16	129	145
Saltbush scrub	12	91	103	10	15	25	14	34	48	37	140	177
Desert sink scrub	4	57	61	0	62	62	62	123	185	67	241	308
Great Basin scrub	0	1	1	0	0	0	0	0	0	0	1	1
Tamarisk scrub	0	0	0	0	0	0	0	3	3	0	3	3
Alkali weed	8	4	12	72	61	133	107	0	107	187	65	252
Playa	0	0	0	0	1	1	45	68	113	45	69	114
Levee	0	1	1	0	0	0	0	4	4	0	5	5
Ditch	0	0	0	0	0	0	0	44	44	0	44	44
Open water	10	2	12	11	1	12	14	7	21	36	10	46
All vegetated wetlands	113	84	197	65	8	73	101	57	158	278	151	428
TOTAL all open water and wetlands (* above)	123	86	209	76	9	85	115	64	180	314	161	474
TOTAL=	147	241	388	164	241	405	353	375	728	666	858	1,524

Source: Ecosystem Sciences. Note: Changes to Drew Unit are not proposed during the first two cycles.

TABLE 7-3
TEMPORARY AND LONG TERM WETLANDS CONVERSIONS (ACRES)
EXPECTED FROM FIRST TWO FLOODING AND DRYING CYCLES

(+/- Indicates Increase or Decrease in Area from Existing Conditions)

	Waggoner Unit (acres)	Winterton Unit (acres)	Thibaut Unit (acres)	Totals (acres)
Existing Conditions				
Open Water	12	12	28	52
Vegetated Wetland	197	73	158	428
Total =	209	85	186	480
Cycle 1 Conversions: Winterton and Thibaut Active, Waggoner Dry				
Temporary Conversions				
Open Water	0	165	354	519
Vegetated Wetland	0	0	0	0
Total =	0	165	354	519
Temporary Change from Existing Conditions				
Open Water	-12	153	326	467
Vegetated Wetland	-197	-73	-158	-428
Total =	-209	80	168	39
Cycle 2 Conversions: Waggoner and Thibaut Active, Winterton Dry				
Temporary Conversions				
Open Water	147	12	354	513
Vegetated Wetland	0	73	0	73
Total =	147	85	354	586
Temporary Change from Existing Conditions				
Open Water	135	0	326	461
Vegetated Wetland	-197	0	-158	-355
Total =	-62	0	168	106
Long Term Conversions (50 percent open water, 50 percent vegetated)				
Open Water	73	83	177	333
Vegetated Wetland	74	82	177	333
Total=	147	165	354	666
Net Change from Existing Conditions				
Open Water	61	71	149	281
Vegetated Wetland	-123	9	19	-95
Total =	-62	80	168	186

Source: Ecosystem Sciences. Note: Drew Unit is not included, as no change is currently proposed.
[1]Current conditions for Waggoner Unit include open water and vegetated wetland in "adjacent habitat" area summarized in Table 7-1 since the water supply to these wetlands will be discontinued during Cycle 1.
[2]Vegetated Wetland = alkali marsh, rush/sedge meadow, and alkali meadow
[3]Temporary change from existing conditions = temporary conditions – existing conditions
[4]Assumes that flooded areas will convert to 50 percent open water and 50 percent emergent vegetation. When the unit reaches this stage, the next cycle will be initiated.
[5]Net future change from existing conditions = "long-term conversions" - existing conditions

Seasonal fluctuations are expected to occur in active management units between winter and summer seasons, as evaporation and plant transpiration rates vary with changing temperatures. For example, in the winter, transpiration and evaporation rates are low and minimal fluctuations in water levels are anticipated, given a constant water supply. In the summer, as temperatures rise, evaporation and

transpiration rates increase, which results in higher demands on the applied water. If the water supply is not increased to meet these greater demands, the flooded area will shrink. The resulting seasonal fluctuation creates wetlands around the perimeter of the flooded area that serve as productive feeding areas for the Blackrock area indicator species. Flooded acreage would not be reduced below 450 acres or exceed 550 acres in average and above average runoff years (unless runoff exceeds Aqueduct capacity). The fluctuations will not displace wildlife and will add to the habitat diversity available to the indicator species by promoting establishment of a variety of wetland vegetation types.

Beginning April 1 of each year, up to 550 acres will be flooded in the Blackrock area. Once the area has been flooded, water releases will be held steady and water levels will be allowed to recede as summer evaporation and plant transpiration increases. As a result, flooded acreage will be temporarily reduced to less than 500 acres (but no less than 450 acres at any one time). If the flooded area approaches 450 acres, water supplies will be increased, and over the course of each runoff year, water supplies to the Blackrock area will be managed to achieve an annual average of no less than 500 acres of flooding in average and above average runoff years.

