Prospects for Wetlands Conservation in Mono County

-With a Discussion of Wetlands Mitigation Banking

March 5, 2007

EASTERN SIERRA LAND TRUST

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Wetlands in the eastern Sierra Nevada have become a conservation priority in recent decades after a belated recognition of their ecological values and awareness of their declining extent and condition. Wetlands can be defined as areas with perennially or seasonally saturated soils that develop distinct vegetation communities dependent on the high water table. Long-considered lands of little use and the domain of vermin, such as mosquitoes, wetlands throughout the nation were routinely drained and "reclaimed" for various types of development. Attitudes about wetlands began to change in the mid-1970s as people became aware of the following ecological services provided by wetlands:

- critical habitat for birds, invertebrates, fish, amphibians, and mammals
- provide physical conditions for adapted vegetation communities
- nutrient retention and transformation, resulting in lower nutrient levels downstream
- retention and transformation of other chemical substances
- detention of flood waters, lowering flood peaks downstream
- deposition and stabilization of water-borne sediment
- source areas or sinks for streams, depending on local geology and hydraulic gradients.

Coincident with the acknowledgment of wetland values was a realization of the rate of the conversion and disappearance of wetlands. For example, California has lost more than 90 percent of its estimated five million acres of wetlands since becoming a state in 1850 (National Research Council, 1992). In the eastern Sierra Nevada, the largest wetland losses resulted from the filling of reservoirs at Crowley Lake, Grant Lake, Waugh Lake, and other impoundments. Water diversions for export and hydropower production dried up several miles of riparian wetlands in the Mono basin and the Owens River watershed. Roads have reduced the area as well as fragmented the wetlands in many places throughout the county. Residential development has filled wetlands on both a piecemeal basis for individual homes, such as in the June Lake Loop, as well as the large development of Snowcreek in the meadow formerly known as Windy Flats in Old Mammoth. Artificial irrigation has increased wetland extent but may be degrading wetland functions in some areas (Curry, 1992).

Although a geographic description of wetlands is separated by the three major watersheds covered by the current round of watershed assessments, the material on conservation is treated the same for all three watersheds.

Wetlands within the Upper Owens River Watershed

Streams throughout the upper Owens River watershed support riparian wetlands that can vary in width from a few feet to hundreds of feet, depending on the depth and slope of the channel. Riparian corridors along the major tributaries cross through several upland vegetation communities in just a few miles because of the steep topography and provide moist habitats in an otherwise dry landscape. Riparian wetlands bordering the upper Owens River between East Portal and Crowley Lake were probably impacted by the augmented flows exported from the Mono basin between 1941 and 1990, although understanding the long-term effects would require study of the sites. Many of these areas have also been irrigated for decades (Curry, 1996).

Other wetlands occur where drainage is locally impeded because of underlying impervious rock or where groundwater comes to the surface as seeps or springs. For example, alluvial fans created by Hilton Creek and Whiskey Creek are complicated mosaics of uplands and wetlands supported by high groundwater and the numerous small creeks into which the named creeks divide (Curry, 1996). The majority of the aspen forest where houses have been built appeared to meet jurisdictional wetland criteria. Similarly, the open areas near and downhill from the old highway, extending across U.S. Highway 395 to the shore of Crowley Lake, were mostly wetlands with many upland islands. Because these wetlands are supported by high groundwater, probably perched upon bedrock near the surface, they extend across nearly the entire slope, rather than being confined to the immediate vicinity of the distributary channels (Curry, 1996). In Little Round Valley, the wetlands that occur on the slope near the old highway are confined to the immediate vicinity of the springs and small creeks. Most of the gently sloping to flat area between the transmission line and U.S. Highway 395 is probably wetland, with some upland islands. Two apparent aspen wetlands are found south of the Aspen Springs loop road. With the exception of narrow riparian thickets along the small channels into which Rock Creek divides, downhill from the Rock Creek campground, wetlands were not observed in the vicinity of Tom's Place or on the north side of U.S. Highway 395 (Curry, 1996).

The lower part of Long Valley contained several thousand acres of wetlands before the dam was built and Crowley Lake was filled in 1941 (Smeltzer and Kondolf, 1999). The center of Long Valley, including the land surrounding the landfill, supports some of the most extensive complexes of meandering creeks, springs, freshwater emergent, and saline/alkaline wetlands in the county (Curry, 1996).

Tiny "pocket" meadows can be found throughout the upper Owens River watershed at all but the highest elevations in local areas where soil moisture is sufficiently high to discourage trees and shrubs and favor sedges, rushes, and grasses. The largest meadows in the watershed are along the upper Owens River, Convict Creek near U.S. Highway 395, and Glass Creek.

Wetlands within the Mono Basin

Riparian areas border the streams and springs of the Mono Basin. The principal riparian systems occur along the three major streams that enter Mono Lake: Mill Creek, Lee Vining Creek, and Rush Creek. The smaller streams and springs also support small wetlands scattered throughout the basin. There are also lake-fringing wetlands around Mono Lake and some of the higher-elevation lakes. Water that has flowed downslope through the soil and subsoil often comes to the surface at streambanks and lakeshores, creating wetland environments adjacent to the waterbodies. Before diversions, the Mono Lake shoreline supported about 615 acres of wetlands, including 260 acres of brackish lagoon and 356 acres of marsh, wet meadow, alkali meadow, and wetland scrub habitat (their relative extent could not be distinguished using historical aerial photographs [Stine, 1993]).

More than 200 acres of lagoons were found along the shorelines of Mono Lake in the prediversion period. Most of the lagoons were east of Sulfur Springs. A 23-acre lagoon developed at the DeChambeau embayment in the late 1940s after the lake dropped five feet below the prediversion level of 6,417 feet (Stine, 1993). Irrigation at DeChambeau Ranch likely enhanced wetlands at the DeChambeau embayment. Irrigation also appears to have contributed to maintenance of a narrow band of wetlands at Bridgeport Creek (Jones and Stokes Associates, 1993). Brackish marshlands are found below the Mono Lake County Park (near the mouth of DeChambeau Creek), at the Old Marina site (north of Lee Vining) and at Warm Springs, on the eastern shore of Mono Lake (Jones and Stokes Associates, 1993).

Rush Creek

Subalpine and forest riparian zones occur along the higher-elevation tributaries of Rush Creek wherever there is sufficient soil to support vegetation. Subalpine meadows are found throughout the headwaters of Rush Creek. Small pockets of wetlands are present in many parts of the June Lake Loop. Several types of wetland areas were identified in the 1991 June Lake Area Plan. Marshlands are located on the south side of June Lake and Gull Lake and adjacent to Rush Creek where it enters Silver Lake. In the 1991 June Lake Area Plan, the Silver Lake meadow was designated as a "Natural Habitat Protection District" and was proposed for a future land exchange into public holdings. The largest areas of open-grass meadows are southwest of Gull Lake in the Rodeo Meadows area and between State Route 158 and Nevada Street south of Silver Lake. A riparian woodland - meadow is located along State Route 158 between the Reversed Creek outlet of Gull Lake and the eastern boundary of Silver Lake Pines Tract #2 (Mono County Planning Department, 1991). The riparian corridor between Silver Lake and Grant Lake looks basically intact but has been impacted by the road, campground, and extensive recreational use. One of the largest historic wetlands in the Mono basin occupied the area now inundated by Grant Lake reservoir (Stine, et al., 1984).

Some initial wetland mapping was done as part of the Lahontan / U.C. Santa Cruz

project (Curry, 1996). Several large wetlands are identified in the June Lake Area Plan Final Environmental Impact Report (Mono County Planning Department, 1991: page II-7, Figure 3). Much of the present June Lake Village area was once wetlands that have been drained and/or filled (Curry, 1996). The water table in the southwestern portion of the June Lake Village has been artificially lowered for at least 20 years, but drainage efforts in the central portion of the Village were less successful and extensive fill was required to raise building sites above the seasonally saturated level (Curry, 1996). High water levels are still evident in spring and early summer in some parts of the Village as well as in the Down Canyon area.

As part of the conditions and mitigation measures of a 10-unit condominium project in the Down Canyon area, a replacement wetland of about 4,400 square feet was to be constructed following project completion that disturbed more than 4,000 square feet of natural wetland. Reports on the function of the replacement wetland were to be filed with the Lahontan Regional Water Quality Control Board.

The dam that enlarged Grant Lake was completed in 1941, but little change occurred downstream until 1947 because of a series of wetter-than-average years. Consistently low releases during the early 1960s caused a rapid loss of riparian vegetation, though some vegetation managed to survive on springflow in parts of the bottomlands. Without healthy riparian vegetation to armor the streambanks, floods in 1967 and 1969 severely scoured the channels and removed large amounts of vegetation and bed and bank material. Because Mono Lake had dropped 28 feet by this time, Rush Creek incised down through its bed to reach this lower lake level. The water table dropped along with the elevation of the stream, causing most remaining vegetation to die or become severely degraded as the stream was almost completely diverted through the 1970s. High runoff in 1980, 1982, and 1984 caused even more damage by increasing incision and, consequently, draining more groundwater from adjacent riparian habitats. Near its mouth, Rush Creek ultimately incised 30 feet below its former floodplain, and the new delta floodplain was considerably narrower.

