Chapter 3G. Environmental Setting, Impacts, and Mitigation Measures - Land Use

The evaluation of land use impacts in this chapter focuses on two areas: lower-elevation portions of Mono Basin and the Upper Owens River basin or "Long Valley". The area of concern in Mono Basin includes land irrigated from the four diverted tributary streams, areas around Mono Lake that may be affected by changing lake levels, public land allotments that could be indirectly affected by project actions, and public and private properties that could be affected by use of the Mono Basin National Forest Scenic Area. This area includes land within the scenic area, additional LADWP land south and southwest of Mono Lake, and land along the June Lake Loop.

The area of concern in Long Valley includes private and LADWP land along the Upper Owens River that could be affected by changed flows in the river. This study area includes land from just upstream of the East Portal near Big Springs, south to Lake Crowley reservoir.

PREDIVERSION CONDITIONS

By the onset of LADWP's diversions, most areas of concern were dominated by agricultural activity, except for the town of Lee Vining, which was a small commercial and residential center. Homesteaders established homes in many areas to support their agricultural activities, and some vacation dwellings and resorts had been developed along the region's lakes and streams. In 1940, as today, Mono County was sparsely populated because of its geographic isolation, cold climate, and large portion of public open-space land.

Mono County's mineral resources had been a major attraction to early settlers to the eastern Sierra Nevada, although few of the mines were located within the areas of concern. Mining within the county as a whole had declined to a low level after the turn of the century. Quarrying of construction materials (gravel and pumice), however, has been a continuing activity in the area of concern.

Recreation and associated land uses in the prediversion period are described in Chapter 3J, "Recreation Resources". The following discussion focuses on the area's agriculture and on land ownership changes associated with development of the area's water resources for power generation and water export.

Sources of Information

Documents produced recently were consulted to obtain an overview of historical land uses and ownerships in the Mono-Inyo Region (USFS 1989a, Fletcher 1987, Kahrl 1982, Rawson 1990 [Court Testimony, Volume I, Streamflow]). This information was supplemented by discussions with local residents familiar with the history of the area (Alpers and J. Arcularius pers. comms.) and LADWP personnel (Anderson pers. comm.).

Land ownership information and some irrigation rights and practices were drawn from testimony and exhibits produced for the 1930 condemnation proceedings, commonly referred to as the Aitken case (Superior Court 1934). Promotional literature produced by LADWP during the prediversion period provided references to additional sources of information. Correspondence and legal documents contained in the Aitken case files, the National Archives, and elsewhere provided information about plans and policies relating to land acquisition (Van Bokkelen, Chappell, Gary, and Wilson pers. comms.; California Senate Committee on Local Governmental Agencies 1945; Verble 1989).

The mapped accounting of acquisition of land by LADWP herein may not be without error; acquisition data were extracted from documents describing the condemnation proceedings, but LADWP's parcel-by-parcel files have only been consulted to verify representative parcels (Wills pers. comm.).

Agriculture

Historical Overview of Agricultural Development in the Mono-Inyo Region

Native Americans. Agricultural development in the Mono-Inyo region predates discovery of the area by Euroamericans. Although the Northern Paiutes who inhabited the Mono Basin area never practiced any sort of agriculture in the basin in the prehistorical period, the Owens Valley Paiute to the south practiced irrigated agriculture to supplement their food supply (Fletcher 1987).

The Mono Basin Paiutes did turn to ranching and farming in the late 19th century and practiced agriculture up to prediversion times. They owned properties on Rush, Lee Vining, and Walker Creeks where they raised irrigated crops, horses, and sheep. Some Paiutes were employed on Euroamerican ranches.

Early Settlements of Euroamericans. Development of the Mono and Inyo County areas for agricultural uses by Euroamericans began during the mid-19th century. U.S. cavalry excursions into the Mono Basin area in the 1850s returned with reports of the area, including samples and reports of gold found in the basin. Based on these reports, a ranch and sawmill on Lee Vining Creek were soon established by Leroy Vining and companions (USFS 1989a). During the remaining years of the 19th

century, ranching, logging, communication, and transportation systems were developed in response to the needs of the growing mining communities of Bodie, Monoville, and Aurora.

Supplying the Miners. The mining boom at Bodie in the 1870s stimulated agricultural development in and around Mono Basin. The demand for food and fiber at the mining towns and camps generated a market for locally produced hay, grains, vegetables, meat, and dairy products. Immigrants to the area were attracted to land suitable for agriculture that could be acquired free, in parcels not exceeding 160 acres, under the Homestead Act of 1882.

Agricultural settlement was most active in the period from 1878 to 1882, when the mines were at peak production. According to a report from 1880, more than 2,000 acres of land were under production near Mono Lake as sagebrush areas were converted to tillable farmland. Because a reliable water supply was needed to grow irrigated crops, farms were concentrated along Mill, Lee Vining, Walker, Parker, and Rush Creeks. Open ditches, controlled by sluices that were opened and closed according to need, diverted water from streams and springs. The total amount of irrigation in the basin during the 1880s and 1890s was probably about 4,000 acres, although irrigated acreage fluctuated. Most irrigation was on livestock pastures that were created by expanding natural meadows.

Conditions in the 1900s. Irrigated acreage probably changed little between 1880 and 1920. The agricultural census of 1919 reported 4,190 acres irrigated from tributaries of Mono Lake. In 1929, the census reported 11,500 irrigated acres in the basin. The increase from 1919 was mainly because of irrigation by the Cain Irrigation Company (Fletcher 1987).

Typical Operation. Mono Lake settlers practiced a mixed agricultural economy. Each homestead was usually a farm and ranch, where a variety of crops and animals were raised. Hay was by far the dominant crop, needed to supply winter feed for cattle and sheep. After hay, the most important crops were wheat, barley, alfalfa, and potatoes. Vegetable gardens, where peas, beans, carrots, onions, strawberries, and squash were grown, were also part of most homesteads. (Fletcher 1987.)

Livestock Grazing. Livestock grazing was introduced into Mono Basin in three distinct periods. The first period occurred in the 1860s when many cattle and sheep were herded through the basin from southern and western California enroute to grazing land in Nevada. The second period coincided with the mining boom of the 1880s. Many settlers who accompanied this boom were ranchers, bringing with them herds of cattle and sheep that remained within the basin year round. The third and most intense period occurred at the turn of the century when large bands of sheep began coming into the basin every summer from Kern County. The total influx every year approached 200,000 sheep, causing considerable competition for forage and range degradation. (USFS 1989a.)

Migratory domestic sheep bands were placed under stricter grazing controls in 1905 when much of the southern half of Mono Basin became part of the Sierra Forest Reserve (soon to become the Sierra National Forest), which regulated grazing within its boundaries. The northwest basin was protected in 1908 when the Mono National Forest was created. Livestock grazing practices, however, remained relatively

uncontrolled until the passage of the Taylor Grazing Act and the formation of the U.S. Bureau of Land Management (BLM) in 1934. (Fletcher 1987.)

Trends in the Prediversion Period. Selected characteristics of agricultural land use in Mono and Inyo Counties for 1910, 1930, and 1940 are shown in Table 3G-1. Agricultural land use trends in the two counties during this period were different. As shown, the number of farms in Mono County remained relatively stable at approximately 90 between 1910 and 1940; however, the number of farms in Inyo County decreased more than 200 over the same period, due in part to LADWP land acquisitions. As the number of farms decreased in Inyo County, the average size of farms increased from about 250 acres to about 800 acres. At the same time, the average size of farms in Mono County *decreased* an average of about 50%. Irrigated acreage in both counties decreased 40-60% between 1910 and 1940.

Mono Basin Agriculture

Irrigated Lands along Diverted Tributaries. When LADWP began acquiring land and water rights in Mono Basin in 1912, agricultural activities in the basin revolved around sheep and cattle production, as they do today, with sheep grazing being the primary activity. For the most part, sheep operators based in Kern County would bring bands of sheep into the basin during summer months to graze the high-country range.

Aerial photographs taken in 1929 show that water was being diverted from Gibbs, Lee Vining, Walker, Parker, and Rush Creeks to irrigate pastures. The photographs show two diversions off Lee Vining Creek, many diversions from Walker and Parker Creeks, and three diversions off Rush Creek. These diversions probably occurred after 1915, when the first dam was built at Grant Lake reservoir. Based on the 1929 aerial photographs, approximately 4,100 acres were irrigated from the four tributary streams, including 1,100 acres irrigated from Gibbs and Lee Vining Creeks, 2,000 acres irrigated from the Walker and Parker Creek drainages, and 1,000 acres irrigated from Rush Creek (Figure 3G-1). A portion of the acreage irrigated from Rush Creek was located east of what is now U.S. Highway 395 (U.S. 395). (Rawson 1990 [Court Testimony, Volume I, Streamflow].)

Property maps of the basin from 1934 show that irrigated acreage along the diverted tributaries remained relatively stable between 1929 and 1934, the years in which LADWP purchased most of its water rights and land in the basin. The Cain Irrigation Company, which owned most of the land along Walker, Parker, and Lee Vining Creeks, irrigated approximately 3,000 acres from these creeks in 1934, which is approximately the same amount of acreage irrigated from these creeks in 1929.

Irrigation practices in Mono Basin generally consisted of flood irrigation of native grass meadows, resulting in high per-acre water use relative to forage produced. During the 1920s, the Cain Irrigation Company, the primary user of water from the four tributary streams, annually applied as much as 6 acre-feet (af) of water per acre in its production of native hay (Kahrl 1982), or as much as 43 af per acre to eliminate sagebrush (Vorster 1985), presumably because of the preponderance of highly permeable alluvial

fan and pumice soils in the area. LADWP estimated that historical water use on the Cain Ranch varied from 5 to 10 af per acre annually, with an average of approximately 7 af (Rawson 1990 [Court Testimony, Volume I, Streamflow]).

Based on this estimate and the irrigated acreage estimates from the 1929 photographs, approximately 7,700 af of irrigation water was annually diverted from Lee Vining Creek, 14,000 af from Walker and Parker Creeks, and 7,000 af from Rush Creek. Including stock water, an estimated 30,000 af of water was used annually from the four tributary streams before LADWP diversions began (Rawson 1990 [Court Testimony, Volume I, Streamflow]).