Controlled Burning

Controlled burning may be used to reduce or eliminate the emergent vegetation during the dry phase, if needed. Water, time and land management will be the main tools for wetland management, and fire will only be used as a last resort if needed to achieve habitat goals. It is expected that proper wetland management should preclude the need to use fire for vegetation management. Burning and other active vegetation management will be done very prudently and carefully to avoid potential direct and indirect impacts to plants and wildlife in the vicinity. In general, the LORP will be managed to avoid the use of controlled burns. Once the management unit is dry, the condition of the residual emergent vegetation can be assessed. Depending on the extent and condition of the vegetation and surrounding habitat, a determination can be made as to whether fire should be used to remove some of the biomass. (See Technical Memorandum #18, Implementation of the Blackrock Waterfowl Habitat Area, for additional precautions for using fire in the management unit)

Construction of Berms, Ditches, and Spillgates

As described in Section 2.5.10, various construction works would occur throughout portions of the Blackrock Waterfowl Habitat Area to convey water and create new impoundments. Approximately 3.3 miles of earthen berms would be established by constructing new berms and repairing existing ones. Most of the existing berms are 10 to 30 feet wide. New berms would be 1 to 3 feet high and about 15 feet wide, sufficient for vehicle passage. About 1.7 miles of new or repaired ditches would be constructed. New ditches would be trapezoidal earthen channels about 3 feet deep and 5 feet wide and would also include an adjacent 15-foot wide maintenance road. New berms and ditches would be constructed using small earthmoving equipment and on-site material. Work would occur within a 50-foot corridor. Seven spillgates or culverts would be installed in new upland areas or replaced in existing irrigation ditches.

Proposed Actions by Management Unit

The proposed management for the four Blackrock Waterfowl Habitat Area management units during the first two flooding cycles is described below.

Waggoner Management Unit

The Waggoner Unit is south of the Blackrock Ditch and east of the Winterton Unit. The Waggoner Unit is presently used as a conveyance for several off-river lakes and ponds. Several improvements to water supply and control facilities will be completed prior to implementing the project, as described in Section 2.5.1.1. During the first 6 to 12 months of project implementation (the beginning of cycle 1), the water supply to the unit will be discontinued and the area of open water and vegetated wetland in the unit will be reduced from about 268 acres (including the "adjacent habitat" area) to 0 acres (Table 7-3). This reduction of the flooded area in this unit is proposed to promote the reduction of the biomass of emergent vegetation (i.e., cattail and bulrush) that has accumulated over the past 15 to 20 years. (It should be noted that the water supply to Goose Lake will be maintained while the Waggoner Unit is in a dry cycle. An alternate route will be used to convey water to Goose Lake, which requires the construction of a new ditch that will begin at the south end of Lower Twin Lake and connect with an existing ditch that flows into the north end of Goose Lake. Hence, water will by-pass the majority of the Waggoner Unit when it is in a dry phase.) Over a period of several years, the Waggoner Unit will dry out. Controlled burns may be conducted to help reduce residual vegetation and persistent cattails and bulrush. The condition of the emergent vegetation in the Waggoner Unit will determine the need for fire.

The second cycle of flooding will be initiated when emergent vegetation in the Winterton Unit reaches about 50 percent of the flooded area of that unit. At that time, the water supply to the Winterton Unit will be discontinued and approximately 147 acres will be flooded in the Waggoner Unit. The unit will continue to be flooded until the area of emergent vegetation reaches about 50 percent of the flooded area in the unit.

Winterton Management Unit

The Winterton Unit is south of the Blackrock Ditch and west of the Drew and Waggoner units. An artesian well at the upper end of the unit sustains approximately 76 acres of existing open water and vegetated wetlands within the area proposed for future flooding (Tables 7-2 and 7-3). The area supported by the artesian well will remain wet even during dry phases in the Winterton Unit. Upon implementation of the LORP (cycle 1), a total of about 165 acres (including the existing 76 acres of wetland) will be flooded in this unit, for a net gain of 89 acres (Tables 7-2 and 7-3). The 165 acres of flooded wetlands will be monitored to document overall species composition, cover, and structure. When the flooded area of the unit (165 acres) has developed approximately 50 percent cover of emergent vegetation, the water supply to the unit will be reduced or discontinued and flooding will be increased in the Waggoner Unit (cycle 2).

