United States Department of the Interior

BUREAU OF LAND MANAGEMENT
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EA Number: CA-180-08-01

Proposed Action: CONTINUED HERBICIDE USE AT COSUMNES RIVER PRESERVE – OCT. 1, 2007 TO OCT. 1, 2010

Location: Southern Sacramento County within portions of six townships: T5N, R4E; T5N, R5E; T5N, R6E; T6N, R4E; T6N, R5E; and T6N, R6E (Most section lines in these townships have not been surveyed. Of the approximately 138,000 acres within these townships, 14,756 acres are lands owned by Preserve partners and included in this EA.) See Map 1 in Appendix A.

1.0 Purpose of and Need for Action

1.1 Need for Action

The U.S. Bureau of Land Management (BLM) proposes to continue to implement a weed management program at the Cosumnes River Preserve (Preserve) that includes the continued use of select herbicides and treatments through the year 2010. The Preserve is a 46,000-acre preserve whose mission includes the protection of California's native biodiversity. Currently, several invasive, non-native plant species such as perennial pepperweed (*Lipidium latifolium*), star thistle (*Centaurea solstitialis*), bristly ox-tongue (*Picris echioides*), and water primrose (*Ludwigia peploides*) are becoming increasingly common at the Preserve. These species are extremely problematic because they tend to spread quickly and displace native plants. This in turn negatively affects the wildlife and other fauna that rely upon those native plants for their existence and the result is an overall loss of native biodiversity.

Several methods of controlling invasive, non-native plants are, or have been, implemented at the Preserve including mowing, disking, burning, grazing, hand removal, and previous herbicide treatments. No single method has been completely effective by itself so a weed management strategy that includes the continued use of select herbicides and treatments is imperative.

Per the Federal Land Policy and Management Act of 1976 and the Federal Noxious Weed Act of 1974, the BLM is required to manage noxious weeds on public lands. The infestation rate and expansion of invasive, non-native plant species at the Preserve is expected to continue and, thus, serious ecological effects will continue to occur. As infestations continue to expand, the cost and complexity of controlling such infestations will increase exponentially, as is evidenced by the continued expansion of star thistle and perennial pepperweed within, and outside, the boundaries of the Preserve, in spite of current control efforts.

The proposed action would be implemented over the next three years in order to protect the existing natural resource values at the Preserve. The proposed action would help to maintain healthy functioning ecosystems at the Preserve; aid in the restoration of native plant communities that have been degraded or displaced by invasive, non-native plant species; maintain established invasive plant

infestations at or below current levels; eradicate new colonies of invasive plant species before they become permanently established at the Preserve; and reduce the risk the of spread and invasion of invasive, non-native plant species to other areas of the Preserve and to neighboring private lands.

1.2 Conformance with Applicable Land Use Plans and Other Guiding Documents

The BLM's *Sierra Planning Area Management Framework Plan (MFP) Amendment and Environmental Assessment* was completed in 1988, a few months before BLM acquired properties and became a partner at the Cosumnes River Preserve. The plan places emphasis on good land management and does not preclude the limited use of herbicides. Goals for several Management Areas addressed by the amendment include "Protect key resource values". This cannot be done without control of invasive exotic plants. Thus, this proposal is in conformance with the MFP.

The Bureau of Land Management has prepared the *Sierra Proposed Resource Management Plan* (PRMP) and *Final Environmental Impact Statement* (FEIS) which is scheduled for final approval in December 2007. The proposed action is in conformance with the proposed RMP and tiers off its FEIS, Alternative D, the Preferred Alternative, which balances environmental protection with public use. The goal for vegetative communities within the entire Folsom Field Office-managed area is to "Promote a healthy and diverse mix of plant communities..." (page 2-19). One objective under that goal is: "Treat vegetation to control invasive species and increase native plant species using early detection, rapid response, and prevention measures." Under the PRMP, one of three actions for vegetative communities states (page2-21):

"Control and eradicate invasive species in important habitat for special status species. Invasive species management...would be designed to prevent or minimize damage to rare biological resources. Herbicide use would only occur...if rare resources can be protected from herbicide damage..."

This EA also tiers to *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States - Programmatic Environmental Impact Statement* (PEIS), USDI BLM 2007. http://www.blm.gov/wo/st/en/prog/more/veg_eis.html. The guidelines and methods approved for vegetation management in that document are incorporated by reference into this document. The relevant environmental analyses in that document are also incorporated here.

2.0 Proposed Action and Alternatives

2.1 Proposed Action

The proposed action is to implement a weed control program at the Cosumnes River Preserve using mowing, disking, grazing, prescribed burning, and hand removal at the appropriate time of year and location as the primary tools for controlling invasive, non-native vegetation. Select herbicides would be used as a secondary treatment to increase the effectiveness of the primary treatment techniques. Five herbicides are proposed for use:

- Glyphosate
- Triclopyr
- Clopyralid
- Chlorsulfuron
- 2,4-D

These products will be applied at the manufacturer's suggested application rates, and methods as specified on the product labels and summarized in the attached pesticide use proposals (PUPs). All relevant BLM standard operating procedures (SOPs) for herbicide treatments outlined in the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States* PEIS identified in Appendix B of the Record of Decision (ROD) will be implemented. The combined total of all treatments of any one product on a given site will not exceed the maximum use rate per year as recommended by manufacturer label. All standard and required safety measures will be implemented prior to, during, and after application of all herbicides.

Maps of proposed treatment areas are included in Appendix A. The proposed herbicides, target pest species, and treatment acres the acreages are shown in Appendix B, Table 1.

Glyphosate is a non-selective, systemic herbicide that may be applied year round using hand held equipment, by ground vehicle, or aerial application. It will be used to control non-native grasses and broadleaf plants. Only glyphosate products that are approved for use in aquatic environments will be used to control water primrose. Less than 250 acres per year will be treated with glyphosate products.

Triclopyr is a selective systemic herbicide that may be applied February though December undiluted as a cut stump, basal bark, or girdle treatment on exotic tree species. It can be applied using handheld equipment, ground vehicles, or by aerial application to control Himalayan blackberry (*Rubus armeniacus*) and other broadleaf plants. Less than 250 acres per year will be treated with triclopyr products.

Clopyralid is a selective herbicide that may be applied using hand held equipment or ground vehicle usually January through June. It will be primarily used to control thistle species. Clopyralid may be used along with other products to control broadleaf plants on native grass plantings. Less than 50 acres per year will be treated.

Chlorsulfuron, is a selective systemic herbicide that may be applied by hand held equipment usually April through September for annual and perennial broadleaf weed control. The target species is perennial pepperweed and other broadleaf plants in native grass plantings. Less than 50 acres per year will be treated.

2,4-D is a selective broadleaf herbicide that will be applied by hand held equipment, ground vehicle or aerial application usually March through October primarily to control water hyacinth (*Eichhornia crassipes*) infestations but will also be used to control other non-native, invasive broadleaf species such as bristly ox tongue. An average of less than 50 acres per year will be treated. Because 2,4-D is slightly to moderately toxic to birds and toxic to some aquatic organisms 2,4-D will only be used when other herbicides are not effective.

2.2 Project Design Features

- All mitigation measures for glyphosate, triclopyr, clopyralid, chlorsulfuron, and 2,4-D outlined in the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Final EIS* (USDI BLM 2007) will be implemented.

- Herbicides will be applied at the lowest effective rate, per the manufacturer's label.

- Herbicide treatments will be used in conjunction with restoration, when practical, to reduce the likelihood of weed expansion or colonization. For example, native grasses may be planted after an area is treated for star thistle.