As of 1989, there were 135 acres of mature woody vegetation, 33 acres of newly establishing riparian vegetation, and 40 acres of meadows in the Rush Creek riparian zone. These areas represent a 50 percent loss of pre-diversion woody riparian vegetation and a 70 percent loss of pre-diversion meadowlands (Jones and Stokes Associates, 1993). Restoration of the Rush Creek riparian zone has been under way for more than a decade. Although the initial response to riparian restoration has been very encouraging, riparian acreage and ecological values are not expected to return to prediversion conditions because the physical channel situation has been altered so much (Jones and Stokes Associates and Trihey & Associates, 1994).

Parker Creek

Before 1941, Parker Creek below Parker Lake was lined with meadows, watercress, and dense riparian vegetation near its confluence with Rush Creek. The Lee Vining Conduit crosses Parker Creek above the irrigated pasturelands of Cain Ranch, and

diverted virtually all of the water in Parker Creek into the Los Angeles Aqueduct via Grant Lake between 1947 and 1990. Drying the stream below the conduit caused loss of riparian vegetation and aquatic habitat.

As of 1989, 49 acres of woody riparian vegetation remained along Parker Creek, mostly highly stressed willow scrub; nine acres less than pre-1941 conditions. There were also extensive rush-dominated meadows, and a total of 32 different species of birds, mammals, and reptiles (Jones and Stokes Associates, 1993).

Walker Creek

Walker Creek below Walker Lake is lined with meadows, watercress, and near the confluence with Rush Creek, dense riparian vegetation. The Lee Vining Conduit crosses Walker Creek above the irrigated pasturelands of Cain Ranch, and since 1947 diverted virtually all of the water in Walker Creek into the Los Angeles Aqueduct via Grant Lake. This diversion dried up the stream below the conduit, causing a loss of riparian vegetation and aquatic habitat.

As of 1989, there were 43 acres of woody riparian vegetation along Walker Creek, mostly highly stressed willow scrub; seven acres less than pre-1941 conditions. There were also extensive rush-dominated meadows, and a total of 29 different species of birds, mammals, and reptiles (Jones and Stokes Associates, 1993). Walker Creek began to be rewatered in 1990.

Bohler Creek

Most of the water in Bohler Creek below the aqueduct road is diverted for pasture irrigation at the north end of Cain Ranch. The main channel and irrigation ditches support about the same amount of scattered mixed riparian and willow scrub as was present in 1940. Riparian vegetation is essentially absent in the Bohler Creek canyon east of U.S. Highway 395 (as it was in 1940), and the willow scrub near the mouth of the canyon appears to have about the same extent and condition as in 1940 (Jones and Stokes Associates, 1993).

Lee Vining Creek

In 1941, diversion of water from Lee Vining Creek into the Los Angeles Aqueduct began. The diversion dam is just upstream from the Lee Vining Ranger Station. After 1947, high runoff ceased and pasture irrigation ended, causing the stream to be virtually dry below the diversion dam. The canyon is narrow below the diversion dam to a point a half-mile below U.S. Highway 395, and this confinement kept soils moist enough for riparian vegetation to survive. Below this point, vegetation declined rapidly, and was severely affected all the way to Mono Lake. In 1954, a fire consumed much of this dead and some live riparian vegetation. The stream was nearly or completely dewatered until a 1969 flood caused severe channel widening, migration, and incision.

In 1986, continuous low flows were obtained with a court order, and modest recovery of riparian vegetation occurred in places. A grazing moratorium was instituted in 1991, allowing further recovery of vegetation. As of 1989, there were 60 acres of mature woody riparian vegetation (44 acres upstream of 0.5 miles below U.S. Highway 395), a loss of 50 percent of what existed before 1941 (Jones and Stokes Associates, 1993). A series of restoration measures began in the early 1990s.

The riparian zone of the reach of Lee Vining between the Southern California Edison powerhouse and the intake for the LADWP diversion was described in a California Department of Fish and Game report as narrow with vegetation consisting of lodgepole pine, aspen, willow, grasses, and a few Jeffrey pine. Numerous campgrounds exist in this reach. The Forest Service is considering removal of campsites from floodplain and streambank areas.

Post Office Creek

About 27 acres of willow scrub occur on the small Post Office Creek delta below the 1940 lake level of 6,417 feet. Above U.S. Highway 395, the creek supports a narrow but generally continuous strip of willow and cottonwood-willow vegetation. Willows and cottonwoods also grow at several small hillside seeps above the creek (Jones and Stokes Associates, 1993).

Mill Creek

Mill Creek, the third largest stream in the Mono Basin, has a wide, continuous riparian corridor characterized by Jeffrey pines and quaking aspen in the upper reaches and (before stream diversions) a dense, multi-storied, cottonwood-dominated stand in the lower reaches. The Mill Creek bottomlands near Mono Lake were a seasonally wet complex of riparian forests, thickets, wet meadows, ponds and sinuous channels. The lowest reach of Mill Creek was routinely dewatered by diversions for irrigation between the 1890s and 1920, resulting in the loss of riparian woodland on the delta. Photos show that most of the riparian stand in the lower reaches had already been lost by 1929. Following diversions to the Lundy power plant and Conway Ranch, stands of black cottonwood and Jeffrey pines declined along the mid-reach, between U.S. Highway 395 and the lower boundary of Mono City. Similarly, the narrow riparian corridor diminished through the bottomlands approaching Mono Lake (USDA-Forest Service, 2003).

Locally high groundwater levels have created small seasonal wetlands on Conway Ranch and Thompson Ranch Meadow, which are enhanced by irrigation based upon Mill Creek water rights held by Mono County and LADWP (USDA-Forest Service, 2003).

Wilson Creek

Pre-diversion vegetation along Wilson Creek was typical of other ephemeral desert

creeks such as Bridgeport Creek. Willow shrubs grew near the headwaters and in the vicinity of springs; the lower reaches passed through sagebrush, rabbitbrush, and bitterbrush along a channel lacking significant riparian vegetation. At present, a narrow band of riparian vegetation, primarily narrow-leafed willow, follows Wilson Creek (USDA-Forest Service, 2003).

Distribution of vegetation on the Conway Ranch is associated with the location of natural seeps and the long history of irrigation for grazing on the property. Much of the Conway Ranch property has been flood irrigated for at least 100 years, resulting in the presence of hydrophytic (water-loving) vegetation in some irrigated portions. Natural wetland portions, representing approximately 47 acres of this property, consist of several areas of wet meadow located both north and south of Wilson Creek and a narrow fringe of narrowleaf willow paralleling Wilson Creek.

DeChambeau Creek

DeChambeau Creek and various springs support extensive willow scrub thickets between U.S. Highway 395 and Mono Lake. About eight acres of willow scrub occur below the 1940 lake level of 6,417 feet. Native and non-native cottonwoods and poplars occur along the main channel and irrigation ditches almost to U.S. Highway 395. Intermittent to continuous willow scrub, cottonwood-willow, quaking aspen, and conifer-broadleaf habitats follow the stream above the highway (Jones and Stokes Associates, 1993).

Wetlands within the West Walker River watershed

Compared to the Upper Owens River watershed and Mono Basin, remarkably little information has been found concerning the wetlands and riparian areas of the West Walker River watershed. Although most of the riparian corridors at the higher-elevation portions of the Humboldt-Toiyabe National Forest are undisturbed (except by historic grazing), many of the riparian areas in lower valleys have been changed by road construction, overgrazing, and recreation. Roads follow many of the streams of the watershed for significant portions of the stream length and are often within the riparian zone. U.S. Highway 395 through Walker Canyon is the most obvious example. U.S. Highway 395 also follows the course of Hot Creek from Devils Gate to Sonora Junction. State Route 108 is adjacent to portions of Leavitt Creek and Sardine Creek, and State Route 89 is adjacent to the lower portion of Slinkard Creek. Forest roads are within the riparian zone of parts of Silver, Wolf, and Mill creeks and the Little Walker River. Analyses of GIS road and stream layers by Mono County found that there are more than 380 road crossings of streams and more than 38 miles of roads within 100 feet of a stream within the West Walker River watershed. Although such road locations are often the only reasonable route for the road, riparian degradation is a cost of such of such locations.

The largest areas of wetlands are flood-irrigated lands adjacent to the West Walker River in Antelope Valley and Little Antelope Valley. These areas probably would not be

classified as wetlands without the artificial application of water for more than a century. There are a large number of sites labeled as meadows on Forest Service and U.S. Geological Survey maps (e.g., Upper Piute, Lower Piute, Walker, Sardine, Silver, Leavitt, Pickel, Junction, Grouse, and Cottonwood) that are obviously wetlands. There is an extensive dry meadow within the lower portion of the Mill Creek watershed (USDA-Forest Service, 1988). Wetlands surround Koenig Lake and occur between Koenig and Latopie lakes (USDA-Forest Service, 2004).

Areas adjacent to and downstream of springs are likely to have some wetland characteristics and values. Although meadows without a road or obvious water development nearby can be assumed to relatively undisturbed (except for grazing), additional details and field observations are needed for an adequate evaluation. Wetlands adjacent to roads, structures, and engineered waterways can be assumed to be disturbed. Canals and irrigation ditches have both drained and created wetlands within the lower portions of the watershed.

