Chapter Nine

CONSERVATION/OPEN SPACE

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Chapter Nine

CONSERVATION/OPEN SPACE

I. INTRODUCTION

A. Background

The Conservation/Open Space Element of the General Plan identifies significant natural and man-made resources that exist within the City and surrounding area and provides policies and actions for the preservation and best utilization of those resources. The previous General Plan designated this element as the Environmental Resources Element. But for the purpose of this update, it will be essentially renamed as the Conservation/Open Space Element to more accurately reflect the State General Plan Guidelines. Most of the information is directly derived from the previous general plan and amendment (1984).

Natural resources include mineral deposits, hydrologic resources, areas of historic or archaeologic significance, open space/scenic areas, prime agricultural land, and areas containing unique wildlife or vegetation. These natural resources are being consumed or impacted by human activities, and the principal objective of resource policies is to minimize the level of impact of urban activities as the community grows. In addition to these physical resources, the Conservation/Open Space Element will address impacts on air quality resulting from implementation of land use policies.

The City of Bishop occupies approximately 2 square miles of land in the northern portion of the Owens Valley. Having such a small land area and urban character, the City has few environmental open space resources within its boundaries. In contrast, the surrounding area possesses many unique and important environmental open space resources. These resources were inventoried, analyzed and addressed in the Bishop Community Plan, and this element is derived from that source.

B. Purpose

The Conservation/Open Space Element is a combination of two mandated elements; Conservation and Open Space. These two elements are combined due to the considerable overlap that exists in the legislative requirements of each, plus it promotes internal consistency and avoids duplication of information. The element is designed to identify the goals, policies, and actions which the City can utilize to conserve and manage the existing natural resources of the City and surrounding area.

C. Authorization

Government Codes Sections 65302(d), 65302(e), and 65560 through 65567 mandate each city and county in California to adopt Conservation and Open Space Elements, which are intended to provide direction for the conservation, development, and utilization of resources, including water and its hydraulic forces, forests, soils, rivers, natural open spaces, plant and animal life, minerals, and other resources where applicable.

II. SUMMARY OF ISSUES, OPPORTUNITIES & CONSTRAINTS

A. Issues

- Preservation of Natural Resources. The abundance of wildlife and native plants in and around the City of Bishop require the sensitive approach to the development of urban uses. Areas which have significant ecological importance must be preserved whenever possible.

- Managed Production of Resources. Geologic conditions of the area, as well as the characteristics of the soil must be carefully managed to assure that no disruption to sensitive watershed areas occurs. Mining and agricultural/ranching activities also require careful management in order to minimize impacts on the ecological systems.

- Outdoor Recreational Areas. Open space areas which possess significant scenic and recreational value must be preserved in their natural state so that they may be enjoyed by current and future residents and visitors of the Bishop area. Historical and cultural resources that exist within the City and area also must be protected from urbanization.

B. Opportunities

- The City of Bishop and the surrounding area is situated in an area containing a vast amount of scenic, cultural, and natural resources which have not been disturbed by urban development. These areas offer a significant interaction between the natural environment and recreational activities.

- Naturally occurring streams which flow through the City provide an excellent open space amenity that can be utilized as part of the recreational system.

- Many governmental agencies provide programs to manage the nearby natural and recreational resources, thus assisting Bishop with their tourist industry development.

- The vast amount of open space surrounding the Bishop area provides excellent preservation of native plant and animal species.

- The groundwater quality of the domestic supply is excellent, and offers a good supply of water for existing and future development.

- Air quality within the Bishop and Owens Valley is good, rarely exceeding state air quality standards.

C. Constraints

- The City is located in a geologically active area, indicating the potential for ground disturbance and displacement of soils throughout the region.
- The surface water quality in the Bishop area is not suitable for many purposes, containing a high coliform content.
- The lack of developable private land creates a substantial risk to existing natural open space areas that are privately held.
- Acquisition of open space areas in the Bishop planning area could create a cost burden to the City government and private development.

III. EXISTING CONDITIONS

A. Background

In order to understand the complexities involving natural resources that exist within and around the City of Bishop, it is important to point out the dominant political characteristics. Less than 2% of the 10,000 plus square miles of Inyo County is privately owned. Federal agencies including the Department of the Interior (BLM and National Park Service) and the Department of Agriculture (U.S. Forest Service) own or exercise control over most of Inyo County. Within the Owens Valley and the City of Bishop, the Los Angeles Department of Water owns in excess of 90% of the Valley floor. This characteristic also pertains to the annexed land area within the City, with the LADWP owning the majority of land.

Groundwater pumping is the most significant environmental issue affecting the resources of the Owens Valley and the City of Bishop. The pumping of groundwater impacts the Valley's vegetation, wildlife, air quality and economy. Inyo County feels that these impacts will be significant enough to effectively degrade the environmental resources of Inyo County to the point where other alternatives should be employed. The LADWP agrees that there will be impacts, particularly to vegetation, but disagrees over the magnitude and significance of these effects. In any case, it is apparent that a water resource management plan must be prepared to address this issue. This plan is not part of the Bishop General Plan process, since it encompasses a much larger context than the Bishop planning area.

B. Natural Resources

This section is intended as an overview of the plant communities and selected biological resources within the Bishop General Plan study area, the latter of which are identified in the Department of Fish & Game Natural Diversity Database (NDDB, 1992). Sensitive biological resources include: (1) species given special recognition by federal, state, or local resource conservation agencies and organizations due to declining, limited, or threatened populations, resulting in most cases from habitat reduction; and (2) habitat areas that are unique, of relatively limited distribution, or of special value to wildlife.

