3 Natural Resource Stewardship

The Cosumnes River and its watershed currently support an extraordinarily rich and complex mosaic of habitat types. This Chapter provides goals, objectives, and actions to conserve the Preserve’s natural resources, specifically, its native flora and fauna.

3.1 Biodiversity of the Central Valley and Cosumnes River Watershed

At one time much of the Central Valley was dominated by native grassland and extensive freshwater marsh. Riparian woodlands extended along lowland streams and vernal pools lay scattered in pockets amid the grasslands. The valley perimeter was ringed by oak woodland and chaparral. Since 1850, however, most of the Central Valley has been converted to intensive agriculture. The lowland floodplains have been severed from their rivers by levees, channelization, and flow regulation by dams (Mount 1995). This hydrologic disconnection facilitated the conversion of more than 90–95 percent of historic riparian forests, wetlands, and basins into farmland, rangeland, and urban centers as previously described in Chapter 2 (USFWS 1998; Griggs and Golet 2002).

The Cosumnes River floodplain has long been recognized as an outstanding wetland and riparian site. Today, the Preserve, with its wetlands, grasslands, agricultural land, and remnant stands of valley oak riparian forest, supports tens of thousands of migratory waterfowl and waterbirds, including about half of the Central Valley’s population of greater sandhill cranes. Neo-tropical migratory songbirds, Swainson’s hawks (*Buteo swainsoni*), mammals, native and non-native fish, and other state- and federal-listed threatened and endangered species are also found at the Preserve.

There are four known and ten potentially occurring special status plant species on the Preserve. These special status plant species are described in more detail in the Lower Cosumnes River Watershed Assessment (RBI 2006). Of the plant species occurring on the Preserve, 63 percent are native to California; the remaining 37 percent are exotic species (RBI 2006).

Wildlife diversity on the Preserve is high, with a total of 295 known wildlife taxa, including 30 species of mammals, 18 species of amphibians and reptiles, and 247 species of birds (RBI 2006). A few of the species have been identified as special status, meaning that they have been designated as rare, threatened, or endangered by state and/or federal wildlife agencies. These special status species include vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardi*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), California tiger salamander (*Ambystoma californiense*), western pond turtle (*Clemmys marmorata*), giant garter snake (*Thamnophis gigas*), greater sandhill crane (*Grus canadensis*), and Swainson’s hawk (RBI 2006).
3.2 CONSERVATION ACTION PLANNING

A process called “Conservation Action Planning” (CAP) was used to develop the goals, objectives, and actions listed in the table at the end of this Chapter. The CAP process was originally developed by The Nature Conservancy and has been used successfully in public planning processes throughout the United States and internationally (The Nature Conservancy 2007). The CAP process was applied to the Preserve and its surrounding lands in order to identify biological targets for conservation, assess ecological requirements for long-term viability of these targets, identify threats, and develop specific strategies to restore target viability and reduce threats.

Several conservation targets were identified for the Preserve. Conservation targets are species, communities, or ecological systems that represent the biological diversity of a specified area. Ideally, targets are elements of the system that, if properly conserved, will result in the conservation of the full diversity of the landscape. Coarse-filter targets serve as “umbrellas” that capture the smaller-scale biodiversity, both common and rare, that tier within them. Fine-filter targets include those small-scale elements that “fall through” the coarse filter and require individual attention.

**FIGURE 3.1: LAND COVER WITHIN THE PRESERVE (ACRES)**

Land cover types are described in more detail in the Lower Cosumnes River Watershed Assessment (RBI 2006).
The Steering Committee selected six targets for the Preserve (described below), including five “coarse-scale,” system-level targets and one species-level target. The number of targets was purposely kept small in order to facilitate the tracking of each target. The process used by the Steering Committee was to nominate a broad range of targets and to selectively funnel and consolidate the targets based on a collaborative discussion and the professional expertise of Committee members.

An assessment of each target, including a conceptual model, was prepared. Ecological requirements were identified for a range of attributes, such as viable habitat area, population size, community structure, species composition, hydrologic regime, disturbance processes, landscape connectivity, and others. Acreage goals for protection and restoration of each target were based on the current extent of habitat (land-cover mapping) and the inferred potential or historic habitat (based on location of appropriate soils, hydrology, and topography).

The assessment of conservation targets also included identification of major data gaps and these gaps are incorporated into the actions attached to the goals and objectives through this planning process, and listed in the monitoring elements discussed later in this chapter. Posters documenting the results of each target assessment were displayed at the first round of public workshops held in July and August 2006 to solicit public comments on this process. A summary of each target is provided below.

**Riparian Forest** – Less than 10 percent of the historic riparian forest remains in the Central Valley and in California (Great Central Valley 2005), and less than five percent remains in South Sacramento County (Sacramento County Municipal Services Agency 2007). The Cosumnes River floodplain has exceptionally large stands of remnant valley oak riparian forests (80–200 acres) and an intact flooding regime. Much of the area along the 14 miles of the lower Cosumnes River (below Wilton Road) that is suitable for riparian forest is now protected (approximately 1,700 acres [69 percent] of existing forest; 5,900 acres [44 percent] of existing and restorable lands) and a mosaic of successional stages of riparian forests occur at the Preserve. River-floodplain connectivity has been restored via levee breaches in the lower five to six miles of the river. Those breaches support the natural processes that facilitate restoration of additional stands of riparian forest.

**Vernal Pool Grasslands** – These seasonal wetlands are oases of endemic species in a sea of non-native grasses. Southeast Sacramento County has some of the most intact Laguna and Valley Springs vernal pool complexes remaining in the Central Valley, including more than 16 globally rare species and communities. Less than 10 percent of vernal pool complexes remain in the Central Valley (Holland 1998). Based on GIS mapping, approximately 42,503 acres of vernal pool grassland exist today within the Cosumnes River Protection Area.
River watershed. Approximately 40 percent of the existing vernal pool grassland in the watershed is protected and managed by the Preserve for the benefit of the vernal pools and their endemic species.

Freshwater Emergent Wetlands – Less than 10 percent of historic wetlands remain in the Central Valley (Central Valley Joint Venture 1990). These wetlands historically supported millions of wintering waterfowl and waterbirds in the Central Valley. Today, the Preserve provides a portion of this critical stopover and wintering habitat by maintaining approximately 1,800+/- acres of managed seasonal wetlands and flooded organic rice on the floodplain. An additional 2,000+/- acres of cropland is flooded on Staten Island each year. Perennial natural marsh also exists along the Cosumnes River and in sloughs.

Giant Garter Snake – Badger Creek supports a unique sub-population of this state- and federally listed threatened species, one of only 13 sub-populations remaining in the state (Miller et al. 1999). This sub-population is assumed to be relatively safe due to permanent habitat protection by the Preserve; however, habitat conditions have been declining for several years due to a reduction in surface flows and the expansion of an invasive subspecies of water primrose (Ludwigia spp). Because no formal surveys have been conducted within the past few years, the current status of the species at the Preserve is unknown at this time.

Blue Oak Woodland – Blue oak woodland is an important and widely distributed matrix community in the foothills ringing the Central Valley. In the Cosumnes River watershed, 9,443 acres (10 percent) are protected. Lack of recruitment and altered fire regimes are a widespread and poorly understood problem for blue oak woodlands. Urbanization occurring within the blue oak woodland communities is cited as a major and continued threat to this community. Blue oak woodlands occur on the Howard Ranch property, located at the far eastern edge of the Preserve.

Fall-run Chinook Salmon – The Cosumnes supports a small population of fall-run Chinook salmon. Annual returns in the last decade (1997–2005) have ranged from 100 to 1,200 adults, roughly a quarter of historic levels (sometimes over 4,000 during 1953–1973). Chinook salmon are an umbrella species for the aquatic system of the river, its floodplain, and tributaries. The Preserve is involved in a program to provide adequate flows during the fall season for the fall run of Chinook salmon.

The next step in the CAP process was to identify and assess Critical Threats. Threats are defined as factors that reduce the viability of conservation targets. These threats were ranked according to three criteria in order to gauge the degree of the threat: scope, severity, and urgency. Identified threats to the Preserve’s conservation targets include the following:

- Continuing fragmentation and degradation of habitat (both natural and surrogate agricultural lands) will erode ecological function of the larger landscape by isolating populations, disrupting species movements, altering ecosystem processes, increasing edge effects, and decreasing species richness (e.g., Hansen et al. 2005; McArthur and Wilson 1967). Urbanization and other forms of land development are the primary cause of habitat fragmentation and direct loss of habitat area.
- Depletion of groundwater has reduced stream baseflow.
Figure 3.2: Land Cover on the Preserve
Figure 3.3: Riparian Corridor Along the Cosumnes River
Land conversion to more intensive, less wildlife-friendly agriculture.
Invasive species.
Levees that limit river meandering and floodplain connectivity.
Altered flooding regimes that affect riparian forest.
Altered fire regimes that affect vernal pool grasslands and oak woodlands.

3.2.1 Ecological Restoration

Restoration of ecological function has been a cornerstone of the Preserve since its inception. Many studies and restoration projects have been implemented on Preserve properties over the years by Preserve staff and UC Davis researchers. Restoration efforts have focused on the reestablishment of three habitat types: riparian forests, floodplains, and managed wetland ponds. The Lower Cosumnes River Watershed Assessment (RBI 2006) describes these past efforts in more detail. As part of restoration activities, land cover and habitat types should be monitored and managed using adaptive management techniques.

In the restoration of riparian forests, success seems to be dependent on the suitability of the soils, hydrology, and elevation. Early efforts to enhance and restore habitats along the lower Cosumnes focused on active measures, such as wetland construction and hand planting of trees. However, a 1994 study found that hand planting was expensive and some plantings failed or grew slowly (Reiner 1996). For example, this occurred on the Valensin Access Road property as described in Chapter 7. Furthermore, natural regeneration of oaks was occurring in many areas, particularly where natural flooding and sediment deposition still occurred. TNC reoriented the forest restoration program in 1995 to identify areas where natural regeneration could be encouraged by reestablishing natural flooding (Reiner 1996).

Riparian forest systems occur only on streamside lands with appropriate soils, elevation, and hydrology (Keller and Quinn 2003; Viers et al. 2006). A GIS analysis compared current extent of forest, survival of various planted restoration sites, and soil characteristics. Depth to hardpan layer was best apparent correlate, specifically those areas where depth to hardpan layer was >2 meters. The lands with the potential to support riparian forest (“riparian zone”) include both current existing habitat and potentially restorable land. The potential riparian zone was mapped from the confluence with the Mokelumne River (River Mile 0) upstream to Freeman Road (RM 15, just due south of Wilton Road). Upstream of Hwy 99,
the leveed river channel becomes too incised to allow frequent overbank flooding (Vick and Williams 1997; Florsheim and Mount 2003). Table 3.1 summarizes the potential riparian zone along the lower Cosumnes River (approximately 14 river miles, from Mokelumne River up to Freeman Road near Wilton Road).

As of December 2006, 5,877 acres (44 percent) of land were protected within this corridor (Table 3.1). Some of the potential riparian lands in conservation ownership are not natural habitat; they are currently managed as agricultural lands or fallow that could be restored to riparian habitat in the future. Currently, approximately 2,200 acres of riparian forest (canopy cover) exist along the lower Cosumnes River below Freeman Road, with approximately 1,700 acres protected within the Preserve. The extent of riparian forest ranges from several large patches (100–200 acres) down to narrow, discontinuous strips of trees along the river and small tributaries. The approximate length of this mapped riparian corridor is 36 miles and its average width is 1 mile. Several Preserve properties are located within this corridor.

### Table 3.1: Riparian Zone of the Lower Cosumnes River

<table>
<thead>
<tr>
<th>River Reach</th>
<th>Rivermile</th>
<th>Riparian Zone (acres of existing and potential forest)</th>
<th>Riparian Forest (acres existing)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>Protected</td>
</tr>
<tr>
<td>Mokelumne River – Twin Cities Road</td>
<td>RM 0-6</td>
<td>5,121</td>
<td>2,887</td>
</tr>
<tr>
<td>Twin Cities Road – Hwy 99</td>
<td>RM 6-11</td>
<td>5,083</td>
<td>2,166</td>
</tr>
<tr>
<td>Hwy 99 – Freeman Road/ Wilton</td>
<td>RM 11-15</td>
<td>3,124</td>
<td>824</td>
</tr>
<tr>
<td>Total Acres</td>
<td></td>
<td>13,327 (100%)</td>
<td>5,877 (44%)</td>
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</tbody>
</table>

*Area (acres) of riparian corridor (existing and potential forest) and riparian forest (existing and restoring) along the lower Cosumnes River. Forest area is measured from GIS of canopy cover. Protected area is land protected by the Cosumnes River Preserve (fee title or conservation easement).*
## Goals, Objectives, Actions, and Monitoring

**OVERARCHING GOAL I: NATIVE BIOLOGICAL COMMUNITIES AND THE RESIDENT AND MIGRATORY SPECIES DEPENDENT ON THEM ARE RESTORED AND MAINTAINED TO SUSTAINABLE CONDITIONS AND POPULATION LEVELS.**

Natural Resource Stewardship Sub-goal 1: Protect the free-flowing Cosumnes River within an ecologically functional landscape.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Actions</th>
<th>Monitoring Elements</th>
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<tbody>
<tr>
<td>1.1 Ensure the Cosumnes River remains free-flowing by preventing major dams, impoundments, or significant increases in surface water diversions.</td>
<td>1.1.1 Monitor public policy regarding water supply and flood management.</td>
<td>Flood management policy by DWR and Sacramento Area Flood Control Agency (SAFCA).</td>
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<td></td>
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<td>Review planning documents for south Sacramento County and San Joaquin County.</td>
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<td>Status of dams on river.</td>
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<td></td>
<td>1.1.2 Engage, as necessary, in public policy to prevent construction of dams or significant increases in surface water diversion.</td>
<td>Flood management policy by DWR and SAFCA.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Status of dams on river.</td>
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<td></td>
<td></td>
<td>Monitor surface water rights and diversions, especially of major users like El Dorado Irrigation District.</td>
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<td></td>
<td>1.1.3 Map the Preserve’s flooding and levee breaches in a comprehensive way. Update this data set on an annual basis.</td>
<td>Annually map new levee breaches, fire, etc.</td>
</tr>
<tr>
<td>1.2 Maintain a landscape that supports natural processes and habitat for the Preserve’s focal conservation targets consisting of natural lands and suitable agriculture at and surrounding the Preserve (100-year floodplain up to Sacramento County’s Urban Services Boundary).</td>
<td>1.2.1 Map land-use patterns and change in the lower watershed every two years using available GIS data and aerial photos.</td>
<td>GIS data and aerial maps of lower watershed every two years (e.g., DWR land-use mapping, aerial photos from Farm Services Administration Services [annual, 1–2m resolution]).</td>
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<tr>
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<td>Maintain GIS layers of protected lands surrounding the Preserve (fee title and conservation easement).</td>
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<td>Annually document status of conservation easements in online tool “Conservation Track.”</td>
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<tr>
<td>Objectives</td>
<td>Actions</td>
<td>Monitoring Elements</td>
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<td>1.2.2</td>
<td>Participate in regional land-use planning and floodplain management efforts (<em>e.g.</em>, South Sacramento County HCP, City of Elk Grove General Plan, county general plans, LAFCO decisions) that may affect Preserve resources (<em>e.g.</em>, habitat destruction, degradation, or fragmentation) or complement conservation goals (<em>e.g.</em>, open space and wildlife corridors among other natural lands).</td>
<td>Track land-use designations, zoning, and general plans in the area.</td>
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<td>1.2.3</td>
<td>Coordinate regional land management with other natural lands managers (<em>e.g.</em>, Stone Lakes NWR, CDFG Woodbridge ecological reserve, Sacramento Valley Conservancy) and with guidance from regional natural resource plans (<em>e.g.</em>, Central Valley Joint Venture, Riparian Habitat Joint Venture). Review plans and provide comments and technical assistance where appropriate.</td>
<td>Review local planning documents.</td>
</tr>
<tr>
<td>1.2.4</td>
<td>Secure funding to protect surrounding lands that support Preserve biota and provide linkages to other natural lands, working with willing sellers and available resources.</td>
<td>Review goals and objectives of local and regional plans.</td>
</tr>
<tr>
<td>1.2.5</td>
<td>Assess availability and needs for linkages and migration corridors for targets (<em>e.g.</em>, giant garter snake, vernal pool species).</td>
<td>Maintain list of contacts for all reserves.</td>
</tr>
<tr>
<td>1.2.6</td>
<td>Assess habitat values of different land uses. Develop and conduct standardized site assessments to identify areas that have high ecological value for the Preserve, using existing information.</td>
<td>Annual review of new funding opportunities and financial expenditures.</td>
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<tr>
<td></td>
<td>Linkages and corridors</td>
<td>Distribution and abundance of indicator species, including sandhill cranes and Swainson’s hawks.</td>
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<tr>
<td>Objectives</td>
<td>Actions</td>
<td>Monitoring Elements</td>
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<td><strong>1.2.7</strong> Determine habitat needs (amount, type, landscape ecology) of indicator species whose life history needs cross Preserve boundaries (e.g., sandhill cranes and Swainson’s hawks).</td>
<td>Distribution and abundance of indicator species, including sandhill cranes and Swainson’s hawks.</td>
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<td><strong>1.2.8</strong> Promote landscape-scale linkages and corridors along the Cosumnes River and tributaries (e.g., from Delta to headwaters), among vernal pool sites, and among protected areas (e.g., Stone Lakes NWR, Deer Creek Hills).</td>
<td>GIS mapping of protected lands</td>
</tr>
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<td><strong>1.2.9</strong> Update and implement the overall weed control plan every 5 years to address Preserve-wide invasive species threats and priorities.</td>
<td>GIS mapping of weed infestations and comparison with status.</td>
</tr>
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<td></td>
<td><strong>1.2.10</strong> Ensure wildlife-friendly agriculture on the Preserve’s farmlands, and promote these practices on surrounding lands (e.g., annual crops, pasture, rangeland, truck crops).</td>
<td>GIS map of DWR land use designations</td>
</tr>
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<td><strong>1.2.11</strong> Update the Preserve Management Plan every 10 years and implement.</td>
<td>Perform annual review of plan through the development of annual work plans.</td>
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<td><strong>1.2.12</strong> Conduct feasibility study of potential Cosumnes River meander scenarios and implement river meandering scenarios as funding allows.</td>
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<td><strong>1.3</strong></td>
<td><strong>1.3.1</strong> Engage in public policy forums to improve regional groundwater management (e.g., Central Sacramento County Groundwater Forum, South Area Water Council).</td>
<td>Review local water policy documents and plans.</td>
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<td><strong>1.3.2</strong> Engage in regional groundwater management (e.g., Central Sacramento County Groundwater Forum, South Area Water Council).</td>
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<td><strong>1.3.3</strong> Engage in local groundwater management (e.g., Sandhill Crane National Wildlife Refuge, Deer Creek Hills).</td>
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<td><strong>1.3.4</strong> Engage in local groundwater management (e.g., Stone Lakes NWR, Deer Creek Hills).</td>
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<td><strong>1.3.5</strong> Engage in local groundwater management (e.g., Sandhill Crane National Wildlife Refuge, Deer Creek Hills).</td>
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<td><strong>1.3.6</strong> Engage in local groundwater management (e.g., Stone Lakes NWR, Deer Creek Hills).</td>
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<td><strong>1.3.7</strong> Engage in local groundwater management (e.g., Sandhill Crane National Wildlife Refuge, Deer Creek Hills).</td>
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<td><strong>1.3.8</strong> Engage in local groundwater management (e.g., Stone Lakes NWR, Deer Creek Hills).</td>
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<td>Objectives</td>
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<td>Monitoring Elements</td>
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<tr>
<td><strong>1.3.2</strong> Design and implement next phase of groundwater-surface water studies, in collaboration with research partners, in order to refine understanding of groundwater-surface water status and relationships and to determine groundwater and surface flow requirements of riparian and aquatic species. This includes locating groundwater levels that enhance river baseflow.</td>
<td></td>
<td>GIS map of lower watershed every 3–5 yrs, with DWR land use designations and natural habitat. Integrated monitoring of groundwater levels and targets thought to be sensitive to GW depletion. Surface water hydrology in Cosumnes River and tributaries (Badger Creek).</td>
</tr>
<tr>
<td><strong>1.3.3</strong> Design and implement experimental flow releases and other measures to recharge local groundwater levels and enhance surface flows for salmon migration (potential sources of water and/or funding include AFRP and CVPIA, b2 Program).</td>
<td></td>
<td>Groundwater monitoring Surface water hydrology in Cosumnes River and tributaries (Badger Creek).</td>
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<tr>
<td><strong>1.4</strong> Support overall biodiversity of the Cosumnes River watershed.</td>
<td><strong>1.4.1</strong> Support conservation of Ione chaparral by Partners working to implement CDFG’s CAPP in order to protect, manage, and restore at least three geographically dispersed populations, totaling at least 400 acres of high-quality Ione chaparral habitat.</td>
<td>GIS data and aerial photos. Annually evaluate status of land protection and conversion. Viability surveys (include fungal analysis).</td>
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<td><strong>1.4.2</strong> Promote protection of blue oak woodland habitat (particularly along the river corridor), by Partners and on protected Preserve lands where present. Ensure viability of protected oak habitat through proper management and early detection and control of invasive species.</td>
<td>GIS data and aerial photos. Annually evaluate status of land protection and conversion. Targeted weed surveys where necessary.</td>
</tr>
<tr>
<td><strong>1.5</strong> Achieve the Plan Vision by coordinating with state, federal, and local government agencies and non-profit organizations.</td>
<td><strong>1.5.1</strong> Track and, if warranted, participate in the 22 planning efforts identified above and in new efforts that begin in subsequent years.</td>
<td>Annually document where and how staff participates in regional planning efforts.</td>
</tr>
</tbody>
</table>
Natural Resource Stewardship Sub-Goal 2: Protect, maintain and restore riparian and floodplain communities, the natural hydrologic processes that sustain the habitat, and the native species that depend on the habitat.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Actions</th>
<th>Monitoring Elements</th>
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</table>
| **2.1** Permanently protect the entire 13,200-acre mapped riparian core area (existing habitat and restorable lands) by securing the remaining 7,450 acres of unprotected land up to Wilton Road.  