A number of seeps above the east bank of the Little Walker River in the vicinity of Sonora Junction were noted in the application for a small hydroelectric project (North Star Hydro Ltd, 1987). These seeps do not supply much water to the river, but they create wetlands and support riparian vegetation

Development of wetlands within Mono County

The vast majority of destruction and damage to wetlands within the three watersheds has resulted from development of water resources: inundation of wetlands to create reservoirs, dewatering of streams below points of diversion, augmenting streamflow in the upper Owens River below East Portal, and construction of irrigation canals and ditches. Housing development in the Snowcreek Meadow (Windy Flats) area of Mammoth Lakes and in the June Lakes Village area have been the only other large scale conversions of wetlands to other land uses. Road construction has drained, converted, and fragmented wetlands in hundreds of locations throughout the three watersheds. Construction of individual residences in the town of Mammoth Lakes, and communities of Crowley Lake, Aspen Springs, and June Lake has resulted in additional piecemeal destruction of wetlands.

There are currently no public plans for development that would cause destruction of wetlands at the scale that occurred in the past. There are no major water resources projects planned, additional irrigation canals and ditches are unlikely, no new roads are planned, and large-scale housing projects are unlikely unless the City of Los Angeles divests any of their land in Mono County. That leaves construction of individual residences as the most probable current threat to wetlands within Mono County in the near future.

Single-family home development and wetlands within Mono County

During the 1990s, there were a few incidents in Mammoth Lakes and unincorporated portions of Mono County where a property owner wanted to build a house on a small lot that was largely wetlands. Some of these incidents garnered a lot of press coverage and political attention when the owners objected to prohibitions on construction or permitting requirements. The controversy over wetlands permitting was one of the issues that led to the formation of the Mono County Collaborative Planning Team in 1996. The team adopted streamlining of the wetlands permitting process and restoration of wetlands as its top priorities of 1997. Unfortunately, the member agencies of the team were unable to devote sufficient staff time to the wetlands issues, and the project's goals were not met.

In the past decade, after the Collaborative Planning Team's wetlands subcommittee was formed, there have been few proposals to develop areas with wetlands. During the past five years, we have only been able to find two cases where a lot containing wetlands was developed within Mono County: one in the June Lake loop area and one in the community of Crowley Lake. Another wetland parcel within the town of Mammoth Lakes was proposed for development, but a dispute with the former owner has delayed that project.

Continuing risks to wetlands

Although no projects that would impact a large wetland area are imminent, small areas of wetlands remain at risk of drainage and conversion to other land uses. The following section discusses some mechanisms of damaging wetlands that may or may not have much probability of occurrence within the watersheds of the upper Owens River, Mono Basin, or West Walker River. Nevertheless, awareness of potential threats is an important means of avoiding impacts in the event a risky project is proposed.

Perhaps the greatest theoretical threat to riparian areas is the interruption of flows of water and sediment from upstream. The dependence of riparian areas on the natural hydrologic regime cannot be overstated because that is what formed and maintains the riparian system in a given area. When water is diverted out of the stream or a dam prevents the further movement of sediment, the conditions that created and maintained a riparian corridor or wetland are altered, and the new conditions will lead to changes in the plants and animals that lived in the affected area. Furthermore, construction of reservoirs completely inundates the riparian area between the dam and the high water level. Within the three watersheds, there are no proposed water projects that could produce these types of effects.

Roads adjacent to streams may directly convert some of the riparian area into compacted and perhaps paved surfaces, eliminating any ecological values. Roads immediately upslope of a riparian area can interfere with water movement toward the stream as well as wildlife activities on that side of the stream. Road crossings of streams, whether as a

bridge or culvert, interrupt the continuity of the riparian corridor and can present a barrier to movement of fish and some wildlife.

Construction within and immediately upslope of a riparian zone can destroy vegetation, compact and/or drain soils, decrease infiltration capacity of soils, increase erosion and sediment movement toward the stream, alter the shape of the channel, and act as a barrier to wildlife. Extraction of sand and gravel from channels and floodplains has similar consequences.

Wildfires rarely enter riparian areas because of the higher fuel moisture, types of trees, and higher relative humidity near streams. However, under severe fire-weather conditions (high winds, low humidity, and low fuel moisture), riparian areas can certainly burn. When riparian vegetation is destroyed by fire, the ecological values are lost for several years. Fortunately, because of the abundant soil moisture near streams, riparian areas tend to recover from fire damage far faster than adjacent uplands. Even when riparian areas avoid direct damage from fires, loss of vegetation over much of the watershed in an intense and widespread fire can lead to dramatic increases in runoff that can produce channel-scouring floods and considerable damage within the riparian zone. Therefore, unnaturally high fuel loads throughout a watershed constitute a threat to streams and riparian zones.

Overgrazing by domestic livestock has been a long-term threat to riparian areas throughout the Sierra Nevada. Cattle and sheep tend to concentrate near streams for the same reasons that native wildlife occupy and visit riparian zones -- availability of water, forage, shade, and lower temperatures. Unfortunately, large numbers of livestock occupying the riparian zone for a few days can consume or trample much of the vegetation that holds the streambanks and soil together and mechanically change the structure and porosity of the soil adjacent to the stream. Riparian areas and stream channels that have been subject to overgrazing differ dramatically in structure, form, and ecological utility from riparian areas that have been lightly grazed.

Groundwater pumping can lower a near-surface water table if the uppermost aquifer is hydraulically connected to the formation that a well draws from. One area that may have been affected by pumping is in the vicinity of the Mammoth Pacific geothermal plant. Apparently, the area north of the junction of State Route 203 and U.S. Highway 395 once had wetlands and a seasonal pond as shown on the USGS "Old Mammoth" 7.5-minute map of 1983.

Water-borne pollutants can be transported to wetlands and damage the resident organisms. For example, chlorine added to the Whitmore swimming pool, which then ends up in the outflow from the pool, has potential to affect aquatic invertebrates in the receiving wetland that was identified as a "sensitive biological area" in the 1996 USFWS Owens Basin Wetland and Aquatic Species Recovery Plan (Lahontan Regional Water Quality Control Board, 1998). Almost half of the parcels within the Hilton Creek community contain or border a watercourse. Surveys conducted by the Lahontan RWQCB staff in 1975 found that over 64 percent of the existing developed parcels of the

community were located adjacent to surface waters or in areas of obvious seasonal or year-round high groundwater levels. Until a community wastewater collection and treatment system was built in the 1980s, the distributary channels of Hilton Creek contained high levels of coliform bacteria and detergent by-products (Gram/Phillips, 1977).

Invasive plants are a threat to native riparian vegetation. Salt cedar, also known as Tamarix, has become common throughout the southwestern United States and moved north from the Owens Valley in the past few decades. It is present but under control (because of an interagency effort) along the lower reaches of Rush and Lee Vining Creeks. Tamarix crowds out most beneficial riparian shrubs and trees and uses large amounts of water. Soapwort, also known as Bouncing Bet, is established along portions of Lee Vining Creek and in certain areas of June Lake. Botanists have noticed its spread in recent years and have become concerned about its displacement of native vegetation. In 2006, a pilot project tested several methods of control, and is expected to continue in the future. Other invasive plants, such as woolly mullein, Russian thistle, cheatgrass, and Russian olive, also have implications for terrestrial and aquatic ecosystems. More than 20 invasive species were found in 174 riparian transects along Rush and Lee Vining Creeks in 2005 (McBain and Trush report on file at Mono Lake Committee).

Preservation of wetlands within Mono County

More than 90 percent of Mono County is land administered by the USDA-Forest Service, Bureau of Land Management, State of California, County of Mono, or Los Angeles Department of Water and Power (LADWP). However, the proportion of wetlands in public ownership is probably less than the fraction of land as a whole because lands adjacent to water would have been homesteaded or otherwise acquired from the public domain in preference to drier lands. Although most of wetland losses of the past century occurred on public land (reservoirs, water diversions, and roads), publicly owned wetlands are very unlikely to be damaged in the future because of recent policies within the agencies to protect wetlands.

The quasi-public land owned by the LADWP should be classified differently than the other truly public land found in Mono County. While there are currently no plans to release LADWP land for development, it is not unreasonable to consider that future development demands could prompt future politicians in Los Angeles to sell off some or all of the wide open spaces of Mono County. There is currently a working group assembled involving Mono County, LADWP, the Eastern Sierra Land Trust, the Mono Lake Committee, and others to consider mechanisms that would ensure that LADWP land will permanently remain largely undeveloped. Such a conservation agreement would greatly benefit the extensive wetlands found on LADWP lands in the Mono Basin and Upper Owens River Watershed.

There are several examples of public acquisition of wetlands within the three watersheds. Much of Pickel Meadow in the West Walker River watershed was

purchased by the California Wildlife Conservation Board in 1989 as five noncontiguous parcels totaling 991 acres. The land is managed by the California Department of Fish and Game for deer habitat and migration, fisheries habitat, and recreational angling. Much of Slinkard Valley and Little Antelope Valley is owned by the California Department of Fish and Game and is managed largely for deer. The Conway Ranch in the Mono Basin, which contains about 47 acres of wetlands, was acquired by the County of Mono with assistance from the Trust for Public Land as an alternative to a large-scale housing development. Land for another proposed development at Cedar Hills in the northeastern part of the Mono Basin was recently acquired by the Wilderness Land Trust and will be conveyed to the Bureau of Land Management.

Conservation easements are a potential tool for saving wetlands that have not yet been used to a significant extent within the three watersheds.

Opportunities for wetland conservation

Existing wetlands should be conserved because they are not readily restored to their pre-disturbance condition. Wetlands on public lands should remain a priority for conservation based on each agency's management policies. Wetlands on private lands are also a conservation priority because of the ecological and public benefits of the wetlands. Some degree of conservation of wetlands can be required of private property owners as a matter of public policy through land use regulations. However, society can also bear some of the costs of wetland conservation on private lands through tax benefits and purchase of conservation easements.