- Depending on a site-specific analysis, all new invasive species may be chemically treated. Populations or sites of less than 25 plants will first be controlled via mechanical methods, as previously described, and will only be chemically treated as a last resort, with the exception of new invading perennial pepperweed, and Himalaya blackberry sites where mechanical methods are not effective.

- Herbicides will be applied directly to target weeds using hand held equipment, wick applications, cut stem, or by basal bark treatment on all except the largest sites where ground vehicle boom sprayers or aerial application may be used.

- Where weeds compete with desired native grasses, chlorsulfuron, clopyralid, triclopyr and 2,4-D may be used because these herbicides only affect broadleaf plants.

- Herbicide application will not occur when: 1) wind speed exceeds five miles per hour; 2) recommended maximum air temperatures are exceeded; or 3) when precipitation is expected within 24 hours.

- Managed wetland areas adjacent to sites that require treatment using herbicides not approved for aquatic use will be dewatered two weeks prior to application and remain dewatered for 45 days following application unless the manufacturer's recommendations specify otherwise.

- Hand held equipment will be used when applying chlorsulfuron or ester formulations of triclopyr on sites within 50 feet of streams, open water, wetlands or ditches with standing water. Sites with soils exhibiting very rapid infiltration and excessive drainage will not be treated with herbicides that have a high potential for movement.

- To reduce the impacts of off-site drift to typical non-target terrestrial plant species, a 900 foot buffer zone will be established to protect riparian vegetation in salmonid habitat when applying chlorsulfuron.

- Glyphosate and salt formulations of triclopyr may be used in riparian and wetland areas if site conditions (slope, soil characteristics, etc.) indicate that the risk of off-site movement is low. Hand held equipment, basal bark or cut-stump applications will be used as necessary in riparian and wetland areas to eliminate chances for soil and water contamination.

- All herbicide applications will be coupled with manual control methods. For example, star thistle will be mowed prior to the flowering stage and the site may be sprayed if a significant number of plants continue to persist. Additionally, if it is not possible to time manual control methods when they would be most effective (*e.g.*, rainy season when equipment cannot be used), chemical applications may be used in place of the manual control methods at some locations.

- Documentation must clearly demonstrate that manual treatments in combination with herbicide applications are achieving a high degree of effectiveness in reducing weed densities over the three-year implementation period (as demonstrated by our monitoring data).

- All populations of special status plant species within a treatment site will be identified and avoided during treatment operations.

- Herbicide applications in areas where threatened, endangered, or sensitive species are known to exist will be in compliance with all applicable biological opinions issued by the U.S. Fish and Wildlife Service and/or California Department of Fish and Game.

- The public will be notified via signs when treatments are proposed for public areas of the Preserve. Signing will be in accordance with the manufacturer's instructions on the product label.

- Herbicide transport, mixing and use will be governed by:
  1) Carry only enough herbicide daily to cover proposed treatment sites for that day;

  2) Mix only the amount of solution needed to complete daily treatments;

  3) Herbicide containers must be secured and prevented from tipping during transport;

  4) Emergency spill equipment must be on hand to adequately deal with the amount of herbicide concentrate being transported;

  5) Spill plans and protocols are handled by a certified pesticide applicator on staff and will be developed before any proposed treatment is carried out. This information will be available in every treatment vehicle and to all staff that are assisting in herbicide applications;

  6) All staff and volunteer safety equipment and regulations will be used and followed as per the manufacturer's labeled directions, Material Safety Data Sheets, BLM guidelines, and all other applicable guidelines and regulations;

  7) Materials Safety Data Sheets covering each herbicide will be available in the Preserve's MSDS binders located at the Visitor center, Farm Center, and Barn. Copies of the applicable MSDS's will be made available for transport in every treatment vehicle and;

  8) All herbicide treatments will be properly documented by the certified pesticide applicator and all required documentation will be submitted to the appropriate agencies.

2.3 No Action

Herbicides would not be used to control invasive plants at the Cosumnes River Preserve and habitat management strategies would remain limited to the currently employed non-herbicide practices.

2.4 Alternatives Considered but Eliminated from Detailed Analysis

A) No treatment of weed dominated areas at the Preserve. Under this alternative there would be no treatment of invasive non-native plants. Herbicides, burning, livestock grazing, and mechanical methods of control would not be used. This alternative would allow invasive, non-native plants to persist where infestations currently occur and allow new infestations to become established. The primary method of control would be natural processes such as native plants and seasonal flooding. This alternative would not meet the purpose and need of protecting native biodiversity and habitat.

B) Use only cultural and biological control methods. Under this alternative only cultural and biological methods such as livestock grazing or release of non-native insects or pathogens to control invasive, non-native weeds would be used (*e.g., Eustenopus villosus* weevils to control star thistle). Disadvantages to the release of biological control agents include high initial upfront costs, a prohibitive permitting process, uncertainty of effectiveness and the potential for indirect ecological effects. In many cases grazing treatments on areas with perennial pepperweed infestations may accelerate the rate of spread by removing desired plants that compete with perennial pepperweed. Plants such as pepperweed that benefit by disturbance or spread by rhizome and/or vegetative propagation would continue to spread and displace native and desirable plant species. This alternative

was eliminated because these control methods alone will not be effective, may have indirect ecological effects, would not control the spread of most invasive species, and could adversely impact land health.

3.0 Affected Environment

Soils

Preserve lands host a variety of soil types ranging from clay hardpan to sandy loam. The San Joaquin, Columbia-Cosumnes, Egbert-Valpac, Dierssen, and Sailboat-Scribner-Cosumnes soil series are in the project area. The primary soil types are the Columbia-Cosumnes and San Joaquin soils. The following information is from the *Soil Survey of Sacramento County, California* (USDA 1985).

The Sailboat-Scribner-Cosumnes soil series is found on natural levees, the edges of backswamps, channels and sloughs in the Delta area, and low flood plains adjacent to the Sacramento River. Sailboat soils are found on natural levees on low flood plains, are very deep and somewhat poorly drained; typically have a silt loam surface layer and underlying material comprised of stratified clay loam and loam. Scribner soils are on the edges of backswamps, are very deep and poorly drained, typically have a surface layer of clay loam and underlying material comprised of stratified clay loam and sandy clay loam. Cosumnes soils are found on low flood plains, are very deep and somewhat poorly drained soils; typically have a surface layer of silt loam and underlying material comprised of stratified silty clay loam and clay.

The Egbert-Valpac soil series is found on high flood plains, backswamps, and on the natural levees of high flood plains, primarily adjacent to the Sacramento River in the central part of the county and the northern part of the Delta area. Egbert soils are found on high flood plains and backswamps, are very deep, poorly drained, and typically have a surface layer of clay underlain by stratified clay loam and sandy clay loam. Valpac soils are found on natural levees of high flood plains, are very deep, somewhat poorly drained soils, and typically have a surface layer of loam underlain by stratified sandy loam to clay loam.

The Columbia-Cosumnes soil series is on narrow, low flood plains along the Cosumnes River and other streams. Columbia soils on narrow, low flood plains, are very deep, and typically have a surface layer of silt loam that are underlain by stratified sandy loam, silt loam, and loam. Some Columbia soils are underlain by clay. Cosumnes soils are on narrow low flood plains commonly downstream of the Columbia soils with a composition as above.

The Dierssen soil series is on the rims of basins on the west side of the county. Dierssen soils are moderately deep or deep, and typically have a sandy clay loam surface layer. The subsoil is calcareous clay underlain by a hardpan at a depth of 20-45 inches with a perched water table at a depth of 6-36 inches in the winter and early spring.

