

Without doubt, the effect of these restrictions has been the loss of cultural traditions surrounding the proper techniques for taking plants and animals. It is generally understood today that this was not the original intent of the restrictions, but it is also quite clear that the generation that made the transition from hunting and gathering to wage work to make a living in the years between roughly 1900 and 1940, did not understand their purposes. They interpreted these rules and regulations as aimed directly at them and at their way of life. We recorded the following:

My mother, you know, she was very upset. She was real mad. And that's when she said that maybe what we ought to do is get all our hunters and let them go up to wherever the mountain sheep are and kill the whole bunch of them...and then we women could go up there and set fire to the forest where the pine nuts are. Get rid of everything. And then see what they'll do to us. Let them shoot us off, too. And then she said that we'll take all the dead mountain sheep and put it over there at their doorstep for them to see what we have done. And then the mountains will be burning and then they'll have to get rid of us, is what she said. She said they'll come over and kill us off with their guns. Then I heard it from several other people too, they were saying the same thing... 'why don't they just come and just kill us off? They can't just be saving what is part of us. The bighorn sheep and all the other things were just part of us, but they were protecting them. So they said we had no meaning to the land at all. Therefore, we were useless, and they ought to come by and just kill us off.' They said it over and over and they were very perturbed (PE, Tape 3:10-11).

Tribal elders remember their parents making these statements, and some sympathize with these positions still today. They also recall that once the pine nut camps were closed in Wildrose, they tasted very few wild foods. It is hard to maintain one's connection with the land and with heritage if that connection cannot be exercised. Although no one today would advocate a return to hunting and gathering to make a living, either inside or outside the Park, some feel strongly that it is their right to take certain resources if their own proper methods and procedures are followed. The Timbisha Tribe subscribes to the hunting and fishing code of the Western Shoshone National Council, an over-arching group of which the Tribe is a member. Individuals follow this code when taking resources outside the Park. The regulations strictly forbid non-subsistence hunting, and they advocate quotas and reporting procedures (Zabarte et al. 1988).

The data that follow summarize some of the knowledge of plants and animals still carried by the elders of the Timbisha Tribe. They set the stage for a number of their concerns over natural resources both within the Park as well as outside of its boundaries.

## Plants

Knowledge of food and medicinal plants is held today by only a few elders of the Tribe, although there is a considerable desire on their part that this knowledge be taught to their children and grandchildren as part of cultural maintenance. But, with opportunities to teach by doing--which was the former method--severely curtailed, people are uncertain as to how to proceed. Most would like to give young people the opportunity to actually participate in plant collecting experiences, even if these are limited to major resources, such as mesquite, pine nuts, spring greens, some seeds, and a few medicines. Today, active use of resources within the community is also largely limited to these, with some families being more interested in them than others. Elders have heard from their own parents about the processing and use of other species, but most have not actually participated in collecting these. They, too, are eager to learn from each other and from other Shoshone elders elsewhere about the former uses of plants.

Mesquite. As noted earlier, the mesquite groves at Furnace Creek are a special resource, as not only was mesquite a former staple of the Timbisha people, but the trees there produce the sweetest beans in the region. In former times, large quantities of beans and also specially prepared flour cakes were stored for the winter in near-by cache pits. These were located along the ridges above Furnace Creek Wash, including at the present tribal cemetery site, in Breakfast Canyon (Yohe and Valdez 1993), and elsewhere. When people returned to the Valley for the winter, they went to the caches and retrieved the cakes and beans as needed.

The processing of mesquite is lengthy, but rewarding. We reviewed the process with the Historic Preservation Committee and attempted to document the uses of mesquite in all of its stages. Unlike the earlier report by Coville (1892) which outlines the uses of mesquite in the fully ripened stage only, members of the Committee started with uses at much earlier stages, including when the pods were green.

Mesquites (ohbimbi, Prosopis glandulosa) begin to flower in the Furnace Creek groves in mid to late March, depending on the year (Figure 39). Fruit begins to form soon after, so by late April there are green pods hanging from the trees. The seeds within the pods have not fully formed, however, and the pods thus appear flat. At this time, some of the pods (ohbi) are harvested to make the first product of the mesquite. Although this product is rarely used today, some elders remember how it was produced.

In order to prepare it, an earth oven was made in which a layer of stones lined the bottom. Other stones were placed on top of these and a fire built above. When the coals burned down, the top layer of stones was removed, and the green pods placed on the bottom layer. The top layer was returned, and the pit covered with grass or arrowweed to keep it clean. The pods roasted for several hours, and when removed, they had formed a material that was tart to the taste. This was enjoyed by many, particularly the older people.



Figure 39. Mesquites in flower, Texas Springs. March, 1993.