1. Plant Life

The 1980 Bishop General Plan contained the following introduction to the five plant communities in the project vicinity.

Freshwater Marsh

This community, sometimes called the tule marsh complex, occurs in shallow water and along the margins of standing freshwater associated with springs, seeps and ponds. Elements of this community also occur in irrigated pastures and places with high ground water and slow moving ditches and drains. Water and alkalinity affect the type of species present. The freshwater marsh community is of considerable importance due to its high productivity and its high habitat value for various insects, birds, and mammals. Some of the more common species found in this community include cattail (*Typha spp.*), Sedge (*Carex spp.*), monkey flower (*Mimulus spp.*), bulrush (*Scirpus spp.*), and rush (*Juncus spp.*).

Riparian Woodland

This community is associated with streams and rivers. Its productivity, niche diversity and association with water make it one of the most important plant communities found in the Bishop area. In addition to providing food and cover, riparian woodlands provide travel corridors for wildlife. Typically, the riparian woodland includes trees, shrubs and an understory. In the lower portions of Bishops Creek, the larger canals and along the Owners River; species typically associated with the freshwater marsh community are mixed with the riparian woodland. Some of the more common riparian woodland species include: willows (*Salis spp.*), cottonwood (*Populus spp.*), locust (*Robinia pseudoacacia*), water birch (*Betula occidentalis*), salt grass (*Distichlis spicata*), and wildrose (*Rosa woodsii*).

Sagebrush Scrub

Sagebrush scrub is a common plant community in and around the study area on well drained, deep, pervious soil areas such as alluvial fans or other similar areas of the valley floor. The sagebrush scrub community requires approximately 6-15 inches of rainfall annually. Typically, the sagebrush scrub community intergrades with other scrub or alkali-influenced plant communities of the Owens Valley. Despite limited water availability, the sagebrush scrub community is relatively productive, particularly for wildlife. Sagebrush or the many species of sagebrush are found from the valley floor to the upper reaches of both the Sierra Nevada and White Mountains. Some of the more common species found in this community include: sagebrush (*Artemesia spp.*), rabbitbrush (*Chrysanthemum nausesus*), bitterbrush (*Pursha tridentata*), cotton thorn (*Tetradymia spibitus*), and desert peach (*Prunus andersonii*).

Shadscale Scrub

This community, sometimes referred to as semi-desert scrubland occupies areas with heavy soil and hard pans. Plants from this community are shallow rooted and depend largely on precipitation rather than groundwater. Although the plants of this community exhibit a greater tolerance for alkalinity and salinity than do those found in the sagebrush

community, they are not specifically an alkali community. Dominated by the plants from the atriplex genus, the community derives its name from the most common, the shadscale. Some of the more common plants found in the community include: shadescale (*Atriplex spp.*), bud sage (*Artemisia spinescens*), spiny hopsage (*Grayia spinasa*) and bird-nest buckwheat (*Eriogonum nidularium*).

Alkali Scrub/Grassland

This community, which contains two sub-elements, is not widely recognized by the California experts due to their limited distribution and specialized nature. This community is set apart by its adaption to high alkalinity and typically is comprised of a mixture of shrubs and grasses. Typically the plants of this community are associated with alkaline soils derived eight as playas (evaporites) or the locations where capillary rise (surface evaporation which draws water through minute soil cracks) has resulted in significant salt deposits on the surface of the soil. Productivity in this community tends to be mixed, although portions of the alkali grassland tend to be used for grazing. Beginning with the grasses the following species are associated with the alkali scrub-grassland community: saltgrass (*Distichlis spicata*), alkali sacaton (*Sporobolus airoides*), Indian rice grass (*Oryzopsis humenoides*), saltbush (*Atriplex spp.*), rabbitbrush (*Chrysothamnus spp.*), and Nevada ephedra (*Ephedra nevadensis*).

Irrigated/Urban

Much of the plant life in and around the City of Bishop is associated with irrigated pastures. Irrigation has created an assemblage of native and introduced plants. The application of water has resulted in greater overall productivity in an area where water availability is a significant limiting factor. This relatively high productivity gives this plant combination considerable importance for wildlife. Some of the more common plant species in this assemblage include willow (*Salix spp.*), cottonwood (*Populus spp.*), alkali sacaton (*Sporebolus airoides*), various grasses, wild rose (*Rosa woodsii*), Dock (*Rumex spp.*), and white sweet clover (*Melilotus* sp.).

Other significant groupings of plants found in the Bishop area include cultivated alfalfa, urban landscaping and significant stands of willow, popular, cottonwood and locust.

2. **Wildlife**

A complete list of species that occur in the study area and its surroundings is beyond the scope of this report. The Owens Valley supports a diverse wildlife population, in part because of its location at the junction of the Great Basin, Sierra Nevadan and adjacent Mojavian biotic provinces. The Department of Fish and Game inventoried the fauna of the Owens Valley in conjunction with the development of base line data. This inventory concluded that there were more than 270 species of birds, 72 mammals, 14 fish, 30 reptiles, 6 amphibians and numerous invertebrates which occur in the Owens Valley. Fish are an important wildlife resource that occur in the aquatic habitats in and around Bishop. Most of the fish of the Owens Valley are introduced. The four native fish species; Owens Tui chub, Owens sucker, Owens pupfish, and Owens dace, exist as remnants in locations in and around the Bishop area. Trout, both rainbow and brown, are found in the Owens River, Bishop Creek and the larger canals of the planning area. Brown trout are managed as a self-supporting species particularly in the Department Fish

and Game's Brown Trout Management Area, a section of the Owens river from Pleasant Valley to the Five Bridges Area. Rainbow trout are regularly planted in the Owens River and Bishop Creek. Warm water species including bass, bullhead, catfish, sunfish and bluegill were introduced into the Sanders and Rawson Ponds, although many of these fish now inhabit the Owens River and various canals of the planning area. Mosquito fish and carp have also been introduced and have become more or less naturalized, particularly mosquito fish in the area's ditches and canals.