The San Joaquin soil series is found on low terraces in the western and central parts of Sacramento County. San Joaquin soils are moderately deep, moderately well drained soils and typically have surface layers of silt loam. The subsoil is a claypan underlain by a cemented hardpan at a depth of 20-40 inches.

Vegetation

The Cosumnes River Preserve protects a rich diversity of plant species: 442 species have been identified, of which 279 (63%) are California natives. Habitat types found at the Cosumnes River Preserve are described below. These descriptions follow the California Department of Fish and Game's Wildlife Habitat Relationship (CWHR) vegetation types.

Many of the areas bordering the river and sloughs on the Preserve are valley foothill riparian areas. Most trees are winter deciduous with the dominant species consisting of valley oak (*Quercus lobata*) and cottonwood (*Populus deltoids*). Subcanopy trees are Oregon ash (*Fraxinus latifolia*), box elder (*Acer negundo*), and white alder (*Alnus rhombifolia*). California wild grape (*Vitis californica*) frequently festoons both trees and shrubs, and provides 30 to 50% of the ground cover. Typical understory shrub layer plants include wild rose (*Rosa acicularis*), California blackberry (*Rubus urinus*), blue elderberry (*Sambucus cerulea*), poison oak (*Toxicodendron diversilobum*), button bush (*Cephalanthus occidentalis*), and willows (Salix spp.). Herbaceous vegetation constitutes about one percent of the cover. Herbs include sedges (*Carex spp.*), rushes (*Eleocharis spp.*), grasses, miner's lettuce (*Claytonia perfoliata*), Douglas sagewort (*Artemisia douglasiana*), poison hemlock (*Conium maculatum*), and stinging nettle (*Urtica dioica*).

The California Natural Diversity Data Base (CNDDB) identifies two special status plant communities along the Cosumnes River riparian zone. Great Valley Oak Riparian Forest and Great Valley Mixed Riparian Forest. There are four known special-status plant species in the Preserve that are associated with vernal pools, marshes, or slough habitats including Dwarf downingia (*Downingia pusilla*), Rose-mallow (*Hibiscus lasiocarpus*), Legenere (*Legenere limosa*), and Sandford's arrowhead (*Sagittaria sanfordii*).

Valley oak woodlands are comprised primarily of valley oaks interspersed throughout an open grassland community. Other associated tree species include California sycamore (*Platanus racemosa*) and box elder. The shrub understory is often sparse and consists of such species as poison oak and California blackberry. Various annual grasses such as brome (*Bromus spp.*), wild oats (*Avena sativa*), barley (*Hordeum vulgare*), and ryegrasses (*Lolium spp.*) as well as native grasses such as creeping wild rye (*Leymus triticoides*), blue wild rye (*Elymus glaucus*), meadow barley (*Hordeum brachyantherum*)and purple needlegrass (*Nessella pulchra*) dominate the ground cover.

Blue oak woodland habitats exist only at the far eastern edges of the Preserve and generally have an overstory of scattered trees within an open grassland community. Shrubs are often present but rarely extensive, often occurring on rock outcrops. The typical understory is composed of an extension of Annual Grassland vegetation. Common tree species include interior live oak (*Quercus wislizeni*) and Valley oak. The ground cover is comprised mainly of annuals such as brome grass, wild oats, foxtail (*Hordeum jubatum*), needlegrass, filaree (*Erodium spp.*), fiddleneck (*Amsinckia spp.*) and others.

Vast annual grassland habitat is found on the Preserve. These habitats are open grasslands composed primarily of annual plant species including wild oats, soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), wild barley, and annual ryegrass. The native California poppy (*Eschscholzia californica*) is also found in this habitat. Vernal pools, which support downingia, meadowfoam (*Limnanthes spp.*), and other native plant species, are found in small depressions within the annual grassland underlain by a hardpan or claypan layer.

Fresh emergent wetlands are perennial wetlands that depend on year-round water availability. The marshes are typically characterized by species such as common cattail (*Typha latifolia*), bulrush (*Scirpus spp.*), arrowhead (*Sagittaria spp.*), and the highly invasive, non-native water primrose.

Wildlife

The Preserve hosts a rich and wide variety of wildlife species that inhabit wetland, upland, vernal pool, grassland, and riparian areas of the Preserve. There are 295 species known to occur at the Preserve, including 247 species of birds, 30 species of mammals, and 18 species of amphibians and reptiles.

Many of the species that commonly occur at the Preserve are not specifically managed for as part of the Preserve's overall management strategy. However, these species benefit from habitat that is created, restored or preserved as part of the Preserve's projects and continued management. These species include black tailed deer (*Odocoileus hemionus)*, river otter (*Lutra canadensis*), California vole (*Microtus californicus*), beaver (*Castor canadensis*), American bittern (*Botaurus lentiginosus*), northern pintail (*Anas acuta*), redwing blackbird (*Agelaius phoeniceus*), western fence lizard (*Sceloporus occidentalis*), common kingsnake (*Lampropeltis getulus*), and desert cottontail (*Sylvilagus auduboni*).

The lower Cosumnes River watershed hosts a variety of special-status wildlife species including those wildlife species that have been designated as endangered, threatened, or species of special concern, or is proposed for listing (*i.e.*, candidate species) under the Federal Endangered Species Act (FESA) or California Endangered Species Act (CESA). Special-status species known to occur on the Cosumnes River Preserve 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 canadenis tabida)*, and Swainson's hawk (*Buteo swainsoni*).

Hydrology

The Cosumnes River watershed covers approximately 940 square miles (approximately 600,000 acres), from its headwaters in the Sierra Nevada to its confluence with the Mokelumne River in the Sacramento-San Joaquin Delta. The river remains as the only river flowing to the Central Valley in California with out major dams.

The river segment from Highway 16 down to the tidal floodplains consists of a continuum of highly incised meandering channel lined with agricultural levees and limited riparian vegetation in the upper reaches. The river is less incised in the lower reaches where discontinuous low levees and riparian forests flank the channel. The tidal floodplain area includes the portion of the Cosumnes River from the confluence with the Mokelumne River, upstream to the limits of tidal influence near Twin Cities Road bridge. Much of the tidally influenced floodplain is farm fields protected by low levees that do not prevent seasonal flooding. In addition to the mainstem Cosumnes River, several tributaries drain into the lower watershed: Deer Creek, Badger Creek, and Laguna Creek.

Winter storms account for about 80% of the annual precipitation in the Cosumnes River watershed. The Cosumnes River watershed typically does not receive significant amounts of snowfall because of its low peak elevation and, therefore, most floods are caused by intense rainfall events.

Groundwater is typically found in distinct shallow and deep aquifer zones ranging in depth between

200 and 2,000 feet below the ground surface level. Measured groundwater levels in the basin have shown a regional decrease in groundwater elevations characterized by "cones of depression," formed north and south of the Cosumnes River, with groundwater levels as low as 80 feet below mean sea level. Historically, the input of groundwater to the river channel kept the channel and associated wetland areas wet throughout the summer for the entire length of the river. Over the past 60 years, however, groundwater pumping has reduced groundwater levels in the valley segment, leading to a decline of groundwater input to the river.

Fisheries

Thirty-eight fish species are found within or migrate through the Cosumnes River Preserve including a diverse variety of native and non-native species. Several species have been designated as special status species by the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service, and/or California Department of Fish and Game due to concern over their declining numbers. These species include fall-run chinook salmon (*Oncorhynchus tshawytscha*), steelhead (*Oncorhynchus mykiss*), delta smelt (*Hypomesus transpacificus*), Sacramento splittail (*Pogonichthys macrolepidotus*), and Sacramento perch (*Archoplites interruptus*). Two special-status species, hardhead (*Mylopharodon conocephalus*), and speckled dace (*Rhinichthys osculus*), have likely been extirpated from the Cosumnes River. The remaining 26 (65%) fish species have been introduced to California water bodies, either intentionally or unintentionally.