Within the regulatory environment, there is a strong need for an administrative means for tracking proposed projects involving wetlands between agencies. At the present time, the County of Mono informs the owner of a parcel with potential wetlands of the permitting requirements of the Lahontan Regional Water Quality Control Board and the U.S. Army Corps of Engineers. However, there is currently no mechanism for ensuring that the owner contacts the other agencies.

Conservation easements

Conservation easements are a critical tool in conserving resources such as wetlands. A conservation easement is a voluntary agreement between a landowner and a land trust (or other qualified agency) that limits the uses of a piece of property to protect its resources. An easement allows an owner to retain title and management of his or her land while designating how the land will be used now and in the future. Every easement is unique, crafted to the specific needs and desires of the landowner and designed to effectively protect the resources of concern. For example, a landowner may want to protect the property's wetlands or special wildlife habitat qualities in perpetuity. Such values are ensured by prohibiting subdivision of the land that would compromise those valuable qualities. Other private property rights would be retained. Public access is only granted in cases where that is the desire of the landowner.

Once in place, a conservation easement guarantees that the land will be protected in the manner specified in perpetuity, even with a change in ownership. The land trust holding the easement is obligated to monitor the easement by making annual inspections to ensure that the terms of the easement are being upheld. The Eastern Sierra Land Trust (ESLT) was created in 2001 to provide a local organization that could work with landowners to conserve their land and that was legally capable of holding conservation easements.

A conservation easement may be donated or sold by the landowner and constitutes a legally binding agreement that restricts some uses or prevents development of the property in perpetuity while the land remains in private ownership. The owners retain some of their private property rights and can live on and use their land. Typically, the rights that are restricted in a conservation easement are the right to subdivide or otherwise develop the property. An easement selectively targets only those property rights necessary to protect specific conservation values, such as water quality or wetlands, and is individually tailored to meet a landowner's needs. Because the property remains in private ownership, with all other rights intact, a parcel with a conservation easement continues to provide economic benefits and property taxes to the local area.

Property rights are often legally described as a bundle of rights, such as the right to occupy, sell, lease, develop, farm, build structures, or restrict access, which can be separated and owned by different parties. The concept that a landowner can convey certain rights on his or her land while retaining other rights is well founded in hundreds of years of English common law, on which the U.S. legal system is based. In the past few decades, individual states have enacted laws specifically authorizing creation of conservation easements as valid interests in land. The more recent laws are generally modeled after the Uniform Conservation Easement Act adopted by the National Conference of Commissioners on Uniform State Laws in 1981. The California Conservation Easement Act was enacted by the legislature in 1979. California's law considers an easement as a "limitation in a deed" and states that easements are binding on successive owners and perpetual in duration (Hutton, et al., 2000).

Conservation easements become part of the deed and remain with the property when the property is sold or passed on to heirs. Because development or other specified uses are permanently restricted, land with a conservation easement is usually worth less on the open market than comparable unrestricted and developable parcels. Philosophical objections are sometimes raised that a current owner should not be able to limit what future owners of a parcel can do with that property. However, most types of development certainly limit future uses of the land.

Public benefits of conservation easements

Although conservation easements are essentially a private real estate transaction, there are usually major public benefits associated with an easement. Conservation easements can contribute to improved water quality by avoiding development of watersheds and

associated pollution. They can maintain a region's scenic beauty and open space by limiting urban sprawl. They can maintain working lands in farming and ranching and can keep small family farmers and ranchers on the land during economic downturns. Easements have even been used in recent years to provide undeveloped buffer zones around military facilities. This particular use could have potential application near the U.S. Marine Corps Mountain Warfare Training Center.

An important but often overlooked public benefit is that privately owned lands with conservation easements that limit their uses to farming, ranching, and other open-space uses often generate more in local revenues than they require in community services. Undeveloped lands usually cost communities much less in public services than do developed lands.

The Nature Conservancy lists the following benefits of conservation easements:

Public benefits

- Protect water quality
- Conserve wildlife habitat
- Preserve open space
- Preserve farmland, ranchland, & timberland
- Maintain character of rural communities
- Buffer public lands
- Maintain landscapes for tourism
- Require less in public services, generate more in local revenues
- Stretch public conservation dollars

Landowner benefits

- Land remains privately owned; ownership rights stay in place
- Landowners can live on the land
- Agricultural traditions and land uses maintained
- Land protected from subdivision
- Tax benefits help keep land intact and in the family
- Land protected beyond their lifetimes
- Landowners can fulfill their vision for the future of their land and waters
- Options preserved for children and grandchildren to farm and ranch
- Ecological and scenic values preserved
- Tax savings and sales proceeds can boost agricultural operations
- Easement agreement remains with the property, even if the land is sold
- Easement terms individually tailored to meet landowners' needs

Designing the right easement for the land and landowner

There is no generic conservation easement. Each easement should be individually designed to meet conservation objectives and the needs of the landowner. A conservation easement can be written to accomplish relatively narrow objectives, such as protecting

wetlands on a small fraction of the property. Alternatively, easements can be written with broad objectives, such as protecting open space or agricultural land. Easements are also carefully written to meet the needs of the landowner, such as continuing to farm the land or build a house in the future. Easements around the country have been tailored to some very specific and unique conditions. Some conservation easements are remarkably simple, while others can be fairly complex.

The land trust working with the owner will try to ensure that a proposed easement protects important resources and has sufficient public benefits that the easement qualifies for tax benefits if that is the desire of the landowner. As experience with conservation easements has grown over the past few decades, land trusts have learned much about how to write legal language that captures the intent of the landowner.

Responsibilities of the easement holder

Public agencies or nonprofits whose purposes include conservation or historic preservation can hold conservation easements. For easements to qualify for an income tax deduction, the easement holder must meet criteria described in several sections of Internal Revenue Code. In California, an easement holder must be authorized under California Civil Code Section 815.3(e).

Acceptance of a conservation easement encumbers the easement holder with a large responsibility. The organization or agency that holds the easement must make sure the easement's terms are upheld into the future. Land trusts and public agencies that hold conservation easements must commit staff and resources to monitor the land and ensure easement terms are followed by present and future owners. They also must be prepared to legally defend an easement in the event it is ever violated.

A land trust does not actually hold the rights conveyed by a landowner through a conservation easement, but rather holds the right to enforce the landowner's promise not to exercise those prior rights in the future. Under the terms of a conservation easement, development or other specified rights associated with the land are extinguished and, in theory and practice, no longer exist. Those extinguished rights cannot be exercised by anyone in the future. In the event a future owner ignored the easement terms within their property deed, the holder of the easement would first remind the owner that they did not have the legal right to pursue the activity in question. If the owner persisted in violating the easement, the holder of the easement has legal standing to seek a court injunction to halt the activity.

The easement holder generally prepares a baseline document (a detailed description of the current conditions of the property) at the time the easement is drafted. The easement holder then inspects the property on a routine basis (generally annually) to check that the terms of the easement are being followed. These annual visits are scheduled in cooperation with the landowner and involve inspecting only the elements protected in the

easement. The privacy of the landowner is always respected and visits are never made unannounced unless there is an imminent threat to the values protected in the easement. The baseline document provides a set of reference conditions to both the owner and easement holder, which becomes increasingly important as years pass and ownership changes.

Tax benefits to the landowner

Donations of land and conservation easements may qualify donors for significant tax benefits. Tax deductions for gifts of conservation easements were provided by Congress to promote conservation in the United States in the Tax Reform Act of 1976 and the Tax Reduction and Simplification Act of 1977. When the easement donation provisions in those laws were about to expire in 1980, Congress passed the Tax Treatment Extension Act (creating IRC section 170(h)), which made permanent the income tax charitable deduction benefits for gifts of qualified conservation contributions. In 1997, Congress passed the Taxpayer Relief Act, which created a new estate tax benefit (IRC section 2031(c)) for landowners who donate conservation easements. In addition to the federal tax benefits, the Natural Heritage Preservation Tax Credit Act may afford the donor a partial California state tax credit for donation of a conservation easement to nonprofit organizations, such as the ESLT.

The landowner may qualify for a federal charitable income tax deduction under IRC section 170(h) if he or she donates or sells at less the market value (a “bargain sale”) the conservation easement, which requires that the easement 1) comply with state law requirements for easements in land; 2) be conveyed to a qualifying organization to hold the easement; and 3) be conveyed "exclusively for conservation purposes" and in perpetuity.

Assuming that those requirements are met, the amount of the charitable contribution for a donation or gift of bargain sale by the landowner is based on the appraised fair market value of the easement. This amount is determined by calculating the difference between the value of the property today without (or "before") the imposition of the easement and the value of the property today subject to (or "after") the imposition of the easement. This latter value is determined by the nature of the restrictions and their impact on present and future land use. The resulting amount is the value of the easement for tax purposes. Generally, a property's value is based on its "highest and best use," which usually means development. Conservation easements in which development rights are given up can often qualify the property for a substantial value for tax deduction purposes, as the parcel's development potential no longer exists. Under IRS rules, the donor of the easement is responsible for obtaining an independent appraisal to substantiate the value of the easement for tax purposes, and the IRS has published rules as to what constitutes a "qualified appraisal" and a "qualified appraiser" for such purposes.