When the pods turn yellow and ripe and before they begin to fall from the trees (Figure 40), a second product is made, a juice extracted from the pounded pods. Most elderly people have tasted this, and remember it with fondness. At this stage the pods or fruits still contain considerable moisture so that pounding them yields pulp rather than flour. Mesquite fruits consist of a thin, leathery exocarp, a semi-fleshy and sweet mesocarp, and an inner stony endocarp that contains the seed (Mooney, Simpson and Solbrig 1977:39). When the fruit is pounded in a wooden mortar with a long stone pestle, the three elements separate from each other, with the mesocarp making up the material that is most enjoyed. The resulting mixture is then added to water and squeezed to remove the *kahimbi*, or the residue of the exocarp and endocarp. Some people made the juice thin and some thick, depending on preferences. It had a sweet flavor, described by one person as between orange juice and pineapple juice. The juice could also be fed to babies, by placing a little on the finger for the baby to suck off. But young people were cautioned against drinking too much, as it was said to make them drowsy. They were told, "Never drink too much, you young people, because you have things to do. You're supposed to go out there and live, learn life." Elderly people who have already experienced life have time to relax and fall asleep.

The final product of the mesquite fruit was the flour, also made principally from the mesocarp. When the ripened pods had fully dried, they, too, were pounded in the wooden mortar with the stone pestle. For this, the mortar was set into the ground to make it convenient for the pounder to sit with her legs outstretched and bring the pestle down from



Figure 40. Mesquites in the yellow pod stage, Furnace Creek Ranch, June, 1993.

over her head or shoulder with considerable force. This was the only way that some of the stony endocarp was at all crushed, but even this was not enough to fully grind the seeds, most of which were discarded. The floury powder filled the air with its sweet smell, and also covered the pounder.

Once the pounder had reduced the fruits to as fine a meal as she could, the remaining kahimbi was then sifted from this with a basketry tray and set aside. Next the meal was placed on the basketry tray in layers, with a little water sprinkled between. After several layers had accumulated to form a mounded cake, the moistened kahimbi was pressed over this as a protective covering. The cakes, called pikibi, were then ready for transport to the mountains for the summer and for storage in pits in the Valley.

Pits that were to contain the pikibi and also unprocessed mesquite pods were carefully lined with arrowweed and grass to keep the materials clean and dry. Cakes were placed in them in layers, and then after a separation of arrowweed or grass, mesquite beans were added. The pits were capped with more arrowweed and rocks to keep them safe from predators--although the people noted that in times of good harvest, the ground squirrels and



packrats had their own stores, and in times of bad, no one had anything. All put away as much as they could for the winter, as this was the main winter vegetable food. Mesquite flour could be eaten by breaking off the crust (kahimbi) from a cake and then some of the flour. Some preferred to roll the flour in a tortilla. Others, especially young people, mixed it with water to make a drink.

Mesquite harvesting and processing involved everyone, young and old, male and female. Most families moved to the groves as the green pods came on the trees, establishing their camps inside a particular mesquite clone or under a large tree. Everyone helped with the harvest of both green pods and dry. Men built and tended roasting pits and women (but occasionally men) pounded the pulp and flour. Women prepared the pikibi, and all able-bodied adults carried the prepared cakes and dried beans to storage sites.

Because mesquite was such an important food, mesquite trees were carefully tended in the early days by cleaning and clearing undergrowth and trimming the trees of any dead wood or lower branches that interfered with harvesting. These management processes probably facilitated the sprouting of new seedlings, reduced sand hummocking, and kept the trees in good condition. These procedures were followed for spiritual reasons, having to do with people's proper relationships with the natural world, but they also made good ecological sense (see Native Management Practices). The Furnace Creek mesquite groves are of critical importance to the Timbisha people, and they are very concerned by what appears to be a definite decline in the health of the trees (see IV, Land Use and Other Concerns).

Pinyon. The seeds of the pinyon tree (wahapi, Pinus monophylla) were the second major vegetable staple of the Timbisha people (Figure 41). They served as winter food along with mesquite, and they were cached extensively in the mountain areas as well as returned to Valley winter camps. They were formerly harvested in several locations throughout Death Valley and adjacent areas, but today people concentrate on two: Wildrose and Hunter Mountain. Both have pine nuts with excellent flavor. The only other place with pine nuts with this flavor is an area near Darwin (probably in the Coso Range) now locked up on the Ordnance Test Station. The pine nuts in the Grapevine Mountains and at Lida, NV, are good, but have a different flavor and are not as desirable. We reviewed the pine nut collecting and preparation processes with the Historic Preservation Committee.