*Note:* Parcel acreage does not directly correspond to habitat acreage (existing and potential in the riparian core area) due to parcel configurations. | **2.1.1** Identify and prioritize key parcels necessary to secure remaining unprotected 7,450 riparian core acres within the riparian corridor. |GIS map of suitable riparian corridor, based on soils and hydrology.  
Parcel map and protection status of lands within the riparian core area. |
| **2.1.2** Acquire unprotected key parcels remaining in the riparian corridor between McCormack-Williamson Tract and Highway 99 (5,150 riparian core acres remaining within corridor) by 2018, on a willing seller, as-available basis. | | |
| **2.1.3** Acquire or protect key parcels in the riparian corridor between Highway 99 and Wilton Road (2,300 riparian core acres remaining within the corridor) by 2028, on a willing-seller, as-available basis. | | |
| **2.2** Maintain a mosaic of existing and restored habitats for riparian and floodplain dependent species.  
Habitat mosaic can include Great Valley willow scrub, G.V. cottonwood forest, G.V. mixed riparian forest, G.V. valley oak riparian forest, valley oak savannah, elderberry savanna, grassland, and wetland. | **2.2.1** Develop standardized vegetation classification and conduct habitat mapping (similar to scale of CDFG mapping) of existing and restored habitats to monitor status and guide management. |Habitat mapping (similar to CDFG mapping) from aerial photos and field surveys of potential, existing, and restoring riparian communities.  
Species composition, successional stage, canopy cover, and physical structure of vegetation. |
<p>| <strong>2.2.2</strong> Assess condition of habitats within the riparian core area by evaluating vegetation cover and successional trajectory of all sites (existing and restoring habitats) every 3 to 5 years. | | |</p>
<table>
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<th>Objectives</th>
<th>Actions</th>
<th>Monitoring Elements</th>
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<td></td>
<td><strong>2.2.3</strong> Develop and implement restoration and management actions (<em>e.g.</em>, planting, re-contour, weed control) as necessary to enhance development of a diverse riparian-wetland mosaic (<em>i.e.</em>, successional stage, physical structure, species composition) and to maintain population levels of native species.</td>
<td>Riparian birds (point counts)</td>
</tr>
<tr>
<td></td>
<td><strong>2.2.4</strong> Evaluate the response of special status species and indicator species to riparian and floodplain restoration and management actions (<em>e.g.</em>, valley elderberry longhorn beetle; Riparian Habitat Joint Venture focal bird species such as yellow-billed cuckoo, song sparrow, Swainson’s hawk, ringtail cats, and other state and federal protected species).</td>
<td>VELB surveys and elderberry mapping</td>
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<td></td>
<td><strong>2.2.5</strong> Conduct and support research to evaluate factors potentially limiting floodplain-river connectivity, forest recruitment and survival (<em>e.g.</em>, water table levels, soil conditions, stream channel incision, levees).</td>
<td>Database of researchers and projects</td>
</tr>
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<td><strong>2.2.6</strong> Conduct and support other research as necessary to guide management of the Preserve.</td>
<td>Database of researchers and projects</td>
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<td><strong>2.2.7</strong> Increase cottonwood/willow between Accidental Forest and Tall Forest to support cuckoos, willow flycatchers, least bell’s vireos, and other neo-tropics.</td>
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<td><strong>2.3</strong> Minimize the impact of non-native invasive species in riparian and floodplain habitats through early detection and control.</td>
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<td><strong>2.3.1</strong> Locate, map, and evaluate invasive plant species in targeted riparian habitats along the Cosumnes River (annual effort rotated among sites, with most areas visited at least once every three years).</td>
<td>Weed surveys</td>
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<td></td>
<td><strong>2.3.2</strong> Conduct and support other research as necessary to guide management of the Preserve.</td>
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<td>Objectives</td>
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| **2.3.2** Implement control programs (treatment and monitoring), as necessary, to maintain desired species composition and population levels of native species. |  | Weed surveys before and after control  
Vegetation surveys for native species |
| **2.3.3** Conduct and support research to evaluate threats from invasive animal species (e.g., black rat, cowbirds) and techniques for control (e.g., trapping, baiting). |  | Black rat studies  
Cowbird survey (part of bird monitoring) |
| **2.3.4** Conduct and support research to evaluate threats from invasive plants (e.g., perennial pepperweed, Himalayan blackberry) and techniques for control (e.g., prescribed fire, grazing, herbicide treatments, mowing, disking, and weed mat tarping). |  | Weed surveys before and after control  
Vegetation surveys before and after control |
| **2.4** Restore an additional 1,000 acres of existing Preserve lands to riparian and floodplain habitats by 2018. |  | Elevation, topography, channel geomorphology  
Hydrology (magnitude, duration, frequency of flood flows)  
Sediment transport  
Habitat mapping  
Species composition and successional stage  
Fish and bird surveys  
Physical habitat structure and cover |
<p>| <strong>2.4.1</strong> Restore ~500 acres of seasonally flooded riparian habitat on the Preserve’s Denier II property by completing and implementing plans to restore a natural flooding regime and to plant native riparian vegetation. Incorporate experimental design to test approaches that could be applied to restoration of other upstream sites (e.g., Castello). |  | |
| <strong>2.4.2</strong> Develop and implement restoration plans for an additional 500 acres of riparian-floodplain habitat. |  | |
| <strong>2.4.3</strong> Investigate opportunities to restore river-floodplain connectivity and create 300 acres of seasonally flooded habitat (long-duration flooding to support fishes and aquatic food web) to offset any losses due to succession of previously restored habitat. Site assessment includes elevations, hydrology (flooding extent, frequency, duration, depth, and velocity), and sediment supply. |  | |</p>
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<tr>
<td>2.5 Actively participate in the management of water resources and flooding along the lower Cosumnes River.</td>
<td><strong>2.5.1</strong> Work with local irrigation districts and water managers to manage surface flows in the river to support the natural variability and frequencies of specific flood types and water year types as outlined in Booth et al.</td>
<td>Visit the river each fall to assess water levels and whether or not augmentation is needed.</td>
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<td><strong>2.5.2</strong> Focus water and flood management activities on maintaining the hydrologic connectivity between surface and subsurface waters, while recognizing that periodic connection and disconnection of the floodplain within the river channel is vital to the functioning of the floodplain.</td>
<td>Create a decision tree to assess whether or not we need augmentation in a particular year.</td>
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<td><strong>2.5.3</strong> Manage floodplains to ensure that multiple, repeated inundation events occur within a two-to-three year period from at least early January through early May.</td>
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<td></td>
<td><strong>2.5.4</strong> Work with property owners to minimize flooding of residences in the lower Cosumnes River area.</td>
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Natural Resource Stewardship Sub-Goal 3: Protect, maintain, and restore vernal pool and grassland communities, maintain the ecological processes that sustain the habitat, and promote the native species that depend on the habitat.

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| 3.1 Permanently protect 17,655 acres of vernal pool grassland habitat by the year 2012 by securing an additional ~3,417 acres of habitat. | 3.1.1 Annually evaluate status of land protection and conversion in the vernal pool grassland region (rangeland and uplands of south and east Sacramento county). | - Annually track status of key parcels.  
- Evaluate GIS data and aerial photos of vernal pool grassland region. |
| Note: As of 2007, 40 percent of vernal pool grassland in the watershed is protected.) | 3.1.2 Annually monitor vernal pool grassland easements for compliance with easement terms and conditions.  
(Note: compliance monitoring is less intensive than biological monitoring. TNC requires annual monitoring on all easements.) | - Visit each property and interview landowner.  
- Conduct residual dry matter (RDM) monitoring to evaluate grazing intensity (as stipulated in applicable conservation easements or management agreements).  
- Complete easement report and upload to Conservation Track (TNC). |
|                                                                            | 3.1.3 Participate in the South Sacramento County Habitat Conservation Planning Process to ensure consistency with USFWS Vernal Pool Recovery Plan and Preserve goals. | - Review planning documents and provide input. |
|                                                                            | 3.1.4 Identify and prioritize key parcels necessary to secure remaining unprotected 3,417 acres vernal pool habitat. | - Annually track status of key parcels. |
|                                                                            | 3.1.5 Protect key parcels by 2012, on a willing-seller, as-available basis. | - Update GIS database. |
| 3.2 Ensure the management of protected vernal pool grassland habitat supports the maintenance of overall native biodiversity and target species. | 3.2.1 Continue fire management activities in vernal pool grassland habitat in partnership with local landowners and agencies (e.g., fire staff from California Department of Forestry and Fire Protection, BLM, and USFWS Refuges) to burn at least 500 acres of vernal pool grassland per year. | - Acres burned  
- Species response to fire |
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| **3.2.2** | Conduct field surveys and data analysis to assess the status of biodiversity in vernal pool and grassland habitats as a baseline for future evaluation. | - Species inventories for each property  
- Locations of rare species |
| **3.2.3** | Assess effects of grazing on vernal pool plant and animal community by:  
- Continuing data collection and analyzing data from Howard Ranch grazing study to determine long-term grazing impacts on native and non-native plants as well as vertebrate/invertebrate taxa.  
- Participating in TNC statewide grazing study. | - Pool inundation period  
- Native species diversity  
- Rare plant presence  
- Rare invertebrate/vertebrate presence |
| **3.2.4** | Assess effects of fire on vernal pool plant community by:  
- Completing analysis of fire effects data from the Howard Ranch and Valensin Ranch to determine an appropriate fire management regime for these sites.  
- Continuing data collection and analyzing data from study of goat grass control using prescribed fire. | - Goat grass population response to fire |
<p>| <strong>3.3</strong> | Minimize the impact of noxious weeds on vernal pool grasslands through early detection and control efforts. | |
| <strong>3.3.1</strong> | Conduct field surveys to evaluate extent of invasion of <em>Glyceria declinata</em> in vernal pools on the Preserve. Use results of surveys and other information to develop and implement a weed control plan for vernal pools. | - Glyceria cover and distribution in vernal pools |
| <strong>3.3.2</strong> | Evaluate extent of <em>Aegilops triuncialis</em> invasion in grasslands. | - Goat grass population mapping |</p>
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<tr>
<td>3.3.3 Perform periodic weed surveys to document new outbreaks or spread of</td>
<td>3.4.1 Develop a map showing grassland restoration potential on Preserve lands.</td>
<td>Targeted weed surveys</td>
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<td>existing weeds in vernal pool grasslands (at least once every three years).</td>
<td>3.4.2 Study use of native forb species and best methods for establishment in grassland restoration plantings.</td>
<td>GIS data and field surveys</td>
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<td>3.4.3 Document best practices for grassland restoration with guidelines for</td>
<td>3.4.4 Implement best practices on Preserve lands and encourage their use by others.</td>
<td>Survival of native forbs under different</td>
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<td>the best methods and species.</td>
<td></td>
<td>treatments</td>
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<td>3.5 Develop a classification system for annual grasslands on the Preserve.</td>
<td>3.5.1 Develop a classification system for annual grasslands on the Preserve, in collaboration with the California Native Plant Society (CNPS) and other botanical experts.</td>
<td>Grassland community monitoring</td>
</tr>
<tr>
<td>3.5.2 Map the Preserve’s fire history in a comprehensive way. Update this</td>
<td></td>
<td>GIS data layers</td>
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<td>data set on an annual basis.</td>
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<tr>
<td>3.6 Develop accurate and objective data sets that describe the physical</td>
<td>3.6.1 Map the Preserve’s fire history in a comprehensive way. Update this data set on an annual basis.</td>
<td>Annually map fires</td>
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<td>processes occurring on the Preserve (fire, floods, etc.) to support better</td>
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<td>models and better understanding of management approaches.</td>
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Natural Resource Stewardship Sub-Goal 4: Maintain and restore a mosaic of freshwater wetland habitats (seasonal and permanent) that support native species.

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<tr>
<td><strong>4.1</strong> Maintain a minimum of 1,000 acres of seasonal managed ponds and evaluate the need for more managed wetland ponds on a case-by-case basis.</td>
<td><strong>4.1.1</strong> Evaluate needs for seasonal wetland habitat every three years, based on regional waterbird and waterfowl populations and habitat availability, in coordination with other natural lands managers (e.g., Stone Lakes NWR, CDFG Woodbridge, SVC), and with guidance from regional natural resource plans (e.g., CVJV) and adjust CRP wetland restoration and maintenance goal to support.</td>
<td>Waterfowl and crane population surveys at Cosumnes and in Delta. Map acres of managed and natural seasonal wetlands on the Preserve and nearby.</td>
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<td></td>
<td><strong>4.1.2</strong> Annually evaluate condition of managed ponds, and develop and implement plans to maintain desired mosaic of physical habitat using flooding schedule and/or vegetation treatments (e.g., mowing, discing, or spraying).</td>
<td>Habitat mapping of wetland structure.</td>
</tr>
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<td></td>
<td><strong>4.1.3</strong> Develop and implement an annual wetlands operations plan for all Preserve properties (e.g., waterfowl ponds, Staten Island, Grizzly Slough, and agricultural lands) that provides for roosting and foraging habitat throughout the migratory and winter season for migratory and wintering waterfowl, sandhill cranes, shorebirds, and waterbirds.</td>
<td>Number and location of greater sandhill crane roosts. Seasonal waterfowl and crane population surveys at Cosumnes and in Delta.</td>
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<td><strong>4.1.4</strong> Manage fall flood-up schedules that maximize the temporal and spatial habitat values across all of the managed wetlands and rice fields (e.g., July/August flooding for shorebird migrations, August/September for early arriving cranes, etc.).</td>
<td>Monitor the timing, duration, depth, and spatial distribution of flood-ups across the Preserve (as they relate to the numbers of shorebirds, waterfowl, and waterbirds, using ponds consistent with the North American Waterfowl Management Plan (NAWMP) and the Central Valley Joint Venture 2006 Implementation Plan).</td>
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### Objectives

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| **4.1.5** Maintain approximately 15 percent of managed wetland ponds as brood habitat for waterfowl (currently 111 acres), consistent with wetland BMPs for waterfowl and wildlife. | **4.1.5** Maintain approximately 15 percent of managed wetland ponds as brood habitat for waterfowl (currently 111 acres), consistent with wetland BMPs for waterfowl and wildlife. | **Map acres of managed and natural seasonal wetlands.**  
| **Crane and waterfowl survey.** | **Map acres of managed and natural seasonal wetlands.**  
| **Crane and waterfowl survey.** | **Crane and waterfowl survey.** |
| 4.1.6 Coordinate management of CDFG mitigation land on the DWR-owned Grizzly Slough property. | 4.1.6 Coordinate management of CDFG mitigation land on the DWR-owned Grizzly Slough property. | **Map acres of managed and natural seasonal wetlands.**  
| **Crane and waterfowl survey.** | **Map acres of managed and natural seasonal wetlands.**  
| **Crane and waterfowl survey.** | **Crane and waterfowl survey.** |
| **4.2** Create and maintain at least 2,750 acres of flooded agriculture as seasonal wetland habitat for target species (sandhill cranes and waterfowl). | **4.2.1** Work with tenant farmers to create and maintain at least 750 acres of seasonally flooded rice on the Preserve. | **Map acreage of seasonally flooded agriculture.**  
| **Crane and waterfowl survey.** | **Map acreage of seasonally flooded agriculture.**  
| **Crane and waterfowl survey.** | **Crane and waterfowl survey.** |
| **4.2.2** Work with Staten Island farm managers to create and maintain 2,300–3,000 acres of seasonally flooded agriculture. | **Map acreage of seasonally flooded agriculture.**  
| **4.3** Restore tidal freshwater wetlands and associated habitats on McCormack-Williamson Tract. | **4.3.1** Develop a restoration plan for McCormack-Williamson Tract to create up to 1,600 acres habitat mosaic (tidal wetlands, seasonal wetlands, floodplain, and riparian habitat) by breaching levees to restore tidal inundation. Work cooperatively with stakeholders (e.g., DWR North Delta Group, CALFED) to develop, fund, and implement the plan. | **Map acreage of seasonally flooded agriculture.**  
| **4.4** Restore mosaic of tidal freshwater wetlands and associated habitats on tidal sloughs. | **4.4.1** Assess the feasibility of restoring tidal wetlands along slough channels (e.g., Tihuecheme Slough, near Lost Slough). Develop and implement a restoration plan if feasible. | **Acreage of Preserve’s freshwater wetland landcover.**  
| **4.5** Restore and/or create freshwater wetlands to support waterfowl, cranes, and other wetland species. | **4.5.1** Restore approximately 140 acres of managed freshwater wetlands on the Preserve’s Wong property. | **Acreage of Preserve’s freshwater wetland landcover.**  
| **4.5.2** Create and maintain at least 750 acres of seasonally flooded rice on the Preserve. | **Crane and waterfowl survey.**  
| **Map acreage of seasonally flooded agriculture.**  
| **Crane and waterfowl survey.** | **Map acreage of seasonally flooded agriculture.**  
<p>| <strong>Cranes and waterfowl survey.</strong> | <strong>Crane and waterfowl survey.</strong> |</p>
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<tr>
<td>4.5.2 As funding becomes available, evaluate the potential to restore freshwater wetlands on other Preserve properties.</td>
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<td>4.6 Ensure that habitat requirements of special status species are incorporated into wetland restoration and management plans, as appropriate.</td>
<td>4.6.1 Maintain greater sandhill crane roosts on managed and natural wetlands in proximity to foraging habitat (within one-to-two miles), minimize disturbance from other land uses, and reduce sources of mortality (e.g., power lines).</td>
<td>GIS mapping of roost locations.  &lt;br&gt;GIS map of powerlines and mortality incidents.</td>
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<tr>
<td>4.6.2 Maintain and restore perennial wetland habitat in the Badger Creek watershed for giant garter snake (see also Objectives 5.2 – 5.5).</td>
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<td>4.7 Minimize the impact of non-native invasive species in wetlands through early detection and control efforts.</td>
<td>4.7.1 Locate, map, and annually evaluate invasive plant species in wetland habitats along the Cosumnes River (e.g., perennial pepperweed, water primrose, water hyacinth).</td>
<td>Weed survey</td>
</tr>
<tr>
<td>4.7.2 Implement control (i.e., grazing, burning, herbicides, and other mechanical control methods) and post-treatment monitoring as necessary to maintain desired species composition and population levels of native species.</td>
<td></td>
<td>Weed survey  &lt;br&gt;Species composition, successional stage, canopy cover, and physical structure of vegetation.</td>
</tr>
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<td>4.7.3 Conduct and support research to evaluate threats and control techniques (e.g., prescribed fire, grazing, herbicide treatments, mowing, discing, and weed mat tarping) for controlling target invasive plant and animal species in wetland habitats.</td>
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| 4.8 Reduce risk of mosquito-borne and avian diseases where feasible and consistent with wetlands goals. | 4.8.1 Work cooperatively with vector control to reduce mosquito production in a manner that is consistent with the pond flooding schedule.  
4.8.2 Monitor for occurrence of avian diseases (*e.g.*, botulism, cholera, West Nile Virus, etc.) and implement control measures as appropriate and in coordination with National Wildlife Refuges.  
4.8.3 Develop an avian disease rapid response plan to facilitate immediate and appropriate management response to an outbreak of avian diseases (*e.g.*, immediate flooding, scaring birds, etc.). |                                                                                       |
| 4.9 Maintain and enhance water quality.                                    | 4.9.1 Engage in water quality policy forums as necessary to track measures and regulations that affect wetlands management (*e.g.*, CVRWQCB, Agricultural waiver program).  
4.9.2 Implement best management practices as appropriate to maintain and enhance water quality.  
4.9.3 Support research on potential impacts and management of methyl mercury. | Aqueous methyl mercury monitoring.                                                          |
Natural Resource Stewardship Sub-Goal 5: Maintain and enhance the population of giant garter snake in the Badger Creek watershed

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<tr>
<td><strong>5.1</strong> Monitor status of giant garter snake population in the Badger Creek watershed.</td>
<td><strong>5.1.1</strong> Conduct monitoring studies of Snake Marsh every five years to document status of population.</td>
<td>Trapping and mark-recapture studies in Snake Marsh</td>
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<td>~200 adults in Snake Marsh (2002 status)</td>
<td><strong>5.1.2</strong> Survey suitable habitat east of Hwy 99 to detect new population expansion, if funding available or in preparation for potential repatriation (Objective 5.5).</td>
<td>Trapping during active season in NF &amp; SF Badger Creek and Horseshoe Lake</td>
</tr>
<tr>
<td><strong>5.2</strong> Maintain and restore existing 135 acres of perennial wetland habitat at Snake Marsh.</td>
<td><strong>5.2.1</strong> Map habitat and characterize vegetation of Snake Marsh, including extent of water primrose.</td>
<td>Aerial photos, Vegetation surveys</td>
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<td></td>
<td><strong>5.2.2</strong> Characterize the seasonal hydrology, water sources, and water needs of the Snake Marsh and Badger Creek system. Determine whether changes in hydrology are adversely impacting the Snake Marsh population.</td>
<td>Surface water flow gage on Badger Creek and Willow Creek, Extent and depth of water March-October, Upstream landowner interviews</td>
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<td><strong>5.2.3</strong> If water supplies are inadequate, develop and implement plan to provide water, including supplementation if necessary (e.g., surface flow augmentation, wells). Coordinate with local partners in conjunction with regional groundwater and surface water planning efforts (e.g., South Sacramento County Groundwater Plan).</td>
<td>Local groundwater wells, Regional surface water supplies</td>
</tr>
<tr>
<td><strong>5.3</strong> Assess effects of invasive water primrose on giant garter snake habitat and implement control measures if necessary.</td>
<td><strong>5.3.1</strong> Map extent of water primrose in Snake Marsh and upstream sources in Badger and Willow Creeks.</td>
<td>Water primrose mapping in Snake Marsh and upstream sources</td>
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<td>Objectives</td>
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<tr>
<td>5.3.2</td>
<td>Assess whether changes in vegetation are adversely impacting the GGS population in Snake Marsh.</td>
<td>Habitat use by GGS (radio telemetry, trapping) GGS population survey</td>
</tr>
<tr>
<td>5.3.3</td>
<td>Review and test control methods for water primrose. Develop and implement control plan if feasible.</td>
<td>Water primrose mapping in Snake Marsh and upstream sources</td>
</tr>
<tr>
<td>5.4</td>
<td>Manage uplands surrounding Snake Marsh to maintain GGS refugia.</td>
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<tr>
<td>5.4.1</td>
<td>Assess status of upland refugia (burrows for summer, aestivation sites for winter) and potential disturbances (e.g., vehicles, livestock, agriculture).</td>
<td>Presence of emergent vegetation and burrows</td>
</tr>
<tr>
<td>5.4.2</td>
<td>Minimize disturbances of aestivation sites during winter (Oct–Mar) along railroad grade at Snake Marsh and other potential high-ground sites (if GGS population spreads).</td>
<td>Railroad construction activities in winter</td>
</tr>
<tr>
<td>5.5</td>
<td>Support expansion of GGS range in Badger Creek watershed east of Highway 99 by restoring habitat and possibly repatriating snakes, in accordance with the GGS Recovery Plan.</td>
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<tr>
<td>5.5.1</td>
<td>Evaluate habitat potential (physical and hydrologic) of Badger Creek watershed east of Hwy 99. Characterize the seasonal hydrology, water sources, and water needs.</td>
<td>Surface water flow gage on Badger Creek and Willow Creek. Extent and depth of water March–October.</td>
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<tr>
<td>5.5.2</td>
<td>Develop and implement plan to maintain sufficient water supply to restore perennial wetlands east of Hwy 99 (Horseshoe Lake, SF and/or NF Badger Creek), in conjunction with regional groundwater and surface water planning efforts (e.g., South Sacramento County Groundwater Plan).</td>
<td>Local groundwater wells Regional surface water supplies</td>
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<tr>
<td>5.5.3</td>
<td>Ensure connectivity between Snake Marsh population and area east of Hwy 99.</td>
<td>Badger Creek flow and habitat survey east of Snake Marsh</td>
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|            | **5.5.4** Restore perennial wetland habitat on NF and SF Badger Creek (*e.g.*, channelized reaches on Bjelland and George Dairy properties). Provide aestivation sites above winter flooding adjacent to any habitat restored for GGS. | Presence/absence GGS surveys in new habitat  
Habitat survey |
|            | **5.5.5** Implement weed control measures as necessary to minimize impact of invasive water primrose. | Weed survey |
|            | **5.5.6** Assess opportunities to repatriate giant garter snakes to suitable habitat on the Preserve if re-colonization does not occur within 10 years of habitat restoration. Work with USFWS to develop, fund, and implement a restoration and repatriation plan according to Draft Recovery Plan (USFWS 1998) goals and guidelines. | Presence/absence GGS surveys in new habitat  
Habitat survey in unoccupied sites |
Natural Resource Stewardship Sub-Goal 6: Restore and maintain a population of fall-run Chinook salmon in the Cosumnes River, with an average annual spawning run of 2,000 adults (10-year average, range of 1,000–5,000 adults).

