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# Foraging Behavior of a Contemporary Northern Great Basin Population

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**T**HE Burns Northern Paiute Indian Tribe currently is headquartered on a small (770-acre) reservation near Burns in southeastern Oregon. Cultural changes resulting from Euro-American contact and from life in a white-dominated society have drastically changed subsistence practices among these people. A few older women of the tribe, however, still gather wild plants for food, medicinal use, and manufacture of household items in the same habitats as did their ancestors. They have maintained a body of traditional attitudes and practices involving plant use. Although wild foods do not form a major portion of the modern Northern Paiute diet, these women continue to collect and use more than 30 wild plant species.

Our research with the Burns Paiute has two objectives. The first is to elicit information from present Burns Paiute who are involved in the collection of wild plants in more or less traditional ways. We are recording information regarding the areas in which plants are harvested; the numbers of plants and the weight of material collected; the time and energy expended; and the botanical knowledge and beliefs of these women who acquire and consume the plants.

The second objective of our research is to quantify the direct effect of human gathering activity on plant resources. This phase of the research involves study of plant communities in harvested areas before and after harvest, and comparison of these areas with control areas in which no present-day

harvesting takes place. Our study has been underway for more than ten years. We believe that knowledge of contemporary gathering practices may provide information of value in interpreting present and past behavior of hunter-gatherer populations. As Aikens (1986:35) noted:

... the life of the historic peoples is a guide to understanding the ancient cultures attested by archaeological evidence, and historic and prehistoric may be interwoven to portray some of the more timeless aspects of the desert way of life.

This paper discusses the ethnographic evidence for recent and contemporary gathering practices among the Burns Northern Paiute. Ongoing research is providing data regarding the economic and ecological phases of our project.

At present, roots,<sup>1</sup> leaves, and some fruits are collected for food in areas that have been exploited for at least a hundred years, and that probably have been used in a similar manner for substantially longer. Seeds traditionally harvested, including *waada* (*Suaeda depressa*), Indian rice grass (*Oryzopsis hymenoides*), and Great Basin wild rye (*Elymus cinereus*), are still available in the area, although the habitat has been impacted greatly by grazing and by Euro-American settlement. Because yields were small and the harvest of seeds was difficult, seed collecting was abandoned with the introduction of wheat flour by Euro-Americans.

After a brief description of the seasonal

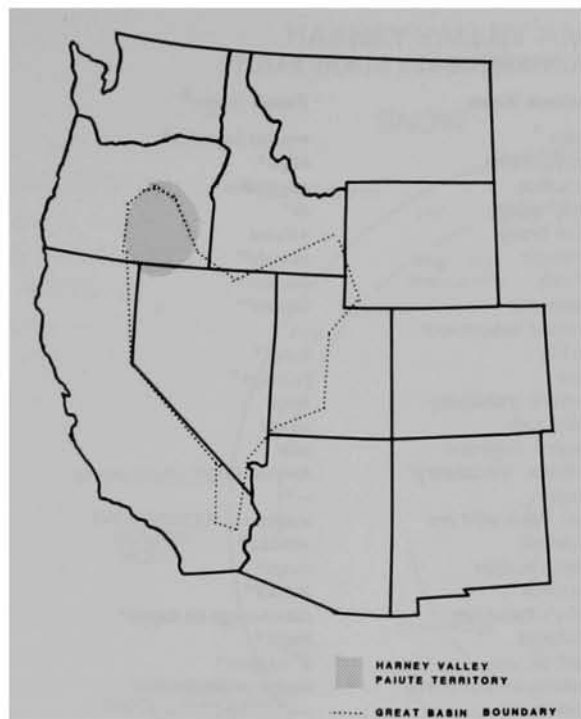


Fig. 1. Harney Valley Paiute territory.

round of these people prior to Euro-American contact, we focus in this paper on the dynamics of present-day spring root collecting.