Other sources indicate that even more water may have been diverted for irrigation from the four creeks than the amounts suggested by irrigated acreage estimates. According to irrigation data available for various periods between 1923 and 1941, irrigation water application rates may have ranged from 4.2 af per acre from Walker Creek to 30.3 af per acre from Rush Creek (Vorster pers. comm.). These data indicate that irrigation diversions from the four creeks averaged approximately 49,000 af per year before LADWP diversions. The data show that an average of 4,050 acres were irrigated from the four streams, similar to the acreage indicated by the aerial photographs from 1929.

Information concerning prediversion livestock production on land irrigated from Lee Vining, Walker, Parker, and Rush Creeks is not available; however, forage production can be estimated based on the estimated average amount of acreage that was under irrigation and the current productivity of these irrigated pastures. Forage production is typically measured by Animal Unit Months (AUMs). An AUM is the amount of forage required by one cow and calf or five sheep for 1 month, or approximately 800-1,000 pounds of forage. LADWP currently estimates forage production of 4.5 AUMs per acre on good irrigated pasture in Mono Basin (Anderson pers. comm.).

Assuming the irrigation of 4,100 acres, an estimated 18,500 AUMs of forage was produced annually on pastures irrigated by the four tributary streams before LADWP diversions began. This amount of forage would support approximately 18,500 sheep for 5 months.

Mono Lake Margin. Little information is available concerning prediversion agricultural production near the margin of Mono Lake. Cattle and sheep were presumably grazed on naturally irrigated and dry rangeland surrounding the lake, especially near established ranches such as the DeChambeau Ranch on the northwestern edge of the lake and on the lower Cain Ranch located southwest of Mono Lake.

Grazing almost certainly occurred along the west side of the lake where tributary streams resulted in naturally irrigated pastures down to the lake margin. During the 1880s and 1890s, 15 farms were concentrated along Mill Creek and 10 homesteads were developed on lower Lee Vining, Walker, and Rush Creeks and along the Mono Lake shoreline between the deltas of Rush and Lee Vining Creeks (Fletcher 1987). Land along the eastern edge of the lake has always been relatively dry and has supported

smaller livestock numbers. The eastern edge, however, was probably grazed by bands of migratory domestic sheep during summer months.

Upper Owens River Agriculture

The upper end of Long Valley was homesteaded in 1896 by the Alpers family (Alpers pers. comm.). Other families established homesteads in the area by the 1920s. Before 1940, all the land along the Upper Owens River north of Lake Crowley reservoir was in private, family ownership. Unlike Mono Basin, where sheep production became the primary agricultural activity, cattle production was the dominant activity in the Upper Owens River basin. One family, however, ran sheep in the area until the 1950s (J. Arcularius pers. comm.).

LADWP purchased private ranchland north of what is now Lake Crowley reservoir between approximately 1927 and 1932, leaving four ranches further upstream in private ownership.

Historically, cattle were grazed in Long Valley on pastures irrigated from the Upper Owens River and on adjacent private and public dry rangeland. Many ranches in Long Valley also included land in the Bishop area, where cattle would be pastured for the winter.

No information has been located documenting agricultural production in Long Valley before diversions from Mono Basin began. Pastures may have been irrigated more extensively before purchase by LADWP, but overall terrain constraints and the lower streamflows unaugmented by Mono Basin exports likely limited acreages irrigated from the Upper Owens River to amounts similar to 1989. The number of cattle pastured in Long Valley was probably greater prior to 1940 than today because grazing controls have been placed on users of LADWP land and adjacent federal land in leases and use permits. Additionally, cattle use of some private land is subordinated to fishery habitat enhancement where land is managed primarily as fishing vacation resorts.

Land Ownership and Water Resource Development

Although most land in Mono and Inyo Counties was initially put to agricultural and mining use, the area's abundant water resources derived from the high Sierra Nevada drew attention to the potential for hydroelectrical power generation and water supply for developing areas of Southern California. Land purchase by utilities for acquisition of water rights began in the early years of this century. Resulting changes in land ownership and use in the areas of concern by the beginning of LADWP's diversions are described in this section.

Federal Land and Water Policies

Settlers in the western United States could acquire free land under the Homestead Act of 1862, and much of the land in the areas of concern owned by private parties or LADWP was first acquired by homesteading of early settlers. To acquire land in this manner, settlers would make a claim on eligible federal land, submit an application to the government land office, demonstrate that they were actually using the land, obtain a survey meeting federal standards, and apply for a patent granting title to the land.

In the early 1900s, vacant public land in Mono County was gradually withdrawn from homesteading because federal management goals were developed that were inconsistent with further private land ownership. The southern half of Mono Basin was placed into the Sierra Forest Reserve in 1905, and the remainder was gradually withdrawn by Congress and the BLM between 1916 and 1931 to facilitate water and power development. In 1931, Congress withdrew the remaining public lands in Mono Basin from homesteading through Public Law 864 for the protection of the watershed supplying the City of Los Angeles and for other purposes (Porter pers. comm.).

The decline of mining and the diversion of human resources for World War I reduced occupancy of public land in Mono County, as much of the land entered under the Homestead Act was vacated before ownership was established.

Pursuant to the Reclamation Act of 1902, the federal government considered promoting and subsidizing agricultural growth in Mono County through a U.S. Bureau of Reclamation (Reclamation) water resource development program. The program was subsequently abandoned, apparently because it would have conflicted with LADWP's water development plans. The scale and form such a program would have taken in the area of concern is therefore unknown.

Early Water Resource Development for Power Production

By 1928, Southern Sierra Power Company (SSP) had acquired more than 11,000 acres of land in Mono County to facilitate the generation of power for export to Southern California. Five power plants were constructed on Rush, Mill, and Lee Vining Creeks between 1900 and 1928. One of the three Lee Vining Creek plants was at a site downstream of LADWP's eventual (current) diversion facility.

In conjunction with the Nevada-California Power Company, SSP had established a plan to accelerate agricultural settlement on lands proximate to its power transmission lines in the region to increase local electrical consumption primarily through pumping of groundwater for agricultural irrigation (Chappell pers. comm.).

LADWP Acquisition of Mono Basin Land and Water Rights, 1913-1945

In the early 1900s, LADWP began planning for diversion of water from Mono Basin in conjunction with plans for power development in the gorge below Long Valley (Kahrl 1982).

LADWP's diversions from Mono Lake tributaries were preceded by the acquisition of land and water rights in the basin beginning in 1912-1913. Waters of the tributary streams were being spread over substantial areas of rangeland for purposes of pasture irrigation; water rights were therefore distributed over large acreages. This situation required LADWP to acquire large tracts of land in specific areas. Other rights were needed to construct water export facilities and to affect the level of Mono Lake.

LADWP policies for land acquisition were developed during acquisition of land and water rights in Inyo County beginning in 1905. The policies were retained as LADWP expanded its operations north into Mono County. Acquisition policies at that time, which remain valid today, require that:

- the land has riparian or appropriative water rights or surface water of interest;
- the land, if developed, would affect existing city water gathering rights; and
- the price of the land is fair and reasonable (Wilson pers. comm.).

Planned Land Acquisitions. LADWP classified lands and appurtenant water rights needed for acquisition according to purpose in the Mono Basin water export project (Figure 3G-2) (Superior Court 1934). The first five divisions pertained to lands having riparian or appropriative water rights to the streams to be diverted. The sixth division encompassed lands surrounding Mono Lake. The seventh division was to accommodate conveyance facilities, and the last two divisions were to accommodate diversion dams and reservoir sites on Rush Creek. More specifically, the divisions included:

- Division 1 - land having water rights to Lee Vining Creek, including land with water rights obtained by the Mono County Irrigation Company in 1915;

- Division 2 - land having water rights to Rush Creek, including land with water rights obtained by Cain Irrigation Company and the California-Nevada Canal Water and Power Company in 1916;

- Division 3 - land having water rights to Walker Creek;

- Division 4 - land having water rights to Parker Creek;

- Division 5 - land having water rights to Gibbs Canyon Creek (as diverted to Horse Meadows);

- Division 6 - land having littoral, riparian, or other rights that could be affected by the level of Mono Lake, considered to be a band around the lake approximately 1-1.5 miles wide, as well as Paoha and Negit Islands;

- Division 7 - land for which ownership or an easement for installation of the Lee Vining conduit would be needed (this division overlaps other divisions above);

- Division 8 - land needed for a dam and reservoir at Grant Lake (much of this land was in federal ownership); and

- Division 9 - land needed for a dam and reservoir at Silver Lake on the June Lake Loop, including a tract of subdivided land.

Subsequently, public land was identified for which subsurface construction rights would be needed to accommodate the Mono Craters Tunnel.

Actual Land Acquisitions. Several means of acquiring necessary land and water rights in the above areas were pursued by LADWP:

- purchase of private land from willing sellers;

- acquisition of private land through condemnation proceedings, deriving from the City of Los Angeles' power of eminent domain;

- withdrawal of public lands from future homesteading by federal agencies, to preclude conflicts with additional private landowners in the future;

- acquisition of permits for rights-of-way on federal public land; and

- acquisition of public land ownership under 49 Stat. 1892 for lands serving "necessary purposes of said city", subject to such a finding by the Secretary of the Interior.

Figure 3G-3 depicts the prediversion pattern of land ownership in Mono Basin that resulted from LADWP's land acquisitions.

Private Land Purchase. Approximately 3,000 acres were acquired through purchase from willing buyers before subsequent condemnation proceedings were initiated in 1930. The perceived inevitability of transfers of land to LADWP, however, may have increased the amount of private land "willingly" sold.

Private Land Condemnation. In 1930, LADWP undertook condemnation proceedings to acquire remaining private land and water rights in Mono Basin that the city deemed necessary for its purposes. A total of 62 private property owners and 16 corporate owners were summoned to court, including banks holding foreclosed property and irrigation and power companies.

Much of the land sought through condemnation belonged to SSP and its associates. During the proceedings, LADWP agreed with SSP to purchase most of their property while not affecting SSP's rights to continued power generation. LADWP was thus able to purchase over 9,500 acres and obtain water rights to an additional 1,800 acres in Mono Basin. The SSP powerplant on Rush Creek and two of the plants on Lee Vining Creek could continue operation. The third plant on Lee Vining creek, located below the proposed LADWP diversion, was to be abandoned for power-generating purposes when the city began diversions.