Collecting pine nuts (tiba) formerly began in August with the harvest of the green cones, or ones in which the nuts had fully matured, but had not yet been released. Normally the nuts are released by a frost which causes the bracts of the cones to open, but the process can be speeded up. First, the cones are removed from the trees with long harvesting poles made of birch or other long straight wood. They are then brought back to a central place that has big sagebrush for fuel. A big pit is dug in the earth, lined with sagebrush, and a fire built within it. Then the cones are added, along with four bundles of rabbitbrush along the outer edge, pointing into the pit. After the pit is filled, more sagebrush is placed on top. Next a small pit is dug adjacent to the larger pit, and a rabbit brush fire is kindled. A torch of sagebrush is lighted in this fire and an elder uses this torch to light the four bundles of



Figure 41. Single-leaf pinyon, Wildrose area. March, 1993.

rabbitbrush in the larger pit. This fire is usually started very early in the morning, by an elderly person chosen by the group. The person lighting the fire speaks asking for acceptance and promising that the pine nuts will be put to good use by the people. Persons in camp cannot drink any water during the period when the fire is burning.

When the fire has burned to coals, dirt is mounded over the pit. After this has occurred, persons in the camp are free to drink water. If the roasting procedures are properly followed, the nuts will be very flavorful. If not, and the fire vents, the flavor might be ruined. Pine nuts roasted in this way are done properly. To bypass this procedure and take only ripened nuts is to go only half way--and to miss the best taste.

Pine nuts are also collected after the bracts of the cones have opened, and the nuts have been released or are about to be released. Harvesting poles bring down these cones or the nuts within them. If the area under the pinyon trees is kept clean and clear, collecting the nuts from the ground will not be difficult. The trees in Wildrose and on Hunter Mountain that produce yellow nuts are favored because these can be easily seen. These special trees also produce bigger nuts.

Pine nuts collected in this way still require roasting. In former times, this was done with basketry trays by deftly tossing nuts and coals together. Today people usually roast

pine nuts in the oven or in a frying pan. They can also be boiled and eaten much as one would beans, or mixed with soups and stews.

Because of the ban on fires, today people must go outside of the Park to gather green cones--if they gather them at all. When the ban first went into effect in the 1950s, one of the elders remarked that the Tribe should set fire to all of the pine nut trees in the Monument, for only then would the Park Service realize what it had done to the People. Today collecting pine nuts within the Park is limited to day trips or occasional overnight trips. However, first a good production of cones must be located, something that is not always easy. Given that the trees produce at best only every two years, and that climatic factors and a host of other conditions might intervene and make it longer, sometimes regular areas produce only every few years. Park staff members sometimes inform tribal members of potential harvest areas seen, and people appreciate this. Otherwise, few individuals have time to go out and check all potential areas in Wildrose and on Hunter Mountain.

Wild Spinach. Some tribal members today still harvest wild spinach in the spring, at various sites, but usually outside Park boundaries. The two species of plants involved are desert prince's plume or tiwadi (Stanley pinnata) and Panamint prince's plume or wiwadi (Stanley elata; Figure 42). Both occur within the Park, but due to the lower elevation of the Valley, Panamint prince's plume is more common. We harvested wild spinach with the Historic Preservation Committee in the area east of Daylight Pass, and near Townes Pass. We also saw it in several other locations.

Coville (1892) correctly identified both of these plants as important spring greens based on observations of their uses by people in the area in 1891. As he noted, the young leaves are what is collected. These must then be boiled and the water discarded--he says once, but the elders say sometimes more depending on the flavor. These plants take up toxins (usually selenium) from the soil and concentrate them (Schumtz, Freeman and Reed 1968:149) into a bitter flavor. Boiling removes the bitterness. By the time they bloom in early May or June (depending on elevation), they are considered inedible.

Of the two species, desert prince's plume is the least bitter, and it usually requires less processing. But both were eaten, and both were stored for winter use. After boiling, the greens are removed and formed into small patties that are set out to dry. Once dry they can then be sacked and put away. They were commonly eaten with rabbit meat during the winter. As the elders pointed out, people had to store whatever they could from the spring and summer harvests for winter. Greens were no exception.

At the time prince's plume leaves were harvested, the plants were also tended. Taking the young leaves was one form of pruning, but in addition, dried leaves and flower stalks were also removed. Not all of the green leaves were taken so that the plants were well able to continue growth. The plants themselves were never pulled up.



Figure 42. Healthy growth of new leaves of Panamint prince's plume. March, 1993.

Wolfberry. Wolfberry or desert tomato (huupi, Lycium andersonii) was another important food that was formerly stored for the winter. The small, orange-to-red berries occur on short bushes in the foothills of Death Valley as well as elsewhere in the region. They can be picked by hand, but a stick beater is also effective in removing them in quantity into an accompanying container.

We saw wolfberries in several locations within the Park, but saw them fruiting only in the Emigrant Pass area. This was once a favorite gathering site for these (as was the lower Wildrose area), but as with all desert plants, they do not always put on fruit in this location. In former times, people had to check in various places to find a good place to harvest the berries.