Congress recently (August 2006) passed a law to enhance the tax benefits of donations of conservation easements to a qualified land trust. If a landowner has land with important

natural, agricultural, or historic resources, donating a conservation easement may be very economically advantageous.

These new incentives make it easier for average Americans, including working family farmers and ranchers, to donate land. The legislation allows:

- A conservation agreement donor to deduct up to 50% of their adjusted gross income in any year;
- Qualifying farmers and ranchers to deduct up to 100% of their adjusted gross income; and
- Donors to carry over deductions for their contribution for as many as 15 years.

These changes allow many modest income landowners to deduct much more than they could under the old rules, bringing increased fairness to the tax code. This rule is currently set to expire at the end of 2007 but new legislation is being introduced to extend it permanently.

In addition to the income tax deduction, under IRC 2031(c), the gift of the easement can also entitle a landowner to qualify for an estate tax exclusion for a portion of the value of the underlying land that is subject to a conservation easement, thereby reducing the estate tax on the value of the landowner's assets that pass to the heirs. Such a tax reduction can make a critical difference in the ability of heirs to keep the land intact; the alternative has often been subdividing the land to pay heavy estate taxes. (Sources: Land Trust Alliance, 2003; The Nature Conservancy, 2007)

Local funding for conservation easements

The County of Mono and member agencies of the Mono County Collaborative Planning Team should consider new means of generating funds for purchase of conservation easements, particularly for wetlands. Other jurisdictions through California and the West have established special funding mechanisms for conservation easement such as habitat mitigation fees, real estate transfer fees, a dedicated portion of sales tax, an additional increment of sales tax, development impact fees, and bond measures. Although Mono County will hopefully receive some reasonable fraction of state conservation funds through the Sierra Nevada Conservancy, Wildlife Conservation Board, and California Farmland Conservancy Program, these mechanisms often need matching funds and significant amounts of money are needed for real estate transactions. Therefore, local funding beyond what non-profit groups such as the ESLT are able to raise through donations are necessary.

A generic template of a conservation easement is attached as an example.

Wetland creation, restoration, and protection

Although wetlands are ideally conserved in their original condition, there are opportunities to restore some degraded areas by removing or reducing the intensity of the disturbances, and, if necessary, recreating environmental conditions that may have been lost through some intentional or inadvertent disturbance.

Restoration of riparian areas and wetlands is a developing field without a solid foundation of theory and experience to guide the efforts. Long-term monitoring and evaluation of restoration trials is essential to improving the state of the art (e.g., National Research Council, 1992). The single most-important step in riparian restoration tends to be the elimination of the problem or disturbance that caused the degradation in the first place. For example, in the Mono basin, returning water to the dry stream channels was the obvious place to start. Once the streams had water again, natural processes could begin to reestablish functional channels and riparian vegetation.

During the mid-1990s, there was considerable debate among geomorphologists, botanists, and others interested in restoring the streams about the relative merits of active reconstruction of channel features versus allowing natural channel processes, largely during high flow events, to do the work. There is much uncertainty in both approaches: how much maintenance is required to force the channel into a design and how much time and water are required for nature to shape a channel that conforms to human desires. In September of 1998, the SWRCB issued Water Rights Order WR 98-05 which required further stream and waterfowl habitat restoration, largely based on a managed flow regime augmented by planting of additional riparian vegetation and placement of large woody debris for the channels to work with.

During 1999, the Los Angeles Department of Water and Power began a variety of efforts to restore the streams with respect to the SWRCB order:

- managed flow releases to provide flushing flows and base flows
- placed large woody debris in channels
- reconstruction of channels in lower Rush Creek
- closed roads along Rush and Lee Vining creeks
- began restoration of the gravel quarry on Parker Creek
- continued the restrictions on grazing and irrigation of pastures

The Mono Lake Basin Water Rights Decision 1631, also required LADWP to prepare a waterfowl habitat restoration plan for wetlands near the shore of Mono Lake. Recommendations included rewatering Mill Creek and developing and implementing the DeChambeau Ponds/County Ponds/Black Point restoration project. Restoration of riparian and deltaic wetland habitats on Mill Creek was considered second in importance only to raising the Mono Lake level. This plan involved establishing a year-round instream flow in Mill Creek to develop habitat and to benefit waterfowl during the annual peak waterfowl migration period, with flows spread among lower Mill Creek distributaries to stimulate greater riparian growth and encourage backwater habitat. However, the SWRCB did not order implementation of the Mill Creek portion of the plan because of water rights concerns and unanswered questions about impacts

to Wilson Creek and irrigated pastures. In 2006, the Federal Energy Regulatory Commission released an Environmental Assessment for relicensing of the Lundy Hydropower Project that included analysis of returning water to Mill Creek.

In the early 1990s, the DeChambeau Ponds on the north shore of Mono Lake were worked on to increase their utility as waterfowl habitat. The project was a joint effort of the Inyo National Forest, California Transportation Commission, Ducks Unlimited, and the Mono Lake Committee. The implementation of the DeChambeau Ponds/County Ponds restoration project included reconstruction of a hot water artesian well and pipeline, restoration of DeChambeau Pond #2 and #3, construction of the 4th and 5th DeChambeau ponds, reconstruction of the East County Pond and installation of nearly three miles of pipeline to minimize transport losses. The project consists of 10 acres of irrigated pastureland, five acres of wetland and 18 acres of marsh and pond habitat. While the Forest Service has a 12.6 cfs Mill Creek water right, it is a junior right and is fulfilled only during the peak runoff season when the power plant is at or near capacity.

When it is approved for public release, the report on "LADWP progress on completing SWRCB restoration requirements" (Los Angeles Department of Water and Power, 2006) should be incorporated as an appendix. The draft document provides an excellent compilation of all the various restoration activities.

In the upper Owens River watershed, four streams have been the focus of research and restoration since 1992. LADWP's valley-wide riparian restoration effort began with Convict, McGee, and Mammoth creeks as well as the upper Owens River with the establishment of grazing strategies, water management, and recreational control designed to improve riparian habitat. The goal of LADWP's stream restoration effort is to employ best management practices (BMPs) for land and water uses that establish and maintain riparian vegetation, protect water quality and improve fish and wildlife habitat while maintaining water supplies to the city. BMPs must also incorporate recreational uses as well as sustainable agriculture practices.

To allow annual recruitment of riparian plants, pasture irrigation was delayed on each of the four streams to allow snowmelt runoff flows to pass. When the flow in the creeks reached near-base conditions, controlled diversion of water into pastures was allowed.

Vehicle access to the streams for angling resulted in substantial degradation of streambanks. Roads that paralleled the streams were also a source of sediment and prevented recruitment of new vegetation. All roads within the riparian corridor were closed, and vehicle traffic on streambanks was stopped. Angler access to the four creeks was limited to walking, with access gates built into the new fence lines.

New grazing practices were prescribed, and fences installed to gain control of livestock distribution, timing of forage use and degree of forage utilization on and near the stream banks.

The Inyo National Forest has plans to restore an area of wetlands around Bodle Ditch

between Mammoth Creek and Lake Mary outlet. These wetlands received water from Bodle Ditch and were functional until the 1980s, when the ditch was no longer used to convey water. The area was later acquired by the Forest Service.

Wetlands surrounding the naturally ephemeral Laurel Ponds were expanded when disinfected secondary-treated effluent from the Mammoth Lakes wastewater treatment plant was discharged there beginning in 1983. The Inyo National Forest regards the site as important waterfowl habitat.

The Owens Gorge, just downstream of the lowest point of the study watershed, has been the scene of a large-scale restoration effort for the past decade. In 1991, a section of the penstock that carried water from the Crowley Lake dam failed, and water had to be released into the Owens Gorge. After repairs were completed, LADWP was required to maintain water in the affected section of the Owens River, which had been essentially dry for about four decades. Experiments with flushing flows have been conducted, riparian vegetation has been successfully reestablished, and the fishery is improving.

In the West Walker River watershed, the California Department of Fish and Game conducted a project in the 1980s to restore riparian vegetation in Pickel Meadow. Additional restoration work including fencing to keep cattle out of the channel was performed in 1996. As of 2007, the California Department of Fish and Game has a draft restoration plan for Pickel Meadow that should be released soon.

No Net Loss Policy

There has been a federal policy of "no net loss" of wetlands since 1988. The responsibility for implementing this policy is shared by the U.S. Army Corps of Engineers and each state's water quality agency. The general concept has three steps:
a) wetlands shall not be filled or otherwise destroyed;
b) if damage cannot be avoided, it shall be minimized;
c) if filling or other damage is permitted (by the U.S. Army Corps of Engineers), then some sort of compensatory mitigation is required.

Mitigation as Compensation for Wetland Losses

Mitigation actions that compensate for loss of wetlands and their functions are a substantial condition attached to a permit for impacts to a wetland. The U.S. Army Corps of Engineers and/or a state permitting agency may allow the permittee to replace the lost functions on a case-by-case basis. The permittee can compensate for the losses caused by its project by establishing a functional wetland elsewhere on its own property or elsewhere in the region. In cases where the permittee cannot accomplish the required mitigation itself, the permittee may pay for the mitigation actions through a mitigation bank or in-lieu-fee program.