Recreation

In general, passive recreational activities, such as bird watching, photography, nature study, hiking and paddling, are encouraged on the Preserve. Designated areas have been set aside for limited hunting. Fishing is only allowed from a boat in waterways that are part of the public trust.

The Visitor Center is the focal point for public access and environmental education at the Preserve. The Wetlands Walk Trail is a one-mile, universally accessible trail that offers visitors an up-close experience into lush marshes, wetland plants, water birds, insects, and amphibians. The River Walk Trail is a 3-mile round-trip trail that winds through a variety of habitats, including buttonbush thickets, valley oak riparian forest, tule marsh, and valley oak savannah along the Cosumnes River. The Cosumnes River Preserve also offers non-motorized boat access via the Visitor Center put in ramp and floating dock as well as a self-guided driving tour throughout the public road system.

Visual Resources

The Cosumnes River Preserve is a major visual resource for the south Sacramento County area from a variety of perspectives. From a distance the distinct forested landscape appears as a natural wooded area in marked contrast to the surrounding agricultural and urban landscapes. Visitors experience a sense of visual enclosure from trails that traverse natural areas and especially from within the forests along the River Walk trail.

Cultural

There are nearly 180 archaeological sites within the Cosumnes River floodplain that are recorded in the California Historical Resources Information System. Of these, almost 160 are prehistoric/ethnographic sites of Native American origin; 18 date to the historic period (including both archaeological remains and standing structures); and 3 are dual-component prehistoric/historic-period sites. There is one registered national historic landmark, the McFarland Ranch, as well as parts of the

forested areas that are registered as national natural landmarks.

Currently two Native American tribes come to the Preserve to collect native plant materials for ceremonial headdress, basketry and traditional building materials for structures.

Fire/fuels

There is a wide variety of fuel types and structure at the Preserve which include grass, shrub and tree species. The Preserve has routinely used prescribed fire for weed control and to reduce vegetation density. In addition, wildfires occur annually on Preserve lands caused by a variety of sources ranging from vehicle-caused fires to bird strikes at power lines. Fuels include down, standing dry, and live native and non-native grasses, forbs, shrubs and trees. A variety of exotic trees such as fig, tree of heaven, Osage orange, honey locust, black locust, and cherry plum which have been killed by previous eradication efforts also serve as standing dry or ladder fuels.

Social/agricultural

The current landscape of Central Valley, including the lower Cosumnes watershed, consists largely of agriculture, especially intensively managed irrigated crops. However, the Central Valley is one of California's more rapidly growing regions, gaining nearly two million more residents in the 1980's and 90's. In the last several years the Sacramento region has experienced explosive growth, with urban expansion driving further south and east. The City of Elk Grove is planning to expand beyond the existing Urban Service Boundary to as far south as Eschinger Road. The City of Galt is located to the east of the Preserve. The city has been working on a General Plan update with ideas of expanding northward, however, they have made few inroads with the agricultural community on this issue. Thornton is an unincorporated town located south of the Preserve in San Joaquin County. Like other towns in the area, there is mounting pressure for new growth and development and land speculation in the area has increased.

The Preserve has an active education program and is currently a field trip destination for over 10,000 K-12 students annually. In addition 3000 K-12 students are involved in service learning projects, and more than 10 higher education field trips are attended by local and visiting colleges annually (J. Durand, pers. com. 2007). In addition the Consumes River Preserve is used by graduate and undergraduate college students for research projects. The Preserve also has an active Volunteer program with several sub groups and a total of over 120 volunteers.

Farming occurs on over 13,000 acres on the Cosumnes River Preserve, and approximately 2,000 acres of additional farmland have been protected through conservation easements. Of the total 13,000 acres in agricultural production, approximately 10,000 acres are managed to be compatible with wildlife. Grazing currently occurs on nearly 3,000 acres of annual grasslands in the Preserve. In addition, well over 15,000 acres of vernal pool grassland are grazed on lands held under a conservation easement.

Prime/Unique Farmland

Currently approximately 2,200 acres of prime farmland exists on the Preserve, primarily in the organic rice operation and on the Bean Ranch (aka McCormack-Williamson Tract), in the form of irrigated cropland. The *Soil Survey of Sacramento County, California* (USDA 1985) identifies Bruella sandy loam, Clear Lake clay, Columbia sandy loam, Columbia silt loam, Cosumnes, silt loam, Dierssen clay loam and Egbert clay as prime farmland where irrigated.

4.0 Environmental Effects

The following critical elements have been considered for this environmental assessment, and unless specifically mention later in this chapter, have been determined to be unaffected by the proposal: air quality, areas of critical environmental concern, hazardous waste, wild and scenic rivers, wilderness, and environmental justices.

4.1 Impacts of the Proposed Action and Alternatives

Soils

Due to the short half-life of the proposed herbicides, relatively rapid breakdown into inert components, and as a result of the minimization and avoidance measures outlined in the proposed action, no long term negative impacts caused by herbicide use are anticipated to the soils found on the Preserve. Over the long term, treatments that remove invasive vegetation, reduce fuels, and restore native plants should enhance soil quality on public lands (USDI BLM 2007).

Impacts to soil compaction are not expected because areas requiring treatment by ground vehicle are primarily access roads and levees and treatments at sites that are off road will be carried out using hand held or ATV drawn equipment or by aerial application.

Herbicides may indirectly affect soil through plant removal resulting in changes in physical and biological soil parameters. As vegetation is removed, there is less plant material to intercept rainfall and less to contribute organic material to the soil. Loss of plant material and organic matter can increase the risk of soil susceptibility to erosion. However, the risk for increased erosion would be temporary, lasting only until vegetation was reestablished. If herbicide treatments lead to revegetation with native plants, soil stability may be improved relative to sites dominated by invasive plants. (PEIS page 4-18)

Glyphosate products are non-selective, systemic herbicides that bind strongly to soil particles and have a short average half-life in the soil of 47 days (Tu *et al.* 2001). In water glyphosate is rapidly dissipated through absorption to suspended and bottom sediments and has a half-life of 12 days to ten weeks. (Tu *et al.* 2001) Glyphosate is biodegraded by soil organisms, and many species of soil microorganisms can use glyphosate as a carbon source (SERA 2003a). Single or repeated applications of gyphosate at the recommended field concentration had little effect on microbial communities (PEIS page 4-19).

Triclopyr, products are selective systemic herbicides that have a short average half-life in soil of 30 days (Tu *et al.* 2001). In soils, both salt and ester formulations of triclopyr degrade to the parent compound, triclopyr acid. Microbial metabolism accounts for a significant percentage of triclopyr degradation in soils (SERA 2003c). Offsite movement through surface or subsurface runoff is a possibility with triclopyr acid, as it is relatively persistent and has only moderate rates of adsorption to soil particles (Tu *et al.* 2001).

Clopyralid is a selective herbicide with a short average half-life in soil of 40 days and is degraded rapidly in soil; however it does not bind to soil and has the potential to be highly mobile (Tu *et al.* 2001).

Chlorsulfuron is a selective systemic herbicide with a relatively short average half-life of 40 days. Chlorsulfuron appears to be only mildly toxic to terrestrial organisms, and effects are generally transient (SERA 2004a) even though bacteria have an enzyme that is functionally equivalent to the herbicide target enzyme in plants.