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<td><strong>6.1</strong> Improve passage for migrating adult salmon by enhancing river flows to reconnect the river during October–December (60–200 cfs flows for at least two periods totaling 10–25 days).</td>
<td><strong>6.1.1</strong> Secure, monitor, and adaptively manage releases of water from Folsom South Canal to pre-wet the stream channel in early fall (as per February 2005 MOA of the Central Sacramento County Groundwater Forum).</td>
<td>Continuous surface flows during fall.  Adult escapement (number of adults observed on spawning grounds).  Baseline monitoring of invasive plants along river (inadvertent introductions from American River).</td>
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<td><strong>6.1.2</strong> Evaluate purchases of additional water rights to provide ecological flows for key targets such as Chinook salmon, giant garter snake, and riparian forest. Investigate opportunities for funding and implementation (<em>e.g.</em>, Anadromous Fish Restoration Program [AFRP]).</td>
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<td><strong>6.2</strong> Maintain river free of physical passage barriers.</td>
<td><strong>6.2.1</strong> Monitor passage status in river and to maintain river free from physical passage barriers (culverts, road crossings, seasonal impoundments). Work with the Fisheries Foundation and others to complete this action.</td>
<td>Survey of river channel for passage barriers once flow reconnects.</td>
</tr>
<tr>
<td><strong>6.3</strong> Enhance spawning habitat in the Cosumnes River between Hwy 16 and Meiss Road (6 river miles) within 10 years.</td>
<td><strong>6.3.1</strong> Support Fisheries Foundation and/or CDFG in monitoring spawning activity (redd counts in fall/winter) in the Cosumnes River.</td>
<td>Presence of redds (nests)</td>
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<td><strong>6.3.2</strong> Support local partners (<em>e.g.</em>, Fishery Foundation, NRCS, local RDs, Cosumnes River Task Force) in efforts to evaluate causes of spawning habitat degradation upstream of the Preserve (erosion, scour, and/or siltation) and to develop strategies to improve conditions (<em>e.g.</em>, gravel augmentation, erosion control).</td>
<td>Extent of stream with suitable gravel</td>
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### Objectives

**6.4** Restore and maintain at least 300 acres of seasonal floodplain habitat for juvenile rearing.

### Actions

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<td><strong>6.4.1</strong></td>
<td>Map every three years extent of seasonal open water floodplain habitat (long-duration floods during January–March).</td>
</tr>
<tr>
<td><strong>6.4.2</strong></td>
<td>Adaptively manage floodplain habitat and, if necessary, plan restoration of additional seasonal open water habitat to maintain 300 acres (to offset succession of seasonal open water habitat to riparian forest, maintain mosaic of habitat types, and to support any changing levels of salmon production). Obtain funding and implement restoration plan (Action 2.4.2).</td>
</tr>
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### Monitoring Elements

- Floodplain area inundated at least 30 days during January–March (when flows >800 cfs at Michigan Bar gage).
BIBLIOGRAPHY


4 Agricultural Stewardship

The Preserve’s agricultural resources and current practices are described in this section. A brief introduction to agriculture in the local region and the various state and federal programs to support agriculture are also described in this Chapter to provide a regional context for the activities that occur on the Preserve.

4.1 Agriculture in the Region Around the Preserve

The Preserve includes properties in two counties, Sacramento and San Joaquin. Most of the Preserve’s agricultural activities occur within Sacramento County, with the exception of Staten Island, which is just below the County line in San Joaquin County. For this reason, this section presents mostly Sacramento County information in order to establish a regional context for the purposes of this Management Plan.

Agriculture has a long history in Sacramento County, beginning with the original settlers who reclaimed the marshy areas and used innovative techniques in flood and drought management to increase agricultural productivity in the Central Valley of California. As of 2005, the Sacramento County Agricultural Commissioner’s Office estimated the County’s agricultural production value was nearly $350 million, with the top ten agricultural commodities being (in descending order): wine grapes, market milk, nursery stock, Bartlett pears, cattle and calves, poultry, field corn, alfalfa, rice, and asparagus (Sacramento County Agricultural Commissioner 2005). The Preserve’s agricultural and grazing operations produce four of the top ten agricultural commodities: cattle and calves, field corn, alfalfa and other hay, and organic rice.

Most of the local farms and ranches in the South Sacramento County area are owned and managed by families that have a multi-generational history of farming in this area. Recent trends show that agricultural land conversion for urban and environmental uses in the South Sacramento County area has resulted in substantially less irrigated crop land in production. Cities in South Sacramento County with ongoing and future possible agricultural land conversions that have the potential to affect the Preserve include Elk Grove, Rancho Cordova, Rancho Murieta, and Galt.
The total value of agricultural production in the Sacramento Metropolitan Region is decreasing. Between 1990 and 2002, nearly four percent (or 283,277 acres) of the Central Valley’s irrigated farmland was converted to other uses, primarily for housing and other urban uses (Great Valley Center 2005).

The Agricultural Sector in the region surrounding the Preserve is feeling economic pressure to convert land to urban development. Many factors may influence the long-term feasibility of agriculture in the region, including:

- Incremental land conversion of farms in the region and associated reduction in the number of farmers and acreage in production.
- Incremental reduction in social and physical infrastructure that supports farmers.
- Increased regulation of dust, pesticides, noise, water quality, and other agricultural by-products.
- Economic incentives to convert agricultural land by receiving significant funds for sale of land to support retirement or other personal needs.
- World competition for existing markets.
- Commodity prices.
- Reduced viability of the local agricultural economy.
- Water and energy costs.

### 4.2 State and Federal Agricultural Programs

The United States Department of Agriculture’s (USDA) Natural Resources Conservation Service (NRCS) offers several programs to support farmers while at the same time supporting wildlife and conservation practices. Two of the most popular NRCS programs that are most applicable to the Preserve are the Wetland Reserve Program (WRP) and the Environmental Quality Incentives Program (EQIP).

The Wetland Reserve Program is a voluntary federal program that provides technical and financial assistance to eligible landowners to address wetland, wildlife habitat, soil, water, and related natural resource concerns on private lands in an environmentally beneficial and cost-effective manner. Two Preserve parcels currently have WRP easements: Howard Ranch WRP and Valensin WRP 2, with easement acreages of 5,354 and 946 acres respectively.

The Environmental Quality Incentives Program (EQIP) is another voluntary federal program that is designed to provide assistance to agricultural producers. The assistance is intended to promote agricultural production and environmental quality as compatible goals, optimize environmental benefits, and help farmers and ranchers meet federal, state, tribal, and local environmental requirements. Although the Preserve Partners do not receive EQIP funds directly, some of the Preserve’s agricultural lessees participate in the EQIP, resulting in upgrades to the Preserve’s agricultural infrastructure system or habitat enhancement.
Figure 4.1: Important Farmland in Sacramento County

Figure 4.2: Williamson Act Parcels in Sacramento County

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, helps prevent the conversion of agricultural land to other land uses by enabling the County to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In exchange, the property owner receives a tax break that decreases the property tax on acreage held in contract under the Program. There are different programs offered under the Act, including a “Super Williamson Act” program for a longer term. The Preserve has a total of 120 parcels under Williamson Act contracts, including 22,830 acres in Sacramento County and 12,417 acres in San Joaquin County (Figure 4.2).

Pesticide Program: Pesticides are commonly used on agricultural lands outside of the Preserve boundaries and occasionally on the croplands within the Preserve. Additionally, organic farms utilize organic pest control methods and materials registered for organic use. Because both pesticides and organic pest control methods are also used by the Preserve in natural habitat areas, we have included a discussion of pesticides in Chapter 7, Section 7.2.1: Property Descriptions and Management.

4.3 AGRICULTURE ON THE PRESERVE

The vast majority of the Preserve’s agricultural lands (e.g., row crops such as corn) are farmed in a “wildlife-friendly” manner that benefits primarily wintering migratory waterfowl and waterbirds, especially sandhill cranes and Swainson’s hawks. Post-harvest treatment of wildlife-friendly crops is the most essential aspect of the operation in order for the full benefit of the land to be realized by wildlife. For example, sandhill cranes begin arriving at the Preserve around the time of the corn harvest; so while they do not use standing corn, they do forage extensively on post-harvest corn fields that have been flooded at Staten Island (Ivey and Herziger 2003; Gause et al. 2003).

The types of crops grown at the Preserve vary annually according to specific land-management considerations, market conditions, and the needs of the local farmers. As of 2000, approximately 21 different types of crops were grown on Preserve lands, including apricots, beans (green), beans (dry), cherries, corn, general field crops, general grain and hay, melons, squash, cucumbers, miscellaneous mixed grain and hay, irrigated pasture alfalfa and mix, irrigated pasture clover, irrigated pasture general, irrigated pasture mixed, rice, safflower, sudan, tomatoes, vineyards, and non-irrigated grassland (Department of Water Resources 2000). While many of those crops may have changed over the past few years, the overall Preserve acreage in active agricultural production remained fairly stable. Figure 4.3 depicts the current distribution of agricultural lands and crops across the Preserve.

The Preserve receives many benefits from agriculture, including:

- Income from the leased properties.
- Buffer between more urban land uses and wildlife habitat near the river.
- Provision of an on-site farmer to help deter illegal activities such as trespass or dumping on the property.
- Maintenance of aesthetics and open space for local residents and Preserve visitors.
Habitat value for target species.
Creation of long-term social capital by retaining the trust of local farmers and communities and their ability to contribute to the local economy through agricultural production and taxes.

### 4.4 Preserve Parcels and Acres in Active Agriculture Production

The Preserve contains 45,859 acres. According to the Preserve’s GIS data, approximately 37,500 acres are used for agricultural production (e.g., crops and grazing), 16,500 on fee-owned lands and 21,000 on easement lands. On the fee-owned lands, approximately 4,200 acres are utilized for grazing and 12,300 acres are used to grow crops.

The most well-known area of the Preserve identified by agricultural activities is Staten Island, which is located in San Joaquin County and within the Sacramento–San Joaquin Delta. Staten Island is managed as part of the Preserve, although day-to-day agricultural decisions are made by an affiliate organization called Conservation Farms & Ranches (formerly managed as M&T Staten Ranch under previous ownership). The Island is a 9,200-acre farm, of which approximately 8,400 acres are suitable for farming. Finding the balance between profitable farming and wildlife habitat is an ongoing process and is being conducted using an adaptive management approach. The current farming program includes approximately 7,000–7,400 acres of corn and 1,200–1,400 acres of wheat. The remaining land is composed of levees, roads, ditches, canals, buildings, and operational facilities.

The Preserve is also well known for its organic rice operations. Currently, approximately 1,000 acres in the lower floodplain of the Preserve are leased for organic rice, of which approximately 750 acres is farmed annually, rotating among the fields. After harvest, fields are rotationally flooded to support wintering waterfowl and waterbirds that feast on grain, crayfish, mice, and invertebrates found in the fields. The birds assist with the breakdown of the rice straw and add fertilizer to the fields (Bird et al. 2000). Organic rice production creates excellent habitat, but it also creates a challenge for managing mosquito abatement needs. Vector control options are limited due to the lack of agrochemicals registered for use in organic rice. The lessee and the Preserve work closely with the Sacramento–Yolo Mosquito & Vector Control District on this issue. More information about the Preserve’s organic rice production is provided in the Lower Cosumnes River Watershed Assessment (RBI 2006).

### 4.5 Agricultural Water

Farmers and ranchers on the Preserve obtain their water from a variety of local sources. Staten Island obtains water by siphoning it from the Mokelumne River. Other Preserve properties and easement lands obtain water from sources such as nearby sloughs and river channels, as well as from existing appropriative water rights issued by the State Water Resources Control Board.
Figure 4.3: Agricultural Crops and Grazing on the Preserve

Crop data are from the CA Department of Water Resources Land Survey, Sacramento 2000 and San Joaquin 1996. Staten Island crops are from Ducks Unlimited survey, 2006. Grazing data are from personal communication with CRP staff, 2006.
A stable source of water is imperative for agricultural operations on the Preserve. The average amount of irrigation water that crops utilize varies according to the type of crop and specific site conditions. For example, the Preserve’s organic rice operations require approximately 3.2 acre-feet of applied water per acre (Schaffer 2001).

Much of the agricultural water used by local farmers and the Preserve is returned to the natural ecosystem through surface water discharge and/or percolation. Surface water discharge and percolation are extremely important in the sense that the groundwater in the Cosumnes watershed is hydrologically connected with surface water, and those interactions are essential to many of the Preserve’s restoration efforts, especially for valley oak riparian forest restoration. Continuation of water conservation practices to protect flows in the river for fish, amphibians, benthic macroinvertebrates, and riparian plant species is needed by all who use the Cosumnes River resources, especially as the County continues to review and approve urbanization projects that affect the river (e.g., Rancho Murieta developments). Additionally, the Preserve will need to continually consider and balance the tradeoff between using water for agricultural purposes, which generate income for the Preserve and provide habitat for certain species, and maintaining in-stream water for the protection of fish and other aquatic biota.

Water quality is an equally important issue for the Preserve’s agricultural lessees, and measures are taken to reduce sedimentation and chemical inputs into surface water sources, including the reduced use of fertilizers and pesticides on organic farms. Riparian or grassland habitat between the aquatic habitats and the agricultural operations serves as a buffer that can significantly decrease the amount of sedimentation and/or pesticide reaching the natural system. One of the proposed actions in this Management Plan is to promote the use of wildlife-friendly farming and other conservation practices that will result in increased water quality and quantity for everyone in the community.

### 4.6 Leases and Easements

The Preserve supports wildlife-friendly agriculture predominantly using two mechanisms:

- **Leases**: Land currently owned by a Preserve Partner is leased to a private farmer or rancher for use in active agricultural or grazing production and management.
Easements: Preserve Partners purchase a conservation easement on privately owned farms and ranches near the Preserve and the owner continues to farm or graze the land at their discretion, provided that it is within the terms and conditions of the easement.

Income from leased properties is an especially important benefit to the Preserve as this agriculture generates a portion of the funding necessary to cover the annual operating and maintenance costs of the Preserve. For example, the Preserve’s organic rice operations provide critical funding to the Preserve while still providing an additional 1,000 acres of wetland habitat, post-harvest. The additional wetland acres supplement the more traditionally managed wetlands on the Preserve and help to support state-listed threatened species such as the greater sandhill crane, and species of concern such as the northern pintail. Additionally, other Preserve properties are managed using cattle grazing, which also provides a steady, reliable income for the Preserve while appropriately managing the habitat.

Easements are a real estate tool used to purchase the future right to develop the land or other rights from willing sellers. Easements are extremely important to the Preserve: they are less expensive than fee-title to acquire, they support the local economy by keeping the land in production by the landowner, and they create a buffer of privately owned and managed lands between urban areas and the Preserve’s natural habitat areas. Landowners benefit by receiving money for the sale of the development rights and a reduction in annual property taxes, as well as the ability to withstand the pressure to subdivide and develop the property, thereby keeping the land in agricultural production. Farmers and/or landowners with easements have indicated that they appreciate the flexibility that the Preserve provides in terms of allowing the farmer to retain control of agricultural management decisions, as long as management is consistent with the terms of the easement.

The Preserve promotes some basic preferences that they request farmers (i.e., lessees or easement holders) to consider in carrying out their agricultural practices. They are as follows:

- Planting of annual crops that provide suitable habitat for wildlife.
- Utilization of organic agriculture techniques when possible.
- Pesticide use must follow appropriate local, state, and federal regulations.
- Farming practices that consider wildlife needs (e.g., flooding rice stubble rather than discing or burning it).

It is important to note that agriculture at the Preserve helps to sustain the local rural farm economy, contributes to the long-term viability of the agriculture tradition, and promotes positive social relationships among neighbors. However, tradeoffs associated with agricultural activity on the Preserve do exist, with water and pesticide use being the two most prominent.
4.7 MANAGEMENT GOALS

As the needs and conditions of the Preserve change over time, it will be necessary for the Preserve to reassess and continue to balance its agricultural enterprises with habitat preservation goals so as to maintain multiple natural resource, social, and economic values. This will be accomplished using adaptive management and associated monitoring to ensure that new information is taken into account.

Agriculture is intimately related to the provision of native habitat and water on the Preserve. Also, many land-management tools used in agricultural practices are utilized for management of native habitats. Given these areas of overlap, readers are encouraged to consult the following chapters for additional and related goals: Chapter 3, Natural Resource Stewardship; and Chapter 2, Description of the Cosumnes River Watershed and the Preserve (contains information on water resources).
Goals, Objectives, Actions, and Monitoring

OVERARCHING GOAL II: COMPATIBLE USES IMPROVE STEWARDSHIP OF THE LANDS IN THE COSUMNES RIVER WATERSHED.

Agricultural Stewardship SubGoal 1: Agricultural stewardship will continue to serve as an important land management tool and will be compatible with the Preserve’s overall mission and goals.