Mitigation banking has been defined as "wetlands restoration, creation, enhancement, and in exceptional circumstances, preservation undertaken expressly for the purpose of compensating for unavoidable wetland losses in advance of development actions, when such compensation cannot be achieved at the development site or would not be environmentally beneficial" (Federal Register, 1995). A third party operates a mitigation bank or program where larger wetlands are created, restored, enhanced, or preserved to mitigate for several smaller conversions of wetlands that are permitted independently with the requirement of purchasing "credits" from a mitigation bank. Ideally, the mitigation banks and their associated wetlands are established and "mature" before there is a regional need for mitigation. After the mitigation project is functional and stable, then the compensation credits become available for projects in the area. A significant investment over a period of years is necessary to establish a wetland mitigation bank, and substantial risks are involved that a sufficient demand will exist in the future.

In-lieu-fee mitigation is an alternative means of compensatory mitigation where a permittee provides funds to an in-lieu-fee sponsor instead of performing on-site mitigation or purchasing credits (U.S. Department of the Army and others, 2000). Unlike mitigation banking where the compensating project is completed before the permitted impacts to wetlands occur, in-lieu-fees contribute to a fund that will offer compensation after the impacts occur (Environmental Law Institute, 2002). In-lieu-fees may be much greater than the cost of equivalent credits from a mitigation bank as a means of compensating for the time lag after the impacts occur. In-lieu-fee mitigation can be used to restore wetlands at a number of sites instead of the typical single large project of a wetlands mitigation bank (Environmental Law Institute, 2002).

The four methods of compensatory mitigation have been defined operationally for the permitting process (Federal Register, 1995):

Creation: The establishment of a wetland or other aquatic resources where one did not formerly exist.
Restoration: Re-establishment of wetland and/or other aquatic resource characteristics and function(s) at a site where they have ceased to exist, or exist in a substantially degraded state.
Enhancement: Activities conducted in existing wetlands or other aquatic resources that increase one or more aquatic functions.
Preservation: The protection of ecologically important (non-project) wetlands or other aquatic resources in perpetuity through the implementation of appropriate legal and physical mechanisms. Preservation may include protection of upland areas adjacent to wetlands as necessary to ensure protection and/or enhancement of the aquatic ecosystem. Although preservation was intended to be used only in "exceptional circumstances" (Federal Register, 1995) because it does not contribute to the national goal of no-net-loss, a nationwide evaluation of mitigation banking found this method to be at least as common as the other methods (Environmental Law Institute, 2002).

Creation of a wetland (conversion of an area that never supported wetland-like conditions) to a functional wetland is a difficult process that has had relatively little

success around the country (Lock, 1994; Committee on Wetland Losses, 2001). Establishing hydrologic conditions that will be stable for decades to centuries and developing soils with wetland characteristics have proved to be quite challenging. Restoring degraded, drained, or filled wetlands that still have the original soils in place has been much more successful than starting from scratch on a well-drained site. Restoration of degraded wetland areas that are adjacent to currently functional wetlands has had the highest rate of success and generally the lowest costs (Lock, 1994).

A document from Region 9 of the U.S. Environmental Protection Agency (1991) differentiated between projects that are or are not suitable for mitigation banking: Projects that tend to be suited to a mitigation banking approach include (1) water-dependent projects (those that require access or proximity to water bodies), (2) linear projects (e.g., roads, canals, pipelines, transmission lines) that have cumulative effects from numerous impacts to aquatic areas, and (3) impacts to very small or isolated wetlands. Projects that are considered ill-suited to mitigation banking are those where (1) on-site mitigation is feasible and would produce a better outcome, (2) threatened or endangered species are affected by the project, (3) prime examples of particular communities or ecosystems would be eliminated, (4) functions with regional value (e.g., groundwater recharge or pollutant retention) would be impaired, and (5) habitats and functions that are not readily recreated elsewhere would be impaired (U.S. Environmental Protection Agency, 1991). The Region 9 guidance also provides some general criteria and implementation procedures that will not be repeated here but serve as a useful reference. Lock (1994) provides some practical guidelines for wetlands restoration.

At least two major evaluations of wetlands mitigation banking have been completed (Committee on Wetlands Losses, 2001; Environmental Law Institute, 2002). Both studies found that although progress has been made in reducing the rate of loss of wetlands, the national objective of no-net-loss has not been achieved. Both studies also found a variety of failures, lapses, and operational difficulties in implementing compensatory mitigation programs. Mitigation banks have also proven to be an extraordinarily expensive undertaking where costs can readily exceed $100,000 per acre of credited wetland.

Mono County Wetlands

The Eastern Sierra Land Trust has had a minor role in the planning of a wetland mitigation bank near Owens Lake in Inyo County during 2006. This involvement has taught the staff and board of the ESLT about some of the administrative, logistical, and financial difficulties of planning and operating a wetlands mitigation bank. As a result of this recent experience, the ESLT understands and appreciates how much more difficult mitigation can be compared to conservation of an existing wetland.

A fundamental question when considering establishment of a wetland mitigation bank is whether there is a projected use and market for the credits in the geographic area of the bank. Most of the development activity within the three watersheds is in the town of Mammoth Lakes. With the exception of some undeveloped land along Mammoth Creek, wetland areas within the town boundaries that could be subject to development are not

obvious. For the next decade or so, much new construction will probably involve demolition of older structures and rebuilding on those sites. Given the town's setback requirements from stream channels and the relative cost of purchasing and tearing down an older structure vs. purchasing mitigation credits, we do not anticipate a demand for a mitigation within or near Mammoth Lakes.

Another area with significant development potential in the next decade is Antelope Valley. Growth in this area is expected to be piecemeal subdivision of agricultural land down to the 10-acre minimum lot size. A non-wetland building site can almost certainly be found on a 10-acre lot and the valley is currently sparsely developed, so we do not anticipate demand for wetland mitigation services in the northern part of Mono County. Furthermore, we hope that through a cooperative strategy with the California Farmland Conservancy Program and the Mono County Community Development Department, most of the land of Antelope Valley can be maintained for agriculture and residential growth can be guided to areas adjacent to the existing communities and away from riparian areas and wetlands. The U.S. Department of Agriculture has a Wetland Reserve Program that allows farmers to be compensated for conservation easements that protect wetlands that also have some agricultural values. The applicability of this program to Antelope Valley should be explored.

The "Land Ownership Adjustment Strategy" of the Inyo National Forest (1995) identified eleven private parcels within the Mono Basin and three private parcels within Long Valley that contained wetlands that may be important enough to warrant consideration for land trades or other protection. Additional large parcels containing wetlands on a portion of the property were identified during the bi-state sage grouse conservation efforts of 2005 and 2006.

The report by Curry (1996) recommended identification of potential mitigation sites where past filling or draining of wetlands can be reversed and functions reestablished. Our preliminary investigations have found few such opportunities within the three study watersheds (West Walker River, Mono basin, and upper Owens River). There is an active restoration program for riparian wetlands in the Mono basin under the State Water Resources Control Board's Decision 1631 and Water Rights Order WR 98-05. Although this restoration program will improve conditions degraded by decades of water diversions, it will not serve as mitigation for future development. We hope that this report will motivate others to suggest areas that we have overlooked. Unfortunately, it appears that most of the areas where wetlands have been eliminated or degraded in the past are not readily amenable to restoration without extraordinary investments (e.g., removing parts of the Snowcreek development or June Lake Village).

Possible areas for potential mitigation

West Walker River

Small parts of the Antelope Valley may be suitable for wetlands mitigation. Detailed site investigations would be necessary. There is a good possibility that the California Farmland Conservancy Program will fund a position in cooperation with the Eastern Sierra Land Trust during 2007-2008 to study agricultural land conservation within Mono County and wetlands mitigation could well be a part of this work.

The California Department of Fish and Game manages portions of Slinkard Valley, Little Antelope Valley, and Pickel Meadow. Recent management plans for these areas include restoration of wetlands functions on a localized basis, but this activity is a state responsibility and unlikely to be connected with mitigation for new development on private lands.

The Sonora Junction area is a prospective site for preservation of existing wetlands on private land. There are several proposed subdivisions in the surrounding area that could potentially contribute to an in-lieu-fee mitigation fund that could purchase a conservation easement for the most critical sites in this region.

Mono Basin

The Conway Ranch, now owned by the County of Mono, may have some opportunities for mitigation where ditches have lowered the water table. However, the Federal Energy Regulatory Commission may determine that restoration of the Mill Creek bottomlands is a higher priority, and water could become a limiting factor on Conway Ranch at some point in the future.

The restoration work currently underway by the Los Angeles Department of Water and Power on several stream reaches tributary to Mono Lake should reestablish wetland functions in areas degraded by long-term water diversions. This program is self-contained as required by the State Water Resources Control Board and does not appear suitable for any additional wetlands mitigation regarding unassociated development projects.

Riparian areas of Bohler Canyon have been damaged by off-highway vehicle use and could be rehabilitated to restore habitat and hydrologic function to some of the meadow areas. However, operation of a wetland mitigation bank on National Forest and City of Los Angeles land could be difficult from an administrative perspective.

Part of the area occupied by the Dream Mountain Resort and Dream Mountain Subdivision near Silver Lake were identified by Curry (1996:22) as “one of the largest complexes of easily restored wetlands suitable for mitigation banking.” Other small parts of the June Lake Loop that have been filled or drained but not built upon might be candidates for restoration.

Upper Owens River

One area of the watershed that appears suitable for mitigation projects on private land are the ranches with Owens River frontage between East Portal and the upstream edge of

City of Los Angeles land. The riparian corridor through this river reach was greatly altered by augmented flows from the Mono Tunnel from 1941 through 1990. Although natural recovery processes are reestablishing some degree of bank stability and riparian vegetation, active restoration could accelerate recovery and reestablish some wetlands functions on a localized basis. However, development threats to other wetlands in the upper Owens River watershed of the scale that would contribute to a mitigation bank along the river are not obvious at this time.