2,4-D is a selective broadleaf herbicide with a very short average half-life of 10 days in soil and less than 10 days in water (Tu *et al.* 2001). Studies have generally shown that at typical application rates, no effect from 2,4-D can be detected on soil macroorganisms (Eijsackers and Van Der Drift 1976). Furthermore, most sutudies of the effects of 2,4-D on microorganisms concluded that the quantity of 2,4-D reaching the soil from typical applications would would probably not have a serious negative effect on most soil microorganisms (Bovey 2001).

Due to the potential for movement or persistence in some soils, clopyralid, chlorsulfuron, and ester formulations of triclopyr will not be applied to areas where offsite movement is likely and non-target vegetation or water resources are at risk.

Vegetation

When properly administered and as a result of minimization and avoidance measures outlined in the proposed action, no negative impacts are expected to occur to the four known special status plant species or the 10 other special status plant species that potentially occur on the Preserve.

No negative impacts to the two special status plant communities identified by the CNDD which include the Great Valley Oak Riparian Forest and Great Valley Mixed Riparian Forrest are expected because the native plants will not be targeted.

The use of herbicides would benefit plant communities with weed infestations by decreasing the growth, seed production, and competitiveness of target plants, thereby releasing native species from competitive pressure (e.g. water, nutrient, and space availability) and aiding in the reestablishment of native species (PEIS pages 4-47 and 4-48).

Wildlife

Impacts to wildlife species may include a temporary reduction in the amount of escape cover from predators. Populations of Himalayan blackberry and yellow star thistle that provide dense spiny refuge for animals like desert cottontail, California quail (*Callipepa californica*), California voles, and other prey species would temporarily be reduced until native vegetation could be re-established.

When the products proposed for use are properly administered and as a result of minimization and avoidance measures outlined in the proposed action no negative impacts to wildlife are expected because negative impacts to habitat components- soil, water and native vegetation are expected to be temporary and future conditions will be improved.

Clopyralid can cause severe eye damage if splashed into the eyes during application, but otherwise is non-toxic to fish, birds, mammals, and other animals (Tu *et al.* 2001). Salt formulations of triclopyr can cause sever irreversible eye damage (per label warning). Both salt and ester formulations of triclopyr are relatively non-toxic to terrestrial vertebrates and invertebrates. The ester formulation, however can be extremely toxic to fish and aquatic invertebrates (Tu *et al.* 2001).
2,4-D is considered to be slightly to moderately toxic to mammals and birds and can cause sever eye damage during application. Some formulations are highly toxic to fish (EXTOXNET 1996).

Most wildlife will benefit from weed control on the Preserve by improving habitat conditions over the long term. Herbivores will benefit from the reduction of terrestrial weeds that are less palatable or unpalatable and compete with the native and desirable species. The reduction of water primrose is likely to improve habitat conditions for giant garter snakes which rely primarily on an aquatic prey base of small fish, tadpoles, frogs and minnows. When stream or lake habitats are completely covered by water primrose and water is no longer available due to absorption and evapotranspiration, that habitat becomes unsuitable for giant garter snakes. Foraging habitat for raptors, including Swainson's hawks, may also be improved by yellow starthistle and perennial pepperweed removal by providing better access to prey species on the ground. Invasive non-native weed control would have beneficial effect on overall biodiversity by reducing competition for space water and sunlight for native plant species that generally provide better habitat for wildlife.

Hydrology

As a result of the proposed action no negative impacts to hydrology are expected because only herbicides approved for aquatic use will be used on aquatic vegetation. Herbicides not approved for aquatic use will only be used near open water if potential for offsite movement is low and per BLM recommendation. The proposed action would have a positive overall effect on the hydrology by removing or substantially reducing invasive aquatic weed species that alter flows and absorb and transpire water resources.

Fisheries

When properly administered and as a result of minimization and avoidance measures outlined in the proposed action, no negative impacts to fisheries are likely to occur. Only chemicals considered to be non-toxic to fish and aquatic organisms and that are approved for use will be used to control vegetation in aquatic environments. Application of all products that are considered to be toxic to fish or have the potential to be harmful to aquatic resources will be applied outside recommended buffer zones or in a manner that minimizes or eliminates potential for contamination of fish habitat. In addition products that are toxic to fish or aquatic environments and are highly mobile will not be used when there is a high potential for offsite movement into fish habitat.

Positive impacts to native fish species are likely to occur because non-native vegetation would be replaced by native plant species for rearing. Improvements to habitat conditions in floodplain environments that exist during flood events which serve as juvenile salmon and delta smelt rearing habitat would be likely.

Recreation

The reduction of noxious weed species along public access trails, at the boat launch, and around the Visitor Center would improve the visitor experience and provide enhanced recreational opportunity by providing better access and viewing opportunities at the public areas. Additionally, visitor experiences also would be enhanced by availability of native plant species along roads and trails. Short term impacts from the use of herbicides would include temporary trail closures but this is not expected to be significant.

Visual Resources

Short term impacts to visual resources are likely to occur as treated vegetation wither and die. The short term impacts will provide opportunities for public education about invasive weeds and long term benefits of improved visual resources. Visual resources on the Preserve would improve because of the reduction in ugly exotic or noxious weed species. Native and desirable species are expected to fill in and persist where noxious exotics were removed, which would restore the visual landscape to a natural setting.

Cultural Resources

Herbicide use would have no effect on the prehistoric Native American sites because of the subsurface nature of the sites. In addition, identified sites will be avoided with vehicles and will only be subject to the use of hand held equipment. As proposed, herbicide use at the Preserve would have minimal or no effect on the archeological component of the cultural resources. Use of herbicides at the 18 sites from the historic period would be positively affected by reduced fuel loads around structures. The parts of the forested areas designated as national natural landmarks would also be positively impacted by removal of non-native invasive trees and shrubs that compete for resources with native species.

Fire/Fuels

A short term increase of fuels would likely occur after treatment of target vegetation such as Himalayan blackberry and yellow starthistle because of the residual dry fuels left after treatment. Other than the short term impacts to light fuels at treated sites, herbicide use would have little or no considerable effect on fires or fuels because the sources of ignition would continue to be present and the non-native weed fuels would be replaced by native vegetation or annual grasses. Although, a slight reduction in fire hazard could occur as a result of replacing short-lived, non-native plant species with native species that tend to stay greener longer into the summer dry season.

A slight increase in the amount of larger fuels and standing dry fuels from dead exotic tree species killed by treatment would occur. However, the replacement of tall non-native weeds like Himalayan blackberry with shorter native plant species or desirable grasses would ultimately lead to an overall reduction in amount and height of ladder fuels that could carry fire into tree canopies.

Social/agricultural

The removal of noxious and invasive weeds may further improve relationships with the neighboring cities of Galt and Elk Grove by improving long term visual resources, recreational opportunities and the educational experience, as well as by reducing the risk of weed spread to adjacent privately owned land and fostering good relations between the Preserve and its neighbors.

Surrounding farmlands (including leased lands) would be positively affected by noxious weed removal because the risk of weed spread to adjacent lands would be reduced or eliminated. In addition rangelands on the Preserve that are leased to local ranchers would have improved forage quality and palatability with fewer invasive species. Weed control would also have beneficial effects on other agricultural production on the Preserve, because as weed infestation decreased, quality and quantity of agricultural products produced would be likely to increase.

Prime/Unique Farmland

Due to minimization and avoidance measures outlined in the proposed action no adverse impacts to prime or unique farmland is expected. Because of the low toxicity of the products proposed for use and no use of herbicides within the organic rice operation no negative impacts to soil microorganisms on prime farmland is expected.