Wildlife Corridors

A wildlife corridor is a strip of land connecting two or more larger land areas that is free of barriers which would seriously curtail or prevent wildlife passage. These corridors can serve as useful habitat in their own right, or can serve as travel lanes for seasonal movements of wildlife. Their value depends upon width, habitat type and structure, nature of surrounding habitat, human use patterns, and other factors. Typically, a wildlife corridor provides refuge and ease of movement, and often follows ridgelines or drainages. Wildlife movement corridors are important for the free movement of animals between population centers, for access to food and water sources during drought, as escape routes from brush fires, and, in the longer term, for dispersal of individuals between populations. Corridor boundaries are not regarded as absolute. The size of a corridor will fluctuate depending on existing environmental conditions.

Urban development fragments natural habitats into smaller and more isolated units which affects the ability of certain species to live. In the process, it destroys habitat of many species, modifies habitat of others, and creates new habitat for some. Habitat size is the most important factor in determining land vertebrate species diversity. The degree of habitat isolation and percentage of vegetative cover are other major factors in species variety and abundance.

Dispersal of individuals between populations is important in maintaining viable wildlife and plant populations. As they become more fragmented and isolated, their likelihood of survival is reduced. In addition, the smaller the population (as in populations isolated by development), the greater the likelihood of inbreeding, which allows harmful, or fatal, recessive traits to be paired together, thereby manifesting the trait. Wildlife corridors can prevent local extinctions by connecting relatively small open space preserves, thereby allowing gene flow and providing for a wide diversity of genetic traits throughout the interconnected populations.

Sensitive Species and Plant Communities

The plant and animal species of special interest that potentially occur in the study area are summarized in Tables 1 and 2. These lists were compiled using the NDDB list of special animal species (NDDB 1992); U.S. Fish and Wildlife list of candidate animal species (Federal Register, 1991) and through consultation with the Department of Fish & Game office in Bishop. The list includes species listed by the state or federal governments as endangered, threatened or rare and species which are candidate for future listing. It also encompasses those species determined by the NDDB to meet the CEQA (Section 15380) criteria as "rare and endangered", even though they have not been officially listed by any agency. For both plants and animals, the NDDB reveals a number of species removed from the study area that are unlikely to occur in or around

Bishop. For plants, this includes the White Mountain horkelia (*Hackelia brevicula)* and the Poison Canyon stickseed (*Hackelia brevicula*). The animals include the wolverine (*Gulo gulo*) and Nelsons bighorn sheep (*Ovis canadensis nelsoni*).

Table 9-1
Sensitive Plant Species and Communities in the Project Region

Species	Status		Comments
	Federal	State/ Local	
Sidalcea covillei Owens Valley checkerbloom	C2	E	Occurs in project vicinity (NDDB, 1992).
Calochortus excavatus Inyo County mariposa lily	C2		Occurs in project vicinity (NDDB, 1992).

Status
C1 Species for which there is sufficient biological information to support a proposal to list as Endangered or Threatened.
C2 Candidate for federal listing, insufficient information for listing at this time.
CT State listed as threatened.

Table 9-2
Sensitive Animal Species in the Study Area Vicinity

Species	Status		Comments
	Federal	State	
FISH			
Gila bicolor snyderi Gila tui chub	E	E	Potentially occurs in study area.
Cyprinodon radiosus Owens pupfish	E	E	Type locality is from Fish Slough, aprox. 16 km N of Bishop. Not found within downtown study area, but occurs in surrounding area.
Catostomus fumeiventris Owens sucker		CSC	Endemic to the Owens River drainage and occurs in Bishop Creek and canals around the study area.
Rhinichthys osculus Owens speckled dace	C2		Several subspecies not yet formally described occur in the study area (Sada, pers. comm.).
BIRDS			
Accipiter gentilis Northern goshawk	C2	CSC	Probably forages in the study area occasionally, but not known to nest in the vicinity.
Accipiter cooperi Cooper's hawk		CSC	
Buteo swainsoni Swainson hawk	3C	T	Forages in riparian areas near alfalfa, hay, or wheat fields supporting vole populations (NDDB, 1992).

Table 9-2
Sensitive Animal Species
in the Study Area Vicinity

Species	Status		Comments
	Federal	State	
Icteria virens Yellow-breasted chat			Nests in willow thickets, often mixed with cottonwoods and shrub understory (NDDB, 1992).
Asio otus Long-eared owl		CSC	Occurs in riparian woodlands and forages in adjacent open lands (NDDB, 1992).
Coccyzus americanus occidentalis Western yellow-billed cuckoo	C3	E	Nests in willow thickets, often mixed with cottonwoods and shrub understory (NDDB, 1992).
Lanius ludovicianus Loggerhead shrike	C2	CSC	
M A M M A L S			
Plecotus townsendii pallescens Pale big-eared bat			
Taxidea taxus American badger		CSC	
Felis concolor Mountain lion		P	

Federal
- FC2 - Federal Candidate List 2 insufficient information for listing at this time.
- E - Listed as federally endangered.
- PE - Proposed to be listed as endangered.
- P - Protected from take by federal law.