Wolfberries, like other berries, are easily dried and preserve well in storage. They can then be reconstituted into a pudding by adding water and boiling. This can be eaten alone or with other foods such a meat. Meat can be dipped into the pudding as a sauce. They can also be mixed with mesquite flour and made into small cakes to be eaten fresh or stored for later use.



**Screwbeans.** Screwbeans (k<sup>w</sup>iyadambi, Prosopis pubescens) were formerly used as food, but not in recent times. The mature beans were pounded into flour as was mesquite, and the small black seeds removed by winnowing. It was eaten in the same ways as was mesquite. Areas for collecting screwbean are few within the area. Screwbeans grow in Furnace Creek Wash up as far as Travertine Springs on both sides of the roadway. They also used to grow along Cow Creek as far as Nevares Spring.

**White-stemmed Blazing Star.** White-stemmed blazing star (kuha, Mentzelia albicaulis) was formerly used for its seeds, but today is little used. It occurs at higher elevations within the area, especially around Dante's View, Townes Pass, Daylight Pass, and in the Greenwater area. It is a known fire follower, and people burned over areas to encourage its growth (see Native Management Practices). It produces several small gray seeds at the base of the flower, and these were once harvested with a seed beater. The seeds were ground on a metate with mano, and the meal made into a mush or gravy. Tribal elders remember tasting this when they were younger, but not in recent times.

**Chia.** Chia (pasita, Salvia columbariae) is another seed plant that is known but rarely used. It too grows in higher elevations, in many of the same locations as white-stemmed blazing star. It produces a small dark and shiny seed that formerly was ground on the metate with mano and made into a mush. People also recall tasting this, but not recently. Both chia and white-stemmed blazing star were formerly stored for the winter.

**Joshua Tree Buds.** Harvesting Joshua tree (muupi, Yucca brevifolia) buds was described by Coville (1892), and this practice is still known today. However, only a few people have harvested these in recent years. Twisting the buds (paki) from the tips of the tree's branches is not easy, given the sharp leaves, but then the buds must be pit roasted in addition. Some who have tried the roasted buds do not care for the flavor, but also suggest that perhaps they need to try the process earlier.

**Green Ephedra.** Green ephedra (tutumbi, Ephedra viridis), is a mountain plant that is still harvested by several people to brew as a tea. Straight, long stems are specifically selected and trimmed from the plant. Wildrose and Hunter Mountain have good plants for this purpose (Figure 43).

**Other Plant Foods.** Additional information was obtained on some other foods, as listed in Table 2. Some of these were seen in the field, but others were identified through photographs for Dayley (1989). People remember having eaten these in the past, but not recently. Names in the Timbisha language are still recalled.

**Medicinal Plants.** People still use some plants medicinally, and they recall having heard their elders speak of the former use of others. However, this information is sensitive, and knowledge about these plants varies with families. Three plant species of concern are yerba mansa (Anemopsis californica; Figure 44), turtleback (Psathyrotes ramosissima), and native tobacco (Nicotiana attenuata). Populations of yerba mansa are decreasing in the



Figure 43. Ephedra, Wildrose area. March, 1993.

Table 2: Additional Food Plants, Timbisha Shoshone

Plant Name		Food
Chokecherry	( <u>Prunus melanocarpa</u> )	berry
Barrel cactus	( <u>Echinocactus polycephalus</u> )	fruit
Wild rose	( <u>Rosa woodsii</u> )	fruit
Indian ricegrass	( <u>Oryzopsis hymenoides</u> )	seed
Buckberry	( <u>Shepherdia argentea</u> )	fruit
Sunflower	( <u>Helianthus annuus</u> )	seed
Common cane	( <u>Phragmites australis</u> )	sugar
Wild grape	( <u>Vitis girdiana</u> )	fruit
Mariposa lily	( <u>Calochortus kennedyi</u> )	bulb
Sego lily	( <u>Calochortus bruneauis</u> )	bulb
Elderberry	( <u>Sambucus caerulea</u> )	fruit
Beavertail	( <u>Opuntia brasilaris</u> )	fruit
Mustard	( <u>Descurainia pinnata</u> )	seed
Cattail	( <u>Typha domingensis</u> )	seed
Tule	( <u>Scirpus americanus</u> )	seed

Travertine Springs area, probably due to water diversion. The turtleback populations appear to be normal, or as in earlier times. Tobacco is still found on Hunter Mountain, although no one is burning for it as in earlier times (see Native Management Practices).



Figure 44. Yerba mansa, Eagle Borax. March, 1993.