4.2 Impacts of the No Action Alternative

Soils

Under the no action alternative negative impacts to Preserve soils are likely. Noxious weeds and other invasive vegetation can impact soil function and reduce soil biodiversity. Sites infested with weeds often have more extreme soil temperatures that can alter soil moisture regimes (PEIS page 4-13).

Under the no action alternative weed infestations would continue to spread and displace native plant species. Without the use of herbicides, it is likely that invasive plants would continue to spread rapidly, resulting in dramatic and potentially irreversible effects on soil quality through changes in organic matter content, diversity and abundance of soil organisms, and nutrient and water availability (PEIS page 4-23). Overall native biodiversity would be negatively impacted by the spread of invasive non-native weed species because non-native plants generally out-compete native species for resources.

Wildlife

Wildlife habitat would be adversely impacted due to the continued spread of non-native invasive species that displace native or desirable plants that provide high quality habitat.

Hydrology

Aquatic weeds will continue to spread depleting surface water resources as they absorb and transpire water through respiration. If water primrose, which cannot be treated by mechanical methods, is left unchecked, it will cover most of the surface of permanent water thereby degrading habitat quality or eliminating it completely. In addition aquatic weeds will continue to reduce or impede water flow throughout the Preserve.

Fisheries

Sites that have large monocultures of water primrose and other aquatic weeds may negatively impact fisheries as aquatic weeds spread or choke out water bodies that serve as open water habitat. Non-native invasive weed species would continue to spread in floodplain habitats displacing native plant species that are used by native fish.

Recreation and Visual Resources

The Preserve trail system and boat launch sites may be negatively impacted because the weeds that hang over and encroach onto trails make access more difficult. Tall weed species would create visual barriers to high quality wildlife viewing opportunities along the trails and driving tour. Monocultures of noxious weeds and/or mixed weed patches would persist and spread which would degrade the scenic value of the Preserve.

Cultural Resources

Under the no action alternative it is unlikely that the prehistoric sites on the preserve would be impacted. Archeological sites that have standing structures would be at increased risk of damage or loss by fire because of the highly combustible light fuels formed by non-native, invasive species that build up near those sites. Adverse impacts are likely to occur to native vegetation collection sites as invasive weeds displace the native plants used by Native Americans.

Fire/fuels

Under the no action alternative, the frequency of fire on the Preserve will not be affected. Fuels however, are likely to have more of an adverse impact on the Preserve as the amount and height of fuels created by invasive weed species increase, which in turn will increase the intensity of the fires and capacity for fires to carry into the tree canopies.

Social/agricultural

If no action is taken to control non-native invasive weed species, relationships with adjacent land owners, neighboring cities, and education programs are likely to be negatively affected. The Preserve's image and reputation as a pioneer in ecologically sound restoration design would be damaged. Agricultural production and quality would decline as noxious invasive weeds became more dominant in crops and rangeland.

Prime/Unique Farmland

Prime or unique farmlands may be negatively impacted because invasive weeds would continue to spread or colonize on properties that are identified as having prime farmland. Other potential adverse impacts include wind erosion and soil compaction from increased mechanical removal efforts.

4.3 Cumulative Impacts

A) Proposed Action

Cumulative impacts from the Proposed Action combined with other herbicide applications within the Cosumnes River watershed are expected to be negligible. A short term maximum increase of approximately 1562 pounds active ingredient could be added to the environment; however, due to the relatively short half lives of the proposed products (generally less than 40 days), breakdown into inert components, and low potential for offsite movement, no adverse cumulative impacts to soils or water quality are expected. By comparison the Department of Pesticide Regulation (DPR) reports that in 2005 Sacramento County alone reported applying pesticides totaling 3,887,613 pounds of active ingredient (DPR 2007). Over time non-native plants will be controlled or eradicated from Preserve properties and general habitat conditions for wildlife within the lower watershed would improve.

As a result of the proposed action some individual plants and animals may be adversely impacted temporarily, however no adverse cumulative impacts are expected to plant and animal populations. Stream flow regimes and water quality can be affected by modifications to watershed processes that occur as a result of the use of herbicides to control or remove invasive aquatic plant species such as water hyacinth and water primrose. Water quality and quantity, which are key components of wetland and riparian habitat, can also have substantial influence over the health of fish and other aquatic organisms (PEIS page 4-207). Because the condition of aquatic environments on the Preserve will be

improved over the long term by removal of invasive aquatic weeds, adverse cumulative impacts to fisheries are not expected. Because there are no long term site specific adverse impacts expected for agriculture, cultural resources, recreation, visual resources, or fire and fuels no cumulative impacts are expected for these resources at a larger scale.

B) No Action Alternative

Cumulative impacts to the lower watershed are expected. Under the No Action Alternative, invasive non-native weed species would continue to spread. Herbicide use on lands outside the Preserve boundary are likely to increase as a result of increased invasive plant seed production and the spread of weeds to adjacent agricultural land. Increased use of herbicides outside Preserve boundaries may have adverse cumulative impacts to the Preserve as offsite use of chemical ingredients increase. Overall biodiversity in the lower watershed may be negatively impacted by the reduced quality and/or quantity of nesting, rearing and migration habitat. Severely degraded habitat that cannot be treated by non-herbicide methods is likely to have an adverse cumulative impact on special status species populations found within the Preserve. As invasive aquatic and terrestrial plants decrease and/or impede flows of tributary streams cumulative impacts to fisheries and natural hydrologic regimes are likely. Cumulative impacts to recreation and visual resources may occur as a result of degraded scenic value and reduced opportunities for recreational activities. Cultural resources, including archeological and historic sites and materials, as well as traditional cultural properties, have a very limited ability to absorb cumulative impacts (PEIS page 4-227). Cumulative impacts to social and agricultural resources are expected as described above. Invasive plant infestations are likely to continue to spread and displace desirable species throughout the Preserve adversely impacting socioeconomic resources and are likely to decrease productivity of agricultural resources.

5.0 Agencies and Persons Consulted

5.1 BLM Interdisciplinary Team

- Mark Ackerman (Wildlife Biologist and Certified Pesticide Applicator, Folsom Field Office, BLM).
- Harry McQuillen (Manager at the Cosumnes River Preserve, Folsom Field Office, BLM)
- Dianna Brink (Rangeland Management Specialist, California State Office, BLM)
- Holden Brink (Wildlife Biologist and Wetlands Manager at the Cosumnes River Preserve, Folsom Field Office, BLM)
- Sandra McGinnis (Planning and Environmental Coordinator, California State Office, BLM)
- Jeff Horn (Recreation Planner, Folsom Field Office, BLM)
- Peggy Cranston (Wildlife Biologist, Folsom Field Office, BLM)
- Al Franklin (Botanist, Folsom Field Office, BLM)
- David Christy (Central California Public Affairs, Folsom Field Office, BLM)

5.2 Other Personnel, Agencies and Organizations

- Scott A. Johnson (Vegetation Management Specialist and Pest Control Advisor, Wilbur-Ellis),
- Joel Trumbo (Staff Environmental Scientist Pesticides Investigations Unit, California Department of Fish and Game)
- Rich Marovich (Staff Environmental Scientist, California Department of Pesticide Regulation)
- Becky Waegell (Ecologist and Certified Pesticide Applicator, The Nature Conservancy),
- Jennifer Buck (Grassland Ecologist, The Nature Conservancy),

5.3 Availability of Document and Comment Procedures

This EA is posted on the Folsom Field Office's website (www.blm.gov/ca/folsom) and will be available for a 15-day public review period. Comments and requests for copies should be sent to the BLM at 63 Natoma Street, Folsom, CA 95630 or emailed to us at ca180@ca.blm.gov.