State
- E - Listed as endangered by the State of California.
- T - Listed as threatened by the State of California.
- CSC - California species of special concern.
- P - Protected from take by California law.

3. Regulations

The Federal Endangered Species Act of 1973

The endangered species act states that no federal agency shall jeopardize the continued existence of an endangered or threatened species and are required to consult with the USFWS on any action proposed, authorized or carried out by a federal agency that could affect these species. This would include projects in which permits are authorized or some type of federal funding is provided. Normally, an informal consultation process in which the resource agency notes the presence of any listed threatened, endangered or candidate species which could occur in the project area. It is required that any potential impacts to these species be addressed in the environmental documentation developed for the project. To determine if a listed species and/or its critical habitat may be affected a biological assessment, providing the information on the species and the potential impacts of the proposed project to the USFWS. If a species or its habitat may be affected then a formal consultation process is initiated. This results in the development of a Biological

Opinion from the resource agency determining if the project could jeopardize the species and any stipulations to reduce impacts to the species in question. The potential loss of a species or critical habitat has been allowed under Section 10 (Incidental Take Provision) of the Act, where the area has been subject to a previously approved Habitat Conservation Plan for that species, such as the least Bell's vireo or the Stephen's kangaroo rat (Recon 1988, 1989).

The Federal Clean Water Act

Section 404 of the Clean Water Act is administered by the U.S. Army Corps of Engineers. This section regulates the disposal of dredge and/or fill material into waters of the United States. Additionally, the placement of any structures into these areas is regulated by Section 10 of the Rivers and Harbors Act. These regulations not only cover activities in bays, waterbodies, and rivers but also in wetland areas. Currently, if the project is less than 10 acres, it may already be authorized under one of the existing nationwide permits. Otherwise, the applicant must apply for a 404 permit if the project could affect Waters of the U.S or adjacent wetlands. Waters of the U.S. are defined to include all rivers and streams, including intermittent streams, to the normal high water mark, as defined in Section 328 of the Clean Water Act (Goode and Pierce 1990). The application must comply with section 4041b, which requires that the applicant show there is no practical alternative to the proposed action.

An individual 404 permit requires a formal application process, which includes a public review period and a NEPA compliance review. An analysis of possible alternatives must be considered for the 404 permit with preference always being given to the avoidance alternative. As noted in the EPA implementation procedures of the 404 program for non-water dependent projects "no discharge shall be permitted if there is a practical alternative which would have less adverse impact..." (U.S. Army Corps of Engineers and EPA 1989).

The recent agreement between the U.S. Army Corps of Engineers and EPA (1989) on the procedures for mitigation on 404 permits (Clean Water Act), re-emphasize the "no net loss" policy for wetlands and requires a minimum 1:1 acreage replacement to achieve this goal. It also contains provisions for even higher compensation ratios, in areas with high functional values.

The USFWS under its authority of the Fish and Wildlife Coordination Act and the Endangered Species Act also reviews the application to insure that endangered or threatened species would not be jeopardized and that fish and wildlife habitat conservation have been considered within the proposed project. The USFWS may require mitigations be developed in accordance with their mitigation policy (USFWS 1981) regarding the loss of any wetland habitat.

Besides the Clean Water Act Executive Orders 11988 (floodplains) and 11990 (wetlands) require that federal agencies consider floodplain management and/or wetland conservation in authorizing or carrying out any federal action. Generally, the action of these orders is in the form of agency guidelines (Water Resources Council 1978), which

require agencies to contain sufficient information in their environmental documentation to describe existing floodplains in the project area and insure that feasible alternatives have been examined to reduce floodplain encroachment or wetland disturbance.

Other important federal regulations concerning biological resources include:

Fish and Wildlife Coordination Act

This act requires federal agencies sponsoring or authorizing water development projects, e.g. Corps of Engineers, to consult with the USFWS to insure that the conservation of fish and wildlife resources has been considered in the proposed project. The USFWS also reviews the project to determine if sufficient measures to compensate for potential impacts have been developed.

Migratory Bird Treaty.

The USFWS is responsible for the conservation and management of both game and nongame migratory bird species. On proposed development projects the USFWS may review projects to determine if there are potential impacts to wintering, resting or nesting habitats of known migratory species.

The California Endangered Species Act (CESA)

The CESA and the older Native Plant Protection Act (NPPA) prohibits the taking of any endangered, threatened or rare plant and/or animal species in the state. It also details the procedures for listing the species and protects candidate species. The CESA requires that state agencies do not jeopardize the continued existence of any listed species and require a consultation, similar to the federal Section 7, on CEQA projects to allow for an biological opinion on the effect of the project to a listed species. CESA also provides for an informal consultation procedure for state and local agencies. The purpose of this consultation is to allow for early communication with CDFG to determine if any listed species could occur in the proposed project area and any concerns of the CDFG. However, due to the retention of the Native Plant Protection Act, plant species can be disturbed upon 15 day notice to the CDFG.

The California Environmental Quality Act (CEQA)

CEQA provides the most important conservation measures for plants, wildlife and their habitats. Under CEQA the lead agency must consider the existing resources, potential project impacts and develop mitigation measures for any significant impacts. In addition CEQA requires that projects affecting sensitive wildlife habitats, such as wetlands, riparian areas, etc., and areas of critical sensitivity be reviewed by the appropriate state agencies (CDFG) even if the state has no jurisdiction over the project, under Section 15206 Projects of Statewide, Regional or Areawide Significance of the CEQA guidelines.