Plants Used in Manufacturing. Several plants formerly used in manufacture are still remembered, including arrowweed (Pluchea sericea), used for arrows and also in the construction of brush shelters and storage pits, and several basketry plants. The basketry plants include willow (Salix lasiandra, S. exigua), which was formerly managed for straight canes (see Native Management Practices); bulrush (Scirpus maritimus), the root of which was used for dark brown decoration; devil's claw (Proboscidea parviflora), planted for its long dark fibers; and rush (Juncus textilis, J. cooperi), used for yellow patterns. We were unsuccessful in finding bulrush root, which used to grow in Furnace Creek Wash, on Furnace Creek Ranch, at Eagle Borax, and elsewhere. We found Cooper's rush at Eagle Borax and at Warm Springs in Panamint Valley, but not basket rush.

Gardening. Little has been written on gardening in Death Valley beyond the early observation by Nelson (1891), the brief ethnographic accounts given to Steward (1938;1941) and Driver (1937), and some historical data assembled by Wallace (1980). Steward (1938:72, 89) felt that gardening probably started in the Grapevine area in the 1870s, as a

result of contact with Anglos near Beatty and Southern Paiutes at Ash Meadows. Others have suggested a Colorado River origin, perhaps from the Mojave via the Southern Paiute as early as 1840 (see Wallace 1980:270f for review). But whatever the origins, the practice was quite extensive, especially in the early historic period around Furnace Creek. Members of the Historic Preservation Committee recalled that their parents and grandparents as well as others irrigated gardens at Furnace Creek Ranch and near Texas Springs that contained corn, beans of more than one type, summer and winter squash, melons, carrots, sunflowers, pumpkins, and much more. Added to these are Coville's (1892) and Nelson's (1891) observations of orchards and grapevines planted at Hungry Bill's Ranch, Indian Ranch, Hunter Creek in Saline Valley, Cottonwood Canyon, etc. Panamint Tom also had a large orchard in Warm Springs Canyon until it was destroyed by a flood in 1897, and his son had gardens at Saratoga Springs, in Johnson Canyon, and elsewhere. Thus, gardening appears to have been quite extensive and to have contributed substantially to Timbisha subsistence, particularly from roughly 1870 to the 1930s. After the people were moved to the present site of Timbisha Village, most gardening ceased as there was not enough water and the soil was very sandy. Today a few people still plant vegetables in home gardens, but not on the former scale.

### Animals

Hunting of all mammals, birds, and reptiles within the Monument had virtually ceased by the late 1930s to early 1940s due to restrictions. Thus, what Timbisha people remember about animals they recall from times when they were young or from experiences outside the Monument. Older people remember the Timbisha names for a number of these, and through those names they recalled what they experienced or have heard about them.

Large Game. The best remembered of the large game species is the bighorn sheep (wasipi), a former staple food during the pine nut season and an occasional one at other times. As noted earlier, the best-known places for hunting bighorns were in Wildrose in the fall, and at various springs near the Furnace Creek area also generally in that season. Fall was the best time to hunt bighorns, as they were in the best condition, and one avoided interfering with breeding and the raising of young. The last bighorns killed in the Monument were taken shortly after the ban went into effect: one taken at Willow Springs in about 1935, and two taken at Navel Springs about 1938-1940.

When the ban on bighorn sheep hunting was imposed, the people were very angry. They considered themselves to be "bighorn sheep-eaters" as part of their identification. Killing a bighorn also had social implications for young men, as this was their way of proving that they were good providers and potential husbands. Potential fathers-in-law would not know a young man's worth unless he proved himself in this way. And, the hunting of bighorn was preceded and followed by prayers and cleansings that would no longer be part of a man's life or that of his sons. Thus, the restrictions did strike at the hearts of the people, as "they [the bighorns] are part of us."



Deer (tiiya) were largely taken in Wildrose, as they do not occur on the east side of the Panamint Range. They were taken less frequently than bighorn, but they were important. The ban included hunting them, but was less upsetting than that for bighorn. Antelope (wantsi) were known mainly from the Spring Range, and the Sarcobatus Flat and Tonopah areas and were not hunted by Timbisha men unless they travelled in those directions.

Small Game. Several small game animals were formerly taken by Timbisha people in the vicinity of the Furnace Creek Ranch, as well as in Wildrose during the summers. Those on the Valley floor included the jackrabbit (kammi), cottontail (tabutsi), ground squirrel (kiiimbe), wood or packrat (kawa), kangaroo rat (paiyii), and occasionally badger (huna). People set traps for jackrabbits in the mesquite and along Furnace Creek Wash. They set noose snares for cottontails along the fenceline at Furnace Creek Ranch. They also set deadfall rock traps for ground squirrels in the same and other locations. Children also hunted ground squirrels while playing at the Ranch. Much of the small game seems to have been attracted to the area by the presence of the Ranch's irrigated fields, but the people also were able to benefit. In Wildrose people trapped gray squirrels (engwi), golden mantled ground squirrels (koi), Panamint chipmunks (wo?aitsi), and occasionally pinyon mice (puwaisi). There were also jackrabbits, and sometimes cottontails and ground squirrels.<sup>11</sup>

Restrictions against hunting these mammals were slower in coming, but came nonetheless. People recalled that they still trapped when they moved to Timbisha Village, so the restrictions seem not to have been imposed until the 1940s. They also continued to trap in Wildrose until the same period, when things began to be closed there as well. Younger people have hunted small game outside the Park on public lands or at Indian Ranch, but mostly rabbits and birds.