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<th>Objectives</th>
<th>Actions</th>
<th>Monitoring Elements</th>
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| 1.1 Balance the Preserve’s agricultural land uses with the Preserve’s overall mission and goals. | 1.1.1 Assess all of the existing Preserve properties for their potential to contribute to accomplishing the Preserve’s overall mission and goals through the implementation of agricultural and/or grazing practices.  
1.1.2 Implement agriculture and grazing on all Preserve properties where implementation is deemed suitable and complimentary to the Preserve’s overall mission and goals.  
1.1.3 Conduct outreach regarding the importance of agriculture to the Preserve’s overall goals.  
1.1.4 Collaborate with adjacent landowners and tenants regarding common land-management issues.  
1.1.5 Continue to communicate and collaborate with agricultural agencies and organizations by attending meetings, conferences, and workshops sponsored by entities such as NRCS, the local RCDs, CCA, FSA, CFBF, etc.  
1.1.6 Continue to communicate and collaborate with policymakers to ensure that local and regional agriculture remains viable, as reflected in documents such as County General Plans, the South Sacramento County HCP, etc.  
1.1.7 Continue to promote wildlife-friendly farming approaches and organic farming methods to local farmers and the general public. | |
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<th>Objectives</th>
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<td><strong>1.1.8</strong> Address water quality issues by supporting efforts to research and collect site-specific data on aquatic parameters, including production of methyl mercury.</td>
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<td><strong>1.2</strong> Use traditional and innovative agricultural and grazing techniques to ensure proper ecological functioning of the Preserve’s landscapes.</td>
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<td><strong>1.2.1</strong> Use grazing strategies and other land-management tools to maximize native plant biodiversity while minimizing and controlling invasive plant species infestations.</td>
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<td><strong>1.2.2</strong> Minimize the impact of grazing on sensitive habitats such as riparian areas and vernal pools (e.g., design livestock infrastructure systems such as exclusionary fencing and gates, stock water placement).</td>
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<td><strong>1.2.3</strong> Maintain approximately 1,000 acres of organic rice operations, in rotation, on the Preserve in order to supplement the managed wetland program’s habitat availability.</td>
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<td><strong>1.2.4</strong> Manage grazing and agricultural lands (especially Howard Ranch, Valensin Ranch, and irrigated pastures), as necessary, in order to support and maintain viable populations of federal-listed vernal pool species and state-listed wildlife species such as the Swainson’s hawk.</td>
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<td><strong>1.2.5</strong> Continue to utilize economically viable agriculture and grazing as a land-management tool to support federal- and state-listed species and overall biodiversity. For example, Staten Island agriculture supports greater sandhill crane.</td>
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<td><strong>1.2.6</strong> Use a range of agricultural practices and land-management tools, as necessary and appropriate, to supplement wildlife-friendly farming and grazing techniques.</td>
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<td><strong>1.2.1</strong> Species diversity, invasive plant distribution and abundance in relation to management techniques.</td>
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<td>1.3 Maintain the Preserve’s agricultural capacity by ensuring that existing infrastructure is maintained and that new infrastructure is installed as necessary.</td>
<td>1.3.1 Maintain and replace, as necessary, the Preserve’s agricultural infrastructure, including pumps, water control structures, roads, levees, etc.</td>
<td>1.3.1 Bi-annually inspect (prior to and after the season) all agricultural infrastructure to ensure proper functioning.</td>
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<td>1.3.2 Require all agricultural and grazing lessees to maintain the leased agricultural infrastructure as a term and condition of their lease.</td>
<td>1.3.2 Routinely monitor and renew leases as necessary.</td>
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<td>1.3.3 Maintain the Preserve Partners’ existing State water rights.</td>
<td>1.3.3 Prepare State water rights reports every three years, or as required by the State.</td>
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<td>1.3.4 Examine the feasibility of water conservation practices and equipment on the Preserve, especially for agricultural operations (e.g., recycle, recapture).</td>
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BIBLIOGRAPHY


5.1 PUBLIC USE: RECREATION

5.1.1 Existing Conditions and User Groups

The Preserve currently offers a wide range of wildlife-compatible recreational activities, including wildlife viewing, hiking, boating, canoeing, hunting, fishing, sightseeing, and geocaching. Designated areas of the Preserve are open to the public, including trails and facilities located on parcels owned or managed by the BLM, SMUD, and TNC, as well as along public roads and on the river channel. Currently, there is no fee charged to visit the main Preserve or to park in the parking lot.

TYPES OF RECREATION ACTIVITIES

Popular activities are described in more detail below.

- **Boating/Paddling:** Only non-gas-powered boats (e.g., kayaks, canoes, etc.) are allowed to launch from the Preserve’s dock. Paddling (canoe or kayak) is a very popular activity at the Preserve. In addition to the guided paddle tours led by Preserve volunteer naturalists, there are independent paddlers, paddling clubs, and commercial paddling companies that use the Preserve’s facilities. This recreational use is growing slightly each year and numbers have increased dramatically since the completion of the new launch site.

  There are no restrictions to motorized boats on the Cosumnes waterways in accordance with State laws. However, motorized boat use is difficult due to shallow and varying water depths and vegetative overgrowth. The closest boat ramp for motorized boat launching is located outside the Preserve, farther downstream at Wimpy’s Marina on the Mokelumne River, which offers better motorized boating opportunities.

- **Wildlife Viewing:** Birding is very popular at the Preserve. Individual bird watchers and clubs, including the Audubon Society and Central Valley Birding Club, visit the Preserve on a regular basis, especially during crane and waterfowl migrations. Thousands of ducks, geese, swans, sandhill cranes, and various shorebirds are visible from the roads and trails in fall and winter. Many people come year-round to view the smaller passerine birds as well. Crane season usually lasts from mid-September until mid-March.
Hiking: Hiking and general sightseeing are the two leading recreational activities at the Preserve. In addition to the guided walking tours led by volunteer naturalists on a regular basis, there are independent and group hikes organized by walking and hiking clubs.

Fishing: Fishing in the Cosumnes River has a long history. Native Americans, farm settlers, and current sportfishing enthusiasts have pursued native fall-run Chinook salmon and steelhead (*Oncorhynchus mykiss*), as well as non-native sunfish and several species of bass in the river. Although bank fishing is not allowed within the Preserve boundaries, fishing from a boat in the navigable waterways is allowed in accordance with State law and the California Freshwater Sport Fishing Regulations.

Geocaching: Geocaching is a modern adventure game that utilizes a hand-held Global Positioning System (GPS) unit and spatial coordinates to locate a cache site posted on the Internet. Currently, there are four approved geocaching sites on the Preserve that are accessible from the public trails. The Preserve’s Volunteer Coordinator monitors the geocaching sites through regular contact with the geocacher user-group. Currently, there is no special use permit required for the four geocache sites on the Preserve.

Photography: Photographers are often seen taking photographs of waterfowl, waterways, and other natural features on the Preserve. Photography enthusiasts can participate in guided photo-walks that offer advice on photo techniques and locations as well as in self-guided photography opportunities. There are currently no specific photography facilities on the Preserve.

Rural Road Sightseeing: Rural roads that pass through the Preserve offer unique viewing opportunities. The Preserve’s Driving Tour has become very popular with visitors. The tour allows visitors to see the scope of the Cosumnes River Preserve by highlighting Preserve properties that are accessible by public roadway, but are not open to the public for walking, etc. While the tour focuses primarily on the lower Cosumnes, it has optional Preserve destinations in the North Delta, such as Staten Island and the foothills at Howard Ranch.

Hunting: The Preserve currently operates four active hunts:

1. **Weekend Dove Hunt**: Organized by the California Department of Fish & Game (DFG), this hunt occurs over one weekend per year, generally on the first weekend of September. Only 100 hunters are allowed to hunt on the property and these are chosen via a lottery system. The hunt occurs on DFG’s Castello and Valensin properties, which are currently managed using grazing and dryland farming.

2. **Cosumnes Lame Duck Shooters (CLDS) Duck Hunt**: Each year, the CLDS applies to the BLM for a special use permit to hunt waterfowl at the Cougar Wetlands area. The CLDS is a group of mobility-impaired hunters that typically hunt Sunday and Wednesday at the Preserve during the three-month duck-hunting season. This group coordinates all the logistics associated with organizing this event.
3. **GreenWings Duck Hunt**: Ducks Unlimited (DU) typically offers a junior hunting opportunity via their GreenWings Program at the Cougar Wetlands area. Each year DU applies to the BLM for issuance of a special use permit for this hunt. The GreenWings typically hunt on Saturdays throughout the waterfowl hunting season.

4. **Staten Island**: Staten Island is privately owned by The Nature Conservancy (TNC), which generally does not allow hunting of any kind on its properties. In this case, due to the important historic and social considerations of this unique site, TNC granted a compatible-use variance to continue the past practice of limited waterfowl and pheasant hunting by Conservation Farms & Ranches.

Species that inhabit the Preserve and are legally hunted in California include deer, pheasant, turkey, quail, dove, and waterfowl. Of these, only turkeys, pheasants, doves, and waterfowl are currently present in numbers large enough to be considered for a public hunting program. Neither deer hunting nor target shooting are allowed at the Preserve.

The land-ownership pattern plays a significant role in the timing and location of existing and future hunting programs at the Preserve. Each Preserve Partner has existing policies and practices regarding hunting and these are available in the Preserve’s files. The Partners will examine all opportunities to expand the hunting program, provided that expansion does not adversely affect their ability to achieve their natural resources goals and does not conflict with the policies of the land-owning entity.

In addition to ownership issues and policies, other complicating factors are lease arrangements and requirements of funding sources that were originally used to purchase specific parcels. Easements across privately owned parcels can also define hunting activities that are compatible with the goals and terms of the easement. Individual parcels have unique topographic, biologic, and other site constraints, which are very site-specific. Additional evaluation of these complicating factors is needed before modifications to the existing hunting program can be approved.

**RECREATIONAL FACILITIES, SIGNS, AND LITERATURE**

Recreational facilities on the Preserve include the Visitor Center with its attached administrative offices, several kiosks, and trails.

- **Visitor Center**: The 2,000-square-foot Visitor Center is located on an elevated pad that is above the high water mark, adjacent to Willow Slough. The original Visitor Center, built in 1994, was unfortunately burned in an arson fire in 1995. It was quickly rebuilt in 1996 and has served as the primary visitor area and administrative offices since that time. The site includes upper and lower parking areas, visitor benches, a kiosk, a dock for non-motorized boats, restored riparian (valley oak) forest, native plantings, and a mini-wetland area adjacent to the building. The Visitor Center houses interpretive exhibits that describe the natural and cultural history of the region as well as the restoration and management of the Preserve. The Visitor Center is staffed by Volunteer Naturalists every weekend and by Preserve staff during the week. The conference room in the Visitor Center may be reserved for use by small public groups of up to 20 persons. The Visitor Center is accessible to mobility-impaired visitors.
Trails: The Preserve offers two self-guided tour trails open year-round, sunrise to sunset. The Cosumnes River Walk is a three-mile dirt loop nature trail along the rivers and sloughs and through the area known as the Savanna. This trail is subject to flooding. The Lost Slough Wetlands Walk is a one-mile paved mobility-impaired accessible loop trail. A wooden boardwalk, one-half-mile round-trip, is accessible off of the Wetlands Walk. In 2006, a mobility-impaired accessible crane viewing platform was built across from the Visitor Center by a volunteer naturalist for his Eagle Scout project. A map of the trails is shown as Figure 5.1.

Visitors may also hike the Rancho Seco Howard Ranch Trail. This trail was created in 2006 via a public/private partnership between Sacramento Municipal Utilities District (SMUD), TNC, and the private property owner of the Howard Ranch. Funding for the construction of this trail was provided to TNC by an anonymous donor. The Rancho Seco Howard Ranch Trail is a seven-mile loop trail that passes along Rancho Seco Lake and goes onto the Howard Ranch, a working private cattle ranch. Currently the trail is open to the public for a ten-year time frame in accordance with contractual arrangements that TNC has established with both the private landowner and SMUD. Under this contract, SMUD is responsible for trail maintenance and public-use management.

Trail Maintenance: As a majority of the recreational activities and educational walks occur on trails, it is imperative that they be well-maintained at all times. Trails are subject to dense vegetation, erosion from water, and damage from mammals such as beavers. Flooding and vegetation also damage the concrete of the mobility-impaired accessible trails, so it is necessary to continually inspect and repair these trails to the standards of the Americans with Disabilities Act (ADA).

The Site Coordinator position is responsible for overseeing trail maintenance, among other duties. The Sheriff’s Work Crew and volunteers also assist with trail maintenance. At certain times of the year, large numbers of volunteers do trail work during special workdays. Additional Preserve staff time and equipment is needed to tend to regular routine maintenance of trails and amenities. The Preserve does not currently have the financial resources to support additional staff or acquire the necessary equipment. Therefore, the Preserve relies heavily on volunteers and the Sacramento County Sheriff’s Work Crews to maintain the trails.
Figure 5.1: Map of Visitor Facilities, Trails, and Public Buildings
Paddling Facilities: A dock for the launching of non-gas-powered boats was constructed in 2006 and funded by a California Department of Boating and Waterways grant. The dock, located off Middle Slough, fluctuates with changing water levels and tides. This is the only legal public river access point on the lower Cosumnes River. There are also two allowed pull-out locations at the “Tall Forest” and “The Point” within the Preserve.

Paddle routes currently cover approximately three miles of the Cosumnes River waterways. Other sections of the river and sloughs are overgrown with vegetation and/or otherwise blocked by dams. Future improvements and expansion of existing routes may be possible by removing bushes or removing or slotting dams, especially upstream into Wood Duck Slough and the Cosumnes and Mokelumne Rivers.

McFarland-Orr Ranch: The McFarland-Orr Ranch is currently the site of many public events, including Pioneer Day, Fall Pumpkin Patch, Future Farmers of America (FFA) livestock demonstrations, antique car and tractor shows, and the Kite Festival. The McFarland-Orr Ranch is almost 103 acres in size and is owned by Sacramento County, which leases 35 acres of the Ranch to the Galt Historical Society. The Master Plan for the McFarland Living History Ranch contains many goals, objectives, and actions for management of the Ranch. Potential future recreational opportunities include the development of a visitor center, campground, and a trail. DFG owns the remainder of the property called McFarland Ranch and this property is 1,017 acres in size.

Signs: Standard directional and safety signs are currently posted throughout the Preserve. Implementation of the Preserve’s Signage Plan is an ongoing activity.

Kiosks: Informational kiosks for visitors are located in the upper parking lot, boardwalk parking lot, the Visitor Center, Howard Ranch trailhead, boat launch area, and approximately six panels along the trails.

Recreational Literature: The Preserve has a number of brochures available to assist and educate members of the public during their visit to the Preserve. Please check on-site for additional and current information.

PRESERVE’S CURRENT RECREATION REGULATIONS

The Preserve’s Recreation Program and facilities are subject to a number of local, state, and federal regulations. Local regulations are primarily recreation-related policies adopted by Sacramento County and the Cities of Elk Grove and Galt. The primary regulations that affect activities at the Preserve are agency special use permits, Preserve Visitor Rules, DFG Ecological Reserve Designation, and California fishing and hunting regulations. Each is described in the following paragraphs.

Special Use Permits: The Preserve issues an assortment of special recreation permits for commercial use, research, competitive use, filming, special area use, and organized group activity and event use. Special recreation permits are required for specific recreational uses of the public
lands and related waters. They are issued as a means to manage visitor use, protect natural and cultural resources, and provide a mechanism to accommodate commercial recreational use. Although each agency (BLM, DFG, TNC) has its own directives and form for special use permits, the Preserve has standardized some forms for ease of use and issuance.

**Ecological Reserve Designation:** A portion of the Preserve (11,895 acres) is designated as an Ecological Reserve in accordance with the Fish and Game Commission’s October 3, 2003, decision (Figure 5.2). The Ecological Reserve designation is codified as amendment to Section 630, Title 14, California Code of Regulations. This action adopted special regulations for the Preserve that restrict access. Of the 11,895 acres designated as an Ecological Reserve, most are owned by TNC and a small portion is owned by DFG. This situation is a bit unusual because, normally, DFG owns and controls the land it designates as an Ecological Reserve.

**Fishing Regulations:** California Freshwater Sport Fishing Regulations that apply to the Preserve are available on the DFG website.

**Hunting on Navigable Waterways and Floodplains:** Hunting on navigable waterways within the Preserve boundary and the Eco-Reserve boundary is regulated by multiple laws including, but not specifically limited to, the Fish and Game Code, Harbor and Navigation Code, and Section 4 of Article X of the State Constitution. These and other related laws, policies, and guidance can be found on the California Fish and Game Commission website.

**INAPPROPRIATE USE AND VIOLATIONS**

Inappropriate uses can be tiered into two categories:

- Minor violations, such as trail cutting and littering, can be addressed through education.
- Major violations, such as trash dumping, poaching, marijuana growing, and off-highway vehicle (OHV) use, need to be addressed through increased law enforcement.

Below is a list of the law enforcement entities that have some responsibility for enforcing laws at the Preserve and/or the surrounding area:

- **Fish and Game Warden:** Fish and Game Wardens make up the law enforcement staff of the DFG. They enforce fish, wildlife, and habitat protection laws, including criminal and civil statutes on DFG-managed lands. The wardens are sworn peace officers (all of whom have certain state hiring and training requirements) and can secure and serve search warrants, make arrests, and testify in court.
- **BLM Law Enforcement:** The BLM’s law enforcement program is responsible for protecting public safety and resources across the 230,000 acres of BLM-managed public lands within the Folsom Field Office’s jurisdiction, which it does in partnership with state and local law enforcement agencies. The Folsom Field Office has four full-time Law Enforcement Officers in addition to one full-time Special Agent.
Figure 5.2: Lands Within the Preserve Designated as an Ecological Reserve

Ecological Reserve lands represented are as of the 2003 Ecological Reserve designation.

Legend
- Railroad
- Roads
- County Boundary
- Major Water Body
- Stream or River
- Preserve Properties
- Eco Reserve
  - CA Department of Fish and Game
  - The Nature Conservancy
**County Sheriff:** County Sheriff patrols county roads and the unincorporated areas. Because portions of the Preserve lie in two counties, Sacramento and San Joaquin, and directly adjacent to a third county, Amador, the specific location of an incident will determine which County Sheriff is contacted.

**California Highway Patrol:** The CHP patrols State Highways.

**Sacramento County Ranger:** Conducts routine patrols of those portions of the Preserve that are within Sacramento County boundaries.

The most frequent violations include:

- Dumping of trash, abandoned vehicles, etc.
- “No Parking” violations
- Trespassing (hunters, birders, and OHV users entering “Closed Areas”)
- Uncontrolled fires
- Vandalism of Preserve facilities, visitors’ vehicles, fences
- Theft
- Firewood collection
- Marijuana growing

Illegal hunting and poaching are sporadic. Illegal OHV use on the Preserve is particularly problematic on certain properties. Trash and appliance dumping occurs several times per week along rural roads throughout the Preserve area. Marijuana growing is a particularly dangerous criminal activity that occurs at the Preserve because of the access to remote wooded areas adjacent to ample supplies of water. Vandalism and parking violations are sporadic and typically occur in the visitor use areas.

**5.1.2 Use Levels and Trends**

Volunteer Naturalists track the number of visitors who come into the Visitor Center on the weekends. The number of people entering the Visitor Center ranges from 20,000 to 25,000 on an annual basis. However, most regular visitors—typically bird watchers—enter the Preserve without coming into the Visitor Center. It is estimated that the actual number of visitors is closer to 60,000 per year. The Preserve does experience steady, and at times heavy, public use. Peak recreation times are spring, early summer, and fall, which encompasses bird migration and the paddling season. Busloads of people visit every November for the sandhill crane season. On busy days, all three parking lots fill to capacity and overflow parking occurs on both sides of Franklin Boulevard.

Due to the Preserve’s proximity to growing urban areas (including Sacramento, the San Francisco Bay Area, and Reno) and easy vehicular access from Interstate 5 and Highway 99, it is expected that future demands for recreational use, public access, and use of existing facilities will increase. Further compounding the growing population issue is the fact that publicly accessible open space is limited. Although the Preserve is not actively pursuing an increase in visitor numbers, this is occurring by word of mouth and educational programs. The anticipated increase in visitors brings both challenges and opportunities to the Preserve.


5.1.3 Future Challenges

The Preserve faces four important challenges in the provision of recreational services:

1. Provision of additional public access in a manner that is compatible with the overarching goal to protect natural resources. Sensitive species and their habitats are currently protected from recreational activities by gate closures and restricted public access to nesting and breeding areas.

2. Maintenance and security of existing facilities, including trails.

3. Compatibility of different recreational uses.

4. Staffing and financial resources to support the recreation program are highly constrained. It is possible that the Preserve will lack the staff and finances needed to accommodate future anticipated increases in demand. Ideally, from a management perspective, as visitation to the Preserve increases, the level of staff and funding devoted to the Public Use Program should also see a corresponding increase.

Exploring new recreational opportunities is complex and constraints are dependent on the restrictions associated with ownership, easements, and stipulations associated with the original funding source. Further complications are the varying policies of the land-owning Partners, lack of facilities, limited parking, staffing constraints, and insufficient budgets.

The Preserve is slowly undergoing a transition in focus from acquiring new lands for Preserve expansion to managing and restoring existing Preserve lands. This transition may or may not include a transition in roles among the Partners’ management and the role that recreation plays in differing management approaches.

In terms of providing and managing public access, the Preserve Partners each have somewhat different missions. The institutional missions of BLM, CDFG, and Sacramento County tend to promote public access, whereas promoting biodiversity in natural habitats is the core mission for TNC and public access is a lesser priority. On the other hand, Ducks Unlimited’s mission is waterfowl and wetland conservation, with an emphasis on the recreational aspects of waterfowl hunting. It will be an ongoing challenge for the Preserve to balance these differing missions along with other competing needs.

Proposed New Facilities
This Management Plan anticipates that new recreational facilities will likely be needed on the Preserve in the future. For the provision of new recreation facilities, five key factors must be considered:

1. Feasibility
2. Preferred methods
3. Costs and financing
4. Implementation schedule
5. Maintenance
A process to evaluate the feasibility of new recreational facilities and amenities is needed. The U.S. Fish and Wildlife Service (USFWS), for example, utilizes a compatibility determination that requires projects to have funding, be a wildlife-dependent use, and be consistent with the refuge. A similar process would allow Preserve Partners a review procedure to ensure that the proposed recreational facility is consistent with the intent of this Management Plan. New recreational facilities are feasible if they meet the following three criteria:

- Compatible with the Natural Resource Stewardship goals described in Chapter 3 of this Management Plan and with the existing natural resources present on the site.
- Provide an opportunity to teach stewardship.
- Have adequate funding for both short-term construction costs and long-term maintenance and operations costs (including staff).

If a proposed recreational use is not compatible with the Natural Resource Stewardship goals in this Management Plan, then it will not be approved. The goals, objectives, and actions listed at the end of this Chapter provide mechanisms for the Preserve to overcome potential future challenges.
5.2 PUBLIC USE: VOLUNTEER PROGRAM

5.2.1 Existing Conditions and User Groups

Volunteerism along the lower Cosumnes River began prior to the 1987 establishment of the Preserve. Once the Preserve was established, Preserve Partners began advertising for volunteers to assist with overall Preserve management. Today, volunteers are essential to the operation of the Preserve. Each year the Preserve benefits from the efforts of approximately 125 active volunteers who assist with a variety of projects. Volunteers staff the Visitor Center, lead guided tours for Preserve visitors, perform trail work and vegetation management, monitor wildlife, and conduct habitat restoration projects. An estimated 5,000 hours of volunteer services are contributed annually to the Preserve.