### THE SEASONAL ROUND

The present-day Burns Northern Paiute Tribal members are the descendants of a Northern Paiute population that formerly occupied an area centered on Harney Valley in southeastern Oregon. This population, referred to as *wadádika?a* (Fowler and Liljeblad 1986:464) or *wadátikad<sup>i</sup>* (Kelly 1932:72) 'waada (*Suaeda depressa*) eaters' by other Northern Paiute groups, is also known as the Harney Valley Paiute (Whiting 1950; Couture 1978). They exploited the large freshwater marsh system surrounding Harney and Malheur lakes, and the Silvies, Malheur, and Donner und Blitzen rivers. The Harney Valley Paiute lived in small groups and migrated throughout this area (Fig. 1), exploiting resources as they became avail-

able, and sharing areas where there was good fishing, hunting, and foraging. They lived mostly at peace with neighboring peoples, coming together with other groups regularly each year. Although territorial boundaries were not definite, there was a tendency to frequent the same hunting and gathering areas from year to year.

Plants played a major role in the subsistence of these people. A wide range of local resources was utilized, including seeds, roots, berries, fish, and game. The general pattern was one of intensive exploitation, probably by small family-based groups similar to those reported for the Owens Valley Paiute (Steward 1933) and the Surprise Valley Paiute (Kelly 1932). Larger groups came together regularly at the root camp, salmon fishery, and *waada* sites. Some of the women we have interviewed regarding the seasonal round had been interviewed by Beatrice Whiting between 1936 and 1938. Our interviews, conducted 40 to 50 years later, provide corroboration for Whiting's (1950) report, as well as additional data not elicited by her. Table 1 provides scientific names, common names, and Paiute names for a number of plant species used by these Paiute at present or in the recent past.

Figure 2 presents a calendar of the seasonal round. Names of the Paiute months were elicited by Stewart (1941:445). The calendar reflects the movements of Harney Valley Paiute through their territory in search of plants and animals for food and for raw materials for manufacture of items of material culture.

During the spring, according to present Burns Paiute, groups including predecessors of the present Warm Springs Indians, Bannock, Yakima, Northern Nevada Paiute, Shoshone, Umatilla, and Surprise Valley Paiute joined with the Harney Valley Paiute at a place where spring roots were collected (Fig.