Non-game Animals. The Timbisha people name additional animals that are not used as food and also know various things about the habits of these. They have heard that there used to be wolves (toopi) at a specific spring on the east side of the Panamint Range in the Wildrose district, and they have heard that there were bear (pang<sup>w</sup>itsi) on Telescope Peak. Mountain lions (tukumiinzi) used to be seen in Wildrose, and bobcats (tugubitsi) were once more frequent in the mesquites around Furnace Creek Ranch. Coyotes (itsapi) are still frequent in most areas, and observed and respected as in times past.

Birds. Mourning doves (heewi), valley quail (takaagatsi), and a few species of waterfowl such as coots (saiyapi), geese (nigida), mallards (pihi) and teal (toapitsi) were formerly hunted near Furnace Creek, either in the mesquite groves or in the old ponds on Furnace Creek Ranch. Waterfowl were also present at Eagle Borax, and the Wilson family hunted them there. Most of this activity also stopped in the 1940s, and once the Pacific Borax Company sold its holdings at the Ranch to the Fred Harvey Company, the ponds were altered so that they rarely attracted waterfowl.

Despite the ban on hunting birds for food, the Timbisha people have retained their

knowledge of birds to a considerable degree. Dayley (1989) recorded the names of over 50 birds from people in the 1970s, and many of these are recalled today. Many birds were named that were not sources of food, and people often observed their habits.

Reptiles. Two major reptiles are still part of Timbisha cultural tradition, although only one as food. This is the chuckwalla (tsag<sup>w</sup>ada), which is still hunted outside the Park. This large lizard has quite a bit of meat and is considered to be particularly good roasted in the coals. People still take them occasionally, although some feel that they are not as plentiful as they once were, including in the Park. There are indications that recent dry years, and probably predation for pet stores, are causing serious declines in chuckwalla populations (see Management Concerns).

The desert tortoise, always rare in Death Valley, was not eaten by Timbisha people, according to those interviewed. They are occasionally seen as people drive outside the Park either toward Beatty or Shoshone. As with birds, more reptiles are named than ever served as food (see Dayley 1989).

Insects. The only insect that people remember as a food source within the Valley is the larvae of an unidentified moth (probably the white-lined sphinx moth, Hyles lineata), which comes early in the spring, especially in good flower years. These were formerly roasted on hot rocks or parched in a basket with coals. Few people have tasted them, but they recall hearing about their former use. Several larvae were used in western North America, and most are very high in protein (Fowler and Walter 1982; Sutton 1988).

Fish. The only fish that was eaten within the Monument was the pupfish at Salt Creek, according to what members of the Historic Preservation Committee recall. These were scooped from the stream in former times with winnowing baskets and allowed to dry. They were then eaten whole or added to soups or stews.

## NATIVE RESOURCE MANAGEMENT PRINCIPLES

Environmental management by Native peoples in western North America has received considerable attention of late, especially with the republication of Henry Lewis' classic paper on the use of fire by pre-contact California peoples, and the series of essays by several people on other management principles that accompanies that republication (Blackburn and Anderson 1993). In addition to fire, known for some time to have been a major management tool employed by many indigenous peoples of the world to achieve and maintain certain preferred habitats (Lewis 1993:57), documentation has now been brought together on the transplantation of shrubs or small trees to new locations; the construction of ditches for water diversion to native seed and root plots; the pruning and coppicing of plants for desired growth habits; broadcast sowing of wild seeds on moist ground; weeding and tilling of various plant communities; the construction of erosion control devices; and much more (Blackburn and Anderson 1993:19). In the case of California, as well as elsewhere in the

world, many of these tasks were accomplished by hunting and gathering peoples, who for a long time were thought to not purposefully manipulate their environments--only live in them and take from them. Few scholars denied that hunters and gatherers knew a considerable amount about the resources of their environments, but most felt that there was an important difference between what they knew and what agricultural people practiced in manipulation. Now those differences are less obvious, and most see instead a real continuum in principles of environmental manipulation and resource management. Hunters and gatherers--and former hunters and gatherers--hold some very sound ideas about these topics, most of which are well worth exploring (see Harris 1989; Ucko 1989).