Thibaut Management Unit

The Thibaut management unit is south of the Blackrock Springs Fish Hatchery and east of the Aqueduct. The Thibaut Unit is adjacent to an area designated as "off-river lakes and ponds" known as Thibaut Ponds (see Section 8.0). Existing wetlands in the Thibaut Unit are comprised of open water, alkali marsh, rush/sedge meadow, and alkali meadow. Under the LORP, 354 acres will be flooded in this unit, for a net gain of 239 acres of open water and vegetated wetland (Table 7-3). This unit will be flooded during both cycle 1 and 2, unless it is determined through adaptive management that the unit should be converted to a dry phase.

Drew Management Unit

The Drew Unit will only be flooded if it is needed to meet project objectives, including MOU obligations to flood 500 acres or to meet habitat goals. The Drew Unit totals about 397 acres (Table 7-1). The area is adjacent to and north of the Blackrock Ditch. Many characteristics of Drew Slough are reminiscent of an old field, both from the standpoint of its flat terrain and existing vegetation composition and physiognomy. In fact, historically the area was periodically flooded and used as a field.

Dry Year Water Supply

The management strategies for different types of runoff years are summarized below:

- **Forecasted Average to Above Average Runoff Year (100 percent or more of the average annual runoff).** The MOU requires that approximately 500 acres of habitat be flooded at any given time under these runoff conditions. This acreage requirement would be met through flooding operations in one or more of the four management units at any one time to achieve an annual average of approximately 500 acres in average and above average runoff years (see above). The area of the existing off-river lakes and ponds, which are included in the "Off River Lakes and Ponds" feature of the LORP (see Section 2.6), is not included in the calculation of flooded acreage in the Blackrock area.

- **Forecasted Below Average Runoff Year (below 100 percent of average annual runoff).** The MOU states that water for the Blackrock Waterfowl Habitat Area will be reduced in general proportion to the reduction in the forecasted runoff. The amount of acreage to be flooded in years when the runoff is forecasted to be less than average will be set by the Standing Committee based on recommendations in the LORP Plan and in consultation with the CDFG. Under these conditions, the duration of the dry phase of a management unit then in a dry phase would be extended, and water supply to units then in a wet phase would be reduced. Hence, there would not be a rapid and substantial change in water conditions in these years. Instead, there would be small incremental changes in the amount of water in the area, reflecting the general reduction in runoff throughout the valley.

Reductions in the planned flooding of the Blackrock Waterfowl Habitat Area during dry years could potentially reduce the overall extent of expected additional open water and vegetated wetlands, but are not expected to reduce the extent of flooded wetlands to a greater degree than would occur under current conditions. Currently, LADWP typically reduces diversions to the Blackrock area for stockwater and wildlife habitat during below average runoff years.

7.1.3 Potential Impacts

7.1.3.1 Wetland Management

During the first year of the active or flooded phase, the newly flooded areas would consist of mostly open water. Over time, emergent wetland plants are expected to colonize the margins of the newly flooded areas until emergent wetlands (i.e., cattail and bulrush marsh) would occur throughout much of the flooded areas. When the proportion of open water to emergent wetlands reaches approximately 50 percent, water will be removed from these areas for a dry cycle, and other wetland plants and annuals are expected to colonize the newly exposed substrate.

It is anticipated that vegetation within about 300 feet of the edge of flooded areas, or "adjacent habitat areas," would receive greater soil moisture from elevated groundwater and seepage, resulting in higher

plant productivity and potential colonization by wetland plants. These areas are expected to develop into a mosaic of wet meadows, emergent vegetation, mesic meadows, and seasonally flooded areas. The degree of influence that flooding will have on these areas will depend on soil types and water holding capacities of adjacent area soils, as well as seed dispersal or vegetative reproduction of wetland plants. The higher plant growth and vegetative density in these adjacent areas will provide high quality habitat for nesting waterfowl.

In the short term, existing vegetated wetlands would be converted to open water when a management unit is flooded. Eventually emergent vegetation would develop in part of the open water, although the timing of the changes and the types of vegetation that will be developed cannot be predicted with accuracy. Simultaneously, some cattails and bulrush wetland areas will dry out and are expected to convert to other wetland or upland types. For example, in cycle 1, the Winterton unit will initially gain 154 acres of open water as it is flooded, converting 65 acres of vegetated wetlands and 89 acres of upland habitat types (11 acres is currently flooded), and the Thibaut unit will gain 340 acres of open water, converting 101 acres of vegetated wetlands and 239 acres of upland habitats (Tables 7-2 and 7-3). At the same time, the Waggoner unit will be dried out, which will result in the short-term loss of 18 acres of open water and 250 acres of vegetated wetland (including the "adjacent habitat" area). Over the long term, it is expected that the wetting and drying cycles will approximately mimic a natural wetland, with about 50 percent of the flooded areas remaining open water and 50 percent remaining vegetated wetlands (Table 7-3). This target ratio will create greater diversity in wetland habitats and attract more habitat indicator species to management units in the wet cycle.