DESCRIPTION OF VOLUNTEER TEAMS

The people who volunteer at the Preserve are very diverse professionally and include attorneys, doctors, teachers, engineers, and state employees. Their ages range widely, from elementary school children to retirees and, overall, there is no dominant gender. They donate their many talents in photography, science, natural history, communication, teaching, canoeing, and hiking to support the Preserve and its efforts to protect the river.

The Preserve offers a diverse range of volunteer opportunities structured around seven teams, as described below.

- **Volunteer Naturalist Team**: Volunteer Naturalists provide visitor services that improve the quality of experience enjoyed by guests at the Preserve. The primary mission of the Volunteer Naturalists is to staff the Visitor Center, and each commits to a minimum of four hours each month on weekends. Leading guided tours is the next priority for this team. Approximately 500 visitors annually attend the guided tours, which include photo walks, nature walks, and paddling trips. Other tasks that the Volunteer Naturalists assist with include roving the trails to be available to answer visitors’ questions or participating in special projects, such as landscaping around the Visitor Center. The Preserve provides training to each Volunteer Naturalist on such matters as technical information on Central Valley wildlife, plants, history, and a variety of other specific topics. The majority of Preserve volunteers are Volunteer Naturalists. Between 2000 and 2005, an average of 15 Volunteer Naturalists per year were trained. As of mid-2007 the total number of active Volunteer Naturalists was 80.

- **Paddle Team**: Formally established in 2001, the Paddle Team provides tours to visiting kayakers and canoers for purposes of orientation to the Preserve’s waterways, testing paddle skills, and demonstrating safe boating practices. For many newcomers this opens up the natural world of the Cosumnes River and actively engages them in learning about the river environment and the Preserve’s goal of protecting the river and its environs. Approximately 100 visitors participate annually in the guided paddle tours. This number is not expected to increase substantially as most people take the guided tour only once in order to familiarize themselves with the river.
The Paddle Team leaders are Volunteer Naturalists who have undergone a special paddling training session provided by Preserve staff. The Paddle Team generally guides one paddle per month on the Cosumnes River between March and October. As of 2006 the Paddling Team consisted of 14 volunteers.

Habitat Restoration Team (HRT): The volunteers who make up this team are instrumental in protecting and restoring native habitats within the Preserve. The program consists of active volunteers who attend the workdays on a regular basis, as well as one-time volunteers. Many of the volunteers participating in the HRT are dedicated, long-term volunteers. The HRT Workdays, which began in 1988, occur twice per month.

From 1988 to 1996, HRT focused on restoration and the reintroduction of a wide variety of native plants. Between 1996 and 2007, HRT’s primary emphasis shifted towards invasive plant species removal. Today, with transitions in staff and management focus, future HRT projects will contribute more directly towards implementing the Preserve’s Management Plan, including research and biological monitoring. Currently, this team has approximately 40 active volunteers. HRT workday participation levels range from 6 to 20 people, with about half being one-time volunteers.

Within the HRT is a cadre of volunteers known as “Hard Corps,” some of whom have been coming to the Preserve for more than 15 years. The Hard Corps not only implement projects but also play a critical role in training, recruiting, and supervising new volunteers. Additionally, they leverage their skills and experience through a number of other volunteer groups, including high school and college students, various youth groups, and the Sheriff’s work crews. The Hard Corps maintain a consistently high level of experience and knowledge.

The Habitat Restoration Team has noticed that restoration practices have evolved from hand planting to natural process restoration, whereby the reintroduction of flooding is used to restore the habitat. This approach requires fewer and more highly skilled volunteers. Invasive species management also requires smaller numbers of highly skilled volunteers to achieve control objectives and minimize negative impacts. Training volunteers to give them the necessary skills—and retaining those volunteers—will be an ongoing challenge for the Preserve.
Biological Inventory Team (BIT): This team conducts monitoring of three wildlife taxa (butterflies, wood ducks, and birds) on the Preserve. The general public is invited to participate in these programs, which serve to introduce those who have no prior experience in the methodology of scientific monitoring.

Butterfly Count: The annual butterfly count is part of an ongoing program of the North American Butterfly Association (NABA) to census the butterflies of North America. The butterfly count has been consistently conducted at the Preserve in late June on an annual basis since 1993. The number of volunteers participating in the butterfly count fluctuates yearly, ranging from 5 to 27. The volunteers are comprised of several regulars, professional scientists, and a mix of interested individuals, which include students, teachers, and retirees.

Bird Counts: Volunteers whose experience ranges from novice to expert birder conduct set transect counts on four different Preserve-managed parcels each month. The total number of bird species counted varies depending upon the season and water conditions and typically ranges from 65 to 95 species. While two of the four bird surveys are open to the public (*), the other two are not advertised to the general public in order to avoid excessive trampling of habitat. Specific dates and times for the public bird surveys are listed on the Preserve’s website, and generally follow this monthly schedule:

  First week: Lost Slough
  Second week: Tall Forest Walk *
  Third week: Willow Slough on the River Walk *
  Fourth week: McFarland-Orr Ranch

The Lost Slough bird counts are usually conducted by only one person, as a matter of convenience, but occasionally one or two additional volunteers provide assistance. Tall Forest surveys typically attract 3–6 participants although this varies significantly, anywhere from 1 to more than 20 participants. Willow Slough surveys attract approximately 3–7 participants each month, accruing 4,369 volunteer hours over the past 12 years (i.e., an average of 364 volunteer hours per year). McFarland-Orr Ranch surveys usually have 4 or 5 volunteers who take part by invitation only, and over the past 12 years it has accrued 2,709 volunteer hours, (i.e., an average of 225.75 hours per year). Overall, the number of volunteers and volunteer hours for all 4 surveys has stayed fairly consistent over the past 12 years.

Wood Duck Team: Monitoring of wood duck (Aix sponsa) populations on the Preserve began in the 1980s. Today, the Preserve Wood Duck Program is associated with a statewide effort that has been supported and coordinated by the California Waterfowl Association since 1991, when the California Wood Duck Program first began. On the Preserve, six team leaders, with the assistance of other active volunteers, are responsible for monitoring 160 boxes located at various sites along the Cosumnes River from Middle Slough to McFarland-Orr Ranch. Volunteers monitor the boxes once or twice a month (depending on weather and flooding) from February
to July, usually checking each set 8–10 times per season. The team also builds, sets up, and cleans out nesting boxes; they replace about 15 boxes each year due to losses to bee infestation and disrepair.

The number of volunteers participating in the Wood Duck Team has increased over the past four or five years. If additional volunteer team leaders are trained and available, new sets of boxes could be added on the Preserve in the future.

**Howard Ranch Rancho Seco Trail Docent Project:** In 2006 a new trail was opened on the Rancho Seco property and with it, a new program began to train docents to lead vernal pool tours. Vernal pool docents lead public tours along the trail every Saturday from mid-March to mid-May. Special training on the ecology of vernal pools is provided to the volunteer docents in conjunction with the Jepson Prairie Docent Training program. The training includes hands-on field experience and technical information on invertebrates, plants, soils, etc.

Sometimes third-party organizations are interested in managing a volunteer-based activity at the Preserve. In these instances, the organizations obtain permission from the Preserve before beginning work. However, the Preserve does not contribute any staff or financial resources to these efforts. Two such volunteer efforts are:

**Annual Christmas Bird Count (CBC):** The CBC is a one-day count that has occurred at the Preserve every year (except 1996) since 1995. Birds are counted within a 24-hour period and the objective is to document all bird species and abundance, thereby providing a one-day snapshot of birds present in the winter. The count usually takes place between December 18th and January 5th. Over the past 10 years, the number of participants each year has remained fairly consistent, ranging between 54 and 79 people. Because this volunteer effort is staffed by birdwatchers who are not necessarily biologists, sampling efforts can vary; therefore, it is not considered a standardized scientific study. Data is compiled and sent to the Audubon Society.

**Bird Nest Box Monitoring:** Volunteers take an active role in managing and monitoring bird nest boxes for western blue birds (*Sialia mexicana*) and tree swallows (*Tachycineta bicolor*), although few bluebirds have ever been documented in the boxes. Today, most boxes are utilized exclusively by tree swallows. Nest box monitoring began in 2003 and is currently an ongoing effort largely implemented by Preserve volunteers. Sixty-seven boxes are visited weekly or bi-weekly from March to August. This effort is part of a larger effort, the Golondrinas de las Americas, a community of biologists dedicated to studying tree swallows and their tropical nearest relatives from Alaska to Argentina. They combine detailed studies of the breeding biology of the birds with standardized sampling of the swallows’ aerial insect prey.

**One-Time Volunteers**

The Spring Work Day Extravaganza occurs annually in April and draws an average of 50 one-time volunteers each year. Started in 1996 as a bi-annual event that took place in the spring and fall, it has been an annual event, occurring in the spring only, since 2001. Volunteers, many of
whom are local residents, complete numerous work projects at the Preserve, including planting and landscaping, painting, trail maintenance, invasive species removal, McFarland-Orr Ranch renovation, and bird surveys for children.

Other one-time volunteer activities occur occasionally. For example, in 2005 the California Native Plant Society (three or four volunteers) and Preserve staff participated in a one-time monitoring effort, surveying two properties, Schneider Ranch and Howard Ranch, for rare vernal pool plant species.

**Volunteer Recruitment**

The Preserve Volunteer Coordinator uses a variety of methods to recruit new volunteers:

- Advertisements in local newspapers
- Notices on the Preserve website
- Outreach during special events (usually held at locations other than the Preserve)
- Contact at the Visitor Center with interested members of the public

The best tool for recruiting new volunteers, however, seems to be through “veteran” volunteers encouraging friends or co-workers whom they think might be interested in volunteering at the Preserve.

Individuals from the general public who are interested in learning more about volunteer opportunities are asked to complete a “Volunteer Interest Form.” Preserve staff then contact interested individuals and share information about the Preserve. Once an arrangement is reached, all volunteers are required to fill out a Volunteer Agreement Form. Volunteer Naturalists sign an Annual Commitment Form each January.

Continual attraction of new volunteers to the Preserve is needed to deal with normal attrition and transition among volunteers. This will be an ongoing challenge. Preserve staff have suggested utilizing an Ameri-Corp volunteer, college intern, or similar person to assist the Volunteer Coordinator with this and other tasks.

**Volunteer Retention**

In the future, Preserve staff may need to rely on volunteers to perform stewardship work to a greater degree than they have in the past. This will likely mean that an increased skill or knowledge level will be needed. Experience is the best way to train volunteers and to ensure they have the necessary skills to help in a productive way. After making the investment in training the volunteers, it will become increasingly important to
retain skilled volunteers. To accomplish this, the management actions listed at the end of this chapter recommend an increased emphasis on the provision of incentives and rewards for volunteers, in order to increase their “job” satisfaction and to increase retention levels. Volunteers are important community and organizational assets and Preserve staff should strive to make the best use of their time and commitment by trying to ensure the best fit between the volunteer, their volunteer activities, and the Preserve.

One important future challenge facing the Preserve is to accurately document the many contributions provided by the volunteers. Key baseline information about volunteer contributions is currently estimated rather than based on hard data. This is problematic when applying for grants that contain volunteer requirements or allow volunteer hours to be counted as in-kind contributions.

5.2.2 Use Levels and Trends

Existing trends indicate that staffing levels at the Preserve will remain stagnant or decline, while the need for active land management and stewardship will increase. As population increases in the greater Sacramento Metropolitan region, the pool of potential visitors to the Preserve will correspondingly increase. Given these trends, the demand for the visitor and stewardship services that volunteers provide is also likely to increase in the future.

Socioeconomic trends on the national, state, and local level may influence the number of volunteers the Preserve is able to recruit and retain. Volunteering is an essential component of the attitude, spirit, and willingness of Americans to help others and a key indicator of what is called a community’s “social capital.” Establishing and building social relationships across boundaries of economic, geographic, and racial/ethnic differences will be an ongoing challenge for the Preserve, especially considering local demographic factors.

STAFF RESOURCES

The Preserve’s Volunteer Program is currently supported by several staff. The most critical position is the Volunteer Coordinator position, created in 1996, and currently staffed by an employee from the Sacramento County Regional Parks Department. The Volunteer Coordinator’s role is to maintain and grow an active volunteer program at the Preserve, to facilitate the operation of the Visitor Center, and to support recreation, education and restoration activities. The Volunteer Coordinator oversees the recruitment, training, and deployment of volunteers. Other staff at the Preserve contribute anywhere from 10 percent to 40 percent of their time to support volunteer activities.

Most of the financial support for the Preserve’s Volunteer Program is dedicated to funding the Volunteer Coordinator’s position. Sacramento County funds the Volunteer Coordinator position with revenue from the sale of organic rice from fields that are managed by the Preserve on behalf of the County. The amount of funds available varies, depending on the rice crop quantity and the current price of rice leases for the property. There is always a concern that receipts from the future rice crops may not be sufficient to fully fund the County’s staff position at the Preserve, especially given the uncertainty of both labor costs of staff and prices for rice leases. It will be beneficial to secure a more permanent source of funding for the Program in the future.
Current and possibly future limited budget and staff resources will likely place a practical constraint on expansion of the number of new volunteer programs on the Preserve. Volunteers are not free; staff time and resources are needed to create an infrastructure that can recruit, place, and manage prospective volunteers. Staff effort is needed to ensure that volunteers enjoy their experience at the Preserve so they will continue to return. Additional staff support (i.e., in addition to current levels) will likely be needed to support the Volunteer Program in the future. Preserve staff have indicated that one full-time employee is desired to manage the volunteers for the Habitat Restoration Team.

To some extent, use of volunteer labor can help ease staff shortages. One key to success will be for Preserve staff to retain flexibility to ramp up and ramp down the number of active volunteers and the number and type of projects they support. Overall, the Preserve’s staffing and its financial resources to support the volunteer program are highly constrained. It is possible that the Preserve will lack the staff and finances required to accommodate future anticipated increases in demand.

5.2.3 Programmatic Overlaps

The Preserve’s Volunteer Program has a close relationship with the Preserve’s Education Program via shared responsibilities among staff and volunteers. The Preserve’s Volunteer Coordinator assists with the Education Program’s teacher training, outreach at special events, and other duties. Outreach during special events serves the dual purposes of providing education to the public while simultaneously attracting potential volunteers to the Preserve. Another example of the interrelationship between the two programs is that students who participate in school field trips at the Preserve sometimes volunteer at the Preserve later in their lives.

A similar overlap in programs exists between the Recreation Program and the Volunteer Program. Volunteer Naturalists are tasked with enriching the visitor’s experience at the Preserve by staffing the Visitor Center and providing guided walks. Conversely, visitors who have a positive experience at the Preserve may someday volunteer at the Preserve to assist with stewardship activities.
5.3 **Public Use: Research**

The Preserve has long advocated, supported, and conducted basic, as well as practical, scientific research because sound scientific information is essential to the management of the Preserve. Research is typically conducted by visiting researchers from academic institutions who utilize the Cosumnes River, its associated floodplain, and upland ecosystems as a living laboratory. The Preserve benefits from scientific research in numerous ways, including:

- New scientific research and adaptive management techniques that improve Preserve staff’s technical know-how and ability to achieve even more success in restoration and management efforts.
- Cross-fertilization of ideas occurs between the Preserve’s land-management staff involved in day-to-day operations and the diverse research community.

### 5.3.1 Cooperative Partners

Between the years 2001 and 2006, over 90 researchers representing 18 institutions conducted research at the Preserve (Table 5.1). Partnerships with these 18 institutions and other similar institutions are critical to the future success of the Preserve. Given the complexity of managing habitat for the numerous species that occupy the Preserve in an adaptive management context, it is important for the Preserve’s scientists and other staff to keep updated on new scientific research and conceptual models. This is best accomplished by maintaining close relationships and partnerships with the research institutions. Additionally, these research institutions conduct research onsite, which increases the level of certainty that the results will be directly applicable to the Preserve’s ecosystems. Chapter 8 discusses the importance of cooperative partnerships such as those between the Preserve and research institutions in more detail.

#### Table 5.1: Institutions That Have Conducted Research at the Preserve

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<tr>
<th>Institution</th>
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<tr>
<td>California Energy Commission</td>
<td>Natural History Museum of Los Angeles</td>
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<tr>
<td>California Archaeological Site Stewardship</td>
<td>Sacramento Valley Conservancy</td>
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<tr>
<td>CRP – Volunteer Naturalist</td>
<td>Stanford University</td>
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<tr>
<td>California State University Sacramento</td>
<td>Towill, Inc.</td>
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<tr>
<td>California Department of Fish &amp; Game</td>
<td>UC Berkeley</td>
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<tr>
<td>Estep Environmental Consulting</td>
<td>UC Davis</td>
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<tr>
<td>May Consulting</td>
<td>US Fish and Wildlife Service</td>
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<tr>
<td>Point Reyes Bird Observatory (PRBO)</td>
<td>USDA/Agricultural Research Service (ARS)</td>
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The UC Davis Center for Watershed Sciences is the most active institution conducting research at the Preserve. The Center obtained grants to support two phases of research, the first of which, called Cosumnes I, focused primarily on the relationship between hydrologic conditions and aquatic ecosystems. The second phase, Cosumnes II, built on this earlier work but emphasized the influence of flood regimes and vegetative and geomorphic structures on the links between...
aquatic and terrestrial systems. The results of these studies may be viewed on their website. This research is applicable to CALFED restoration and watershed monitoring strategies.

Research projects are conducted by scientists at various stages of professional development. These include high school students, undergraduates, graduate students, professional scientists, and public agency personnel. Research activities are mostly extramurally funded.

5.3.2 Types of Research Projects

Studies conducted at the Preserve generally fall into either a short-term or long-term timeline. Short-term studies are typically conducted by an individual or small group for one-to-three-year projects, such as those conducted by graduate students for completion of a thesis or dissertation. Long-term studies are typically conducted with support from an institution, such as the Point Reyes Bird Observatory (PRBO) or UC Davis, and may require access to specific permanent vegetation productivity plots, mapped forest stands, etc. Long-term studies can preclude the use of some land for other uses, potentially for a very long time. The Preserve’s permit process tracks the geographic locations of long-term studies so that future researchers studying that land can find out where the previous studies have been conducted, as well as what associated historical data may be available. Markers for the research sites may also be required.

Two types of research projects are conducted on Preserve properties:

- **Non-manipulative projects** in which the basic ecosystem is not modified to suit the purposes of the researcher. The most common type of non-manipulative research is population- and community-level monitoring that provides baseline data and ongoing information about the ecosystems, plant and animal populations, and community relationships. Monitoring enables managers to detect changes in populations, communities, and community processes and to document impacts or threats. Future monitoring needs are described in Chapter 3.

- **Manipulative studies** are usually directly related to management treatments (e.g., grazing, hydrologic manipulations, prescribed burning, etc.). Manipulative uses of the land may preclude other future ecological or genetic studies. Specific recommendations to reduce conflicts regarding manipulation of sites for research are provided below.

In 2006 there were 23 research and/or monitoring projects conducted on Preserve properties, 5 of which were new projects. Preserve staff and volunteers led 9 of the 23 projects and collaborated on 2 additional projects with UC Davis. UC Davis led 4 of the 23 projects (Table 5.2). In addition to the two they collaborated on with the Preserve, they also collaborated on one with the Audubon Society, bringing their total to seven projects during the year 2006. Approximately 15 of the existing Preserve projects continued in 2007.

"Fish Monitoring" – Photo courtesy of Preserve Photo Library
During 2006, research at the Preserve covered an extensive range of topics, including species monitoring, bird dispersal, chemical content of a plant, effects of grazing, effects of fire, native bees, mercury, and many more.

5.3.3 Preserve Permit Process

Permission to enter Preserve properties not open to the public is granted via a permit process used to track researchers, the nature of proposed research, and its impact on other current research projects. Permits are issued consistent with the following Preserve documents and policies:

- Researcher Guidelines
- Access Permit
- Access Protocol
- Collection Permit
- Release Form

### Table 5.2: Institutions Leading Research at the Preserve

<table>
<thead>
<tr>
<th>Institution</th>
<th>Number of Research Projects</th>
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</thead>
<tbody>
<tr>
<td>USDA</td>
<td>1</td>
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<tr>
<td>CA Energy Comission</td>
<td>2</td>
</tr>
<tr>
<td>CSU Sacramento</td>
<td>3</td>
</tr>
<tr>
<td>Joint PRBO &amp; Cornell</td>
<td>4</td>
</tr>
<tr>
<td>Joint UC Davis &amp; Audobon Socie</td>
<td>5</td>
</tr>
<tr>
<td>USGS</td>
<td>5</td>
</tr>
<tr>
<td>Joint CRP &amp; UC Davis</td>
<td>6</td>
</tr>
<tr>
<td>UC Berkeley</td>
<td>7</td>
</tr>
<tr>
<td>UC Davis</td>
<td>8</td>
</tr>
<tr>
<td>Preserve</td>
<td>9</td>
</tr>
</tbody>
</table>

2006 Research Activity
Permission to enter is limited to the person, hours, and location as designated on the permit. Permittees are also required to read and sign the Preserve’s Release of Liability. As part of the permitting process, researchers are required to submit a brief written research proposal for all studies conducted on Preserve properties. Proof of federal and state permits is often required at the time of Preserve permit application. Researchers are required to submit annual reports of their research findings and provide copies of any data collected on the Preserve.

Access to Preserve property may be granted, denied, or restricted at any time by the Preserve Manager or designated representative for any reason.

5.3.4 Resources for Research

Currently, the Preserve’s resources to support external research efforts are very limited and consist of tracking researchers via the permit process and associated databases. Preserve staff have expressed an interest in the future development of a research institute to be located at the Preserve and affiliated with an academic organization to generate productive learning. Options include a Long-Term Ecological Research (LTER) site or a UC Natural Reserve site. This item is addressed in Management Action 3.1.1. Sometimes a Preserve Partner may collaborate on a specific project with research institutions and may provide staff time or equipment towards the research.

5.3.5 Research and Monitoring Needs

During the planning process for this Management Plan, the Preserve Partners identified research and monitoring needs based on identified goals and objectives. These needs frame long-term questions that the Preserve Partners would like to have answered and that are intended to help the Preserve in the following ways:

- Direct the research efforts on the Preserve and guide future proposals.
- Serve as a basis for developing collaborative research proposals between Partners and other institutions that can be submitted to a variety of funding sources.