SSP also offered to assign to LADWP land that had been optioned by private parties for purchase by SSP. An additional 3,100 acres were acquired in this manner. Seven ownerships ranging from 160 to 760 acres in size were involved. Throughout the proceedings, LADWP negotiated sales with several individual landowners, terminating portions of the litigation. Approximately 13,000 acres (Figure 3G-3) were so acquired.

In 1937, 7 years after the condemnation proceedings were initiated, the Aitkin case was closed and LADWP was awarded purchase rights to several additional properties at court-specified values. Subsequently, LADWP declined to purchase some of them. Much land originally sought remained in private hands, particularly along the perimeter of Mono Lake (Figure 3G-3).

Withdrawals of Public Land from Homesteading. Some public land near Mono Lake was withdrawn from entry by homesteaders by the BLM both to facilitate water and power development and, for some land, specifically at the request of LADWP. This land, shown of Figure 3G-3, remained in public ownership.

Acquisition of Public Land Rights. In 1937, LADWP acquired special-use permits from USFS and BLM for rights-of-way on federal land for the Mono Basin aqueduct and appurtenances.

In 1945, LADWP submitted two applications under 49 Stat. 1892 (noted previously) to the federal government requesting purchase of this land and nearly 24,000 acres of additional federal land for various purposes related to operation of the Los Angeles aqueduct system in both Mono Basin and the Owens River basin. This land entailed reservoir and dam sites, adjacent land that could affect water quality, water treatment sites, a disposal site for waste from the Mono Craters tunnel, land littoral to Mono Lake, and land riparian to Lee Vining and Rush Creeks. LADWP wanted ownership of this land because, although withdrawn, it could be opened to homesteading again in the future.

After a review lasting nearly 9 months, the Senate Committee on Local Governmental Agencies denied LADWP's request, stating that fee title (ownership) was not necessary and the city could successfully operate with easements, rights-of-way, and other commitments from the government (California Senate Commitee on Local Governmental Agencies 1945).

Acquisition of Appropriative Water Rights. In 1940, the City of Los Angeles was granted permits by the State of California allowing the appropriation of the flows from Rush, Lee Vining, Parker, and Walker Creeks into its newly constructed Mono Basin export system. Limited capacity of the Los Angeles aqueduct downstream prevented full appropriation of Mono Basin waters for many years. By 1970, however, the aqueduct system had been expanded, and full diversion during periods of average runoff became common.

In 1974, SWRCB issued licenses confirming the city's right to divert water from the Mono Lake tributaries. From 1974 until 1989, the city annually exported an average of 83,000 af of water from Mono Basin.

LADWP Acquisition of Lands and Water Rights along the Upper Owens River

In the prediversion period, private land along the Upper Owens River was used principally for cattle grazing, as previously discussed in the "Agriculture" section. Some private owners also established fishing ranches on their properties as described in Chapter 3J, "Recreation Resources".

By acquiring ownership of private land along the river, LADWP hoped to guarantee that conveyance of Mono Basin waters via the Upper Owens River would not be hampered. Several parcels, consisting of nearly 7,800 acres or nearly 65% of the private land in the area (Figure 3G-4), were purchased from private owners, including an individual who, knowing LADWP's interests, had been purchasing land several years before the above-described condemnation action was initiated.

During the condemnation action, LADWP had not yet determined the location of the Mono Craters Tunnel, so the other privately held parcels along the river were not sought through the condemnation process (Superior Court 1934). The testimony provided by LADWP in the Aitken Case indicated that additional properties in the Owens Valley would be identified for acquisition later, but additional acquisitions never occurred and additional condemnation proceedings were never undertaken.

Effects of Land Acquisition by LADWP

No substantial changes in use of acquired land appear to have resulted from LADWP's land acquisitions; however, the intensity of agricultural production in Mono Basin changed with variations in the amounts of water available for irrigation of LADWP properties. LADWP's policy allowed former owners to lease back properties for activities that would not disturb LADWP's water procurement (Verble 1989, Wilson pers. comm.). The amount of acreage allowed by LADWP to be irrigated by lessees varied each year due to runoff levels and LADWP's export needs. A total of about 3,000 acres was irrigated from streams supplying the aqueduct until the mid-1960s, when irrigation of lands east of U.S. 395 was eliminated by LADWP. Irrigated acreage has totaled approximately 2,000 acres in recent years. Irrigation

water applications have also varied from 0 to 11 thousand acre-feet (TAF) on acquired lands, averaging an estimated 8 TAF over this period.

Commerce and other uses of other land in Mono Basin and Upper Owens River basin also were little affected by LADWP's land acquisitions. This situation resulted primarily because many privately owned parcels were not acquired by LADWP and, as noted, agriculture on LADWP-acquired land changed little. This situation was in contrast to events in Inyo County, where LADWP purchase of lands and water rights led to substantial reductions in irrigation, the departure of former occupants, and therefore an overall decline in local commercial activity.

The town of Lee Vining was little affected by the land acquisitions. At this time, Lee Vining encompassed approximately 16 acres. A substantial portion of the Lee Vining townsite was located on USFS land that was leased by residents and merchants on a renewable annual basis, and these leases were not affected by LADWP procurement of lands. (California Senate Committee on Local Governmental Agencies 1945.) The Lee Vining townsite has since passed to private ownership.

ENVIRONMENTAL SETTING

Sources of Information

Agricultural land use and production is derived from production information compiled by the Inyo-Mono Department of Agriculture and discussions with ranch owners, livestock managers, and BLM and LADWP staff responsible for rangeland management. Land use policies and practices of Mono County, LADWP, and USFS are reported as described by responsible personnel and relevant policy documents.

Agriculture

Agricultural Land Use and Production in Mono County

Most agricultural land uses in Mono County are dedicated to the production of livestock feed and forage crops, including alfalfa hay, irrigated pasture, and dryland grazing (Table 3G-2). These three crops accounted for an estimated 98% of Mono County's harvested acreage in 1989. The data presented in Table 3G-2 indicate that amounts of irrigated pasture in the county have increased substantially since 1974; however, much of this change is due to irrigated pastures on federal lands being included in this category beginning in 1979. Amounts of irrigated pasture in the county probably changed little between 1974 and 1989.

Irrigated pasture accounted for 36% of harvested agricultural land in the county at the point of reference in 1989; dry grazing land accounted for 58% of all agricultural land in the same year.

Livestock production, by far the largest agricultural activity in Mono County, increased nearly in proportion to the increase in acreage dedicated to feed and forage crops between 1974 and 1989. The number of cattle and calves produced in the county doubled from 1974 to 1989, increasing from almost 5,000 to nearly 10,000 head of cattle (Table 3G-3). While livestock production increases were substantial over this period, all the increases occurred in the first 5 years of the 15-year period (1974-1979); livestock production actually declined between 1979 and 1989.

Mono Basin Agriculture

Patterns of Use. About 79% of the land in Mono County is in public ownership (USFS 1989a). Within Mono Basin, the percentage of land in public ownership, including federal, state, and LADWP land, is even higher. Excluding the lake surface, 95% of the land within the Mono Basin National Forest Scenic Area is in public ownership (USFS 1989a). Because of the small amount of private land within the basin, most agriculture occurs on land leased from LADWP or used through permits issued USFS or BLM.

Livestock production is the dominant agricultural activity within Mono Basin. Sheep and cattle are grazed within the basin during summer months; very little livestock remain in the basin year round because of adverse weather conditions. Most livestock operations are based elsewhere, including Inyo and Kern Counties, California, and Nevada.

Typically, Mono Basin sheep operators truck animals from south to north, and from low elevations to high elevations following the growth of forage plants. This usually includes winter and early spring grazing in the lower San Joaquin Valley and Mojave Desert; late spring and summer grazing on LADWP, USFS, and BLM lands in Mono Basin; and fall grazing in the Owens Valley. This rotation incorporates forage produced by private properties in the San Joaquin Valley and forage produced by federal and LADWP properties in Mono Basin.

Levels of Use. The number of sheep and cattle brought into the basin each summer varies based on a number of factors, including relative forage availability in the basin, water availability, livestock prices, and operation-specific factors. Four sheep companies and one cattle company use most of the grazing lands within Mono Basin.

The agricultural productivity of Mono Basin can best be judged in terms of its forage production. Forage availability and livestock use associated with grazing land are measured and controlled by LADWP and federal agencies according to the number of animal unit months (AUMs) produced and allowed to be harvested by livestock per acre of land.

Estimated forage production within the area of concern during normal water availability years averages about 20,500 AUMs, including about 9,100 AUMs associated with federal grazing allotments and about 11,400 AUMs associated with LADWP properties (Tables 3G-4 and 3G-5). A small amount of forage is produced by private properties in Mono Basin. Approximately 86% of production on LADWP land is from pastures irrigated by the diverted tributary streams; the remainder is from dryland grazing. Irrigation occurs from April through October, with most of the irrigation occurring during the May-August period.

LADWP Land. Land along the diverted tributaries owned by LADWP was leased in 1989 to two sheep operations: the Mono Sheep Company and the Inyo Sheep Company. (The Mono Sheep Company was bought by the Inyo Sheep Company in 1991.) Leases cover a 1-year period, with the lease year spanning April 1 through March 30. Lease arrangements may be terminated at the end of any lease period but are normally offered to existing lessees for renewal. The two current lessees within Mono Basin have leased this land for many years. (Anderson pers. comm.)

Land leased by LADWP for grazing purposes is classified according to irrigability and forage productivity, with associated AUMs and lease rates per AUM. The productivity of LADWP's irrigable land in the basin ranges from 1.5 to 4.5 AUMs per acre. Adjacent dry grazing land produces from 0.05 to 0.125 AUMs per acre.

The application of water not to exceed 5 af per acre during the irrigation season is allowed on land classified as irrigable; however, according to the structure of its leases, LADWP may decrease or suspend the allowable water application rate at any time. Irrigable land is reclassified (called a "dry finding") if water is not available to serve the city's need during a given year because of dry conditions (c.f. LADWP model lease).