CEQA also requires that potential impacts be determined not only on listed endangered, threatened or rare species but also those species "likely to become endangered in the foreseeable future" under Section 15380 of the guidelines. This consideration would include those species on the state, CNPS 1, or federal candidate lists or species noted of

local concern. State lead agencies are required to consult with the CDFG on CEQA projects that may affect state listed species.

The State Department of Fish & Game Stream Alteration Agreement (1601, 1603)

The CDFG requires that an agreement be completed and approved by the CDFG before any alteration of a river, stream, or lake is conducted. The usual procedure is for the description of the project; existing biological resource information; potential impacts and mitigation measures to be described in the CEQA documentation. Final development of the mitigation design and actual application for the agreement is done prior to the onset of construction. The agreement is not a permit and any disagreements on the scope of the mitigation requirements are resolved in a binding arbitration process.

Currently, all agreements must comply with the CDFG's wetland policy (CDFG 1987, 1991) of no net loss of wetlands. Mitigation measures would have developed in compliance with the CDFG's wetland protection position (1990). These guidelines note that avoidance is always the preferred alternative, since the creation of new wetlands always has an element of potential failure. The guidelines also stress the onsite compensation for the loss of wetlands, since this would benefit existing wildlife populations. These guidelines require that at a minimum the mitigation must assure that there is "no net loss" of wetland acreage or habitat values. The emphasis on protection also includes a requirement for 100 ft. buffer for any development that would potentially encroach on a riparian area.

4. Water Quality

According to the 1991 Annual Water Quality Report for the City of Bishop, the quality of water used for potable purposes is of extremely high quality. The source of water for the City of Bishop is the underground aquifer of the "Bishop Cone". Water is pumped from the aquifer by three wells, as described below:

- Well No. 4: This is Bishop's primary well, located approximately 3 miles west of the City and 260 feet south of Highway 168 (West Line Street) near Bishop Creek. This well produced about 530 million gallons, accounting for 93% of the City's water production.

- Well No. 2: This is the backup source of water for Bishop, located 400 feet north of Sierra Street and 550 feet west of Main Street. The well normally operates during April through September and produced about 20 million gallons, accounting for 4% of water production.

- Well No. 1: This well is an inactive well available for emergencies such as fires. The well is located at the southwest corner of Warren Street and Church Street behind the Police Dept. This well is not used as a normal production source because some water quality tests have shown fluoride concentrations equal to the maximum state standard. Because of a burned out motor at Well No. 4, Well No. 1 was operated during the summer and produced 16 million gallons or 7% of the total water production during that time.

The City of Bishop operates under permit by the State of California Department of Health Services. The drinking water standards are established both by DHS and EPA in compliance with the Safe Drinking Water Act.

The water system is tested frequently in accordance with a schedule established by DHS. Water samples are taken by Public Works maintenance personnel and tested at Inyo County's laboratory. Bacteriological samples are taken at least once a week at various locations throughout Bishop. Samples are also taken at Wells No. 4 and 2 monthly and at Well No. 1 quarterly. Samples for the physical quality of the water are taken monthly at various locations throughout the City. All test results are reported to DHS.

Radioactivity monitoring was done in 1985, 1987, and 1990. Additional monitoring will be done every 3 years beginning in October 1993. The water sources have also been tested for organic and inorganic chemicals according to DHS requirements. The test results and standards are shown in the following Table.

The groundwater supply for the City of Bishop is of excellent quality. Water from Wells 1 and 2 is not treated. Water from Well 4 is chlorinated at 2 locations to prevent water-borne diseases and stop growth from forming inside the pipe network. The water is safe to drink and no contamination is evident. Organic and inorganic chemicals are either not detectable or are found in a fraction of the maximum contaminant level. The Water is aesthetically pleasing, being clear, soft, clean and has very low concentrations of constituents in both adopted and unadopted secondary standards. Fluoride is detected in very low levels and is not added to the supply. Sodium levels in the water are also very low.

Water Resources-watershed

The water resources of the planning area, both surface and groundwater, originate in the adjacent mountains as snow. The City of Bishop is located in the lower Bishop Creek drainage, the largest tributary to the Owens River. In addition to Bishop Creek, the Owens River passes to northeast of the City. Both Bishop Creek and the Owens River are regulated by dams upstream. Reservoirs designed to release water for power generation are located on both forks of Bishop Creek while the Owens River is regulated at Pleasant Valley. No additional reservoirs on either stream are contemplated by any agencies at this time. Approximately one half mile below southern California Edison's Plant Six, Bishop Creek divides into two streams. The north fork of Bishop Creek passes through the Mc-Laren, Bishop Reservation and lower Dixon Lake/Meadow Farms areas before joining the Owens River north of the Airport. The south fork of Bishop Creek passes through the Bishop reservation and City of Bishop before entering the Buckley-Rawson Ponds south of the airport. Using water diverted from the Owens River and Bishop Creek, numerous canals, ditches and drains interlace the area. The allocation and management of most of this distribution is carried out by the Bishop Creek Water Association, in existence since 1897. There are many ponds and water bodies allocated for wildlife habitat. Buckley and Rawson Ponds, located southeast of the Airport, are the largest of these ponds.

Runoff data indicates that Bishop Creek experiences peak flows one out of every five years in response to precipitation. Long term runoff data indicates that Bishop Creek has an average annual discharge of 67,330 acre feet or 93 cubic feet per second (cfs.). The Owens River has an average annual discharge of 329,120 acre feet or 440 cfs.

Scenic Resources

Panoramic views of the surrounding Sierra Nevada and White Mountains, along with the surrounding ranch and open space lands are the dominant scenic features in the Bishop area. Spectacular views of the mountains are available from many vantage points within the City. Within the developed portion of the City, panoramic views tend to be obscured by buildings, trees and utility wires.