6.0 References

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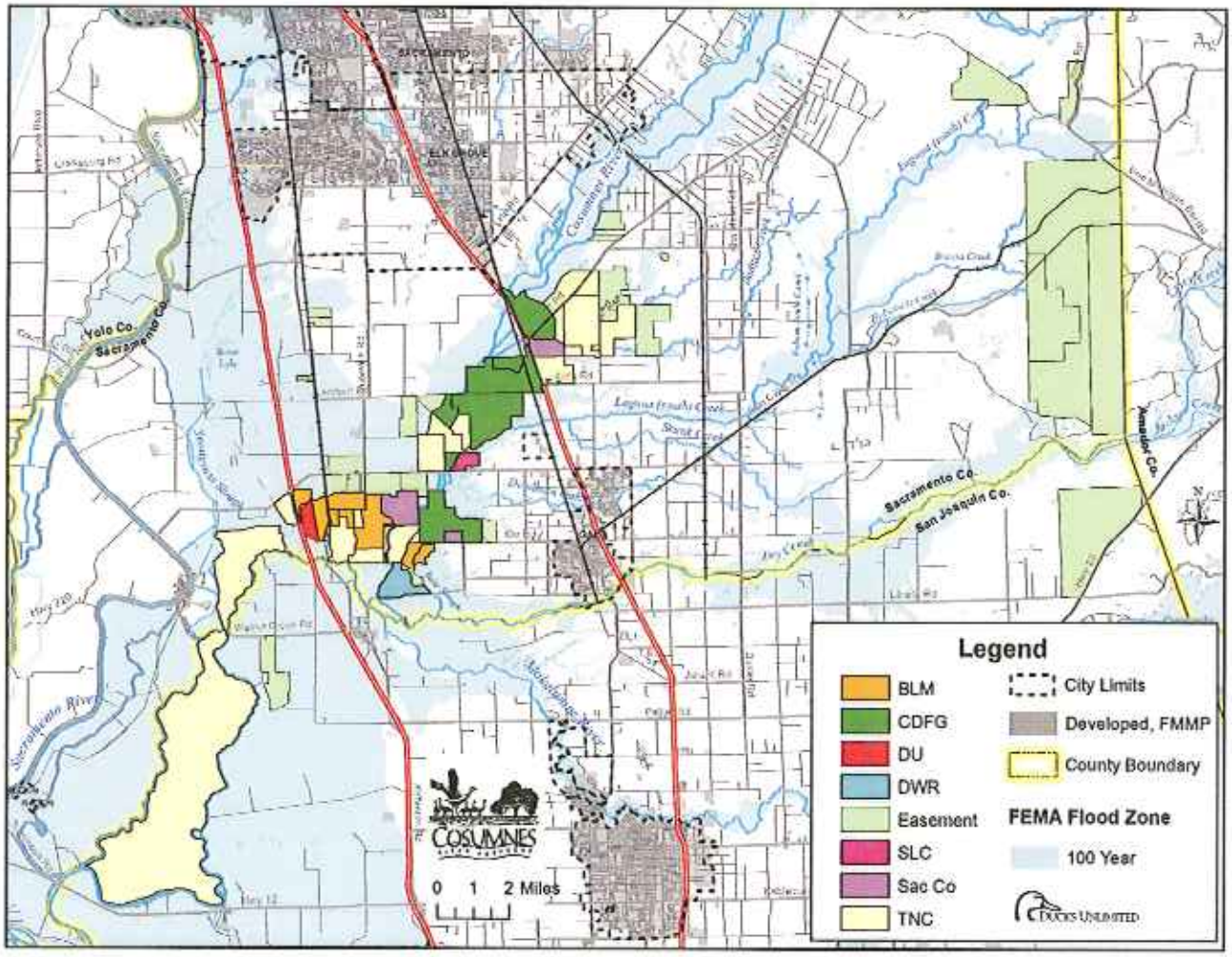
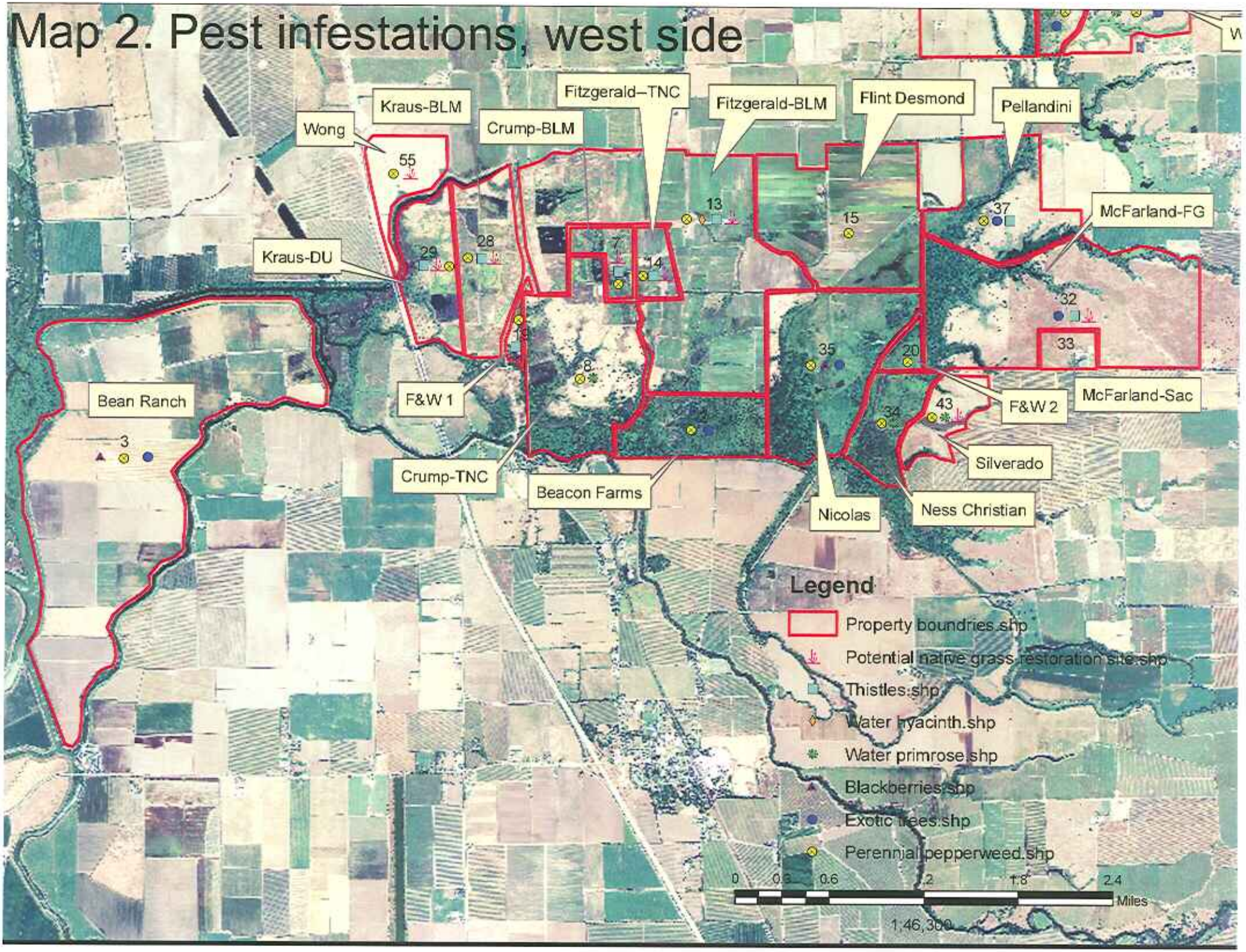
Appendix A