There may be some opportunity for small-scale wetlands mitigation along Mammoth Creek between the UC Valentine Eastern Sierra Reserve and the Mammoth Creek Park at Old Mammoth Road if further development of the Snowcreek complex should proceed. The new owner has contacted the Eastern Sierra Land Trust about options for conservation.

Portions of the Aspen Springs area were identified by Curry (1996:22) as suitable for restoration and mitigation banking. Individual projects in this area would be very small scale.

Although the general concept of wetland mitigation banking is an attractive option for maintaining some wetland functions when destruction of existing wetlands is permitted, potential demand for such services seems very limited within the watersheds of the West Walker River, Mono basin, and upper Owens River. The Mono County Community Development Department should keep the option of mitigation banking open by maintaining an inventory of restorable wetlands in the event someone wishes to invest in a mitigation bank in the future. In general, we believe that Mono County will be better served by strong policies to steer development away from wetlands and riparian areas and avoid disturbance of such areas in the first place. The Eastern Sierra Land Trust can help conserve wetlands in Mono County by working with willing landowners to place conservation easements on these critical parts of our landscape.

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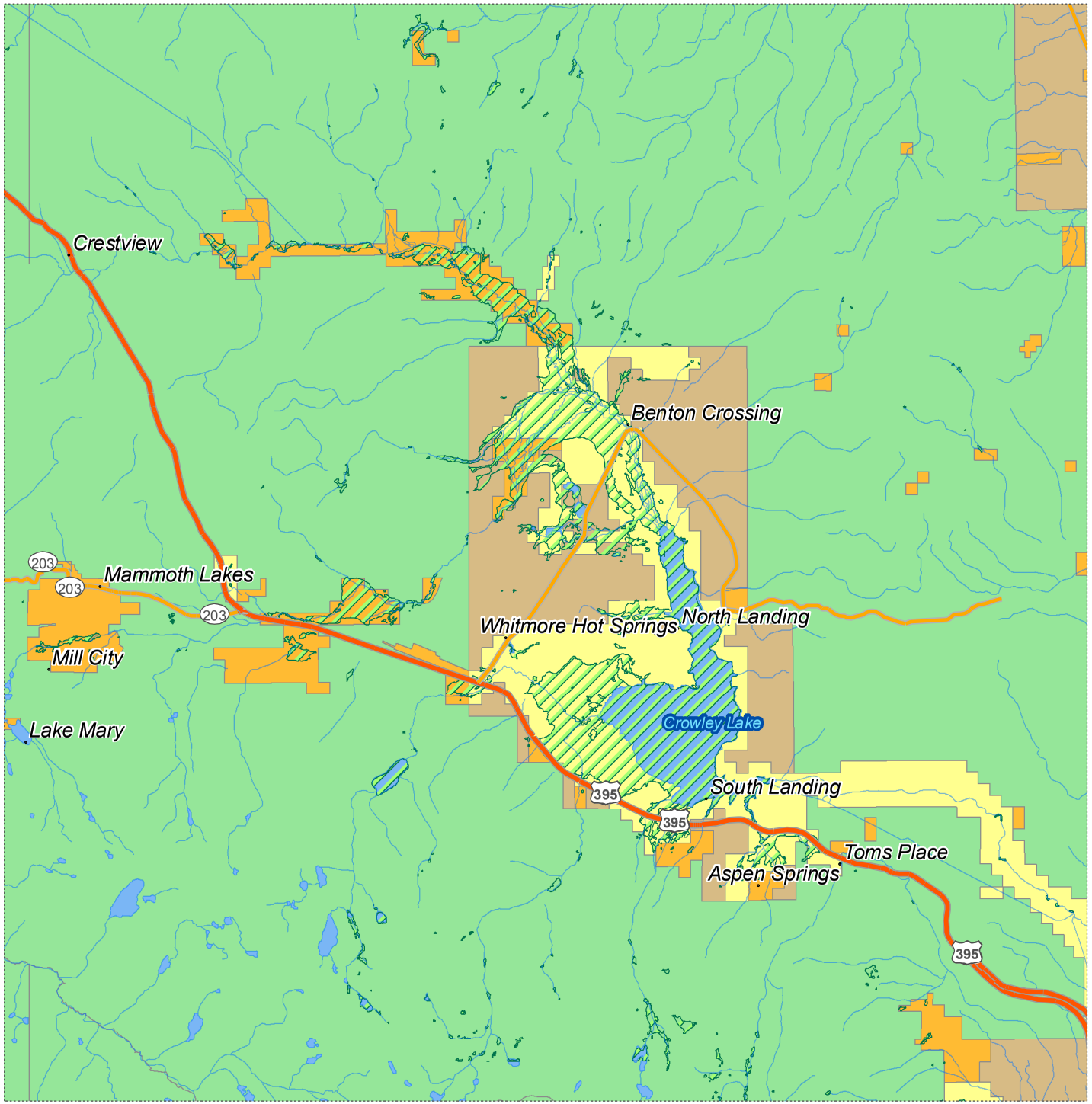


DOCUMENT

Prospects for Wetlands Mitigation Banking in Mono County

EXHIBIT

Upper Owens River Overview

DATE

February 24, 2007

LEGEND

- Streams
- Wetlands Inventory Data *
- Lakes

Land Ownership

Agency

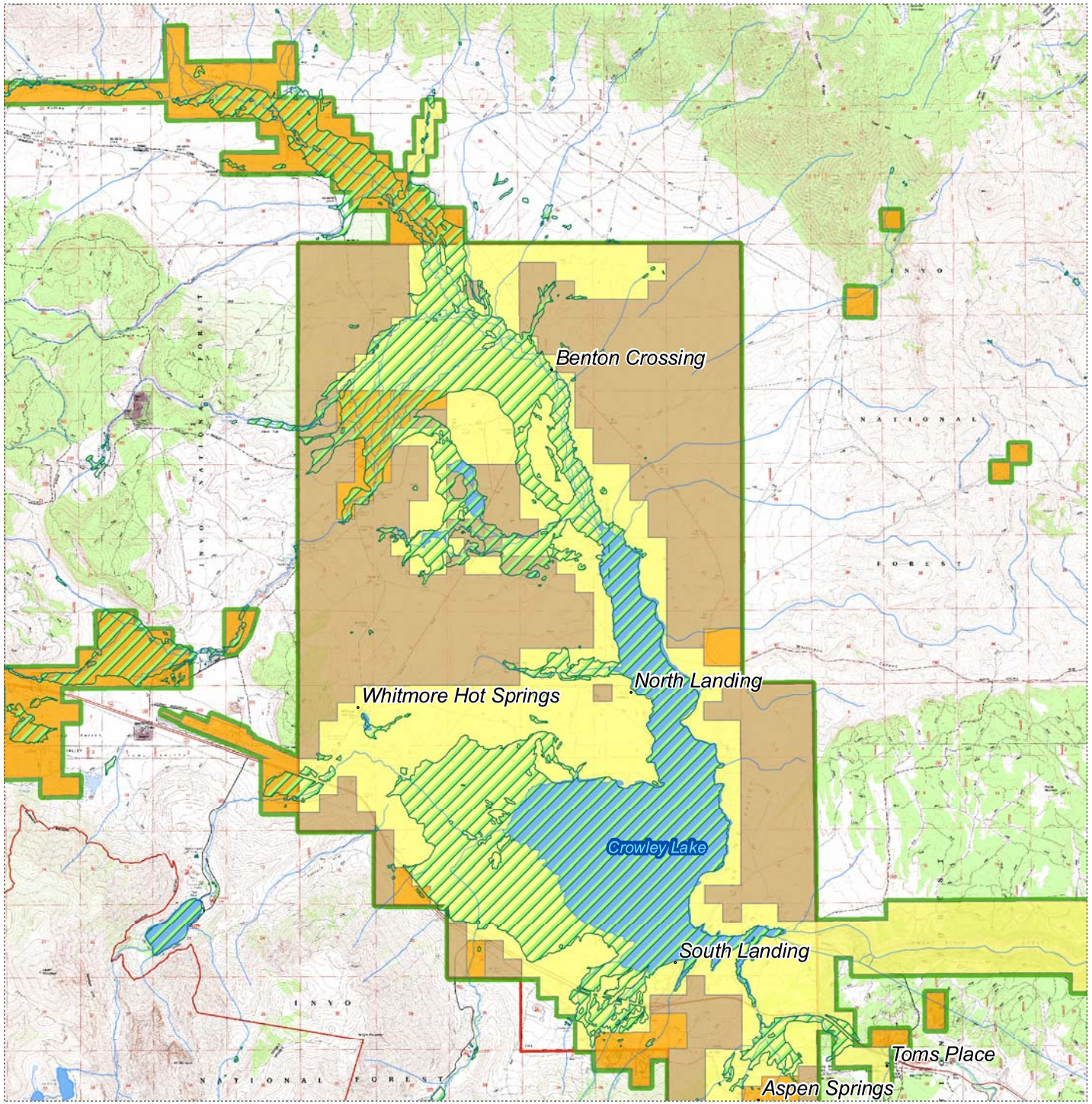
- Bureau of Land Management
- LA Dept of Water & Power
- National Park Service
- State
- US Forest Service
- Private