While the MOU calls for of 500 acres of flooded area (with some reductions in below-average runoff years, as determined by the Standing Committee), the types and extent of vegetated wetlands that will develop over the long term cannot be estimated precisely. Actual conditions may vary from this estimate, and some changes may be needed in the wetting and drying scheme to encourage high-value wetlands and discourage either monocultures of cattails and bulrushes or extensive areas of open water.

The vegetation types within the areas proposed to be flooded during the first two cycles of implementation of the LORP are presented in Table 7-2. Approximately 314 acres of wetlands (nearly 90 percent vegetated wetlands) are currently present in the three Blackrock Waterfowl Habitat Area management units where the proposed flooding would occur during the first two cycles of project implementation (see Table 7-2). These wetlands do not include off-river lakes such as Lower Twin Lake, Goose Lake, or Thibaut Ponds, which are discussed in Section 8.0.

Seasonal flooding is expected to provide high quality feeding and cover habitat between open water and the upland shoreline.

7.1.3.2 Habitat Conversion

Most of the created and enhanced flooded wetlands will be managed as semi-permanent wetlands that are flooded for several years then dried to remove emergent vegetation. When full, these waterbodies would have depths ranging from a few inches to several feet. These wetlands will primarily consist of seasonal ponded water and cattail/bulrush marsh. The lands adjacent to the flooded areas will be hydrologically influenced by the flooding.

During the first year of the active phase, the newly flooded areas would consist of mostly open water. Over time, emergent wetland plants would colonize the margins of the newly flooded areas until emergent wetlands (i.e., cattail and bulrush marsh) would occur throughout much of the flooded areas. As the water is removed from these areas for a dry cycle, other wetland plants and annuals would colonize the newly exposed substrate. These areas are expected to develop into a mosaic of wet

meadows, emergent vegetation, mesic meadows, and seasonally flooded areas. The degree of influence that flooding will have on these areas will depend on soil types and water holding capacities of adjacent area soils. The higher plant growth and vegetative density in these adjacent areas will provide high quality habitat for nesting waterfowl.

During the course of the flooding and drying cycles, wetlands and flooded areas will increase in some management units and decrease in others compared to current conditions. With the exception of the Waggoner Unit (which is currently flooded), during the wet cycle, when water is being supplied for flooding, the acreage of vegetated wetlands in a management unit would be greater than under current conditions. The increased water supply will result in the conversion of uplands to wetlands and from drier wetlands to wetter types. New vegetated wetlands will be established within and adjacent to the flooded areas. During dry cycles when water is removed from a unit, the amount of vegetated wetlands would be reduced compared to current conditions.

Flooding of existing upland and wetland habitats in the Blackrock Waterfowl Habitat Area would result in the direct conversion of one habitat to another, and would primarily affect wetlands that occur in the low-lying areas that can be readily inundated. The project would result in the conversions of non-emergent wetlands (such as alkali meadow and rush/sedge meadow) temporarily to open water, and eventually to a combination of open water and emergent wetlands (alkali marsh). Although the exact mix of future wetlands types cannot be precisely predicted, the long growing season, shallow flooding and mild winters will favor development of more emergent wetlands. The most common habitats that would be created due to the proposed flooding regime are expected to be open water and alkali marsh. Some areas of upland vegetation, including greasewood scrub and desert sink scrub, would be converted to wetlands. Existing wetland types in the management units would also be converted to other types during flooding, such as conversion of alkali meadow to alkali marsh or open water habitat. The project calls for flooding 500 acres on an annual average basis, which will result in some temporary conversions of existing vegetated wetland to open water. Over the long term (i.e., as a result of the implementation of cycle 1 and cycle 2) throughout the Blackrock Waterfowl Habitat Area, 43 acres of existing open water and 416 acres of vegetated wetland are expected to be converted to about 333 acres each of open water and vegetated wetland, which will result in a net gain of 290 acres of open water and a net loss of 83 acres of vegetated wetland (see Table 7-3). This impact is considered neutral because the mixture of open water and wetlands will vary greatly from year to year, and because there will continue to be an abundance of wetlands in the Blackrock area even under the proposed flooding regime.

It should be noted that the creation of various habitats over time in the Blackrock area would be monitored, and that LADWP has the ability to modify flooding regimes and resultant habitat types through adaptive management in the event that the observed habitat conversions are not achieving the goals of the MOU.