The open agricultural/ranch lands that surround the City are important elements in the scenic imagery of Bishop. Irrigated pasture, tall grass, and grazing cattle under cottonwood trees provide strong character of the area. The deep green of alfalfa fields are quite a contrast to the streets, parking lots and buildings or the dry, brown, scrub lands surrounding Bishop. Few communities have such a unique, scenic setting. These lands, owned by the City of Los Angeles DWP, virtually assures their permanence as scenic open space land. Preservation of both panoramic views and views of adjacent agricultural lands which form the "edge" of urbanized areas is important to retain.

Another similar scenic aspect of the community involves the tree lined roads and lanes of the City. The view while traveling on these roadways reinforces the image of Bishop as a "rural" community. Preservation and/or replacement of the trees that line these roads would contribute greatly to the preservation of the scenic qualities of the City's environmental character.

5. Geology and Soils

Although the City of Bishop is situated on the Owens Valley floor, there are several important land forms which influence the environment. Mountains, composed of igneous rock or metamorphic rock are readily distinguished by their high elevation and steep slopes. Alluvial fans, composed of poorly sorted, unconsolidated material, are located at the outwash of nearly all mountain canyons. Uniform slopes and fan shapes characterize alluvial fans. Composed of pervious material, alluvial fans are thought to be the site of considerable groundwater recharge. The Valley floor is composed of smaller, well sorted material deposited by decreasing stream gradients. Although relatively flat, the City area has a west to east slope with an approximate 1.5 percent gradient. Other landforms of interest found in or adjacent to the City include the volcanic tableland, volcanic cones, or the base of volcanic extrusion, and river terraces adjacent to the Owens River.

Major faults occur along the base of the mountains and on the valley floor. The Fish Slough Fault is the most significant of these found in the Bishop area. Located between the City of Bishop and the Bishop Airport, the Fish Slough Fault runs generally north-south with numerous lineaments or splinter faults in a similar fashion. Seismic hazards and their relationship to land use is the subject of the Alquist-Priolo Special Studies Zones Act and the Safety Element of the General Plan.

Nearly all of the soils of the planning area are alluvial, transported by streams draining from the adjacent mountains. Generally, the soils in the Bishop area fall into two categories; the older more mature soils which often have hard pan conditions and tend to be of limited agricultural value, and the younger soils, characterized by more porous, even textured conditions which are among the most productive found in the Owens Valley. The Johnstonville soil series is typical of the older soils. The more recent alluvium includes the Lahontan, Lynndyl, Cajon and Bishop series. Soil limitations for agricultural use include alkali, stoniness and high groundwater conditions. Soil limitations for construction purposes are limited to high groundwater conditions in the Dixon Lane/Meadow Farms area.

6. **Historical-Cultural Resources**

Archaeological or Pre-historic

Physical evidence indicates that the Owens Valley was occupied by a people thought to belong to the Ponto Basin culture prior to being occupied by the Northern Owens Valley Paiutes of the Shoshonean liquistic group. Paiute occupation of this portion of the Great Basin is thought to date back to 1,000 A.D. Semi-nomadic, the Paiute subsisted on game, plants and seeds, particularly the pinyon pine nuts. Their camps or villages were located in the Owens Valley along streams where the land was more productive. There is evidence that the Paiute practiced a form of irrigation by diverting water form the mountain streams to seed lands. The Bishop area was one of the principal Paiute settlements, probably due to the overall productivity of the areas water and soil resources.

Due to the long term, intensive occupation of the Bishop area by the Paiute, the entire area should be considered an archaeological-historic resource area. Much scientific information could be gained by the preservation of significant archaeological resources. The mitigation of impacts to archaeological resources range from recording the location and presence of the site to complete excavation and the cataloging of all artifacts found at the site. In some cases projects may be either redesigned or delayed while the necessary recovery work is being performed. The preservation of archaeological resources need not prevent construction or development in all but a very small fraction of situations. Rather than stop the project, mitigation measures can be incorporated to assure the preservation and/or recording of the resource.

The key to the preservation of archaeological resources rests with the early involvement of a professional archaeologist to determine presence and significance and to guide appropriate mitigation measures. Guidelines should be provided by a certified archaeologist to establish appropriate mitigations for any identified site.

Present Cultural Groups

The Owens Valley Paiutes, descendants of prehistoric peoples, have an abiding interest in cultural resources. The past conflict over the East Bishop recreational lake points out the need to involve the Indian community in these kinds of issues. It is in this area that scientific interest in study and examination clash with Indian attitudes, beliefs and desires to preserve their own cultural values. In this regard the Bishop Commercial Development Committee contacted the Indian community about the areas held by present day Paiutes and which should be avoided. A football shaped area with a northwest-

southeast axis was identified, centered on or about the Bishop Airport was identified as a former winter village-burial ground and as such "sensitive" to present day Paiutes. Subsequent archaeological investigations performed in conjunction with the Airport Master Plan confirmed the existence of numerous sites within this area including a significant site south of the Airport. A means for Indian community involvement should be included in County policy on archaeological resources. Present Paiutes occupy an 880 acre reservation located in the center of the planning area.