Without an obvious effort to romanticize the past of Native management, but also not an equally romantic and erroneous view that the past was represented by unmanipulated wilderness, common ground and common sense dictates that Native management principles be investigated and assessed. Although at this point in time it is no longer possible to observe Timbisha resource management systems in action in Death Valley National Park, people still remember enough about former practices to outline at least some of what used to occur.

### The Use of Fire

Timbisha people today recall that fire was used as a management tool in at least three situations in earlier times: 1) to encourage the growth of tobacco; 2) to clear marshy areas of dense growth of cattails and fringing grasses; and 3) to promote the growth of certain types of seeds, particularly white-stemmed blazing star. They tend to associate each with specific places they have heard discussed in the past, but, in all likelihood, these activities took place in other locations as well. They also say more generally that fire is good, and useful to clean the country. They were told this by the Old People. The best were natural fires caused by lightening which were always thought to be beneficial to the land.

Hunter Mountain is particularly well-known for its good tobacco (Nicotiana attenuata). On our trip there in June, 1993, we observed a considerable amount of it growing in disturbed conditions along the roadway leading up to the mountain from the west side, and also several individual plants in and around pine nut harvesting camps on the summit. In former times, the people who habitually used Hunter Mountain for pine nut camps and other seasonal purposes (Saline Valley, Darwin people) apparently burned certain areas on the mountain to encourage tobacco growth, and many people knew it. Timbisha people are not certain as to where these places were, but other people who still use the mountain frequently probably do know the locations. This might also be determined by careful vegetative surveys of the type Lewis (1993) has found useful in looking for evidence of burning. Timbisha people can recall hearing of one instance when a tobacco fire got away, but apparently this rarely happened.

Both Steward (1941:281) and Driver (1937:84) were told by the people they

interviewed that burning for tobacco was a former practice of the Death Valley, Saline Valley and Koso people (probably also Panamint Valley). Tobacco was known to be a fire follower by many Native California and Great Basin peoples, who followed similar practices of firing a few acres in the fall or spring, usually in areas dominated by big sagebrush or by sagebrush and juniper (Fowler 1986; Kroeber 1941; Steward 1938).

The use of fire in and around marshes to remove unwanted growth of emergent vegetation and also fringing grasses is best documented for Warm Springs in Panamint Valley, but is likely to have taken place in Death Valley as well. According to what Timbisha people have heard, George Hanson used to tell his relatives that it was time to burn the marsh at Warm Springs when the vegetation was dry (late fall, winter). This would clear the area and provide open water for waterfowl. Although what they have heard probably relates to the 1890s or later, there is historical evidence that this site was burned much earlier in the past, also to encourage the growth of grasses for horses. Charlie Wrinkle related to Mark Kerr in the 1930s a historical tale involving a horse raid into southern California, probably prior to 1850. In order to get ready, Warm Springs was fired by the men so that there would be grass when they returned with the horses (Irwin 1980:69).

Cattail (*Typha* spp.), especially, can become a weedy problem if conditions are right and it is not controlled (Morton 1975). Bulrush is less troublesome, although three-square (*Scirpus americanus*) is known to be invasive. Some managers today advocate deep dredging to remove cattails, or cutting below the water line two to three times during the growing season (Morton 1975:13). But burning is probably also effective, especially if water levels are slightly lower so that the fire reaches part of the rhizome. It certainly clears the area of old matted vegetation which itself can facilitate the spread of cattail.

Timbisha people have noticed particularly how open water has been lost to cattail (and probably three-square) at the pond at Eagle Borax. In the 1930s, there was considerable open water in this location and duck hunting occurred regularly. Tom Wilson and Tim Bilson, who camped here regularly, kept the growth of cattails and alkali sacaton in check by letting their horses and burros graze the area each fall. Otherwise, the animals were kept in corrals. It is possible that they may have used fire before acquiring livestock.

A number of annual plants formerly harvested for their seeds are known to be fire followers today, and it is quite clear that people knew of their habits in the past. Timbisha people today remember primarily this characteristic for white-stemmed blazing star, and they recall looking for it in places where natural fires had occurred. But both Steward (1941:281) and Driver (1937:65) record that all of the individuals they interviewed said that areas were purposefully burned to encourage the growth of several types of seeds. George Gregory of Olancho told Mark Kerr in the 1930s that while women were collecting blazing star seeds, the men burned in the same region during rabbit drives (Irwin 1980:15).