Mono Sheep Company. The Mono Sheep Company, based in Barstow, leases over 5,800 acres in Mono Basin from LADWP for the grazing of sheep. Leased land is located in three areas of the basin, including nearly 2,800 acres in the Horse Meadow/Lee Vining area, about 1,850 acres near the northwest corner of Mono Lake, and nearly 1,200 acres near the northeast corner of the lake.

As shown by Table 3G-4, allowable grazing use of LADWP land leased by the Mono Sheep Company is about 2,000 AUMs, with 76% derived from 440 acres of irrigated land and 24% contributed by the more than 5,000 acres of dry rangeland. The Mono Sheep Company's operation included approximately 3,000 sheep in 1989 (Iturriria pers. comm.).

During normal water availability years, and in 1989, the Mono Sheep Company irrigates 149 acres from creeks diverted by LADWP and creeks tributary to the diverted creeks in the basin. Based on the 5 af per acre maximum irrigation rate specified in the lease, irrigation during normal years would result in the annual use of 745 af of water from these creeks. The Mono Sheep Company irrigates 28 acres in Upper Horse Meadow and 31 acres in Lower Horse Meadow from Gibbs Creek (a tributary to Lee Vining Creek) through the Horse Meadow Diversion. Another 90 acres are irrigated along U.S. 395 south

of Lee Vining through the Gibbs Siphon release and two sandtrap releases from water diverted from Lee Vining Creek.

Allowable grazing use of these irrigated pastures is 4.5 AUMs per acre. Pastures irrigated by the Mono Sheep Company from Lee Vining and Gibbs Creek produce a total of 670 AUMs during normal precipitation years. (Anderson pers. comm.)

Inyo Sheep Company. The Inyo Sheep Company, based in Oildale, Kern County, leases nearly 9,900 acres in Mono Basin from LADWP for sheep grazing. Almost all of this acreage is located on the Cain Ranch on both sides of U.S. 395 southwest of Mono Lake and south of Gibbs Canyon. As shown in Table 3G-4, LADWP classified over 1,800 acres for irrigation; remaining acreage is classified for dryland range. Based on the maximum irrigation rate of 5 af per acre specified in the lease, irrigation during normal water availability years results in the use of about 9.2 TAF of water from tributary creeks.

Property leased by LADWP to the Inyo Sheep Company produces nearly 9,400 AUMs during normal years, with the irrigated land accounting for 89% of this total (Table 3G-4). In 1989, a dry finding was made on 335 acres of irrigable land because of drought conditions, reducing total AUMs allowed by the lease to about 8,300. All of the land irrigated under the lease to the Inyo Sheep Company are located west of U.S. 395 and are irrigated from the Farrington Siphon located on the aqueduct between Lee Vining and Walker Creeks, and from diversions from Walker and Parker Creeks. (The Inyo Sheep Company also has access to one BLM range allotment and three USFS allotments within the basin, with total forage production of 3,987 AUMs.

The Inyo Sheep Company was established in 1938. The number of sheep included in the company's operation have declined from approximately 20,000 in 1940, to 14,000 in 1970 after the second barrel of the aqueduct became operational, and to 10,500 by 1989. Sheep are taken to the Cain Ranch area by late April and are rotated among pastures at the Cain Ranch and federal allotments in the Mono Basin area until late September or October. Ewes are then transported to Bakersfield to lamb, and the sheep are generally kept in the Bakersfield area until late April. When pasture and dry grazing forage are scarce, sheep are grazed on leased alfalfa fields in Mono, Inyo, and Kern Counties. Lambs are sold in spring to slaughterhouses in Dixon, California; Colorado; and Texas. (Iturriria pers. comm.)

Importance of LADWP Land. Land leased by LADWP to livestock operators in Mono Basin represent a substantial amount of the agricultural productivity of the basin. Together, land leased to the Mono and Inyo Sheep Companies produce approximately 11,400 of the 20,500 AUMs produced in Mono Basin from diversions of 11 TAF/yr. The 2,284 acres of irrigated pasture leased to the two companies accounted for about 4% of the irrigated pasture in Mono County in 1989.

Federal and Other Public Land. Most of the land along the margin of Mono Lake is federal public land managed by USFS. Small parcels of private land are distributed around the lake, with the greatest concentration of private land along the west shore. As mentioned previously, LADWP also owns

land along the southwest and northwest margin of the lake. Sheep and cattle are grazed around the lake on much of this land.

Relicted Land. Some dryland grazing occurs on the relicted land, or land that has been exposed by the declining level of Mono Lake since LADWP diversions began. Relicted land lies between elevation 6,417 feet and the daily fluctuating lake level. Based on the point-reference (6,376.3 feet) lake elevation, approximately 14,100 acres of this land have been exposed since 1941. Approximately 43% of the relicted land is vegetated, primarily with bulrush and saltgrass. Relicted land is managed both by USFS and the DPR through a memorandum of understanding (MOU) (USFS 1989a).

Grazing on relicted land is prohibited by USFS as part of its management of the Mono Basin National Forest Scenic Area and by DPR. The relicted land, however, borders grazed public and private land, and unauthorized grazing on relicted land may occur. Relicted land is fenced off along the northeastern and eastern edge of the lake, but other relicted land is not separated from adjacent land by fencing.

Public Land Allotments. Range allotments managed by USFS and BLM ring Mono Lake and include substantial acreages. Among these allotments, six are located adjacent to Mono Lake and five are located west and south of the lake. Eight allotments are partially included within the Mono Basin National Forest Scenic Area and extend beyond onto adjacent land. Allotments often include both federal and nonfederal (private or LADWP) land that is managed together.

Allotments extending onto National Forest land are managed by USFS. The six allotments that extend onto BLM land are managed cooperatively under a 1985 MOU between USFS and BLM. Table 3G-5 lists the allotments within Mono Basin and the agency managing each allotment.

Forage production on federal land range from 0.125 to 0.020 AUMs per acre on shrub range; production on irrigated meadows range from 1.0 to 4.0 AUMs per acre (Primosch pers. comm.). Approximately 9,275 AUMs of forage are allowed to be grazed on the 10 allotments within the area (Table 3G-5). All but one of the allotments is grazed by sheep; the Mono Sand Flat allotment is grazed by cow-calf pairs.

Grazing permits run for 10 years and are usually renewed if the permittee wishes to continue using an allotment. An allotment is tied to its base property (private property owned by the permittee) or the livestock that use an allotment associated with leased land. If the base property is sold, the allotment permit is usually offered to the new owner. In the case of an allotment tied to leased land, the allotment would likely be offered to the buyer of the lessee's livestock.

An allotment is considered vacated if it is not used by the permittee over a 4-year period or if a new owner of base property or livestock does not choose to use an allotment. Vacated allotments may be offered to a new permittee, withdrawn from use by the managing agency, or reoffered with new use conditions. (Primosch pers. comm.)

The USFS management plan for the Mono Basin National Forest Scenic Area (USFS 1989b) calls for the closing of grazing allotments within the scenic area when permits are waived back to the government and when there is no qualified purchaser of either permitted livestock or base property belonging to the current permittee.

As shown in Table 3G-5, the Inyo Sheep Company is a permittee on four allotments within the area of concern. The Inyo Sheep Company controls the Horse Meadow, Mono Mills I, June Lake, and Alger Lake allotments. Together, the allotments produce nearly 4,000 AUMs of harvestable forage.

Aggregate Forage Utilization by the Inyo and Mono Sheep Companies. The Inyo and Mono Sheep Companies, utilizing both LADWP land and about 49% of the productivity of federal allotments, account for 77% of the livestock forage utilization in Mono Basin.

Upper Owens River Agriculture

Land ownership along the Upper Owens River is divided among private parties, LADWP, and the federal government. Within the study area, four private landowners operate cattle ranches in the northwest portion of the study area (Figure 1-4), and three ranchers lease land from LADWP north of Lake Crowley reservoir. At least three of the private landowners operate sportfishing facilities in addition to cattle ranches.

Few cattle stay in Long Valley year round because of adverse weather conditions. Cattle operators graze their cattle on land at lower elevations, usually in the Bishop area, during winter and early spring months. They truck them to Long Valley in May and graze them until October or November. All but one of the cattle operations along the Upper Owens River are cow-calf operations. Calves produced by these operations are usually sold to local buyers at weights ranging from 500 to 600 pounds. The animals are then typically shipped to Kern County for finishing.

Pastures in the area of concern are irrigated from both the Upper Owens River and Hot Creek, and dry rangeland also is used. Irrigation patterns are generally similar to those of Mono Basin, although the net evapotranspiration is higher; irrigation typically occurs from April through September, peaking in June and July. During a normal water availability year, a maximum of about 17 TAF is diverted and about 11 TAF is consumed for irrigation of this land.

Forage production from the combined use of private, LADWP, and federal grazing land along the Upper Owens River totals about 14,000 AUMs during normal water availability years (Tables 3G-6, 3G-7, and 3G-8).

Private Land. Four private properties, used for cattle and fishing operations, are located along the Upper Owens River in the northwest portion of Long Valley near the East Portal. All except the Owens River Ranch and a portion of the John Arcularius Ranch are downstream of the East Portal. These

properties contain approximately 3,080 acres, including an estimated 1,350 acres irrigated from the Upper Owens River. Three of the properties also control adjacent federal grazing allotments.

The four landowners have riparian water rights that allow them to use a correlative share of natural streamflow for reasonable beneficial uses. An estimated maximum of 6.7 TAF of Upper Owens River streamflow is annually diverted, and 4.3 TAF is consumed, for irrigation of this land during periods of normal runoff, based on estimated evapotranspiration rates in this area (Table 3A-9). (The difference between these two amounts is irrigation runoff and percolation that return to the river.) Upper Owens River streamflow effects of these and LADWP's irrigations diversions are described in Chapter 3A, "Hydrology" (Table 3A-9).

Production on private land in the Long Valley study area is difficult to estimate because forage harvesting by cattle is not managed or regulated by public agencies. The amount of land being irrigated and the AUMs produced on the private land are not carefully documented by landowners. In addition, the number of cattle sold by ranches using private land does not provide a good measure of the productivity of this land because cattle are grazed on land outside of the area of concern for much of the year.

Average current production on private land along the Upper Owens River, expressed in AUMs of forage, was estimated assuming 3 AUMs of forage production per acre on irrigated land and 0.1 AUM per acre on dry grazing land. These production rates were based on rates used by BLM and LADWP for evaluating the carrying capacity of grazing properties.