Ideally, researchers will integrate these identified needs with proposed projects. Studies pertinent to a national, regional, or local conservation issue are desirable. Research of unique areas, species, etc., that could not be done effectively elsewhere will be considered as well.
5.4 PUBLIC USE: EDUCATION AND OUTREACH PROGRAM

5.4.1 Existing Conditions and User Groups

The intent of the Preserve’s Education and Outreach Program is to share information with the public regarding:

- The mission of the Preserve itself and the role the Preserve plays in the larger region.
- The importance of biodiversity (both aquatic and terrestrial).
- The important role that citizens play in land stewardship.
- The mission of the agencies and organizations that built and support (in perpetuity) the Preserve.

Due to its natural setting, the Preserve offers unique outdoor education opportunities for all visitors, including the general public, various user groups, and students of all ages. Education Programs occur on those parcels that are open to the public (approximately 500 acres), including the McFarland-Orr Ranch.

The Preserve’s overall Education and Outreach Program consists of five distinct sub-programs:

- K–12th Grade Education
- Higher Education
- Informal Education
- Adult Education
- Stewardship Outreach

K–12TH GRADE EDUCATION

The Preserve’s K–12th Grade Education Program began in the early 1990s and currently achieves the following:

- Provides teacher and student informational resources about the Cosumnes Watershed.
- Provides teacher training and staff development for more than 100 teachers annually.
- Prepares students and teachers for field trips through classroom presentations.
- Directs field trip activities for more than 6,000 youth visiting the Preserve annually.
- Coordinates service learning projects that support stewardship, restoration, and monitoring for K–12 students.

The Preserve’s K–12th Grade Education Program has gained state and national recognition. It has been featured in a State-adopted 4th-grade Social Studies textbook published by National Geographic and featured on several TV and radio programs.

Many school districts in the region utilize the Preserve’s K–12th Grade Education Program. During the 2005/2006 and 2006/2007 school years, classes from 10 districts, including elementary, middle, and high schools, visited the Preserve (Table 5.3). Additionally, several private and home schools participated in Preserve education programs. Most field trips occur
during the school day; however an increasing number of after school programs are beginning to utilize the Preserve as a field trip destination.

### Table 5.3: School Districts utilizing CRP’s Education Program

<table>
<thead>
<tr>
<th>School District</th>
<th>Number of Schools in District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arcohe Union Elementary School District (K–8)</td>
<td>1</td>
</tr>
<tr>
<td>Elk Grove Unified School District (K–12)</td>
<td>63</td>
</tr>
<tr>
<td>Escalon Unified School District (K–12)</td>
<td>7</td>
</tr>
<tr>
<td>Galt Joint Union Elementary School District (K–8)</td>
<td>7</td>
</tr>
<tr>
<td>Galt Joint Union High School District (9–12)</td>
<td>2</td>
</tr>
<tr>
<td>Lincoln Unified School District (K–12)</td>
<td>12</td>
</tr>
<tr>
<td>New Hope Elementary School District (K–8)</td>
<td>1</td>
</tr>
<tr>
<td>Oak View Union Elementary School District (K–8)</td>
<td>1</td>
</tr>
<tr>
<td>Sacramento City Unified School District (K–12)</td>
<td>90</td>
</tr>
<tr>
<td>Stockton Unified School District(K–12)</td>
<td>57</td>
</tr>
</tbody>
</table>

Galt Joint Union Elementary School District (GJUESD) has the highest student involvement due to its proximity to the Preserve and its early collaboration with TNC in 1993 to develop an education program at the Preserve. The Preserve’s Education Coordinator is also a GJUESD employee who serves as district Service Learning Coordinator, actively recruiting teachers within the GJUESD to participate in field trips and restoration projects. Beginning in 2000 and continuing through 2007, the GJUESD has taken a significant role in funding the Preserve’s Education Program. Given the small size of the GJUESD, both in terms of the number of students and the financial resources, it will be important in future years for GJUESD to share costs associated with its support of the Preserve with the many other school districts throughout the region that utilize the Preserve.

An increasing number of field trips are being scheduled from Elk Grove Unified School District (EGUSD), one of the largest districts in the state with a population exceeding 60,000 students. The EGUSD has supported the Education Program to a limited extent through the coordination of teacher workshops.

The majority of the students taking part in the Education Program are in elementary grades, likely due to the self-contained classroom setting and the logistics of field trip planning. High school students also participate in the Preserve’s Education Program, during events such as HRT Workdays or the Spring Extravaganza where they can earn extra credit or accumulate community service hours. Agriculture students from several high schools have been active at the McFarland-Orr Ranch.

Students visit the Preserve throughout the year and activities vary seasonally. Both the Preserve and McFarland-Orr Ranch experience the highest student use in fall and spring. In addition to trail hikes and wildlife viewing, fall activities include acorn collecting at the Preserve and the McFarland-Orr Ranch Pumpkin Patch. Winter activities include acorn planting and wetland and grassland restoration. Fall and winter field trips offer the best opportunities for sandhill crane observation.
and waterfowl viewing. In spring, students participate in the McFarland-Orr Ranch Pioneer Days and they participate in the Preserve’s duck egg rescue and butterfly census. An increasing number of students are expected to use the Howard Ranch trail in spring. The number of students visiting fluctuates with variations in weather and the availability of restoration projects.

The Preserve’s K–12 Education Program provides a critical service to an underserved, minority, and low-income student population. The student population in the local area reflects the wide range of languages, socioeconomic status, and cultural diversity. For example, in Galt schools, 50 percent of the students are low income and qualify for free or reduced-fee lunches; 29 percent are English language learners; and 50 percent are Hispanic. Students visiting the Preserve from urban and suburban areas of Sacramento and Stockton speak more than 30 languages and represent multiple ethnicities. Although there are no special programs for disabled or minority students at the Preserve, and students with special needs are not tracked, the parking lot, Visitor Center, and certain trails are accessible to mobility-impaired students and other visitors. More funding would be needed to pursue opportunities for students with special needs. These socio-economic statistics illustrate both the complexity of the task to provide education to this diverse community and the importance of this type of outdoor education, which the students would otherwise not receive.

Curriculum: The Preserve’s K–12th Grade Curriculum Resources provide teachers with pre-visit, site visit, and post-visit activities. Curriculum guides are available on the Preserve’s website for primary, intermediate, and secondary grades. At the workshops teachers are provided with additional information about appropriate curriculum for teaching environmental studies, including materials from the International Crane Foundation, Project Wild, California Waterfowl Association, DFG, Project Wet, Splash, and others.

Field Trips: The Education Coordinator works with teachers prior to a field trip to provide investigations and preparation that will enhance the time on the trails. During the 2006/2007 school year (September to June), 62 field trips were conducted at the Preserve and McFarland-Orr Ranch, accommodating a total of 3,944 students. Field trips have an average of 59 students per trip. A majority of these field trips were for elementary students; although five of the field trips were for college classes.

Service Learning: Service learning is a teaching and learning strategy whereby students are engaged in thoughtfully organized service that:

- Is integrated into and enhances the academic curriculum.
- Is coordinated with community partners and meets the needs of the community.
Helps foster civic responsibility.
Provides structured time for students to reflect on the service experience.

Through service learning, students at the Preserve are able to apply what they have learned in their science, social studies, mathematics, and environmental studies classes to stewardship activities.

Involvement: Parents and family members also take part in field trips and service learning projects. Parents join their school-age children as both chaperones and assistant educators. To prepare the parents, the Education Coordinator trains them or sends written information home for them to read prior to the field trip. The parents are expected to be knowledgeable about the Preserve, to actively support the teacher, and to engage the students. At McFarland-Orr Ranch, parent involvement is critical as the parents lead group activities and assist with instruction. Teachers, school administrators, board members, and other school staff are involved in the Preserve’s Education Program; supporting policies that allow students to visit the Preserve and helping to build support for service learning.

Other community representatives involved in service learning include:

- Non-faith-based community organizations
- Faith-based organizations
- Private, non-profit K–12th schools
- Public agencies
- Businesses
- AmeriCorps members
- Seniors and Youth Engaged in Service
- Other senior citizens
- Legislators and community officials

Teacher Workshops/Presentations: Since 1995 all school teachers who participate in the Preserve’s K–12th Grade Education Program are required to attend the Preserve’s teacher workshop. The Preserve’s Education Coordinator and Volunteer Coordinator are the instructors, providing a minimum of four annual teacher workshops (two in fall and two in spring) at the Visitor Center and at the McFarland-Orr Ranch.

The Preserve also provides all-day teacher workshops for Project Wet, Project Wild, Wild About Wetlands, Bay and Delta studies, World Water Monitoring Day, and Crane-specific Programs. The DFG sponsors Project Wet and Project Wild and the California Waterfowl Association sponsors the Wild about Wetlands workshops. In conjunction with the Preserve’s Education Coordinator and Volunteer Coordinator, these program organizations lead the instruction and provide materials and supplies. The International Crane Foundation provides the extensive crane curriculum and the DFG provides the Crane Kits.

School Programs: The Education Coordinator provides various presentations at the schools, including assembly-type programs and classroom visits. Programs include information about wildlife, field trip preparation, expectations, and trail etiquette.
Preserve staff also support school teachers during service learning and restoration projects, and provide supervision and tools for specific projects while schools provide the manpower.

**Teacher Resources:** Resources are provided to teachers during the Preserve’s Teacher Workshops and resources typically include a Teacher Activity Guide and logistical information. Other resources provided by the Preserve for teachers are “kits” available for check-out: Crane Kits (includes feathers, bones, and information on crane behavior) and Wetland Kits (includes bird skulls, bird eggs, and bird beaks to complement an extensive curriculum on migration, habitat, and the food chain). These kits are provided through a partnership with other organizations or agencies. While the kits are extraordinary, they are underutilized.

The continual development and/or distribution of high-quality, Preserve-specific educational and outreach resources and materials, given the Preserve’s limited resources, is an ongoing challenge. In the future teacher resource materials available for distribution may include:

- Traveling Preserve Kit (pressed oak leaves, acorns, artifacts, feathers, bones, seeds, and information about invasive species).
- PowerPoint presentations on migratory birds, common birds, flooding, and seasonal changes.
- Wildlife-friendly farming curriculum, which is currently available through the Rice Growers Association.
- The California Native Plant Society and Mosquito Abatement curriculums, which are currently available.

**Teaching Facilities:** The Preserve has no facilities specifically designated for formal instruction, although approximately 30 primary or 15 middle school students can sit on the floor at one time in the Exhibit Hall at the Visitor Center. The outdoor trails provide exceptional opportunities for observation and interpretation, but additional facilities are needed to take full advantage of the Preserve as a premier learning destination.

**Transportation:** Students are transported from school to the Preserve mainly by school buses, although personal vehicles are occasionally used to save money.

**McFarland-Orr Ranch:** The McFarland Living History Ranch (McFarland-Orr Ranch) is located on the Preserve on property owned by Sacramento County and leased to the Galt Area Historical Society. School groups have been visiting this Ranch since 2000.

All activities and renovations at the McFarland-Orr Ranch are accomplished through the efforts of volunteers, including school and church groups, scout troops, and local service clubs. Students have participated in a number of service learning projects, including the construction of the bunkhouse, the rebuilding of the chicken house, and numerous landscape, irrigation and tree planning projects. The restoration of the historic 1870s Victorian ranch house is an enormous accomplishment and is nearing completion. The Pioneer Days and Pumpkin Patch events held in the spring and fall, respectively, attract thousands of students and the general public. The McFarland Living History Ranch Program is expected to continue to expand and draw students and teachers from throughout the region.
The McFarland-Orr Ranch provides an area for Scout troop activities and FFA livestock demonstrations. It is also the site for several large public events, including the Antique Engine and Tractor Show, Old Car Show, the Kite Festival, and Native American programs. The current teaching facilities at the McFarland-Orr Ranch are limited to outdoor areas, but in time the Victorian home and some of the outbuildings may provide room for an entire class. The Master Plan for the McFarland Living History Ranch proposes a future Visitor Center.

Currently, the Preserve’s Education Coordinator also coordinates the education programs at McFarland-Orr Ranch; however a full-time education coordinator focused on the McFarland-Orr Ranch (i.e., separate from Preserve’s Education Coordinator) is needed.

Use Level and Trends (K–12th): During the last seven years, the growth of the Preserve’s Education Program has been significant. In 1999 fewer than 400 students were involved in service learning projects at the Preserve. Over each of the last seven years, more than 3,000 students from GJUESD alone have participated in high quality service learning projects at the Preserve. Although only the number of Galt students was accurately tracked over the past decade, it is estimated that annually 6,000 students from Galt, Sacramento, Stockton, and the surrounding region visited the Preserve to participate in education and restoration projects.

Currently, the demand for field trips exceeds the staff capacity. No additional Preserve staff are available to lead activities. Teachers lead tours with the help of parents, but with such large classes (60–90 students out on the trail at one time), the students located in the rear of the group often have difficulty hearing and seeing during the tour. To increase the quality of the field trip and allow for smaller group interaction, a higher volunteer-to-student ratio is necessary.

Higher Education Program

The Preserve also offers guided field tours and research opportunities to college students. College classes that have visited the Preserve on field trips typically originate from the following local colleges:

- University of the Pacific (UOP)
- University of California, Davis (UCD)
- American River College (ARC)
- Cosumnes River College (CRC)
- Sacramento City College
- Sacramento State University
- Delta College

“Boy with Binoculars” – Photo courtesy of Preserve Photo Library
A college may send several different classes to the Preserve for field tours supporting student course work in environmental science, geology, geography, and water resources. Field tour topics typically include restoration design, land management, floodplains, land use, wetlands management, Staten Island, and birds. The number of classes, students, and professors has not been specifically tracked; however, a trend of increased interest (increased number of students and tours) in college tours has been noted by staff.

**INFORMAL (NON-SCHOOL-BASED) EDUCATION**

This program involves outdoor groups that are not school-based, including Girl Scouts, Boy Scouts, Eagle Scouts, FFA, and 4-H. These groups usually participate on regular HRT Work Days or come to the Preserve to visit the Visitor Center and hike the trails. After contacting the Volunteer Coordinator for a list of potential projects, many Eagle Scouts get involved in individual projects (e.g., maintenance, facilities, etc.) under the supervision of the Preserve’s Site Coordinator. In the future it is likely that more Scouts will visit the McFarland-Orr Ranch with the completion of the youth activities and campout area. Although the number of groups, leaders, or Scouts visiting the Preserve is not specifically tracked, several troops visit on an annual basis.

**ADULT EDUCATION**

Since 2004, the Preserve has hosted adult education classes in conjunction with Galt Elementary and Galt High School Districts. Adult English-language learners attend evening classes with multiple components often linking science and language skills. For example, in the Crane Program, adult students practice literacy and English language, focusing on crane and wetland vocabulary words, as they learn about their environment and about service learning opportunities. The number of students fluctuates, depending on grant funding. In 2007, the number of schools participating decreased from four to two, yet the student demand for these classes exceeds funding and staff capacity.

**Seasonal Employee Program:** This program began in 1999 and typically employs recent college graduates with B.S. degrees. Hired as full-time, short-term employees by TNC, these seasonal workers are paid an hourly wage as they gain experience in the field of conservation science. Seasonal employees typically begin work in April and continue until the end of September. TNC tracks the number of seasonal employees and over the past nine years, TNC has hired a cumulative total of 30 seasonal employees. Seasonal employees often go on to pursue an advanced degree or other types of work. The purposes of the Preserve’s Seasonal Employee program are numerous:

- Allow young professionals an opportunity to gain valuable work experience.
- Learn about Preserve Partners and operations.
- Learn about the Preserve’s flora and fauna.
- Foster the next generation of conservation scientists.
- Conduct scientific monitoring in accordance with the Preserve’s Monitoring Plan.

The seasonal employees conduct research and monitoring on a variety of subjects, including grazing, native vegetation, invasive plants, vernal pools, and prescribed burning. In the past,
TNC has supported (paid) these employees utilizing a variety of private funding sources, including foundation grants. If TNC, or any of the other Partners, were to secure permanent funding for the seasonal employee program, it would enable the Preserve to continue to provide mentoring and training to future professional biologists.

**Tours:** Specialized tours of the Preserve are offered upon reservation. Nine tours of the Preserve were provided to agencies and non-profit organizations between September 2006 and June 2007. Past tour groups included Bay Nature, Elkhorn Slough Reserve, Audubon Society, Wildlife Society, The Bay Institute, California State Parks, and the Contra Costa Hiking Club, among others.

**Enrichment Programs:** The Preserve currently hosts enrichment presentations for the volunteers and teachers. In the past these programs have included:

- Bat Night, held in August 2007
- Mountain lion information, held in March 2007
- Duck Days (California Waterfowl Association presented information on wood ducks)
- Crane workshops (held for teachers only)

The Preserve would like to increase the level of the public’s understanding of basic physical and biological science. An action item has been included in this Management Plan to actively promote these types of enrichment presentations.

**STEWARDSHIP OUTREACH**

Stewardship outreach consists of presentations, Preserve-hosted public events, off-site outreach events, and written material such as brochures, newspaper and magazine articles.

**Presentations:** Preserve staff members give presentations to community groups, such as the National Wild Turkey Federation and the Audubon Society, among others, to provide information about the impacts of public access and the need for increased stewardship.

**Preserve-Hosted Public Events:** Several times a year, the Preserve invites the general public to the Preserve to actively participate in special events designed to draw a large number of visitors for a single day. The Preserve and the McFarland-Orr Ranch hosted nine events between September 2006 and June 2007. The special events held at the Preserve (proper) include:

- Spring Extravaganza
- Salmon Fest Schools Day
- Lodi Crane Festival
- Anniversary Festival
- Howard Ranch Trail Grand Opening (one-time event)
- Nature Bowl (a cooperative team competition for local 3rd–6th graders)
Special events held in the past at the McFarland-Orr Ranch include:

- McFarland Ranch Old Car Show
- McFarland Ranch Fall Festival
- McFarland Ranch Concert
- McFarland Ranch Craft Fair
- McFarland Ranch Antique Engine & Tractor Show
- McFarland Ranch Pumpkin Patch

**Off-site Outreach Events:** Preserve staff participates in events hosted at off-site locations to distribute outreach materials and to interact with the general public, as well as to recruit potential volunteers. A booth staffed by Volunteer Naturalists is typically set up and stocked with brochures and other outreach materials. Preserve staff participated in six off-site public outreach events between September 2006 and June 2007. Outreach events that Preserve staff and volunteers have participated in include:

- Earthfest at Sacramento Zoo
- Wings of Spring at the Sacramento Zoo
- Walk on the Wildside at the Beach Lake Preserve
- Migration Celebration at the Micke Grove Zoo in Lodi
- Salmon Festival
- Sandhill Crane Festival

**Written Outreach Materials:** The Preserve website posts a variety of the Preserve’s written outreach materials. Brochures are also available at the Visitor Center. A variety of magazine and newspaper articles have been written about the Preserve, providing public information. The most prominent recent article was published in *Bay Nature Magazine* (January/March 2006) entitled, “Dance of the Cranes: Winter Revels Along the Cosumnes.”

### 5.4.2 Use Levels and Trends

California’s public education system is immense: more than 6 million students in more than 9,500 schools and programs that are provided by the County Offices of Education (COEs). The State’s residents have high expectations for public schools, but school districts have limited resources with which to reach those expectations. Locally, population growth in the greater Sacramento Metropolitan region results in increasing numbers of students. Additionally, the population is increasing in diversity; both in culture and language, making the task of public outreach more complex.

### STAFF RESOURCES

This section describes the staff resources that are allocated to the Education and Outreach Program at the Preserve.

**Existing Staff Resources:** The Preserve’s Education Coordinator position is staffed via a teaching position funded through the GJUESD. The Education Coordinator is the lead person for the K–12th Grade Education Program and, currently, is responsible for securing funding,
managing grants, supporting local school districts, coordinating education efforts at the McFarland-Orr Ranch, and managing the Preserve’s Education Program. Since 2003, a much larger portion of the Education Coordinator’s staff time has been devoted to program management at the school-district level, with more grant writing, grant budgeting, and grant reporting. Due to a reliance on grant funds, which are uncertain from year-to-year, the Coordinator must pursue school funding to support new initiatives. While grants support the Coordinator’s work at the Preserve, they also entail huge responsibilities, including the following roles:

- After-school Service Learning Coordinator
- Regional Service Learning Coach
- Youth Development Coordinator through the REACH program

The following Preserve Staff also support the Education and Outreach Program:

- **Volunteer Coordinator**: Serves as the staff leader for the Stewardship Outreach Program, organizing general outreach and special public events, designing brochures, etc. Assists the Education Coordinator by co-leading teacher workshops, makes school field trip reservations, assists with scheduling and logistics for Higher Education restoration projects. The Preserve’s Stewardship Outreach Program is funded by the Sacramento County Regional Parks Department through their funding of the Volunteer Coordinator position.
- **BLM Staff**: Leads college classes and field tours.
- **TNC Lead Regional Ecologist**: Assists with grant requests.
- **TNC Restoration Ecologist**: Assists with college tours for the Higher Education Program. Coordinates planting and restoration projects that are completed by students and volunteers.
- **TNC Site Coordinator**: Assists the Education Coordinator with service learning projects, such as acorn collection and grass planting/cutting. Larger student groups of 30–40 receive an overview of the project and lessons on proper field techniques, before dividing into smaller work groups. The current Site Coordinator offers bilingual services and is chair person of an English language program. The Site Coordinator also supervises college students with HRT projects.

**Need for Additional Staff Support**: Educators interact with multiple students who have many needs to address on a daily basis. Over the last several years, the job responsibilities of the Education Coordinator have greatly expanded, so that now many of his duties are related to program management and administration rather than direct teaching. Also, the number of work days required to accomplish this position’s duties has increased beyond that supported by the school contract.