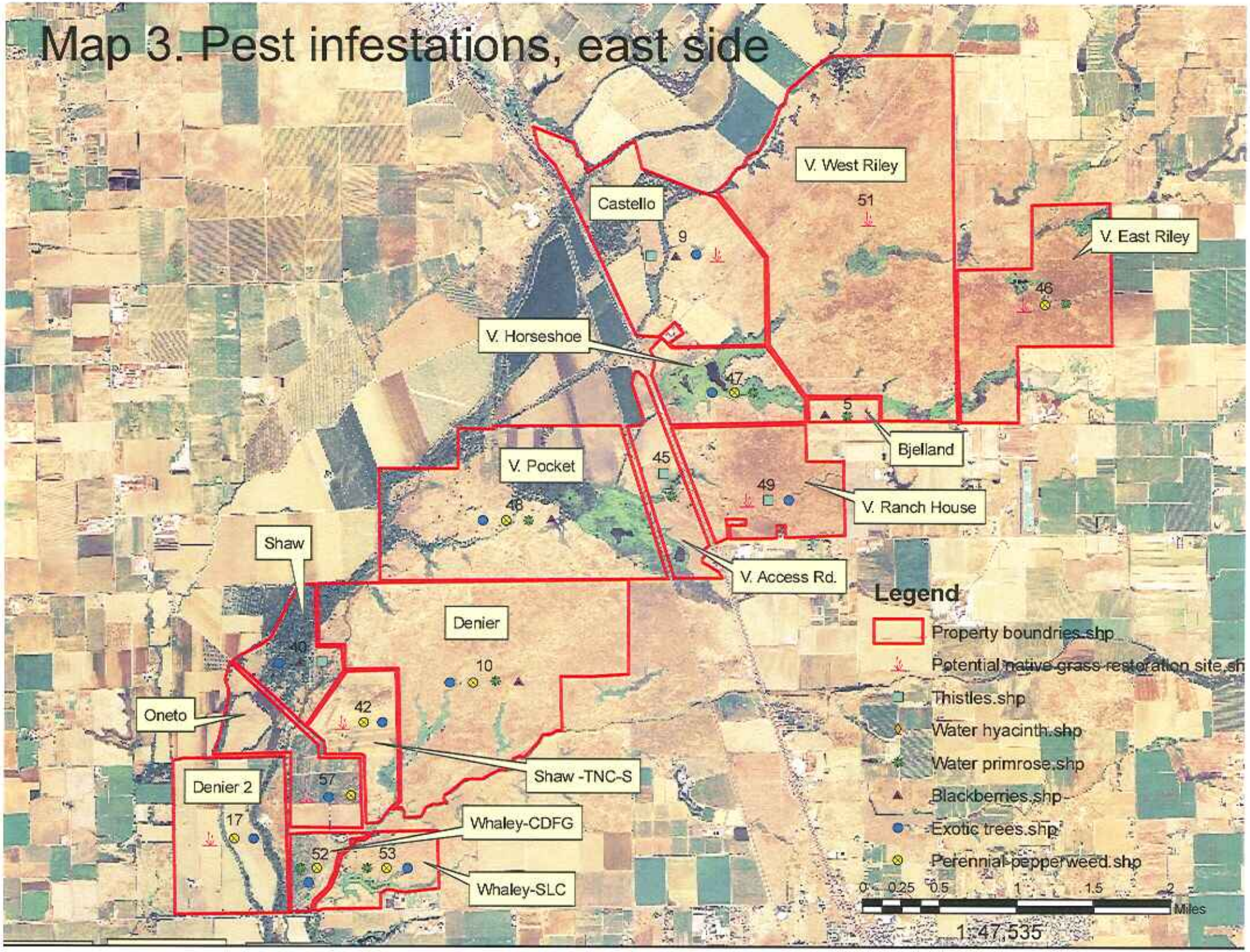
Map 1. Preserve properties



Map 2. Pest infestations, west side



Map 3. Pest infestations, east side



Appendix B

TABLE 1. Properties, Pest Species, Acres Potentially Impacted, and Products Proposed for Use at the Cosumnes River Preserve

			Acres Impacted By Infestation							Herbicide
PROPERTY No. - Name	TOTAL ACRES	OWNER	Pepper-weed	Thistles	Exotic trees	Black-berries	Water primrose	Water hyacinth	Forbs and grasses*	proposed for use
2 - Beacon Farms (West bottoms)	236	TNC	100		30					G,T
3 - Bean Ranch	1631	TNC	50		10	15			50	G,T,Chl
5 Bjelland (S. Badger Cr.)	90	TNC				5	10		30	G,T
7 - Crump-BLM (near Barn)	72	BLM	10	10					10	G,Cl,Chl
8 - Crump-TNC (Barn and savannah)	451	TNC	25				20			G,T
9 - Castello	737	CDFG		15	50	10			10	G,T,Cl
10 - Denier	1212	CDFG	20		20	20	20			G,T,Chl
13 - Fitzgerald-BLM	982	BLM	30	30				20	15	G,Cl,Chl,2
14 - Fitzgerald-TNC	74	TNC	5	10					15	G,Cl,Chl
15 - Flint-Desmond	528	Sac Co	80							G,Chl
17 - Fred Denier (Denier 2)	485	TNC	50		10				60	G,T,Chl
19 - F&W 1 (near VC)	55	TNC	15	15		15			15	G,T,Cl,Chl
20 - F&W 2 (MacWorld)	34	TNC	10							G
23 - Grizzly Slough	436	DWR	NO SPRAYING BY THE PRESERVE ON THIS PROPERTY							
28 - Kraus-BLM	242	BLM	30	10					10	G,Cl,Chl
29 - Kraus-DU	258	DU	50	5		15			10	G,T,Chl,Cl
32 - McFarland-FG	775	CDFG		50	200				50	G,Cl,T
33 - McFarland-Sac	100	Sac Co	10	10						G,Chl,Cl

PROPERTY No. - Name			Acres Impacted by Infestation							Herbicide proposed for use
			Pepper-Weed	Thistles	Exotic trees	Black-berries	Water primrose	Water hyacinth	Forbs and grasses*	
34 - Ness Christian (Cougar Wetland)	128	BLM	20				20			G
35 - Nicolas (East bottoms)	503	TNC	100		20	20				G,T,
37 - Pellandini	285	CDFG	50	10	40					G,T,Chl,Cl
40 - Shaw	220	CDFG		10	100	10				G,T
42 - Shaw-TNC-S	207	TNC	15		15				30	G,T
43 - Silverado (Valley Oak)	180	BLM	20				10		25	G,Chl,2
45 - V.Access Rd. (Valensin)	210	CDFG		5			15			G,Cl
46 - V. East Riley	580	TNC	10				50		100	G,T,Chl
47 - V. Horseshoe	272	Sac Co	20		5		100			G,T,Chl
48 - V. Pocket	1047	CDFG			40	40	200			G,T
49 - V. Ranch House	438	TNC		10	5				25	G,T,Cl
51 - V. West Riley	1739	TNC							100	G
52 - Whaley-CDFG	88	CDFG	20		5		10			G,T,Chl
53 - Whales-SLC	188	SLC	15		5		10			G,T,Chl
55 - Wong	140	BLM	10	5					40	G,T,Chl,Cl
57 - Oneto	133	TNC	100		50				100	G,T,Chl
TOTALS	**14,756**		**865**	**195**	**605**	**150**	**465**	**20**	**695**	

* Potential native grass restoration sites
G=Glyphosate
T=Triclopyr
Cl=Clopyralid
Chl=Chlorsulfuron
2=2,4-D