* Data source: US Fish & Wildlife Service

N

0 0.5 1 2 3 Miles

EASTERN SIERRA LAND TRUST



DOCUMENT

Prospects for Wetlands Mitigation Banking in Mono County

EXHIBIT

Crowley Lake Area

DATE

February 26, 2007

LEGEND

- Streams
- Wetlands Inventory Data *
- Lakes

Land Ownership

Agency

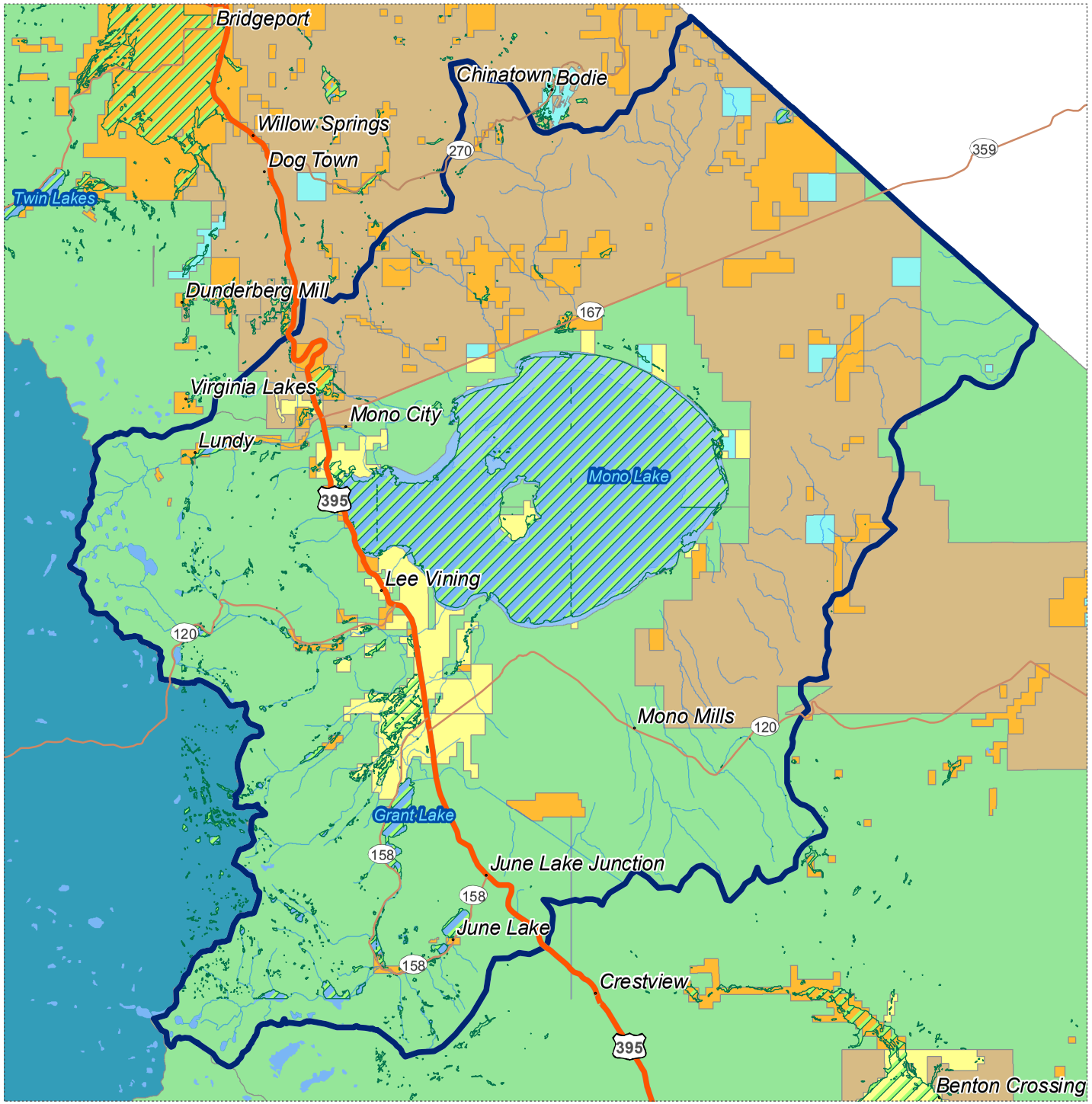
- Bureau of Land Management
- LA Dept of Water & Power
- National Park Service
- State
- US Forest Service
- Private

* Data source: US Fish & Wildlife Service

N

0 0.5 1 2 Miles

EASTERN SIERRA LAND TRUST



DOCUMENT

Prospects for Wetlands Mitigation Banking in Mono County

EXHIBIT

Mono Basin Overview

DATE

February 24, 2007

LEGEND

- Mono Basin Boundary
- Wetlands Inventory Data *
- Waterbodies

Land Ownership

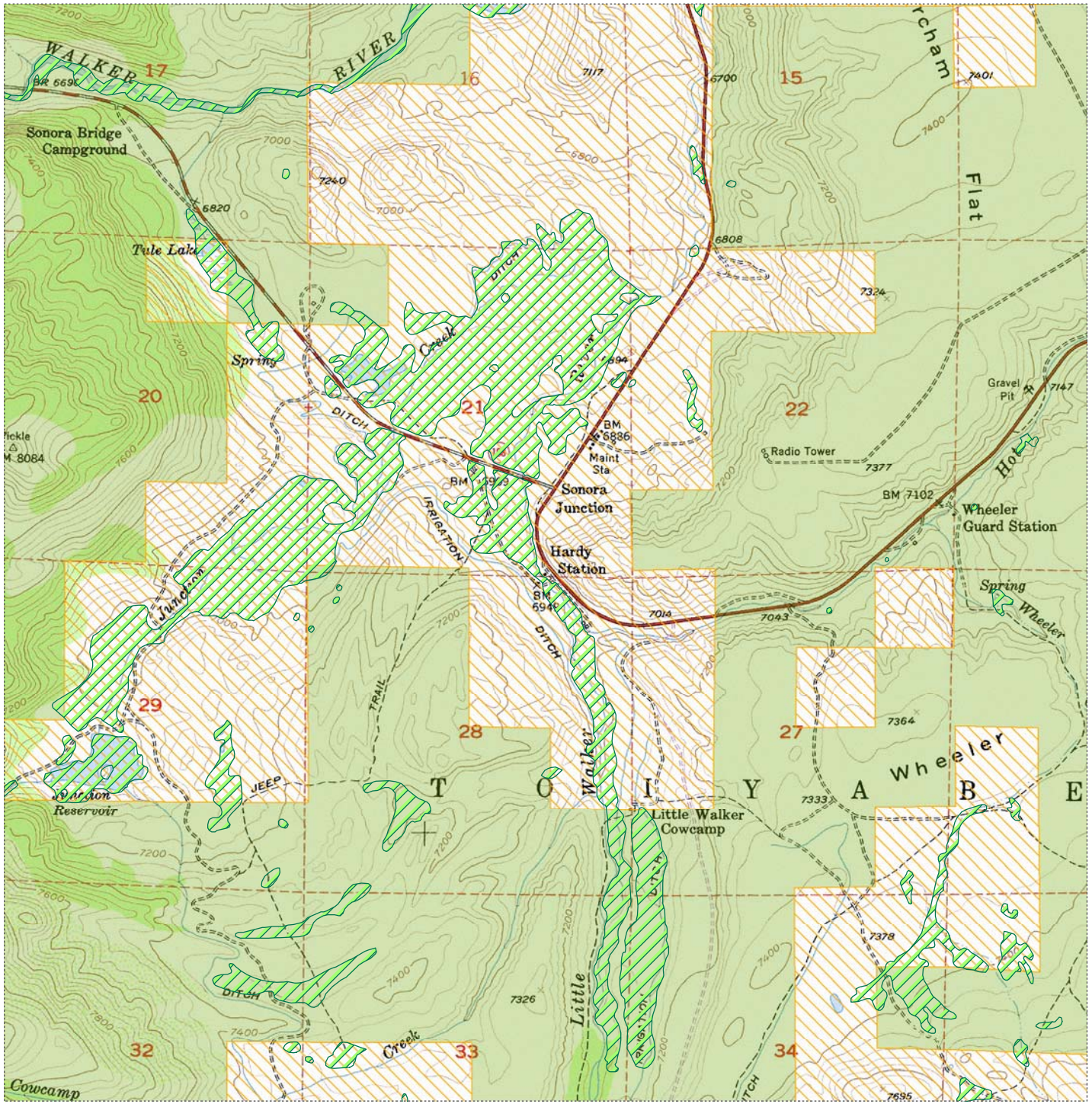
- Bureau of Land Management
- LA Dept of Water & Power
- National Park Service
- State
- US Forest Service
- Private

* Data source: US Fish & Wildlife Service

N

0 1 2 4 Miles

EASTERN SIERRA LAND TRUST



DOCUMENT

Prospects for Wetlands Mitigation Banking in Mono County

EXHIBIT

Sonora Junction Area

DATE

February 26, 2007

LEGEND

Wetlands Inventory *

Land Ownership

US Forest Service

Private

* Data source: US Fish & Wildlife Service

N

0 1,000 2,000 Feet

EASTERN SIERRA LAND TRUST

The Eastern Sierra Land Trust is a nonprofit organization that works with willing landowners to protect vital lands in the Eastern Sierra for their scenic, recreational, historical, agricultural, botanic, and wildlife values.

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