One method to counteract this problem would be to more carefully define the Education Coordinator’s responsibilities to allow him/her to focus on strategic program management items and long-term solutions such as outreach to schools, funding, development of classroom facilities, development of more specific curriculum, organization of student service learning projects, and organization of school-based and Preserve-based programs.
Ideally, instructional assistants and grant managers could be hired to assist the Education Coordinator in the future. It is anticipated that up to three full-time education staff may be needed over a 10–15 year time horizon, including a full-time Education Coordinator for the Preserve with a focus on Galt Joint Union Elementary and High School Districts, one position focused on the Elk Grove School District and the other eight Districts, and one position focused on the McFarland-Orr Ranch Project.

**EXISTING FUNDING RESOURCES**

The Preserve relies solely on grant funding to the GJUESD for the Education Program (K–12th Grade and Adult Education Programs). These grants come to the GJUESD through California Department of Education’s CalServe initiative, Youth Service CA, and the Sierra Health Foundation. Over the past seven years (i.e., from the school year 2000/2001 to 2006/2007) the Education Coordinator secured a grand total of $692,200 in funds. This represents an average of $98,885 per year. These funds have been used to pay coordinator salary and benefits and teacher stipends, provide bus transportation, purchase optical equipment and supplies, and for miscellaneous office expenses.

One drawback to relying on grants is that they are limited to covering new initiatives and do not support existing programs. Current grant funds are all related to service learning and youth development. There are no existing grant funds to support environmental education. This indicates that reliance on grants as the only source of funding for the Preserve’s Education Program is problematic and a more secure funding source needs to be found. In 2006, the Program completed the second of the three-year funding cycle through the CalServe grant and was not eligible to reapply. The $50,000 grant represents about half of the annual budget for GJUESD’s Service Learning Program. Further compounding the problem, several grants for the Education Program (including community learning) are available through 2009, but these will run out in 2010.

Developing a more sustainable funding source is the biggest challenge that the Education Program faces in the future. Existing grants are scheduled to expire in the 2010/2011 school year, and the Preserve is not eligible to reapply or extend these grants. An average of $99,000 annually is needed in order to maintain the program at its current level. However, anticipated future needs of the education program will include the allocation of sufficient resources in facilities (e.g., outdoor education staging area, environmental education center, office space for two new positions, etc.) and equipment (e.g., microscope, computers, etc.).

**INSTITUTIONAL STRUCTURE OF THE EDUCATION PROGRAM**

The Preserve Partners value the involvement of youth and adults in recreation, education, restoration, and stewardship projects. Outreach to school districts and the general public is a key strategy in building community understanding and support for the Preserve and its mission. Due to differing institutional missions and philosophies that the Partner organizations have inherited, education for K–12th and college students may not be a primary consideration for many of the land-owning Partners; rather their missions stem from the pressing needs to conserve habitat and conduct basic land-management activities. Many believe that the local school districts should
support a Preserve Education Program to provide services to the traditional constituencies of the schools. This has resulted in an informal structure for the Education Program that is based upon various agreements associated with grants. Implementation of the Program has largely depended on solid working relationships among the Education Coordinator, various school districts, and the Preserve Partners. However, as the Program grows, and as the future funding situation becomes increasingly uncertain, and as transitions among staff occurs, the Preserve has identified a need to formalize the structure of the Education Program.

One proposed management action that is critical is to find a new model for the Education Program’s institutional structure. The education programs at Yolo Basin Foundation have been suggested as a potential model. Yolo Basin Foundation is a 501(c)(3) with an advisory board that represents the community, business, and elected officials. They have been very successful at securing a variety of funding sources, including grants from the Intel Foundation and others. An alternative model that has been suggested is the Effie Yeaw Nature Center, a regional park operated by the County of Sacramento. Ideally, whatever model is ultimately chosen will enable shared decision-making and responsibilities among Preserve Partners and create appropriate teams of teachers, staff, students, and volunteers who can share responsibility in an equitable manner and offer support to each other. Although individual Partner organizations may not benefit directly from an education program at the Preserve; the Preserve as a whole benefits from a high-quality education program.

5.4.3 MANAGEMENT OF EDUCATION AND OUTREACH PROGRAM

The Preserve has the potential to become the leader in the field of environmental education. Existing partnerships with higher education and local school districts could lead to a first class student- and teacher-education program. To achieve this, the Preserve will need to capitalize on its existing resources, such as spectacular trails with parking access, unique ecosystems, world class birding, a multitude of opportunities for scientific research, a captivating Visitor Center, and its location only 30 minutes from downtown Sacramento. Additionally, the Preserve will need to implement the goals, objectives, and actions listed in the following section of this Plan that provide strategies and mechanisms to take advantage of future opportunities. If the Education Program grows beyond what is currently predicted in this Management Plan, or if new funding is received that allows for expansion of the Education Program, it is recommended that an Education Program Plan be developed to outline steps necessary to accommodate that growth.
**Goals, Objectives, Actions, and Monitoring**

**OVERARCHING GOAL II: COMPATIBLE USES IMPROVE STEWARDSHIP OF THE LANDS IN THE COSUMNES RIVER WATERSHED.**

Public Use Sub-goal #1: Recreational use of the Preserve will be compatible with the Management Plan’s Natural Resource Stewardship goals, will promote the teaching of environmental stewardship, and will have adequate and stable funding sources.

<table>
<thead>
<tr>
<th>Recreation Objectives</th>
<th>Actions</th>
<th>Monitoring Elements</th>
</tr>
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</table>
| 1.1 Improve tracking of visitor use. | **1.1.1** Collect, compile, and evaluate data on visitor use and experiences at the Preserve.  
**1.1.2** Determine the future recreational carrying capacity of the Preserve based on the information gathered through the recreational monitoring activities.  
**1.1.3** Apply adaptive management techniques to recreation programs and facilities that may be negatively impacting natural resources. | **1.1.1** Car counters at parking lots; metal rangers at trailheads and parking lots, Visitor Center tally sheets, activity sign-in sheets, self-registration book at boat dock, exit surveys to evaluate visitor experiences. Development and use of a single-use permit acceptable to all Preserve Partners.  
**1.1.2** Assess the need to add facilities (e.g., buildings, trails, signs, etc.) to support the Preserve.  
**1.1.3** Biological monitoring (See Chapter 3). |
| 1.2 Promote and enhance existing recreational opportunities. | **General Recreation Activities**  
**1.2.1** Continue to design, construct, install, and maintain interpretive signs throughout the Preserve (e.g., for the wetlands area, sandhill cranes, trails, etc.) as needed.  
**1.2.2** Continue to design and distribute high quality public use/educational brochures (e.g., driving tour, walking tour, paddling guide, etc.) and update them as necessary.  
**1.2.3** Continue to provide safety information to visitors on current conditions (e.g., floods, fires, mountain lions, etc.) within the Preserve. | **1.2.1** Number of interpretive signs  
**1.2.2** Number and type of brochures and visitor feedback.  
**1.2.3** Content and quantity of flyers or advisories. |
### Recreation Objectives

<table>
<thead>
<tr>
<th>Hiking</th>
<th>Number of guided walks and trail condition.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2.4 Continue to provide a minimum of 12 guided walks led by the Volunteer Naturalists per year.</td>
<td></td>
</tr>
<tr>
<td><strong>Non-gas powered boating (including kayaking and canoeing)</strong></td>
<td></td>
</tr>
<tr>
<td>1.2.5 Maintain existing paddling routes.</td>
<td></td>
</tr>
<tr>
<td>1.2.6 Maintain the existing boat dock.</td>
<td></td>
</tr>
<tr>
<td>1.2.7 Improve coordination and scheduling with the commercial paddling companies</td>
<td></td>
</tr>
<tr>
<td>1.2.8 Increase the number of commercial paddling companies program with secured permits.</td>
<td></td>
</tr>
<tr>
<td><strong>Fishing</strong></td>
<td></td>
</tr>
<tr>
<td>1.2.9 Provide information about existing fishing opportunities, parking, and safety hazards (e.g., mercury levels in fish).</td>
<td></td>
</tr>
<tr>
<td><strong>Geocaching</strong></td>
<td></td>
</tr>
<tr>
<td>1.2.10 Continue to monitor the existing geocaching sites along on-trail locations. Expand geocaching activities in the future if deemed necessary and appropriate.</td>
<td></td>
</tr>
<tr>
<td><strong>Hunting</strong></td>
<td></td>
</tr>
<tr>
<td>1.2.11 Continue to provide existing hunting opportunities at the current level, unless that level is determined to be incompatible with the mission and goals of the Preserve.</td>
<td></td>
</tr>
<tr>
<td>1.2.12 Study the potential to allow additional tightly defined specialty hunts based on a limited permit approach in a comprehensive manner using consistent criteria for all Preserve parcels. Consistent parcel-based criteria should be used.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Monitoring Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2.4 Number of guided walks and trail condition.</td>
</tr>
<tr>
<td>1.2.5 Maintenance tasks completed on paddling routes and boat dock access; number of paddlers signed in.</td>
</tr>
<tr>
<td>1.2.7 Number of commercial paddling trips.</td>
</tr>
<tr>
<td>1.2.8 Number of secured permits.</td>
</tr>
<tr>
<td>1.2.11 Number of cache seeks and number of cache sites.</td>
</tr>
<tr>
<td>1.2.12 Determination of feasibility to hunt.</td>
</tr>
<tr>
<td>Recreation Objectives</td>
</tr>
<tr>
<td>-----------------------</td>
</tr>
<tr>
<td>1.2.13 Implement additional limited-entry hunting opportunities if and when possible to meet the management objectives of a particular property.</td>
</tr>
<tr>
<td>1.3 Explore opportunities for additional recreational amenities that are consistent with the five key factors and three feasibility factors discussed in the text of this document.</td>
</tr>
<tr>
<td>Recreation Objectives</td>
</tr>
<tr>
<td>-----------------------</td>
</tr>
<tr>
<td><strong>1.4</strong> Explore the feasibility of providing a wider range of recreational experiences not currently allowed on the Preserve (e.g., horseback riding, camping, OHV use, and mountain biking) that are consistent with the five key factors and three feasibility factors discussed in the text of this document.</td>
</tr>
</tbody>
</table>
| **1.5** Continue to provide a safe and functional trail system, including boardwalks and viewing platforms for visitors, throughout the Preserve. | **1.5.1** Evaluate current trail maintenance practices and assess practices for effectiveness.  
- Provide new maintenance standard for trails.  
- Secure resources to implement new standard (volunteers, funding, equipment).  
- Ensure accessible trails and viewing platforms continue to meet ADA standards. **1.5.2** Recruit YCC, CCC, and/or other service groups to help maintain trails. **1.5.3** Continue to work with county work crews to help maintain trails. **1.5.4** Hire landscapers or other contractors to maintain public areas more efficiently, as needed. | **1.5.1** Trail maintenance practices and effectiveness.  
- Condition of trails.  
- Resources secured.  
- ADA accessibility. **1.5.2** Recruitment and use of service groups. **1.5.3** Frequency and number of County work crews. |
<p>| <strong>1.6</strong> Maintain a safe, functional, and orderly environment for visitors and staff. | <strong>1.6.1</strong> Add new security features to the Preserve Visitor Center, parking lots, trails, and other facilities, as necessary (e.g. security cameras, security signs, gates, alarms, etc.) <strong>1.6.2</strong> Increase law enforcement presence or patrols (e.g., game wardens, Sacramento County Rangers, DFG, etc.) on the entire Preserve by working cooperatively and/or cost-sharing a position with local, state, and federal law enforcement officials. |</p>
<table>
<thead>
<tr>
<th>Recreation Objectives</th>
<th>Actions</th>
<th>Monitoring Elements</th>
</tr>
</thead>
</table>
| **1.7 Reduce inappropriate uses through ongoing management, outreach and education efforts, and law enforcement activities.** | **1.7.1** Provide educational outreach (*e.g.* brochures, presentations, etc.) to various user groups that contribute to inappropriate use (*e.g.* poachers, OHV riders, etc.).  
**1.7.2** Install and maintain signage, gates, fences, barricades, K-rails, etc. at sites with high incidences of inappropriate use and throughout the Preserve as necessary.  
**1.7.3** Update and implement the Preserve’s Sign Plan, as needed.  
**1.7.4** Limit visitors to authorized trails in order to reduce the potential spread of invasive species.  
**1.7.5** Restore those areas of the Preserve that are damaged by inappropriate uses.  
**1.7.6** Increase law enforcement presence (*e.g.* game wardens, Sacramento County Rangers, DFG, etc.) throughout the entire Preserve to assist staff with the management of inappropriate uses.  
**1.7.7** Improve recording of violations and illegal uses occurring on the Preserve.  
**1.7.8** Analyze and determine any patterns of the violations and illegal uses occurring on the Preserve; focus law enforcement patrol in these areas. | **1.7.1** Outreach efforts, number and content of presentations and brochures.  
**1.7.2** Signage.  
**1.7.4** Spread of invasive species.  
**1.7.6** Presence of law enforcement, location of incidents, and reoccurrences of incidents.  
**1.7.7** Violations and illegal uses record. Locations of violations and illegal uses. |
<table>
<thead>
<tr>
<th>Recreation Objectives</th>
<th>Actions</th>
<th>Monitoring Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8 Secure funding source(s) to support the</td>
<td>1.8.1 Work with Preserve Partners to assess annual budgets, farm</td>
<td>1.8.1 Annual dollar amount allocated to recreation program.</td>
</tr>
<tr>
<td>staff and facilities needed to manage</td>
<td>revenue, grant opportunities, and potential for establishment of an</td>
<td></td>
</tr>
<tr>
<td>recreational uses of the Preserve.</td>
<td>endowment or other financing tool that can be used to support the staff</td>
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<tr>
<td></td>
<td>and facilities necessary to meet recreational demands at the Preserve.</td>
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<tr>
<td></td>
<td>1.8.2 Maintain sufficient levels of staffing and funding to actively</td>
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<td></td>
<td>manage existing and future visitor use and to minimize inappropriate</td>
<td></td>
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<tr>
<td></td>
<td>use of facilities and habitats.</td>
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<tr>
<td></td>
<td>1.8.3 Assess the feasibility of charging visitors a vehicle parking</td>
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<td></td>
<td>fee similar to the State Parks System (e.g., $6 per car and $100 per</td>
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<td></td>
<td>bus). Implement if determined to be feasible.</td>
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<tr>
<td></td>
<td>1.8.4 Seek funding for the construction and maintenance of any needed</td>
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<td></td>
<td>new recreation facility.</td>
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<td></td>
<td>1.8.5 Conduct a review of best practices among similar preserves,</td>
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<td></td>
<td>parks, or refuges to ascertain how they charge, fund, and determine</td>
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<tr>
<td></td>
<td>recreational use.</td>
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</table>
Public Use Sub-goal #2: The Preserve’s Volunteer Program will be compatible with the Management Plan’s Natural Resource Stewardship goals, will promote the teaching of environmental stewardship, and will have adequate and stable funding sources.

<table>
<thead>
<tr>
<th>Volunteer Objectives</th>
<th>Actions</th>
<th>Monitoring Elements</th>
</tr>
</thead>
</table>
| 2.1 Provide a mutually beneficial volunteer experience that yields tangible benefits for both the volunteer and the Preserve. | 2.1.1 Ensure that the Preserve’s Volunteer Program continues to serve a variety of functions and ongoing programs, including the following examples:  
  - Outreach  
    - Volunteers staff the Visitor Center on the weekends as a minimal threshold.  
    - Volunteers help staff booths for special events (e.g., Earthfest, Walk on the Wild Side, Salmon Festival, Davis Duck Days, Crane Festival).  
  - Habitat protection and restoration.  
  - Habitat Restoration Team has a minimum of 12 work days a year.  
  - Recreation.  
  - Maintain trails annually as needed.  
  - Education (e.g., guided walks and paddling tours and/or school activities).  
  - Research as covered by the Biological Inventory Team.  
  - Monitoring (e.g., research, easement, mitigation, and biological). {Monitoring Plan (not yet written) will provide details on what the volunteers will be monitoring.}  
  2.1.2 Staff provide appropriate training, direction, and communication to volunteers. | 2.1.1 Number and type of functions and programs that volunteers provide.  
  - Number of volunteers that staff the Visitor Center and special events.  
  - Number of workdays that HRT conducts.  
  - Document locations of trails maintained by volunteers.  
  - Number educational activities that volunteers have led.  
  - Description of BIT activities.  
  - Type of monitoring e volunteers participate in. Summarize relationship between the training provided by staff and improvements in the quality of monitoring data collected by volunteers.  
  2.1.2 Annual quantification of training provided to volunteers. |
<table>
<thead>
<tr>
<th>Volunteer Objectives</th>
<th>Actions</th>
<th>Monitoring Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1.3</td>
<td>Hold an annual meeting with volunteers to share how their efforts contribute to the CRP’s Monitoring Plan, Research Agenda, Management Plan, and other Preserve Programs.</td>
<td>2.1.3 Meeting notes that summarize the annually meeting and utilize these notes as the documentation.</td>
</tr>
<tr>
<td>2.1.4</td>
<td>Develop and implement a volunteer commitment process designed to balance the level of training provided to volunteers and time donated by volunteers.</td>
<td>2.1.4 Data in the Volunteer Database.</td>
</tr>
<tr>
<td>2.1.5</td>
<td>Include a section in the CRP annual work plan that focuses HRT efforts on accomplishing goals of the Management Plan and research agenda.</td>
<td>2.1.6 Number of volunteer team leaders.</td>
</tr>
<tr>
<td>2.1.6</td>
<td>By 2010, establish a training session for dedicated volunteers to become team leaders of various volunteer programs.</td>
<td>2.1.7 Number of trainings offered, topics discussed, and attendance at each training.</td>
</tr>
<tr>
<td>2.1.7</td>
<td>Provide annual Volunteer Naturalist Training, including updated training materials and maps.</td>
<td>2.1.8 Quantity and type of recognition and incentives given to volunteers.</td>
</tr>
<tr>
<td>2.1.8</td>
<td>Provide volunteers effective recognition and incentives (e.g., certificates of merit, media highlights, and social networking activities).</td>
<td>2.1.9 Quantity of enrichment activities</td>
</tr>
<tr>
<td>2.1.9</td>
<td>Provide enrichment activities, such as a series of scientifically oriented lectures (e.g., natural history of local species, conservation biology, etc.) twice per year.</td>
<td>2.1.10 Quantity of newsletters, meetings, and social networking activities.</td>
</tr>
<tr>
<td>2.1.10</td>
<td>Inform volunteers about CRP activities, updates, future goals, suggestions, and achievements through newsletters, meetings, and social networking activities.</td>
<td>2.1.11 Type of volunteer programs offered.</td>
</tr>
</tbody>
</table>
| 2.1.11               | Develop additional volunteer opportunities or programs (e.g., Junior Naturalist Program, K–12 education, High School Summer School/Spring Break Program, Adopt-an-acre Program, etc.) as needed and if staff and financial resources are sufficient. | }
<table>
<thead>
<tr>
<th>Volunteer Objectives</th>
<th>Actions</th>
<th>Monitoring Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2 Recruit and maintain a diverse volunteer base.</td>
<td>2.2.1 Maintain a diverse overall Volunteer Program at sufficient numbers of active volunteers to staff all volunteer programs. Recruit new volunteers as needed&lt;br&gt;2.2.2 Through the Preserve’s Work Plan, annually evaluate the number of volunteers and the work that they accomplish to ensure that we are balancing quantity and quality (i.e., skill level of work).&lt;br&gt;2.2.3 Expand and improve Vernal Pool Tour Program at the Howard Ranch Trail by developing a sufficient number of vernal pool docents over the next five years.&lt;br&gt;2.2.4 Pursue opportunities to coordinate, communicate, and collaborate on volunteer programs, activities, scheduling, and outreach with other local land managers (e.g., Stone Lakes National Wildlife Refuge, Delta Meadows State Park, SMUD, Yolo Bypass, etc.)</td>
<td>2.2.1 Numbers of active volunteers. (Ideally, the overall Volunteer Program will have a total of 125 volunteers, 80 of them dedicated to the Volunteer Naturalist Program and 50 to HRT. Vernal Pool Tour Program is expected to have 15–25 volunteers.)&lt;br&gt;- Effectiveness of recruitment and retention strategy by documenting numbers of volunteers and their longevity.&lt;br&gt;- Demographic data (age, location, etc.) on volunteers.</td>
</tr>
<tr>
<td>2.3 Develop and maintain an infrastructure to support and direct volunteer efforts.</td>
<td>2.3.1 Develop a permanent funding source to carry out the Volunteer Program. (e.g., establishment of a foundation or similar endowment).&lt;br&gt;2.3.2 Obtain grants to support the volunteer program.&lt;br&gt;2.3.3 Update the volunteer database.&lt;br&gt;2.3.4 The Volunteer Coordinator will prepare an annual report that documents the activities of the Volunteer Program.</td>
<td>2.3.1 Funding for volunteer program&lt;br&gt;2.3.2 Number of grants awarded.&lt;br&gt;2.3.3 Annual Report</td>
</tr>
</tbody>
</table>
Public Use Sub-goal #3: Scientific research conducted at the Preserve will be compatible with the Management Plan’s Natural Resource Stewardship goals, will promote the teaching of environmental stewardship, and will have adequate and stable funding sources.