As shown in Table 3G-6, an estimated 4,200 AUMs of forage are produced annually on this private land, or about 30% of the total production in the Upper Owens River basin. Land irrigated from the Upper Owens River accounts for more than 95% of the forage produced on the four private properties. Nearly 93% of the production is from the three ranches downstream of the East Portal.

LADWP Land. LADWP owns all the land along the Upper Owens River downstream of the four private ranches to Lake Crowley reservoir. These properties are leased to three cattle companies with cow-calf operations. As in Mono Basin, irrigation and livestock use of leased properties are regulated by LADWP.

LADWP land accounts for about 53% of the forage produced in the Upper Owens River basin. About 9,400 acres of land leased by LADWP produce over 7,400 AUMs of forage, with 86% of the forage produced on about 2,000 irrigated acres (Table 3G-7). About 470 acres are currently irrigated from the Upper Owens River, and 1,535 acres are irrigated from Hot Creek. During a normal year, an estimated maximum 2.4 TAF of Upper Owens River streamflow is annually diverted and 1.5 TAF is consumed from the Upper Owens River for irrigation (with the difference returning to the river), while 7.7 TAF and 4.9 TAF are diverted (maximum) and consumed, respectively, from Hot Creek.

The actual amount of irrigated acreage may change during years when flows in the Upper Owens River are reduced due to drought conditions or reduced exports from Mono Basin (Table 3A-9). LADWP leases stipulate an irrigation rate of 5 af per acre on land designated for irrigation; however, the rate was reduced to 4.5 af per acre for the 1991 lease year.

The J&L Livestock Company typically irrigates about 470 acres from the Upper Owens River. About 1,500 acres are irrigated by Cashbaugh Ranch and 4J Cattle Company using water diverted from Hot Creek. The 4J Cattle Company irrigated pasture from a meander of the Upper Owens River prior to 1989, but reduced flows in the river since then have reduced their ability to irrigate from the Upper Owens River (Johns pers. comm.).

All three cattle companies have grazing access to other nearby properties, including federal allotments and private properties. During normal water years, the three cattle companies run a total of approximately 2,350 cow-calf pairs and 500 replacement heifers, and annually sell approximately 1,550 500-pound calves. Calves are typically sold to a buyer based in Bakersfield, where the calves are shipped for finishing. (Iturriria, Cashbaugh, Johns pers. comms.)

Public Land Allotments. Most of the private landowners and LADWP lessees along the Upper Owens River control federal grazing allotments adjacent to their primary properties (Table 3G-7). These allotments are critical components of the grazing operations. Cattle are moved from irrigated pastures on private and leased land to dry grazing land on federal allotments throughout summer to maximize the use of available forage. Forage production on the six allotments totals nearly 2,500 AUMs, or about 17% of the total forage production in the Upper Owens River basin.

Land and Water Resource Ownership and Use

Land Use Changes during the Diversion Period

During the diversion period, land in Mono Basin and along the Upper Owens River continued to retain its rural character. With the steady growth in tourism along the east side of the Sierra Nevada, the town of Lee Vining and rural residency continued to grow slowly. The town's role as a gateway to Yosemite National Park became more prominent as visitation there increased, while a significant recreational-residential center developed along the June Lake Loop. The regional population increased and transportation facilities expanded and became more dependable, decreasing the area's isolation.

Land ownership changed little during much of the diversion period. LADWP did not actively pursue further land and water rights acquisitions during this period, although the southern half of Paoha Island was acquired.

The most significant land ownership change was the recent acquisition of private land within the boundaries of the Mono Basin National Forest Scenic Area by the USFS when private owners are willing. Land exchange for other USFS land, which may be facilitated by the intermediate purchase by a third party, is the most common acquisition procedure. Appropriated funds can also sometimes be obtained after a lengthy process. Since its creation, the scenic area has been expanded by over 2,000 acres through private land acquisitions. Management of the Mono Basin National Forest Scenic Area is described in a subsequent section.

Figures 3G-5 and 3G-4 present the ownership of land at the point of reference in Upper Owens River basin and Mono Basin, respectively.

Town of Lee Vining. The town of Lee Vining continued to expand as the only commercial center in the basin. Retail stores, lodging, restaurants, and gas stations serve the town residents, surrounding areas, and recreational visitors passing through. A USFS ranger station for the Mono Lake Ranger District was developed along Lee Vining Creek about 2 miles upstream of the town along the Tioga Pass Road in the 1960s, and the new Mono Basin National Forest Scenic Area Visitor Center opened at an overlook near the edge of town in 1992.

The town has now expanded to include essentially all the developable land owned by private parties. A lack of sufficient suitable housing in Lee Vining is considered directly linked to the reluctance of LADWP to develop or lease for development its land next to the town. (Mitchel pers. comm.)

Lakeshore. The perimeter of the prediversion lake continues to be a mixture of private, LADWP, and federal land supporting relatively low levels of activity consisting of dispersed housing, grazing (discussed previously), and dispersed recreation associated with the lake (see Chapter 3J, "Recreation Resources"). During the diversion period, LADWP increased its ownership of lakeshore land by purchasing the southern half of Paoha Island after an offer of sale was made. Otherwise, LADWP did not pursue further land acquisitions during the diversion period.

Over this period, a restaurant and a few lodging accommodations expanded or developed along U.S. 395 around the west side of the lake. In the early 1960s, a brine shrimp harvesting and processing facility was constructed in this area. This small facility processes Mono Lake brine shrimp for fish food and utilizes a minor portion of the annual shrimp production of the lake.

As the lake has drawndown by the diversions, approximately 14,000 acres of lakebed have emerged as noted previously. After adjudication, it was determined that "relicted" land downslope of federal land is federal public land and land downslope of private or LADWP land is state public land. This land is now managed by the Inyo National Forest and by DPR for the State Lands Commission. This land serves as habitat and is used only for nonintrusive public recreation activities.

Other Mono Basin Areas. Arid land east of the Sierra Nevada continues to serve principally as rangeland with gradually increasing dispersed recreation uses, as managed by BLM and USFS. Small pumice and gravel mining operations have continued to operate on federal and LADWP land in Pumice Valley to support local construction and road-building activities. One gravel pit, a Caltrans operation now terminated, was located along the dewatered bed of Parker Creek, east of U.S. 395. The other is located along Rush Creek near the confluence of Parker Creek. The pumice mine is next to the town of Lee Vining. Quarries are also present at Black Point and east of the Mono Craters.

Forested land on the east slope of the Sierra Nevada, proximate to Yosemite National Park, have been increasingly managed for recreational and wildlife values, although logging and grazing occurred in certain locations. Higher-elevations above the area of concern are now managed to preserve wilderness values under provisions of the Wilderness Act of 1964. Power has continued to be produced by Southern California Edison at SSP hydroelectric plants described previously, and two small hydroelectric plants have been proposed below the Edison powerhouses on Mill and Lee Vining Creeks.

Along the tributary streams south and southwest of the lake, national forest land predominates with substantial private holdings. Along the June Lake Loop, extensive second home development occurred on subdivided lots. An alpine ski hill was developed. A private owner seeking to augment recreational facilities at June Lake continues to exchange private land acquired in the Mono Basin National Forest Scenic Area for USFS land near June Lake that would not otherwise be available for development.

Upper Owens River Basin. Land along the Upper Owens River continues to be used exclusively for agricultural and recreational activities. Cattle grazing and recreational fishing have been supplemented by a trout-raising enterprise at the Owens Valley Ranch. The landownership pattern has not changed since LADWP purchased property in the 1930s.

Management of LADWP Land

Character of Land. LADWP's land ownership (Figure 3G-4) can be divided into several geographic areas.

Land adjacent to the Town of Lee Vining. Approximately 90 acres of undeveloped LADWP land lie on the terrace adjacent to the town of Lee Vining. These are readily accessed from U.S. 395, and consist of nearly level, sagebrush-scrub, undeveloped terrain. This land has been excluded from the Mono Basin National Forest Scenic Area. No undeveloped private land is present (Mitchel pers. comm.).

Land South of Mono Lake. This land includes the lakeshore near the mouth of Lee Vining Creek, the Rush Creek bottomland, the sparsely vegetated flats of Pumice Valley, and the Cain Ranch along the diverted tributary streams. The total ownership is about 12,500 acres. Access is by U.S. 395, paved County Road 120 to South Tufa Grove, the graveled county road near the lake, the paved June

Lake Loop Road, and unsurfaced roads at Cain Ranch. Terrain and vegetation vary considerably, but large areas of gently sloping ground are present. The diverted tributary streams cross this ownership, and, until recently, a substantial acreage was irrigated from the diversion system. Nearly half of this property lies within the Mono Basin National Forest Scenic Area.

Land in the Northwest Corner of Mono Lake. LADWP lands consist of approximately 1,200 acres of gently sloping, sagebrush-scrub land bisected by U.S. 395 and a paved road connecting the highway to the County Park at DeChambeau Creek, Mono Vista Spring, and land northwest of Black Point. This land lies entirely within the Mono Basin National Forest Scenic Area.

Other Land around Mono Lake. Nearly 1,200 acres belonging to LADWP are scattered in six parcels around the perimeter of Mono Lake, in addition to approximately 700 acres owned on the southern half of Paoha Island. Springs occur on several of these properties. One parcel is accessible by a paved highway; the remainder are served by the unimproved, four-wheel drive road that circles the lake. The island is only accessible by boat. All this land is gently sloping, sagebrush-scrub land, except for several marshes.

Land along the Upper Owens River. LADWP owns approximately 7,500 acres of land along the Upper Owens River north of Lake Crowley reservoir (north of the southern tier of sections in T3S, R29E). Most of this land is irrigated meadowland used for grazing, although sagebrush-scrub land is also present. Access is by graveled and dirt USFS roads. Along the river floodplain and approaching the reservoir, much of the land is nearly level and has shallow groundwater.

Land Management Activities during the Diversion Period. LADWP's diversions began in 1940 after construction of small diversion dams on Lee Vining, Parker, and Walker Creeks; a conduit from Lee Vining Creek tying these diversions to Grant Lake on Rush Creek; a dam on Rush Creek substantially enlarging Grant Lake; and a conduit and tunnel through the Mono Craters to the Upper Owens River. Exports to the Upper Owens River began a few months later in 1941.