The potential conversion of vegetation types within the four management units to be utilized during the first two cycles of the LORP are described below.

Waggoner Management Unit

Flooding will be discontinued in the Waggoner Unit to reduce the amount of living and residual emergent vegetation that now covers approximately 205 acres (alkali marsh mapping type in the flooded and adjacent area; see Table 7-1). The temporary change will result in a loss of 18 acres of open water and 250 acres of vegetated wetland, including the "adjacent habitat" area (Tables 7-1 and 7-3). Rewatering in the second cycle will initially add 147 acres of open water, which are expected to

eventually convert to about half vegetated wetland, for a net long-term gain of about 55 acres (73 – 18) of open water and a net loss of about 176 acres of vegetated wetland (250 – 74).

Winterton Management Unit

In this unit, approximately 165 acres will be flooded during the first cycle of the project, resulting in a temporary loss of 65 acres of vegetated wetland and a temporary gain of 154 acres of open water (Tables 7-2 and 7-3). This is eventually expected to convert to about 83 acres each of open water and vegetated wetlands, suggesting a net long-term gain of about 72 acres of open water, and 17 acres of vegetated wetland during the first and second cycles (Table 7-3). Along approximately 11 miles of shoreline, a variety of vegetated and open water wetlands are expected to develop over a period of years. Food availability and valuable cover habitat is expected to be abundant along most of the shoreline and island edge habitats. As the area continues to develop, a variety of shallow emergent wetlands and, to a lesser extent, deep-water emergent wetlands will develop and eventually cover about half of the management unit.

Thibaut Management Unit

About 354 acres of the Thibaut Unit would be flooded during the first two cycles. Flooding would temporarily convert 101 acres of vegetated wetland to open water, and add 340 acres of open water to the unit. Over the long term, it is expected that the flooded acres would convert to 177 acres each of open water and vegetated wetland, resulting in a net gain of 163 acres of open water and 76 acres of vegetated wetland. The flooded area is expected to eventually develop a mosaic of shallow flooded wetlands and emergent and herbaceous wetlands. Some of these shallow basins will evolve into semi-permanent wetlands and some will be seasonal open water ponds and lakes.

The extended duration and frequency of flooding in this unit is expected to result in an increase in the extent and type of herbaceous wetlands such as rush/sedge meadows, alkali meadows, and several ephemeral or seasonal wetlands dominated by annuals and facultative wetland species. There are a series of large playa sink areas extending the length of the Thibaut Unit which currently maintain open water in the spring and early summer. These areas appear to be less susceptible to encroachment by homogeneous stands of cattails and tules, which may be due in part to an old spring complex that may have formed a calcium hardpan layer below the surface of fine sediments. Large playa sink areas with open water are uncommon in the Owens Valley. Wildlife use of the area is expected to increase with the increased availability of water and the conversion of upland types to wetlands and mesic meadows. The amount of shoreline (water to upland interface) will be at least 29 miles. This extensive ecotone should provide an abundant array of feeding and cover opportunities for resident and migratory birds and resident mammals.

Drew Management Unit

Because the current proposal does not include active management of the Drew Unit, no changes and therefore no impacts are expected. This could change in the future if monitoring information suggests that habitat goals would be better achieved if Drew Unit were flooded.

7.1.3.3 Construction of Berms, Ditches, and Spillgates

All berms and ditches would be constructed or repaired in upland habitats. It is estimated that construction work would disturb about 20 acres for berms and 11 acres for ditches, consisting primarily of desert sink scrub. The berms would be allowed to revegetate naturally, although the tops of the berms would be used for vehicular access. Ditches would be used for conveying water, and as such,

would be converted to open water or vegetated wetland habitat. The construction-related disturbance zone around the margins of berms and ditches would be allowed to revegetate naturally. The success of natural revegetation of new berms and construction related disturbance zones is uncertain. There is potential for invasion of non-native exotics in dry areas, and saltcedar in moist areas. Hence, habitat disturbance related to the construction of new berms and ditches in the Blackrock Waterfowl Habitat Area **is considered a significant, but mitigable impact (Class II).** This impact can be mitigated by post-construction seeding with native plants and weeding to prevent an infestation of exotics (see Mitigation Measure B-1).

The repair of existing spillgates and the installation of new spillgates would temporarily disturb upland and wetland habitats in man-made ditches. **This impact is considered adverse, but not significant (Class III)** because the impacts would be very small in area (less than 3,000 square feet at any single site), and temporary. Wetlands in the affected ditches would recover quickly after construction. No mitigation is considered necessary for this impact.