<table>
<thead>
<tr>
<th>Research Objectives</th>
<th>Actions</th>
<th>Monitoring Elements</th>
</tr>
</thead>
</table>
| 3.1 Promote and encourage basic ecological research that provides a basis for management decisions and increases our understanding of natural conditions and processes. | 3.1.1 Evaluate the feasibility of establishing a research institute at the Preserve to provide place-based research on a variety of scientific and ecological topics, including flooding and floodplain management. As part of the evaluation process, assess the possibility of affiliation with an academic organization such as LTER or UC Natural Reserve Site.  
3.1.2 Utilize the Preserve’s Goals, Objectives and Actions to:  
- Assist in directing research efforts of Preserve Partners and serve to guide future proposals.  
- Serve as a basis for developing collaborative research proposals between Partners and other institutions that can be submitted to a variety of funding sources.  
- Alert scientists to important but relatively neglected research areas.  
3.1.3 If any manipulative studies are conducted on Preserve lands, the following guidelines are recommended:  
- The area should be mapped so that future research conducted on previously manipulated sites can take into account the effects of past manipulations. | 3.1.1 Results of evaluation  
3.1.2 Type and quantity of research projects at the Preserve, as documented in the Preserve’s research database. Use 2006 report as a template.  
3.1.3 Research database. |
### Research Objectives

<table>
<thead>
<tr>
<th>Actions</th>
<th>Monitoring Elements</th>
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</thead>
</table>
| Research that implements long-term markers for manipulated sites will be removed when study is complete. Sites should be surveyed with GPS and entered in a GIS. Paper maps of manipulated sites should be archived.  
3.1.4 Develop a strategy to obtain funding to help meet ecological research needs as identified in the goals, objectives, actions, and monitoring noted in Chapter 3, Natural Resources Stewardship. | |

### Public Use Sub-goal #4: The Preserve’s Education Program will be compatible with the Management Plan’s Natural Resource Stewardship goals, will promote the teaching of environmental stewardship, and will have adequate and stable funding sources.

<table>
<thead>
<tr>
<th>Education Objectives</th>
<th>Actions</th>
<th>Monitoring elements</th>
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</thead>
</table>
| 4.1. Educate the public about the importance of the Preserve, resulting in increased numbers of volunteers, broader cultural diversity of volunteers and visitors, and increased participation in environmental stewardship. | 4.1.1 Maintain existing Preserve programs that provide educational and volunteer stewardship opportunities at the Preserve.  
4.1.2 Evaluate the need to institute additional programs that provide educational and volunteer stewardship opportunities at the Preserve (e.g., biological monitoring, Adopt-an-Acre Program, etc.), and institute those that are feasible.  
4.1.3 Develop and distribute outreach materials to educate a diverse public about the importance of the Preserve, its Partners, and their missions, and citizen participation in environmental stewardship.  
4.1.4 Utilize Volunteer Naturalists to provide education to the public. | 4.1.1 Type, number, and function of educational and volunteer stewardship programs at the CRP.  
4.1.3 Annually compile list to whom the outreach materials were distributed.  
4.1.4 Number and type of education programs provided by volunteers (e.g., guided hikes and paddles, interpretation at Visitor Center, outreach at special events, education to school children). |
<table>
<thead>
<tr>
<th>Education Objectives</th>
<th>Actions</th>
<th>Monitoring elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1.5</td>
<td>Beginning in 2008, host at least two science-related presentations for the general public annually.</td>
<td>4.1.5 Attendance and topics of the science-related programs.</td>
</tr>
<tr>
<td>4.1.6</td>
<td>By 2010, obtain at least one grant to support translation of interpretative signs, brochures, displays, and/or educational/classroom materials into several languages.</td>
<td>4.1.6 Number of grants submitted and to whom submitted. Develop a file of potential funding sources.</td>
</tr>
<tr>
<td>4.1.7</td>
<td>By 2009, update the Preserve’s media distribution list to include bilingual media outlets from a variety of geographic areas, including small towns and the larger cities of Stockton and Sacramento.</td>
<td>4.1.7 Occurrences or mention of the Preserve in the media.</td>
</tr>
</tbody>
</table>

<p>| 4.2 | Educate K–12th and college students, resulting in increased volunteers, broader cultural diversity of volunteers and visitors, and increased participation in environmental stewardship. |  |
| 4.2.1 | By 2009, develop and implement a formalized Cosumnes River Preserve Environmental Education Program based on the institutional model that best fits the Preserve’s needs; including a permanent, sustainable funding source for the Education Program. | 4.2.1 Institutional models assessed and funding sources considered. |
| 4.2.2 | Prior to 2012, evaluate the feasibility of developing and implementing an environmental education center at the Preserve. | 4.2.2 Prior to 2009, feasibility study completed including Partner agreement, costs, and location. Based on results of study, implement funding quest and develop construction plans by 2012. |
| 4.2.3 | Continue Service Learning activities at the Preserve at least at current levels (e.g., provide opportunity for students in local school districts to visit the Preserve at least three times during K–12). | 4.2.3 Number of districts and number of student visits, class grade. |
| 4.2.4 | Improve quality of the field trip experience by lowering the ratio of students to teacher/volunteer. A ratio of 15 students to 1 teacher/volunteer is ideal. | 4.2.4 Ratio of students to teacher/volunteer. |
| 4.2.5 | Update the Preserve’s teaching resources as needed to be consistent with state standards and grade-level specific topics and activities. | 4.2.5 Dates resources updated. |
| 4.2.6 | Annually provide at least four on-site teacher training workshops. | 4.2.6 Number of on-site teacher training workshops. |</p>
<table>
<thead>
<tr>
<th>Education Objectives</th>
<th>Actions</th>
<th>Monitoring elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2.7 Annually provide at least eight off-site teacher trainings.</td>
<td>4.2.7 Number of teacher trainings. Also, document how off-site teacher trainings provide strategies related to teaching science (i.e., salmon and crane workshops), service learning, and youth and community stewardship.</td>
<td></td>
</tr>
<tr>
<td>4.2.8 Increase number of teachers participating in each on-site workshop up to a maximum of 25 teachers per workshop.</td>
<td>4.2.8 Number of teachers participating.</td>
<td></td>
</tr>
<tr>
<td>4.2.9 Develop an education program database to accurately track educational activity at the Preserve.</td>
<td>4.2.9 Database metrics could include data regarding teachers, students, grade levels, field trip days, workshops held, and/or Preserve locations visited.</td>
<td></td>
</tr>
<tr>
<td>4.2.10 Develop and begin implementation of a plan to upgrade existing facilities and/or provide new facilities (e.g., new drinking fountain, bathrooms) as needed to support the educational program by 2009.</td>
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</tr>
<tr>
<td>4.3 Enhance relationships with neighboring communities in order to build awareness and support of the Preserve’s mission and its contribution to those communities.</td>
<td>4.3.1 Participate in local community events on an ongoing basis by hosting exhibit booths, providing literature, leading tours, and/or making presentations to the public at large.</td>
<td>4.3.1 Number and type of outreach and community events.</td>
</tr>
<tr>
<td>4.3.2 Make presentations to City and County leaders (e.g., at public meetings, tours) on an ongoing basis.</td>
<td>4.3.2 Number of presentations made.</td>
<td></td>
</tr>
<tr>
<td>4.3.3 Attend a minimum of two agriculture-related meetings (e.g., Farm Bureau, California Cattlemen’s Assn., California Rice Growers Assn., RCD) per year.</td>
<td>4.4.1 Document the additional outreach materials prepared.</td>
<td></td>
</tr>
<tr>
<td>4.4 Improve the compatibility of adjacent land-use practices with the Preserve’s mission and goals by conducting outreach and building partnerships with neighboring landowners and agricultural leaders.</td>
<td>4.4.2 Annually document the number and type of meetings attended.</td>
<td></td>
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</table>
6 Cultural and Visual Resources

This chapter provides goals, objectives, and actions related to the cultural and visual resources at the Preserve.

6.1 CULTURAL RESOURCES

Sacramento County contains a rich and diverse mix of prehistoric and historic cultural resources. This section provides an overview of the cultural resources within the floodplain and the surrounding watershed within and nearby the Preserve. Five types of cultural and historic resources may be present on the Preserve:

- Paleontological resources
- Prehistoric Era (focuses on Native American resources, specifically Miwok)
- Spanish/Mexican Era
- Early American Era (Gold Rush and farming)
- Modern history of conservation at the Preserve

6.1.1 Paleontological Resources

California has a rich fossil record identified by scientists as “Paleontological resources,” which refer to the fossilized remains of plant and animal life from throughout most of geological history, including the Paleozoic (600–225 million years ago), the Mesozoic (225–70 million years ago), and the Cenozoic (70 million years ago to the present). Fossilized animals found in northern California include mammoths, horses, mastodons, camels, ground sloths, bison, and pronghorn antelope.

A number of geologic formations located in the Central Valley have the potential for containing significant paleontological resources (Windmiller et al. 2002). It is possible that as-yet undiscovered paleontological resources may exist on Preserve properties. This should be further analyzed during the environmental review process for all Preserve-related projects. The professional standards of practice, such as those adopted by SVP’s (Society of Vertebrate Paleontology) Conformable Impact Mitigation Guidelines Committee in 1995, can offer additional guidance for control and mitigation of adverse impacts on paleontological resources.

6.1.2 Pre-historic Era

The Cosumnes River served as a natural boundary for communities of Native Americans, although boundaries fluctuated depending on the varying levels of affability or animosity among neighboring groups. Archeologists generally agree that the Preserve is located in the former territory of the Plains Miwok tribelets who are known to have inhabited river terraces.

An archival record search was conducted during the preparation of the Lower Cosumnes River Watershed Assessment (RBI 2006); 60 documented cultural studies completed for this geographic area in the past 30 years were found. These studies documented 179 known
archeological sites, indicating that the area is extremely sensitive for archeological remains, particularly prehistoric and ethnographic-period Native American sites (RBI 2006).

A variety of site types have been identified within Sacramento County and the Cosumnes River watershed, including village sites with artifacts; housepits; the remains of dance houses, cemeteries, and cry sites; petroglyphs (rock art); quarries where materials for stone tools were collected and sometimes processed; temporary campsites; bedrock milling areas where acorns and other seeds were processed; scatters of artifacts and tool production waste materials; and ceremonial sites with little or no physical remnants (Forbes 1969; City of Elk Grove 2003; Jones & Stokes 2006; EDAW 2006).

A number of Preserve properties contain known pre-historic-era cultural resources and it is possible that as-yet undiscovered cultural resources may also exist. As such, further analysis will be required through the environmental review process for site-specific projects as they are developed. If necessary, this process should offer guidance for control and mitigation of adverse impacts on pre-historic cultural resources.

6.1.3 Spanish/Mexican Era

Although most of the Spanish explorers of the 1600s and 1700s concentrated in areas near the California coast, the Spanish did venture inland in the 1800s. Gabriel Moraga led the first Spanish expedition in 1808 through the San Joaquin and Sacramento Valleys; along the way they explored the Mokelumne, Cosumnes, and American Rivers (Jones & Stokes 2001). The influence of the California Missions and the later Spanish land grants did extend into the Cosumnes watershed.

Settlement in the San Joaquin Valley began with the holders of land grants issued by the Mexican government for agricultural purposes. These land grants ranged in size from 20,000 to 50,000 acres and established the enduring patterns of land use and ownership in the region. Five historic Mexican land grants were located in the vicinity of the Preserve, listed here from north to south: San Juan, Rio de los Americanos, Omochumnes, Sanjon de los Moquelumnes, Cosumnes, and Camp de los Franceses (Beck and Haase 1974, as cited in Jones & Stokes 2001).

6.1.4 Early American Era

The Preserve is located immediately west of the gold fields of the Sierra Nevada foothills, the discovery of which dramatically altered the Miwok people’s history. The Master Plan for the McFarland Living History Ranch (Jones & Stokes 2001) provides a wonderful overview of the local history during the Early American era and interested readers are encouraged to review this document. The following paragraphs provide a brief summary of this information.

Gold was discovered in 1848 and the Cosumnes River was soon inhabited by miners seeking their fortunes. Many of the place names along the upper river are reminiscent of this era:

- Michigan Bar (SRL 468) was an early gold camp on the Cosumnes.
- Cook’s Bar was founded by Dennis Cook, two miles below Michigan Bar.
Sebastopol was a lively camp from 1854 to 1859.
Katesville arose in 1854 and had several stores and saloons.

Today, three State Historical Landmarks associated with the Early American era are located in the general vicinity of the Preserve:

- No. 680 Murphy’s Ranch (Murphy’s Corral): Located near the southwest corner of Grant Line Road and State Route 9, site of the beginning of the United States’ conquest of California.
- No. 657 Grave of Alexander Hamilton: Located in Franklin Cemetery, gravesite of a member of the Lewis and Clark expedition.
- No. 719 Grave of Elitha Cumi Donner Wilder: Located in Elk Grove Masonic Cemetery, gravesite of a Donner party survivor.

The most notable historic structure of this period actively supported by the Preserve Partners is the McFarland-Orr Ranch. John McFarland (1823–1902) came to the Sacramento Valley in 1857 and purchased 3,500 acres of the Chabolla ranch for farming grain. He chose the Galt area for its rich soil, ample water, and its location, which was equidistant from Sacramento to the north and Stockton to the south. Shipping ports in both Sacramento and Stockton were used to send his crops to market. In 1878, McFarland began building a home on his ranch. Other improvements around the homestead included a tank house, carriage house, blacksmith shop, barn and corrals, chicken coop, and three sheds. He also built a bunkhouse for the local Miwok Indians he employed to work his fields (Jones & Stokes 2001). Today, 35 acres of the ranch are managed by the Galt Historical Society.

6.2 REGULATORY FRAMEWORK

No state or local agencies have specific jurisdiction over paleontological resources on private lands such as those owned by TNC and DU. Generally, a paleontological collecting permit is not required to recover fossil remains discovered as a result of construction-related earthmoving on state or private land at a project site. However, a variety of federal, state, and local regulations and policies protect paleontological resources that may be impacted by projects undertaken by state or federal agencies. Additionally, there is a suite of local, state, and federal laws that protect cultural resources associated with the Native American period, and historic resources associated with the Gold Rush and pioneer periods. These include the National Environmental
Policy Act (NEPA), the California Environmental Quality Act (CEQA), the Federal Antiquities Act of 1906, the California Public Resources Code, and the recently enacted federal Paleontological Resources Preservation Act.

6.3 EXISTING CONDITIONS AND USER GROUPS

The programs and facilities at the Preserve that support interpretation of cultural resources are primarily located at the McFarland-Orr Ranch, with an emphasis on the early American Era. The educational program at the McFarland-Orr Ranch is supported by the Preserve’s Partners, and coordinated by the Preserve’s Educational Coordinator and the Galt Area Historical Society, as the primary caretakers of the Ranch. The Prehistoric (Native American) era is represented through exhibits of baskets and other Native American artifacts in the Preserve Visitor Center.

The Galt Historical Society is seeking grants to support continued efforts on the McFarland-Orr Ranch, and the BLM will continue to support cultural resources activities through their staff members in the Folsom Field Office.

6.3.1 Future Opportunities and Challenges

The Master Plan for the McFarland Living History Ranch outlines a variety of planned improvements to historic structures on the ranch. Enhancement of existing education programs are also proposed, which will create a pioneer experience on this “living history” ranch and engender a sense of time and place on a turn-of-the-century pioneer ranch. The agricultural and natural landscapes are an important part of this historic complex.

Additionally, Native American basket weavers have noted that living cultural resources, which are essential to native culture, are jeopardized by modern industrial timber harvest practices, herbicide uses, development, and other types of impacts. Basket weavers today may have to travel great distances to obtain a small amount of the materials necessary for weaving traditional baskets. It is anticipated that basket weavers will continue to seek permission to utilize native vegetation on the Preserve to support traditional basket-making activities.

6.4 VISUAL RESOURCES

6.4.1 Existing Conditions

In this section, visual resources of the Preserve are described in terms of scenic quality, and management goals, objectives, and actions are provided. Scenic quality is the overall impression retained after traveling through an area of land. The Preserve has many special scenic resources that attract visitors, including:

- Distant views of the Sierra Nevada Mountains to the east under clear conditions.
- Distant views of the Coast Ranges (including Mt. Diablo) to the west, under clear conditions.
Close and distant views of natural landscape features, such as riparian forests, stream buffers, wetlands, vernal pool grasslands, and oak trees.

Close and distant views of the Cosumnes and Mokelumne River.

Many opportunities to view a diversity of wildlife, with bird-watching being among the most popular.

Close and distant views of agricultural features, such as field borders, hedgerows, windbreaks, crops, and farm animals.

Wildflower displays.

In their *Sierra Proposed Resource Management Plan* (May 2007), the BLM has utilized a Visual Resource Management (VRM) assessment to rank the Preserve as a visual “Class III,” described as “retain partial character (changes may be evident but subordinate).”

The Preserve is located close to cities that have undergone substantial transformation over the past 20 years from predominantly agricultural/rural characteristics to more urbanized visual characteristics. The Preserve offers a break from the urban landscape by providing an important open space visual resource. For example, the Preserve’s riparian habitat provides textures and colors that are not commonly seen in nearby urban areas. Also, the Preserve’s agricultural lands offer a break from the urban landscape by providing an open visual resource, characterized by no form, line, color, or textural features.

The management of visual resources at the Preserve is important because of the high level of recreational use and other programmatic attention it receives. For example, in 1994 the production staff for an important British Broadcasting Company (BBC) TV production on sandhill cranes considered including footage from the Preserve in their broadcast but decided not to because of the many visual intrusions, such as power lines. Still photography is also an important recreational use at the Preserve, as described earlier in Chapter 5.

Additionally, in January 1996 the National Park Service, administrators of the National Natural Landmarks (NNL) Program, designated a small portion of the riparian and bluff area along the Cosumnes River as an NNL site. The NNL designation includes portions of four properties, one private parcel, and three Preserve properties. The three Preserve properties—the Valensin Pocket, Denier, and Shaw Central properties—are owned by DFG.

During the public workshops for this Management Plan, concern was expressed regarding outdoor nighttime lighting, which could contribute to sky glow, create glare, reduce star-gazing

“Wetlands by Barn” – Photo courtesy of Preserve Photo Library
views, and adversely affect nighttime views of the Preserve area (Harder 2002; Longcore and Rich 2004). Sky glow is the brightening of the night sky due to man-made lighting. Some studies have indicated that artificial light from urban areas can diffuse deep into some of the most remote, wild places (Harder 2004). The Preserve receives nighttime outdoor light emission from three primary sources:

- Lights on Preserve facilities (e.g., the Visitor Center).
- Lights located outside of Preserve boundaries, but within close proximity, including vehicle and overhead lights along I-5.
- Lights from nearby urban areas.

While permanent lighting is necessary for operations during nighttime hours and for security at Preserve facilities, it does have an adverse affect on visitors wishing to view the stars as well as on species that have evolved with specific natural patterns of light and dark (Frank 1988; Longcore and Rich 2004; Moore et al. 2000; Perry and Fisher 2006; Wise and Buchanan 2006).
Goals, Objectives, Actions, and Monitoring

OVERARCHING GOAL II: COMPATIBLE USES IMPROVE STEWARDSHIP OF THE LANDS IN THE COSUMNES RIVER WATERSHED.

Cultural & Visual Resources Sub-Goal 1: Protect cultural resources located on the Preserve.

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<th>Objectives</th>
<th>Actions</th>
<th>Monitoring Elements</th>
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| 1.1 Protect the history of the tribes and early settlers who lived on the parcels that are now part of the Preserve, while promoting an understanding of cultural resources protection. | 1.1.1 Incorporate, as appropriate, information about Native American Indian tribes and early settlers into the Preserve’s interpretive programs and materials as they are updated in the future.  
1.1.2 Provided that it does not adversely affect the Preserve, continue to permit Native Americans physical access to plants to carry out practices such as pruning, digging, sowing, burning, and selective harvesting to create plant growth characteristics conducive to supplying basket-weaving materials.  
1.1.3 Establish a productive relationship with persons or organizations interested in cultural resources protection at the Preserve (e.g., California Basket Weavers Association.) | 1.1.1 Updates to interpretive programs and materials.  
1.1.2 Track number of permits issued.  
1.1.3 Document meeting dates, topics, and participants. |
| 1.2 Continue the McFarland-Orr Ranch program. | 1.2.1 Assist, as needed and able, in the implementation of the Master Plan for the McFarland Living History Ranch by working with Sacramento County and the Galt Historical Society. | 1.2.1 Track assistance provided towards implementation of actions listed in Master Plan for the McFarland Living History Ranch. |
Cultural & Visual Resources Sub-Goal 2: The Preserve’s scenic and visual resources will be protected and enhanced.

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| 2.1 All partners should manage their land in a manner that retains and/or improves the existing visual character of the landscape. Proposed land-management changes should not disrupt the distant and close views. | 2.1.1 Manage BLM lands in the Preserve to achieve VRM Class III classification. The other Partners should follow suit to a similar standard, using their own visual classification system.  
2.1.2 Coordinate with the utility companies and other entities to relocate to underground the existing and future power lines crossing the Preserve. This will enhance the visual resources as well as reduce collision impacts to sandhill crane and other birds.  
2.1.3 As improvements are made to roads and other infrastructure, ask Project proponents not only to reduce the level of impact but also to take steps to improve the aesthetic quality of the project area.  
2.1.4 As new development projects proposed around the Preserve, either in close proximity or in nearby urban areas, undergo environmental review (CEQA), ensure that project proponents consider potential effects on visual resources at the Preserve, including the effects of outdoor nighttime lighting.  
2.1.5 When vegetation is removed, altered, or restored, ensure that it is done in a manner consistent or complementary to the previously existing or historical visual condition (e.g., valley oak trees are replaced with same species or similar, not non-native dissimilar trees). | 2.1.1 BLM VRM Class III classification review.  
2.1.2 Document the removal/relocation of above-ground utilities.  
2.1.3 Document the aesthetic improvements of local road and infrastructure projects.  
2.1.4 Publicly available CEQA documents. Monitor all projects affecting visual resources. |
Objectives | Actions | Monitoring Elements
--- | --- | ---
2.2 Minimize the negative effects of outdoor nighttime lighting. | 2.2.1 Review any new outdoor lighting proposed on the Preserve to ensure it meets the following characteristics:
- High quality design that is consistent with natural setting of Preserve.
- Controlled and shielded to shine down.
- Timed to ensure that there is light is there only when needed.
- The minimum amount (intensity) of light (*i.e.*, wattage), is used to accomplish the light’s purpose.
- Energy efficient.
- Installed only where absolutely necessary. | 2.2.1 Document how the type of lighting purchased meets the characteristics of Action.
**BIBLIOGRAPHY**