Historical

Although settlers had passed through the Bishop area for nearly twenty years, it wasn't until Samuel A. Bishop established the St. Francis Ranch in 1861 that Bishop came to be settled. Both Bishop Creek and the City take their name from Mr. Bishop who left Inyo County shortly after establishing his ranch. While mining was the dominant economic activity in the rest of the County, Bishop was settled by cattle and sheep ranchers exploiting the grasslands on Bishop Creek's alluvial plain. The City of Bishop, incorporated in 1903, became the commercial center of an agricultural economy which became more diversified as the area's water resources were developed and applied to the land. With the City of Los Angeles DWP purchase of Valley ranches for water rights, local agriculture declined and so the population. Today Bishop is the eastern Sierra's largest urban community with an economy based on tourism, recreation and mining.

Bishop contains several places and artifacts of its past. These include the site of Laws, Owensville, the site of the St. Francis Ranch, the former Calelectirc power plant (SCE's plant six), and the silos and rows of trees which mark the site of former ranches. The Barlow home on Barlow Lane could also be included in this category along with the remanent of the grading for the "Apple Railroad" once contemplated as a means of economically delivering produce to the Laws depot from Bishop.

7. **Climate-Air Quality**

Located in the "rain shadow" of the Sierra Nevada, the climate of Bishop is considered arid. Although influenced by its inland location, the climate of the Owens Valley is considered "Mediterranean" with precipitation occurring in the cooler portion of the year. Winter storms originating in the Gulf of Alaska encounter the Sierra Nevada range, which acts as a moisture barrier. Having deposited precipitation, these air masses become compressionally heated as they descend the eastern slope. This descending air absorbs additional moisture, thus assuring the eastern side of the mountains of an arid climate.

Long term precipitation records indicate that Bishop receives an average of 6.3 inches annually. Approximately 80 percent of this precipitation occurs between the months of November and April. Although nearly 100 percent of the precipitation in the Sierra Nevada is in the form of snow, only 25 percent of the precipitation received by the planning area is in the form of snow. Seasonal and diurnal temperatures tend to be extreme. Bishop has an average annual temperature of 56.0* F with an average July maximum of 98.6*F and an average January minimum of 18.2*F. Daily temperature ranges of 40* to 50* F are not uncommon regardless of season. Despite relatively high summer daytime temperatures, thermal losses from the sparsely covered, highly reflective rock-soil surfaces, combined with the thinner air at this altitude produce cool night

temperatures. Winter temperatures are influenced by cold, dense air which collects in the mountain valleys and flows into the Owens Valley creating an inversion condition in the late night, early morning hours. Sunlight striking the valley floor quickly reverses the inversion condition. Relative humidity tends to be low throughout the year.

Strong, persistent winds of 35 knots or greater occur in the Owens Valley, particularly in the Spring and Fall months. Airport wind records indicate that westerly winds are typical except during storms when northerly or southerly winds are common. Daily wind variations are common in the summer months when differential heating on the desert and valley floor creates thermal updrafts and accompanying local winds.

The air quality of the Owens Valley and eastern Sierra region is generally good. Air quality monitoring, however, has been very limited. Sampling by the Great Basin Unified Air Pollution Control District indicates that State and Federal standards tend to be equal or exceeded during Summer months when large scale stable air closely follows a windy period. Spring and Fall winds also generate considerable particulate material around Owens Lake. Major sources of particulates are thought to include the Owens Lake bed, barren portions of the valley floor, mining operations, construction activities and automobiles. The use of woodburning stoves for heating purposes also adds to Winter air quality levels.

The maintenance of the irrigated agriculture adjacent to the developed portion of the community helps moderate the hot summer climate through the cooling effects of evapo-transpiration processes. Protection from the cold winds of spring and fall could be provided by the wind break as suggested earlier. Significant vegetation changes will likely result in additional particulate air pollution. As a result the existing, adapted native plant communities should be preserved as a means of maintaining air quality. In addition the county should continue to work with the Great Basins Air Pollution Control District to control major particulate sources both within the planning area and from outside the area.

State Energy Commission records indicate that Bishop has an average annual degree day heating requirement of 4,275 (Degree day is a unit, based upon temperature difference - 65° F and time used in estimating fuel consumption and the nominal annual heating load of a building.)

Coastal areas of the State, by contrast, have annual degree day requirements of 2800-3200. Inyo County in general has an abundance of solar resources, which could meet a substantial portion of this heating requirement. Inyo County receives an annual average of 3500 hours of solar energy (nearly 91/2 hours per day). The Subdivision Map Act was recently amended to permit the establishment of solar easements which assure that each dwelling has access to sunlight for both passive and active solar energy application. Consideration should be given to this environmental resource.

IV. CONSERVATION/OPEN SPACE NEEDS

A. Preservation of Natural Resources

It is imperative that the natural resources of the City and surrounding area, including water, plants, and animals be protected from urban encroachment. The Owens Valley's many habitat areas are susceptible to depletion from the activities of people. However, through the mechanisms such as the Bishop General Plan and the Inyo County General Plan, it is possible to assure that precautions (policies) will be utilized to minimize the impact of human activity on the natural environment.

In Bishop, sensitive habitats, such as the riparian woodland, are currently protected from urban development within the City through the establishment of an open space corridor. Only passive recreational activities that are controlled will be allowed to occur in those areas. This policy will allow for the preservation of natural open space resources such as Bishop Creek for generations.

B. Conservation of Non-Renewable Resources

The consumption of non-renewable natural resources which may occur within and outside the City of Bishop planning area is of concern, especially regarding the implementation of land use policies which may tend to increase rates of consumption of those resources. There are virtually no consumptive natural resources found in the City of Bishop. Most of these resources are imported to the area. The use of wood for heating and cooling represents the most significant local natural resource consumption, but is not considered to be of major concern.