7.1.3.4 Potential Impacts—Noxious Plant Species And Saltcedar

Supplying water to the Blackrock area could potentially increase the distribution and abundance of perennial pepperweed and other noxious plants, and stimulate the growth of saltcedar, a non-native invasive plant that is spreading rapidly in the Owens Valley. The potential for the growth of saltcedar and other noxious plants is fully described in Section 10.4.

7.1.3.5 Potential Impacts—Mosquitoes

The LORP will results in new open water and marsh habitats in the Blackrock area. These new habitats would provide more opportunities for mosquitoes to breed, which could result in increased nuisance to communities and residents near these areas, and to the people engaged in outdoor recreation. The potential for the increase in mosquitoes is fully described in Section 10.3.

7.1.4 Mitigation Measures

B-1 Temporarily disturbed upland habitats in the Blackrock Waterfowl Habitat Area shall be seeded with native or naturalized grasses and shrubs common to the valley, as available, after construction of berms and ditches to facilitate restoration of vegetative cover and species compatible with the surrounding vegetation. The colonization by non-native weeds shall be inhibited by weed control for three years after construction.

7.2 FISH AND WILDLIFE

7.2.1 Existing Conditions

The Blackrock Waterfowl Habitat Area contains a diverse mixture of upland and riparian habitats, vegetated wetlands, playa, and lakes. As such, it supports a variety of wildlife, including resident and migratory birds. Migratory and over-wintering waterfowl and shorebirds use portions of the Blackrock Habitat Area. Non-native game fish occur in the lakes and ponds.

7.2.2 Potential Impacts

The proposed flooding of portions of the Blackrock Waterfowl Habitat Area would increase wetland productivity by periodic wetting and drying, which will promote nutrient cycling. In addition, these cycles would create greater diversity in wetland types and vegetative structure compared to current

wetlands. Many of the current wetlands in the Blackrock area consist of dense, impenetrable cattail/bulrush marsh habitats that support only a small group of avian species. The drying of wetlands would provide new forage for migratory birds that is not present in the Blackrock area. Finally, the LORP would increase the amount of open water wetlands in the Blackrock area. These actions would increase opportunities for resident, migratory, and overwintering birds (primarily shorebirds and waterfowl). The establishment of a permanent waterfowl area that is intensively managed for the benefit of waterfowl and other water-associated birds along the Pacific Flyway **is considered a beneficial impact to wildlife (Class IV).**

No adverse direct or indirect impacts to wildlife species are anticipated with the proposed management actions at the Blackrock Waterfowl Habitat Area because no high quality wildlife habitat or area supporting sensitive wildlife species would be displaced by the proposed flooding regime.

The proposed management actions in the Blackrock area do not include creation of habitat for native or game fish, introduction of such species, or any plans to manage fish species in the event that they colonize the area.

7.2.3 Mitigation Measures

No adverse impacts to wildlife are anticipated. Hence, no mitigation is required.

7.3 CULTURAL RESOURCES

A description of the two cultural resources inventories conducted for the EIR/EIS is provided in Section 4.8.3. Field surveys were performed in the Blackrock area as part of the first cultural resources inventory conducted in 2000 (Far Western, 2001) to search for evidence of cultural resources within and near the sites for the proposed construction and modification of berms, ditches, and spillgates.

As described in Table 4-14B (Section 4.8.3.2), the Area of Potential Effect (APE, field survey area) for the Blackrock area was defined as the 50-foot wide corridor for 3.75 miles of new berms, spillgates and other flow control structures to be newly constructed or modified, and 1.5 miles of new or enlarged ditches. Precise locational information is not provided in the EIR/EIS, as it is considered sensitive and confidential (see Section 4.8.1 for additional information on confidentiality of cultural resources technical information).

7.3.1 Prehistoric Sites

Two prehistoric sites, a large flaked and ground stone scatter and an extensive artifact scatter, were identified during the cultural resources field survey in Blackrock. Existing disturbance from nearby dirt roads, road construction, and recreational activities appears to be minimal. These two sites maintain a moderate amount of structural integrity and manifest relatively complex surface assemblages, and remain unevaluated with respect to eligibility for the National Register of Historic Places (NRHP).

One of the proposed ditches will be located in proximity of these sites. Several active dirt roads also border these sites, and will be used during project construction. **Disturbance of these sites would be considered a potentially significant, but mitigable impact (Class II).** This potential impact will be avoided through the placement of temporary protective fences, if construction work occurs near the site, as described in Mitigation Measure B-2.

7.3.2 Historic Resources

Four historic structures, all located on LADWP lands, were documented in the Blackrock Waterfowl Habitat Area, as described below. None are considered significant resources eligible for listing on the NRHP. **There is potential for disturbance to one or more of these features, which would represent an adverse, but not significant impact (Class III)** because none of the resources is considered significant, nor eligible for inclusion on the NRHP, as explained below.