Documented in the ethnographic literature for larger Panamint territory is the use of fire in deer drives and also in rabbit drives, which secondarily could have achieved some of



the same ends as purposeful firing for seed growth. Again, George Gregory of Olancho had heard of both and related these incidents to Mark Kerr. The deer drives apparently involved firing around the base of a small hill so that the flames would drive all of the animals, but especially deer, past other waiting hunters (Irwin 1980:22-23). Mr. Gregory described firing the brush for rabbits as follows:

About ten Indians go out on a hot summer day where there are lots of rabbits (ka moo) and build a fire about a half mile long. They call this koo ca na. They station each man along the start of the fire. When they get this stretch burning they go ahead about two hundred feet and start another. The rabbits keep drifting in front of the fires until they get too hot and exhausted to travel. They build so many fires that the country gets so smoky you can hardly see. They say when the rabbits are thirsty and hot they head back towards the fire until they are too hot to travel, and then crawl under a bush. Then the men with bows and arrows sneak up on them and kill them. When they have killed all they can carry, they skin them and take them home (Irwin 1980:24).

#### Clearing, Pruning and Coppicing

An additional set of related management tools used in several ways by the Timbisha people involved clearing areas of undergrowth, and also pruning and coppicing perennial plants and trees. All were used extensively in the pine nut harvesting areas and in the mesquite groves, but coppicing of willow also occurred near springs or seeps, or along stream banks where good willows for basketry were known to occur.

All areas in the pinyon-juniper forests that were places where people habitually camped or collected pine nuts were carefully cleaned of underbrush as part of routine and necessary maintenance. Lower branches of the trees were also cut close to the tree to allow free access underneath. Timbisha people were taught by their elders that these activities were an important part of learning to care for the land properly--to keep it clean and litter-free. Secondly, such care also provided wood for fires and made the collection of pine nuts easier, as those that fell from the cones could be seen more easily on cleared ground. Even beyond these purposes, cleaned and cleared areas would not catch fire, so in the unlikely event that a camp fire got away, the fire could be put out quickly.

In the pine nut camps that we visited in the Wildrose district and also on Hunter Mountain, evidence of this clearing and cleaning process was still present (Figure 45). There was very little big sagebrush or other undergrowth under the trees, especially those immediately surrounding the camps. Many of the trees have had their lower branches cut close to the tree, up to about 4 ft. or so. The Hunter Mountain camps are still kept clean and clear by Panamint and Saline Valley people who still use them (they are now inside the new Park boundary). The Wildrose sites have not been thoroughly cleaned since the 1940s when people were prevented from camping there by Monument regulations. The axe-scarred trees are the primary reminders of these former activities.



**Figure 45.** Pine nut camp, Hunter Mountain, with trees trimmed of lower branches. June, 1993.

This same type of activity was also required in the mesquite groves, particularly those near Furnace Creek. Timbisha people say that their elders told them that when the people formerly camped in the middle of a mesquite clone, they kept the area clean and clear of undergrowth, and also of dead limbs and lower branches. This made it easier for people to make paths through the trees avoiding the thorns, and it was also easier to collect beans from trees that had been properly trimmed and tended. Again, the wood and other debris was used for fires. People did not kill living trees for firewood; they depended on this cleaning process for supplies.

In the case of the mesquites, there was yet another benefit to this clearing process, especially in areas where dunes occurred. Today, a number of the mesquites on the floor of Death Valley, at Furnace Creek and along the western edge of the Valley near Eagle Borax and Bennett's Well, are being taken over by blowing dune sand (Figure 46). Although this is probably to some degree a natural process [it was one noted as early as 1891 by Frederick Coville of the U.S. Biological Survey (Coville 1891)], many Timbisha people feel that it is much more common today than in former times because the trees are not being properly tended. Dead wood is left to accumulate without cutting and lower branches are not trimmed

up above ground level, so that now the blowing sand is stopped and eventually the mesquite is totally engulfed. The trees are still alive under these hummocks of sand, but they do not seem to be flowering or fruiting properly. Although it is unlikely that Timbisha people in former times kept all mesquites clear of dune sand, they certainly were responsible for liberating a much higher number than at present.



Figure 46. Mesquite being engulfed by sand, Timbisha Village. June, 1993.

Clearing and cleaning mesquite groves also may have fostered seedling development. According to authorities (Mooney, Simpson and Solbrig 1977), mesquite seedlings are not good competitors with grasses and other types of undergrowth. They also require sunlight, something that could have been fostered by opening up the groves to more light through trimming the trees. And they do best if somehow the seeds enter the ground even slightly, as might occur as a byproduct of people walking among the trees. Discarding the hard seed after processing the endocarp with a stone pestle (a form of scarification), as seems to have occurred, might also have given seeds a good opportunity to break dormancy.

Although trimming pinyons and mesquites can also be a form of pruning, additional techniques were used on pinyons in former times that seem to have fostered more cone production. These were: whipping the trees, and pinching or breaking the growth tips. Whipping was accomplished with the long harvesting poles that were used to remove cones