Operation of the water export system changed the operation of local irrigation diversions, such as at Cain Ranch. The aggregate effect of the changes on local use of LADWP's land was not great, as previously discussed, and this land remained irrigated and in livestock forage production (see "Agriculture" above).

In 1970, LADWP added a second barrel to the aqueduct between Owens Valley and Los Angeles, allowing a significant increase in diversions from Mono Basin. No significant changes in land use were caused by construction of the project, but the increased export capacity was utilized by decreasing irrigation of the more permeable areas of Pumice Valley. In particular, irrigation ceased on a 695-acre area (Winsor pers. comm.) east of U.S. 395 adjacent to the South Tufa Road (Figure 3G-1). This acreage is currently reverting to sagebrush scrub habitat.

Land Management Policies during the Diversion Period. LADWP's primary mandates are to procure water for the City of Los Angeles, protect its water rights, and ensure the quality of the water procured. Other LADWP objectives include administering assets in a way that is cost-effective for the city, maintaining historical resources, permitting compatible land uses including livestock production and dispersed recreation, and cultivating cooperative relationships with local communities. Uses by local communities that would not conflict with other objectives are favorably considered. (Wilson pers. comm., Verble 1989.)

During the diversion period, LADWP's policy was to keep acquired ranch land in ranching use. Livestock grazing and alfalfa production were considered uses compatible with maintenance of water quality if chemicals were not employed (Verble 1989). Other than agricultural reductions associated with protecting range resources and attributable to opening of the second aqueduct barrel previously noted, this effort was successful. (Wilson pers. comm.)

LADWP has also pursued a policy of allowing dispersed recreational day uses on its acquired land. It has required its ranch lessees to keep at least 75% of the leased land open for low-impact dispersed recreational use. Land is not available, however, for camping, campfires, or off-road vehicle use. (Wilson pers. comm., Verble 1989).

Land Ownership Policies. After diversions began, LADWP determined that further purchases of land in Mono Basin and Upper Owens River basin were unnecessary. LADWP has made occasional purchases of land such as Paoha Island, however, to accommodate private owners otherwise unable to sell land. This policy was first applied to commercial properties in Inyo County in the 1930s.

LADWP had determined earlier that disposal of some commercial lots and other town lots, most of which were located in Inyo County, would be appropriate. The Los Angeles City Charter dictates circumstances under which LADWP may dispose of land. Water rights cannot be sold unless mandated by a two-thirds vote of the citizens of Los Angeles. All water and mineral rights must be retained by the city, and easements for all existing facilities must be required. (Verble 1989.)

In 1945, the city attorney interpreted the city charter to imply that sales and leases of LADWP property must be put up for competitive bid. Local citizens, fearful that they would lose access to property they were leasing, prompted the state legislature to pass an act requiring the city to grant a right of first refusal to current lessees. This action effectively prevented sales of occupied properties until 1980 when an agreement to revise procedures was reached. The accord specifies that the city may contract a long-term lease (15 years) with the current lessee and then put the property up for sale by competitive bid, subject to the conditions of the lease. (Verble 1989.)

Present and Future Land Management Policies and Practices. In 1991, LADWP declared a 5-year moratorium on grazing in riparian corridors along the diverted tributary streams to help the process of vegetation recovery from earlier stream dewatering.

LADWP staff has expressed an intent to reduce irrigation of its Mono Basin land by diversions from the four currently diverted streams (Kodama pers. comm.), making up to 8 TAF per year of additional water available for export. In particular, during the driest 43% of future years, some irrigation may occur above the Lee Vining conduit, but none below. During the 27% of ensuing years having near-normal runoff, historical irrigation will occur above the conduit, and some may occur below. During the wettest 30% of following years, historical irrigation will occur above and below the conduit. The planned pursuit of intermittent irrigation may be frustrated by vegetational succession.

No other changes in land management policy have been proposed or adopted by LADWP. Irrigated pasture grazing in wetter years and dryland grazing in drier years could continue on its land. Management for dispersed recreational values could continue. Public consideration has not been given to retaining only water rights and easements and disposing of this land to private parties or governmental agencies, imposing deed restrictions to protect water quality.

Management of the Mono Basin National Forest Scenic Area

In 1984, Congress created the Mono Basin National Forest Scenic Area (Figure 1-1), which includes land surrounding the lake but excludes the town of Lee Vining, reaches of the diverted tributary streams upstream of the lake (including LADWP's diversions), and irrigated pastures of LADWP.

A management plan supported by an environmental impact statement was recently adopted for the Mono Basin National Forest Scenic Area (USFS 1989a, 1989b), and important provisions are described below. The Mono Basin National Forest Scenic Area Visitor Center was opened on an overlook of the lake adjacent to the town of Lee Vining in 1992, also serving as the Mono Basin National Forest Scenic Area headquarters.

Objectives. The objective of the management plan is to protect the area's geologic, ecologic, cultural, scenic, and other natural resources, while allowing recreational, scientific, and other activities consistent with this goal.

Grazing Uses. The objective of the range management element of the management plan is to establish a healthy ecosystem, including wetlands, springs, and riparian zones, through range improvement projects and cooperation with other landowners and by phasing out grazing allotments on public land over time.

As noted previously, unused grazing allotments are to be closed when there is no qualified purchaser of permitted livestock and/or base property. Boundaries of allotments are to be changed to exclude land within the Mono Basin National Forest Scenic Area whenever the permittee is agreeable.

Recreational Uses. The goal of the management plan is to provide a low level of overnight and day-use facilities in the Mono Basin National Forest Scenic Area, with the visitor center as the focal point

for interpretation. A developed campground is planned for eventual construction in a forested area (Mono Mills) some distance from the lakeshore. Most dispersed recreational activities are allowed, including motorized use of designated routes, subject to maintenance of an atmosphere of solitude over most of the Mono Basin National Forest Scenic Area.

The eastern side of the lake, generally accessible only by boat or four-wheel-drive vehicles, and the relicted land is to remain as no-development zones. Swimming, boating, and low-impact, dispersed camping are generally allowed, but no developed facilities will be provided on federal land. On relicted land, camping is allowed only in certain areas, subject to permit, and woodfires on relicted land are prohibited.

Land Acquisition and Development of Nonfederal Land. The Mono Basin National Forest Scenic Area plan calls for acquisition of private land as opportunities arise or when proposed development is incompatible with the character of the Mono Basin National Forest Scenic Area.

As noted previously, land can be acquired through purchase, if federal funds are appropriated, or through exchange for other land managed by USFS. Political subdivisions of California, including the City of Los Angeles, may only exchange or donate land to the federal government.

Private property within the Mono Basin National Forest Scenic Area may be acquired without consent of the owner, if the property is being developed or is proposed to be developed in a manner incompatible with the scenic area. In the plan, specific limits are adopted on size and characteristics of development as deemed necessary to maintain the character of the Mono Basin National Forest Scenic Area. The most stringent standards pertain to relicted land. If a development proposed for permit approval to Mono County does not meet these limits, it is found to be incompatible, and the property is subject to federal condemnation at fair market value. LADWP land, as well as private land, is subject to this provision of law.

Lake Level Management. Although the legislation creating the scenic area contains no authorization for direct federal control over lake surface elevations, the management plan addresses lake level management. The plan calls for the USFS to "develop strategies and actions for ensuring a range of water levels between 6,390 [feet] and 6,377 [feet] with a maintenance level near the mid-point of this range" (6,383.5 feet).

Mono County Regulation of Land Use

General Plan Policies. Mono County is responsible for regulating the use of private land and LADWP land in Mono Basin and along the Upper Owens River in accordance with provisions of its general plan.

The draft Mono County General Plan (Mono County Planning Department 1992) calls for "the orderly growth of Mono Basin communities in a manner that retains the small town character, coincides with infrastructure expansion, facilitates economic and community development, and protects the area's scenic, recreational, and natural resources." Development of the Upper Owens River basin is to be limited to guest ranches, related commercial uses, agricultural uses, and residential-support uses. The general plan and zoning are currently being revised.

The General Plan land-use designation for all land owned by LADWP in Mono Basin and along the Upper Owens River, including those surrounding Lee Vining, is "Resource Management" or "Open Space". These designations are intended for land to remain undeveloped or to be developed for resource production only, and allow no more than one dwelling unit per 80 acres.

Pending Developments in the Basins

Mono Basin. Two significant development projects have been proposed for Mono Basin. A specific plan for a recreational-residential development on nearly 880 acres was proposed and approved by Mono County for the Conway Ranch in 1989, although no implementation has occurred and prospects for this project are unknown (Higa pers. comm.). The Conway Ranch is located less than 1 mile northeast of the intersection of U.S. 395 and State Highway 167 north of the lake. This area is not in the Mono Basin National Forest Scenic Area.

The approved plan allows the creation of 250 townhouses; 150 lots for home development; a resort lodge with restaurant, shops, and 150 units; another lodge with 200 units; an 18-hole golf course; and a 30-acre lake. Water and wastewater systems would be constructed, utilizing wells for domestic supply and Wilson Creek streamflow for the lake. (Higa pers. comm.)

A 120-unit "Tioga Inn", to include a restaurant, gas station, mini-mart, and 10 permanent residential units, has been proposed for a site near the intersection of U.S. 395 and Highway 120 south of Lee Vining. Onsite water and wastewater systems are proposed, using a well source. A proposed specific plan accompanied by an EIR is being prepared by the developers, and, in anticipation, the county general plan designation for the site is currently "specific plan". (Higa pers. comm.)

Upper Owens River Basin. One development project has been proposed for the Upper Owens River basin: a major expansion of existing recreational developments on the John Arcularius Ranch. The proposed developments include 50 guest cabins (including the 15 cabins already on the site), a 30-room lodge and restaurant fronting the USFS access road, and four single-family residences. A small equestrian center would also be developed. Onsite water and wastewater systems would be expanded. Irrigation of the ranch's meadowland from the Upper Owens River and cattle grazing would continue. A proposed specific plan has been submitted for the project, and a draft EIR has been circulated for a public comment period (closing December 1992). (Higa pers. comm.)