Blackrock/Drew Slough

LADWP constructed the Blackrock/Drew Slough System in 1950, as a part of their effort to control the flow of water in the Drew Slough area. The main Blackrock spillgate replaced an earlier construction apparently built during World War II that allowed water into the natural sloughs and channels east of the aqueduct in that area. The spillgates, ditches, berms, and control structures in the area were constructed to keep water from flowing to the north of the Drew Slough area. The water thus controlled was used to promote stock watering and recreation and helped supply several small ponds containing a warm water fishery.

While the system performs an important function in providing water to the Drew Slough area, it is comprised of structures of common construction. Its spillgate and control structures are of a design commonly found in the Owens Valley, although the spillgate is comparatively large, located as it is on the side of the Los Angeles Aqueduct. It was designed by an employee of LADWP. The control structure on the system is currently abandoned and unusable. The ditch has been cleaned on a regular basis to remove tules, and thus does not retain its original shape or configuration.

The system does not appear to meet the criteria for listing in the NRHP. While it is a feature of the Los Angeles Aqueduct system, it is not an original part, having been built only 50 years ago. It is not associated with the story of Los Angeles' use of Owens River water and thus does not appear to be eligible under Criterion A, which includes events that "have made a significant contribution to the broad patterns of our history." Its designer was not associated with the original design of the aqueduct and thus the system does not appear to be eligible under Criterion B (association with persons significant to our past). Finally, it does not appear to be eligible under Criterion C (a unique or special design, or an engineering feat, or innovative in terms of its construction).

Structure 98

The culvert at site 98 (Figure 2-15) was constructed to allow for the passage of water from one side of the road and berm to the other. The date of its installation is unknown, but the fact that it is constructed from a riveted rather than corrugated metal pipe suggests that it may have been installed some time ago; however, it is also possible that an older pipe was simply reused at a new location. Culverts are common on roads, and there is nothing about this structure that makes it significant. Little is known about it. While it serves an important function, it has neither associations with events or persons significant in our past (National Register Criteria A and B), nor does it contain distinctive characteristics of a type, period, or method of construction (Criterion C). It does not, therefore, appear to meet the criteria for listing in the NRHP.

Structure 99

The flow control structure at Site 99 (Figure 2-15) was constructed to manage the passage of water through a water-spreading ditch in the area east of the Los Angeles Aqueduct. It was apparently built in the early 1950s. The exact date of its installation is unknown, but the materials used (milled redwood

lumber, wire nails, etc.) appear to be consonant with that period of construction; it also does not appear on early USGS maps of the area dating from the early 20th century through 1951. It is currently unusable and has not been operated for several years.

Flow control structures are common on ditches in the Owens Valley and elsewhere in California, and there is nothing about this structure that suggests that it might be significant. Little is known about it. While it once served an important function, it has neither associations with events nor persons significant in our past (National Register Criteria A and B), nor does it contain distinctive characteristics of a type, period, or method of construction (Criterion C). It does not, therefore, appear to meet the criteria for listing in the NRHP.

Structure 105

Like the control structure at Site 99, the gate/bridge at Site 105 (Figure 2-15) was constructed to manage the passage of water through a water-spreading ditch in the area east of the Los Angeles Aqueduct. It was apparently built in the early 1950s. The exact date of its installation is unknown, but the materials used (milled redwood lumber, wire nails, etc.) appear to be consonant with that period of construction; it also does not appear on early USGS maps of the area dating from the early 20th century through 1951. It is currently a functioning structure on the Waggoner Ditch.

As noted above, flow control structures are common on ditches in the Owens Valley and elsewhere in California, and there is nothing about this structure that suggests that it might be significant. Little is known about it. It continues to serve an important function, but it has neither associations with events nor persons significant in our past (National Register Criteria A and B), nor does it contain distinctive characteristics of a type, period, or method of construction (Criterion C). It does not, therefore, appear to meet the criteria for listing in the NRHP.

7.3.3 Mitigation Measures

B-2 LADWP shall implement the following management actions to avoid impacts on cultural resources during construction of the proposed ditch to be located in proximity of the two known prehistoric sites in the Blackrock area:

- LADWP shall notify representatives of regional Native American Tribes prior to beginning construction of the proposed ditch to be located in proximity of the two known prehistoric sites. Interested Tribal representatives shall be invited to be present (on a volunteer basis) during the construction of the ditch.
- LADWP shall work with a qualified archaeologist to locate the proposed ditch to avoid the two known prehistoric sites identified in the field survey by Far Western (2001).
- Temporary protective fencing shall be placed between the known prehistoric sites and proposed ditch areas if construction work will occur within 100 feet of these sites. A qualified archaeologist shall supervise the placement of temporary protective fencing.
- All vehicles shall remain on the road in the vicinity of the known prehistoric sites.
- If construction must occur within 25 feet of these sites, an archaeologist shall monitor construction activities.