Goals, policies, and actions contained in this element, as well as in the land use and circulation element are intended to minimize the depletion of non-renewable natural resources. Recycling of renewable natural resources such as paper, glass, plastics, and metal is also encouraged by the City's goals and policies. A comprehensive recycling program should be developed to properly reuse renewable materials.

C. Protection of Life and Property

Protection of life and property from natural hazards is an important component of the Conservation and Safety Elements. Policies guiding development to locate in areas that are not prone to natural disasters will minimize the potential for property damage and physical injury. The Safety Element will further detail how the City will respond to natural disasters through an emergency preparedness plan.

D. Preservation of Good Air Quality

Maintaining good air quality one of the most important responsibilities of private and public agencies. Buildout of the General Plan land use policies will not significantly alter the existing air quality levels, although emission levels will increase slightly during the planning period. Conformance and cooperation with the Inyo County Air Quality Plan is necessary to accomplish the desired goal of maintaining good air quality levels.

E. Preservation of Scenic and/or Open Space Resources

Although the City of Bishop contains only a fraction of the scenic and open space resources inherent in the Owens Valley, the preservation of those resources is a high priority. The preservation of open space surrounding the forks of Bishop Creek is the single most effective measure available to the City to conserve the resource. Most of the other natural resources of the area are located outside of the City, thus limiting its control of conservation measures. However, the City will assist in whatever means necessary to preserve those resources identified in this General Plan and the Inyo County General Plan.

V. GOALS, POLICIES & ACTIONS

The following goals, policies, and actions have been derived from the previous Bishop General Plan, the Bishop Community Plan, and the 1984 General Plan Amendment. They are intended to preserve the areas natural, scenic, unique, fragile, and historical resources to the greatest benefit of present and future residents and visitors of the City.

The primary goal of this element is summarized below:

The unique natural setting of the Bishop area is a significant element in the quality and way of life for the residents. The mountains, streams, wildlife and vegetation of the area and region not only contribute to the quality of life but form the basis for the recreation oriented local economy. The protection and enhancement of these environmental resources is therefore an important goal of this plan. Protection of the public from natural hazards, the public enjoyment of scenic resources, public recreational opportunities and the management of the area's environmental resources are also goals of this plan.

A. Goals

- To minimize urban sprawl in the surrounding region by concentrating urban development within the designated areas of the City as outlined in the land use and zoning elements.
- To preserve the vegetation, wildlife, plant communities, wildlife habitat, and important ecological areas within the City, and surrounding areas as designated in the land use and zoning elements.
- To conserve, protect, and enhance unique natural resources within the City of Bishop and surrounding region.
- To preserve and protect endangered or threatened plant and animal species.
- To preserve the existing air quality of the Bishop area.
- To insure that the productive resources, including water resources, are not allowed to deteriorate due to misuse, overuse, or abuse.
- To protect the scenic historic resources within the City and surrounding area.

- To protect the cultural and historical resources that form Bishop's heritage for the enjoyment of the present and future population.

B. Policies

- The City shall require appropriate mitigation measures to protect any rare, threatened, or endangered plant and animal species.
- CEQA environmental review processes shall be utilized for all new development projects to identify and mitigate the potentially significant impacts to the City's natural resources.
- The City shall require referral of proposed development projects located in sensitive resource areas to the Department of Fish and Game for their review and comment.
- The City will cooperate with governmental agencies, private groups, and individuals in the preservation and enhancement of the Owens Valley's natural resources.
- Maintain a buffer or setback of 50 feet from Bishop Creek measured from the stream. Developed areas on private lands are excluded from these setback provisions. However, development is discouraged in such areas.
- The natural vegetation and habitat along the existing canals and ditches should be maintained and preserved. Channelization of streams and ditches should be considered only when the public health and safety is threatened.
- The City shall cooperate with the Lahontan Regional Water Quality Control Board in protecting the water quality of the Bishop aquifers.
- The City shall encourage the undergrounding of existing overhead utility lines. The undergrounding of utilities in new construction shall be required to the maximum extent feasible.
- Trees located along roadways should be preserved or replaced if maintenance requires their removal. Similar landscaping should be considered in conjunction with the development of additional roads.

C. Actions

- Assist in the coordination of sub-regional efforts for air quality monitoring and planning.

  Responsible Agency: Planning Department/Public Works

- Develop a list of actions that employers and citizens can use to assist in air quality improvement.

  Responsible Agency: Public Works (Bishop); Inyo County

- New developments have the opportunity to incorporate pollutant reduction measures into project design. By conditioning projects to address air quality measures, the City can feasibly meet future pollutant reduction targets at reasonable economic costs.

  Responsible Agency: City of Bishop; City Council; Planning Commission

- Continue to monitor the water quality of the existing well systems according to Department of Health Services standards, assuring that high water quality standards are maintained.

  Responsible Agency: City of Bishop; Department of Health Services

- Develop and implement a comprehensive parks, recreation, and open space plan that coordinates the active and passive open space parks areas, including Bishop City Park, neighborhood parks, and open space areas along Bishop Creek.

  Responsible Agency: Parks Commission; Planning Department

- Identify potential natural resources which may occur within the planning area and conserve and protect those resources which may have substantial value to residents.

  Responsible Agency: Public Works

- Review proposed development projects for sites that may have potential archaeological significance and require a survey by a licensed archaeologist, who can designate appropriate mitigation measures if necessary.

  Responsible Agency: Public Works; Planning Commission

- Acquire and maintain current information concerning County, State, and Federal ordinances, codes, laws, and studies in the area of biological resources. This information should be available for public use.

  Responsible Agency: Department of Fish and Game; Planning Department