IMPACT ASSESSMENT METHODOLOGY

Assessment of project impacts focuses on two land use issues: agricultural productivity of lands irrigated at the point of reference and associated likelihood of land ownership or use changes.

Agricultural activities in Mono Basin and Long Valley primarily include sheep and cattle production. Changes in the supply of water available for irrigating pastures would result in livestock production changes in these two areas. For agricultural properties, the objective of the impact analysis is to determine how the water diversion alternatives could affect the productivity of agricultural lands in Mono Basin and Owens Valley. For LADWP agricultural properties, potential changes in ownership or leasing and in land use because of changed agricultural activity are also assessed.

Impact Prediction Methodology

Impact Measurement

The agricultural production from the two areas of concern can be expressed in terms of either animal production or forage production. Determining animal production related to use of the two areas is complicated by the fact that grazing by sheep and cattle is rotated among several different areas to maximize harvesting of forage and avoid subjecting animals to harsh weather conditions. Animal production directly related to use of the two study areas is therefore difficult to estimate. Forage production, however, is more easily estimated and is directly linked to the amount of water available for irrigation. Agricultural impacts were therefore measured in terms of forage production changes resulting from implementation of project alternatives. Economic effects resulting from agricultural production impacts, including production value changes and changes in employment and personal income, were used to assess impact significance, as described in Chapter 18, "Economics".

Impact Prediction

The availability of water for irrigation under the point of reference and for the project alternatives was determined differently for the two areas of concern. For irrigation of LADWP's lands at the Cain Ranch in Mono Basin, the assumptions regarding future irrigation reductions described in Chapter 2 were used. Irrigation below the Lee Vining conduit would be curtailed except in wetter years, so that the average irrigation diversion would fall from 8 TAF/yr at the point of reference and for the No-Restriction Alternative to 1 TAF/yr for all other alternatives.

For irrigation of both private and LADWP lands along the Upper Owens River, the simulations of streamflow for the point of reference scenario and the alternatives were used together with estimates of

irrigation diversion demand and irrigation consumption to assess the sufficiency of streamflows for irrigation need. Annual probabilities of insufficient streamflows were examined among the alternatives to determine if reductions in average agricultural productivity would result (see Table 3A-9 and accompanying discussion in Chapter 3A, "Hydrology"). Potential deficits were noted for most alternatives in certain months during the normal minimum flow condition; these deficits were translated into reductions in irrigated acreage. These reductions were adjusted according to the frequency of occurrence of these events.

The following assumptions were made in transforming irrigation use to forage production:

- average annual irrigation demand is 5 af per acre and
- average productivity is 4.5 AUMs per acre on LADWP lands and 3.0 AUMs per acre on private lands along the Upper Owens River.

Estimates of the likelihood of land ownership and use changes under the alternatives were focussed on the potential for LADWP disposal of its lands under each alternative. These estimates were based on the results of the agricultural productivity assessment: if irrigation is substantially reduced, a potential for some land disposal results. If diversions cease, complete land disposal becomes almost certain.

Effects That Cannot Be Predicted

Potential effects on relicted lands around Mono Lake and public land allotments within Mono Basin and Owens Valley are not quantified in the agricultural impact assessment. Grazing on relicted lands is prohibited by USFS as part of its management of the Mono Basin National Forest Scenic Area. Changes in Mono Lake levels and extent of relicted land under the project alternatives should have no substantial effect on amounts of forage available to livestock producers.

Implementation of the project alternatives may have some effect on the utilization of forage on public land allotments. As described in the "Environmental Setting" section of this chapter, allotments are tied to base properties or the livestock that use the allotment. Changes in utilization of LADWP lands in Mono Basin or of LADWP and private ownerships in Owens Valley would not necessarily cause federal allotments to be vacated. Sales of livestock operations caused by reductions in forage production under the project alternatives would likely result in the permits being transferred to the new owners. The likelihood of termination of operations by the Inyo Sheep Company because of loss of Cain Ranch forage is unknown. Current USFS policy is to close allotments when there is no qualified purchaser of permitted livestock or base property belonging to the current permittee. No suitable method of addressing these uncertainties is apparent.

Criteria for Determining Impact Significance

Appendix G of the State CEQA Guidelines states that "a project will normally have a significant effect on the environment if it will convert prime agricultural land to non-agricultural use or impair the agricultural productivity of prime agricultural land". Lands affected by the water diversion alternatives are not considered prime agricultural lands; however, the loss of irrigation water could impair the productivity of these agricultural lands and result in substantial adverse economic effects.

The severity of agricultural production changes resulting from decreased forage production was evaluated relative to countywide agricultural output and the economic effects resulting from production changes. Mono County's agricultural output deviates from year to year based on crop prices, amount of acreage under production, the availability of irrigation water, livestock herd sizes, and crop yields. Changes in production resulting from implementation of project alternatives may not be unusual given the normal fluctuations of the farm economy.

Agricultural production changes occurring under the project alternatives were judged relative to the standard deviation of estimated forage production in Mono County over the past 10 years. Acreages of irrigated pasture and dry rangeland in Mono County remained relatively stable between 1980 and 1989. The standard deviation in estimated forage production over this period was approximately 2,050 AUMs.

Project-related forage production decreases greater than one standard deviation were considered to be substantial. If production changes were considered substantial, economic effects resulting from production changes were evaluated to determine whether production changes would result in substantial adverse economic effects within Mono County. Economic methodology and the criteria used to judge the significance of economic changes caused by agricultural production changes are described in Chapter 18, "Economics." Production changes resulting in substantial adverse economic effects are considered significant project impacts.

The potential for disposal of LADWP lands under each alternative cannot be judged beneficial or substantially adverse. As described in the "Environmental Setting" section, much of this land is suitable for development and could serve several interests (for example, expansion of Lee Vining or opportunities for recreational residences). Much of the land is within the Mono Basin National Forest Scenic Area or along major streams tributary to Mono Lake, and could therefore provide a valuable acquisition to public lands of the scenic area. All such land uses would confer benefits to segments of the public. Developed uses could entail substantial adverse effects on environmental conditions. The nature and magnitude of such impacts, however, are too speculative for further consideration.

SUMMARY COMPARISON OF IMPACTS AND BENEFITS OF THE ALTERNATIVES

As described under "Impact Assessment Methodology", relative land use effects of the alternatives are assessed in this chapter through several key variables:

- amount of acreage irrigated from the four diverted tributaries in Mono Basin and along the Upper Owens River,
- amount of forage produced by these irrigated lands, and
- potential for changes in land ownership and use.

Table 3G-9 provides a summary comparison of the alternatives using these variables.

Irrigated acreage and forage production for each alternative are compared to values for the prediversion and point-of-reference conditions in the table. Table 3G-10 provides the supporting data for this summary. As shown, forage production on affected lands is expected to diminish by over 50% under all alternatives, except the No-Restriction Alternative, because LADWP has apparently chosen to curtail historical irrigation practices below the Lee Vining conduit at the Cain Ranch. Economic effects of this change in agricultural productivity are assessed in Chapter 3N, "Economics", which indicates that this loss is not significant. None of the direct project-related effects are significant adverse impacts; however, the cumulative agricultural effects of the project are considered significant adverse impacts for all alternatives (other than the No-Restriction Alternative). This impact cannot be avoided by SWRCB, because it has no jurisdiction over LADWP's policies for exercise of its riparian water rights.

The substantial reduction in irrigation under most alternatives results in an increased potential for LADWP to dispose of some of its lands in Mono Basin. Much of this land is accessible and developable. Certainly, under the No-Diversion Alternative land disposal would occur. Development of such lands for residential, commercial, and recreational uses may pose a variety of community benefits and environmental impacts that cannot currently be predicted or assessed.

IMPACTS AND MITIGATION MEASURES FOR THE NO-RESTRICTION ALTERNATIVE

Changes in Resource Condition

Irrigated Lands along Diverted Tributaries in Mono Basin

Irrigated lands leased by LADWP to the Mono and Inyo Sheep Companies likely would continue to receive diverted water from Gibbs, Lee Vining, Walker, and Parker Creeks at historical levels. Average annual irrigated acreage and forage production under the No-Restriction Alternative would be similar to levels under point-of-reference conditions (Table 3G-10). Irrigated acreage and forage production would average about 1,750 acres and 7,850 AUMs annually under this alternative. Irrigation from the diverted tributaries in Mono Basin likely could be curtailed during drought to maintain LADWP water export levels. Based on historical (point-of-reference) streamflow conditions, forage production from irrigated pastures could fall to approximately 6,300 AUMs during drought years.

The potential for LADWP to dispose of Cain Ranch lands would remain very low.

Lands Irrigated from the Upper Owens River

Flows in the Upper Owens River through Long Valley under the No-Restriction Alternative would be similar to flows under the point-of-reference scenario during the irrigation season. Under drought conditions, natural forage production would decline in both Mono Basin and Owens Valley study areas.

Under this alternative, the LADWP lessee irrigating from the Upper Owens River north of Lake Crowley reservoir likely would be allowed to continue to irrigate at historical levels. Private landowners with riparian water rights likely would continue to irrigate at levels similar to historical levels.

Average annual irrigated acreage and forage production on lands irrigated from the Upper Owens River would be similar to levels under point-of-reference conditions (Table 3G-10). Irrigated acreage and forage production would annually average 1,821 acres and 6,047 AUMs under this alternative.

Point-of-reference flows in the Upper Owens River during normal minimum flow conditions (Table 3A-9) indicate that drought would have relatively little effect on irrigation and forage production along the Upper Owens River under this alternative.

The potential for LADWP land disposal would remain very low.

Summary of Benefits and Significant Impacts and Identification of Mitigation Measures (No-Restriction Alternative)

No significant benefits nor adverse impacts would be associated with the No-Restriction Alternative.