7.4 AIR QUALITY

7.4.1 Existing Conditions

Under the federal Clean Air Act, the US Environmental Protection Agency (EPA) has set ambient air quality standards to protect public health and welfare. Air quality standards have been set for the following pollutants: particulate matter less than 10 microns in diameter (PM10), carbon monoxide (CO), nitrogen oxides (NOx), sulfur dioxide, and lead. The State of California has also set air quality standard for these pollutants, which are generally more stringent than federal standards.

The southern Owens Valley occurs in the Great Basin Unified Air Pollution Control District (GBUAPCD). Owens Lake has been designated by the State and EPA as a non-attainment area for the state and federal 24-hour average PM10 standards. Wind-blown dust from the dry bed of Owens Lake is the primary cause of the PM10 violations. The area has been designated as attainment or unclassified for all other ambient air quality standards. Air quality is considered excellent for all criteria pollutants with the exception of PM10. Large industrial sources are absent from Owens Valley. The major sources of criteria pollutants, other than wind-blown dust, are woodstoves, fireplaces, vehicle tailpipe emissions, fugitive dust from travel on unpaved roads, prescribed burning, and gravel mining.

7.4.2 Potential Impacts

The water conveyance improvements at the Blackrock Waterfowl Habitat Area include installation of about 3.3 miles of new berms and 1.7 miles of new or rehabilitated ditches. Work on berms and ditches would require a front end loader, backhoe, or smaller tracked dozer. Only limited material hauling would occur, as most of the material would remain on site. Construction of new berms and ditches is expected to require about 6 months. A daily crew of about five people would typically be involved with 3 or 4 light trucks at the construction site.

These activities would generate emissions of pollutants. In addition, fugitive dust could be generated from travel on unpaved roads and from certain earth-disturbing activities. These emissions would contribute to the degradation of air quality conditions in the Owens Valley. As noted above, the region exhibits very good air quality conditions except for PM10. Construction work at the Blackrock Waterfowl Habitat Area would cause negligible emissions because the work would be performed with small equipment (e.g., auger truck or backhoe), require only several days to weeks, and involve few worker trips (two to three vehicles per day).

An estimate of the combined daily and total emissions from the above activities is provided below in Table 7-4. Note that these activities may or may not occur concurrently, and that the activities are located at great distances from one another. Hence, the daily estimates provided below are considered worst case.

Emissions from construction activities are considered an adverse, but not significant impact (Class III). They would contribute to degradation of air quality conditions in the valley, but are unlikely to cause air quality violations. The primary impact is emissions of fugitive dust due to the PM10 non-attainment status for the region. Fugitive dust emissions can be reduced by the application of dust control measures (see Mitigation Measure AQ-1).

Emissions associated with routine maintenance of the Blackrock Waterfowl Habitat Area are expected to be negligible, and similar to emissions associated with current LADWP operations in the area (e.g., inspection of fences, water facilities, etc) As such, no adverse air quality impacts are anticipated to result from operations in the Blackrock Waterfowl Habitat Area.

Emissions from occasional controlled burns would be considered an adverse, but not significant impact (Class III). The burns would contribute to degradation of air quality conditions in the valley, but are unlikely to cause air quality violations because they would be implemented under a permit from the Great Basin Unified Air Pollution Control District, which only allows burns to occur when meteorological conditions will ensure sufficient dispersion to avoid violations.

TABLE 7-4
ESTIMATED CONSTRUCTION EMISSIONS FOR THE BLACKROCK WATERFOWL HABITAT AREA

Activity	Carbon Monoxide	Reactive Organic Gases (hydrocarbons)	Nitrogen Oxides	Particulate Matter (PM10)
Maximum Daily Construction Emissions (lbs per day)				
Blackrock berms and ditches	5.5	7.5	20	4.5
Total Construction Emissions (lbs)				
Blackrock berms and ditches	400	600	1,400	<200

* See Section 5.2 for a description of emissions associated with all LORP construction activities, including installation of the gate at the River Intake, initial channel clearing, and construction of the pump station and power line. Emissions calculated by URS Corporation for the EIR/EIS.

7.4.3 Mitigation Measures

AQ-1 (See Section 5.3.3)