IMPACTS AND MITIGATION MEASURES FOR THE TARGET LAKE LEVEL ALTERNATIVES

Changes in Resource Condition

Irrigated Lands along Diverted Tributaries in Mono Basin

As noted previously, at its discretion, LADWP is expected to diminish irrigation below the Lee Vining conduit under these alternatives. The loss of an average of 1,750 acres of irrigated pasture and 7,850 AUMs of forage annually (Table 3G-10) would substantially affect the operations of the Mono and Inyo Sheep Companies. Forage produced by pastures irrigated from the diverted tributaries account for approximately 50% of the forage available to the Mono and Inyo Sheep Companies in Mono Basin. This forage, in combination with forage produced by federal allotments and other leased pasture, provides partial feed for approximately 10,000 sheep during the 5- to 6-month summer grazing season. Loss of irrigated pasture along the diverted tributaries would likely have substantial adverse effects on the Mono and Inyo Sheep Companies because of the loss of revenue caused by smaller herd sizes and increased costs for summer feed. The loss of forage from irrigated pastures would require these operators to either reduce herd sizes by approximately 4,500 sheep or obtain summer forage elsewhere. On the other hand, reduction or elimination of grazing would greatly benefit vegetation and wildlife resources along the tributary streams and adjoining meadows, in turn enhancing visual character and increasing recreation value.

On a regional basis, the loss of irrigated pasture along the diverted tributaries would not be substantial. The project-related decrease in forage would represent approximately 3.2% of the pasture irrigated in Mono County in 1989. The amount of forage produced by irrigated pasture and dry grazing land within the county is unknown but was likely about 170,000-250,000 AUMs in 1989. Based on this estimate, the loss of 7,850 AUMs of forage would represent an estimated 3-5% of the forage produced in Mono County in 1989. This would result in a relatively minor economic effect countywide, as described in Chapter 18, "Economics".

The major reduction in irrigation of LADWP properties at the Cain Ranch could be followed by a decision to dispose of some of these lands, especially where development would not interfere with

LADWP aqueduct operations and activities potentially degrading water quality were situated below the aqueduct intake structures (diversions).

Lands Irrigated from the Upper Owens River

Flows in the Upper Owens River under the target lake level alternatives would be adequate during most years to allow for irrigation of pastures along the river. However, in about one in 20 years, streamflow would be insufficient in May, June, and July to sustain point-of-reference irrigation diversions for the higher lake level alternatives; under the 6,377-Ft Alternative, inadequate flows would be limited to 2 months and under the 6,372-Ft Alternative to 1 month.

These low flows would affect at least an estimated 325 of the 1,820 acres typically irrigated from the Upper Owens River, resulting in the average annual loss of 72 AUMs of forage production during these infrequent low-flow conditions.

Irrigated acreage and forage production associated with irrigation diversions from the Upper Owens River would be slightly lower, but similar, to levels under the point-of-reference scenario (Table 3G-10). These estimates, however, may understate the impact on cattle producers along the Upper Owens River. During low water flow years, low water flows may inhibit the ability of gravity-flow ditches to deliver water to pastures on higher grounds away from the river. Lower flows may require ranchers to modify irrigation gates and diversions in order to adequately irrigate during low-flow years. Conversely, less land may be irrigated during low-flow years, decreasing forage production on lands along the Upper Owens River.

Once equilibrium conditions are reached for the higher elevation alternatives, more water may be exported from Mono Basin, increasing flows in the Upper Owens River. This long-term condition would make more water available to irrigators along the Upper Owens River during low-flow years when lake level and tributary streamflows have not fallen below the minimum levels.

Summary of Benefits and Significant Impacts and Identification of Mitigation Measures (Target Lake Level Alternatives)

- Substantial benefit to vegetation and wildlife along the diverted tributary streams, increasing visual quality and recreational value.

- Reduction in forage production under these alternatives exceeding the average variation in forage production in Mono County but having relatively minor countywide economic effects; the impact is considered less than significant.

- Increased potential for development of rural properties in Mono Basin, a potential significant growth-inducing impact.

Mitigation Measures. The Mono County Board of Supervisors is responsible for identifying and mitigating significant adverse effects of land development. The county has broad authority through general plan and zoning powers to control the type of development. The USFS could acquire lands where proposed development would conflict with the management plan for the Mono Basin National Forest Scenic Area.

IMPACTS AND MITIGATION MEASURES FOR THE NO-DIVERSION ALTERNATIVE

Changes in Resource Condition

Lands Irrigated along Diverted Tributaries in Mono Basin

Under this alternative, irrigation of Cain Ranch lands would also be substantially reduced. Forage production effects would be the same as those described above for the target lake level alternatives (Table 3G-10).

The cessation of Mono Basin exports would leave no reason for the City of Los Angeles to continue ownership or management of its Mono Basin lands. The likelihood of land disposal would be high as development pressure increased or the USFS was funded for expansion of the Mono Basin National Forest Scenic Area. This effect is considered a potentially significant growth-inducing impact of the project.

Lands Irrigated from the Upper Owens River

Under the No-Diversion Alternative, flows in the Upper Owens River would be adequate in most years to irrigate lands typically irrigated from the river. Inadequate flows in May, June, and July would occur about once in 20 years. Forage production effects would be minor and similar to those described above for the target lake level alternatives (Table 3G-10).

Summary of Benefits and Significant Impacts and Identification of Mitigation Measures (No-Diversion Alternative)

- Increases development of rural properties in Mono Basin, a significant growth-inducing impact.

Mitigation Measures. See "Target Lake Level Alternatives".

Causes reduction in forage production exceeding the average variation in forage production in Mono County but having relatively minor economic effects; the impact is considered less than significant.

CUMULATIVE IMPACTS OF THE ALTERNATIVES

Related Impacts of Earlier Stream Diversions by LADWP

During much of the first half of this century LADWP purchased lands in Inyo County and Mono Basin for the purpose of obtaining water rights. The operation of the first Owens Valley aqueduct barrel beginning in 1913 and the second barrel in 1970 idled many acres of former agricultural land. LADWP has also extracted and shipped groundwater pumped from the Owens Valley since the 1920s, which has decreased forage production in Inyo County.

The agricultural economy of the Owens Valley peaked in the 1920s. As more water was shipped to Los Angeles, less water was available for irrigated agriculture. By 1933, LADWP had acquired 95% of the ranchland in the Owens Valley. Although LADWP leased much of its land back to ranchers, restrictions on water use and leases that stipulated that water supplies could be interrupted without prior notification reduced agricultural production and stymied new investment in agriculture. (LADWP 1990.)

Between 1940 and 1968, LADWP leased approximately 30,000 acres of land classified for irrigation in Mono and Inyo Counties; approximately 8,200 acres were located in Mono County and 21,800 acres in Inyo County. The amount of LADWP acreage irrigated annually ranged from approximately 3,000 acres during dry years to 30,000 acres during wet years. In anticipation of the operation of the second LADWP aqueduct in 1970, LADWP reduced the amount of land classified as irrigated in Inyo County from approximately 21,800 acres to 11,600 acres, at the same time modifying leases to provide firmer water allocations to ranchers. Since 1970, irrigated LADWP lands in Mono and Inyo Counties have ranged from 11,000 acres during dry years to 21,000 acres during wet years. (LADWP 1990.)

Mono Basin

As discussed in the "Environmental Setting" section of this chapter, approximately 4,100 acres were irrigated from Lee Vining, Walker, Parker, and Rush Creeks before 1940. An estimated 18,450 AUMs of forage were produced annually on pastures irrigated by the four tributary streams before diversions. Diversions and lease restrictions by LADWP reduced irrigated acreage from approximately 4,100 acres before 1940 to the approximately 1,960 acres available for irrigation in 1989.

Upper Owens River Basin

During the diversion period, Mono Basin exports resulted in higher flows in the Upper Owens River south of the East Portal, which probably supported similar or perhaps greater amounts of irrigated acreage on private lands with riparian water rights. Irrigation of lands currently under lease by LADWP may have declined following acquisition by LADWP. The overall effect of Mono Basin exports on irrigation and forage production in Long Valley has probably been minor.

Related Impacts of Other Past, Present, or Anticipated Projects or Events

Irrigated acreage in Inyo County declined from approximately 23,600 acres in 1940 to 13,000 acres in 1987. Mono County's irrigated acreage decreased from 29,000 acres to 22,100 acres (Table 3G-1), more than three times the acreage lost or LADWP's lands in Mono Basin. Together, Mono and Inyo Counties lost an estimated 17,500 acres of irrigated land between 1940 and 1987, representing one-third of the irrigated acreage in the two counties in 1940.

Actions by the USFS and the U.S. Bureau of Land Management in the management of federal grazing allotments have resulted in decreased use of forage production from nonirrigated rangeland in Mono and Inyo Counties over the years. Grazing on several allotments within Mono and Inyo Counties has been reduced or abolished to improve range conditions or protect wildlife resources.

The creation of the Mono Basin National Forest Scenic Area has tended to reduce grazing on federal lands by restricting grazing on certain relicted lands along the shore of Mono Lake and by changing grazing seasons, livestock distribution, and forage utilization on several federal allotments. In addition, grazing allotments within the Mono Basin National Forest Scenic Area may now be abolished when relinquished by current permitees if evaluations of range conditions indicate that continued grazing could conflict with other resources (USFS 1989b).

Significant Cumulative Impacts

No-Restriction Alternative

No cumulative land use impacts would result from implementation of the No-Restriction Alternative.

All Other Alternatives

- **#** Contribute to a cumulative loss of agricultural production, consisting of a 37% reduction in irrigated acreage in Mono and Inyo Counties since 1940.

Implementation of any other alternative would further reduce irrigated acreage in Mono and Inyo Counties by an estimated 1,760 acres, adding to the estimated 2,100 acres LADWP previously removed from irrigation along the diverted tributaries and the estimated total of 17,500 acres of irrigated land lost in Mono and Inyo Counties between 1940 and 1987. This cumulative loss of an estimated 19,260 acres of irrigated land within Mono and Inyo Counties represents 37% of the irrigated land that existed within these counties in 1940. The agricultural production effects, and resulting effects on agricultural employment and income, cannot be accurately estimated; however, cumulative impacts on production, employment, and agricultural income have likely been substantial and are therefore considered significant.

Mitigation Measures for Significant Cumulative Impacts

The increase in the cumulative loss of agricultural production could be avoided by continuing Cain Ranch irrigation below the conduit. This measure would have to be implemented by the LADWP, because its riparian water rights allowing Cain Ranch irrigation are not subject to the amendment of the city's appropriative rights governed by SWRCB. The consumptive use of this water, about two-thirds of the total diversion of 8 af/yr, would cause LADWP's exports to diminish accordingly, but lake release flows would be unaffected.

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