Table 1  
PLANTS UTILIZED BY RECENT AND CONTEMPORARY BURNS PAIUTE

Genus and Species <sup>a</sup>	Family	Common Name	Paiute Name <sup>b</sup>
<i>Achillea millefolium</i> <sup>#</sup>	Compositae	yarrow	wodaa kwasiba*
<i>Allium acuminatum</i>	Liliaceae	tapertip onion	küga*
<i>A. macrum</i>	Liliaceae	rock onion	naguutiva*
<i>A. madidum</i>	Liliaceae	swamp onion	sii*
<i>Apocynum cannabinum</i>	Apocynaceae	Indian hemp	wihowi
<i>Artemisia tridentata</i>	Compositae	sagebrush	sawabi*
<i>Atriplex</i> sp.	Chenopodiaceae	saltbush	suuhuu*
<i>Balsamorhiza hookeri</i>	Compositae	balsamroot	kusialä*
<i>B. sagottata</i>	Compositae	arrowleaf balsamroot	—
<i>Calochortus macrocarpus</i>	Liliaceae	sego lily	koogi*
<i>Camassia quamash</i>	Liliaceae	camas	paazigo*
<i>Cercocarpus ledifolius</i>	Rosaceae	mountain mahogany	tuupi
<i>Chrysothamnus nauseosus</i>	Compositae	rabbitbrush	sigupi
<i>Cornus stolonifera</i>	Cornaceae	red-osier dogwood	sübi
<i>Crataegus douglasii</i>	Rosaceae	hawthorn "blackberry"	kwinaa pisa*
<i>Delphinium nuttallianum</i> <sup>#</sup>	Ranunculaceae	larkspur	—*
<i>Elymus cinereus</i>	Graminae	Great Basin wild rye	waiya
<i>Fritillaria pudica</i>	Liliaceae	yellowbell	winida*
<i>Juniperus occidentalis</i>	Cupressaceae	western juniper	tuupi*
<i>Lewisia rediviva</i>	Portulacaceae	bitterroot	kanjici*
<i>Lomatium canbyi</i>	Umbelliferae	Canby's lomatium	tsana-tsuga or happi*
<i>L. cous</i>	Umbelliferae	biscuitroot	tsuga*
<i>L. gormanii</i>	Umbelliferae	desert parsley	k <sup>h</sup> idapoo*
<i>L. hendersonii</i>	Umbelliferae	Henderson's lomatium	haapi or hunibui*
<i>L. nudicauli</i>	Umbelliferae	desert celery	—*
<i>Mentha arvensis</i>	Labiatae	wild mint	pakwana
<i>Mentzelia laevicaulis</i>	Loasaceae	blazing star	guuha
<i>Nicotiana attenuata</i>	Solanaceae	coyote tobacco	puihibamo
<i>Oryzopsis hymenoides</i>	Graminae	Indian ricegrass	—
<i>Penstemon speciosus</i>	Scrophulariaceae	showy penstemon	namogot*
<i>Perideridia bolanderi</i>	Umbelliferae	Bolander's yampah	yampah, yapa, payapa, suiypa*
<i>P. gairdneri</i>	Umbelliferae	Gairdner's yampah	pamahayampa*
<i>Pinus ponderosa</i>	Pinaceae	Ponderosa pine	täba
<i>Populus tremuloides</i>	Salicaceae	quaking aspen	sinjabi
<i>Prunus subcordata</i>	Rosaceae	Indian plum	tuyu*
<i>P. virginiana</i>	Rosaceae	chokeberry	tooisabui or pokopisa*
<i>Ribes aureum</i>	Grossulariaceae	golden currant	pokopisa*
<i>R. cereum</i>	Grossulariaceae	squaw currant	atsapui*
<i>Rosa woodsii</i>	Rosaceae	wild rose	siabi*
<i>Salix</i> sp.	Salicaceae	willow	sübi*
<i>Scirpus acutus</i>	Cyperaceae	bulrush	saibi
<i>S. validus</i>	Cyperaceae	tule	saibi
<i>Shepherdia canadensis</i>	Elaeagnaceae	buckberry	wiapui*
<i>Sisymbrium altissimum</i> <sup>#</sup>	Cruciferae	tumbling mustard	atsa
<i>Suaeda depressa</i>	Chenopodiaceae	Pahute weed	waada
<i>S. intermedia</i>	Chenopodiaceae	seepweed	waada
<i>Trifolium macrocephalum</i>	Leguminosae	bigheaded clover	poziidapi*
<i>Typha latifolia</i>	Typhaceae	cattail	toibi*
<i>Vaccinium membranaceum</i>	Ericaceae	huckleberry	tokabonoma*
<i>V. ovalifolium</i>	Ericaceae	huckleberry	tokabonoma*
<i>Wyethia amplexicaulis</i>	Compositae	mule's ear	aki
<i>Zigadenus venenosus</i> <sup>#</sup>	Liliaceae	death camas	koogi*

\* Plant found at Root Camp. # Introduced (non-native) species. ■ Poisonous.

<sup>a</sup> Plant identification follows Hitchcock and Cronquist (1973). Voucher specimens are on file in the herbarium at Malheur Field Station, Princeton, Oregon.

<sup>b</sup> Note on orthography: Transcription of native terms is broadly phonetic, and similar to that used by Fowler and Leland (1957): *a* as in English "father"; *i* as in "beat"; *o* as in "boat"; *u* as in "book"; *j* as in "just." Pronunciation appears to be subject to much free variation, especially in the treatment of terminal and whispered syllables. For this reason, accent and final unstressed vowels are not shown. For a more complete discussion of these Paiute terms and their meanings, please consult Couture (1978:103-108).

## HARNEY VALLEY PAIUTE SEASONAL ROUND

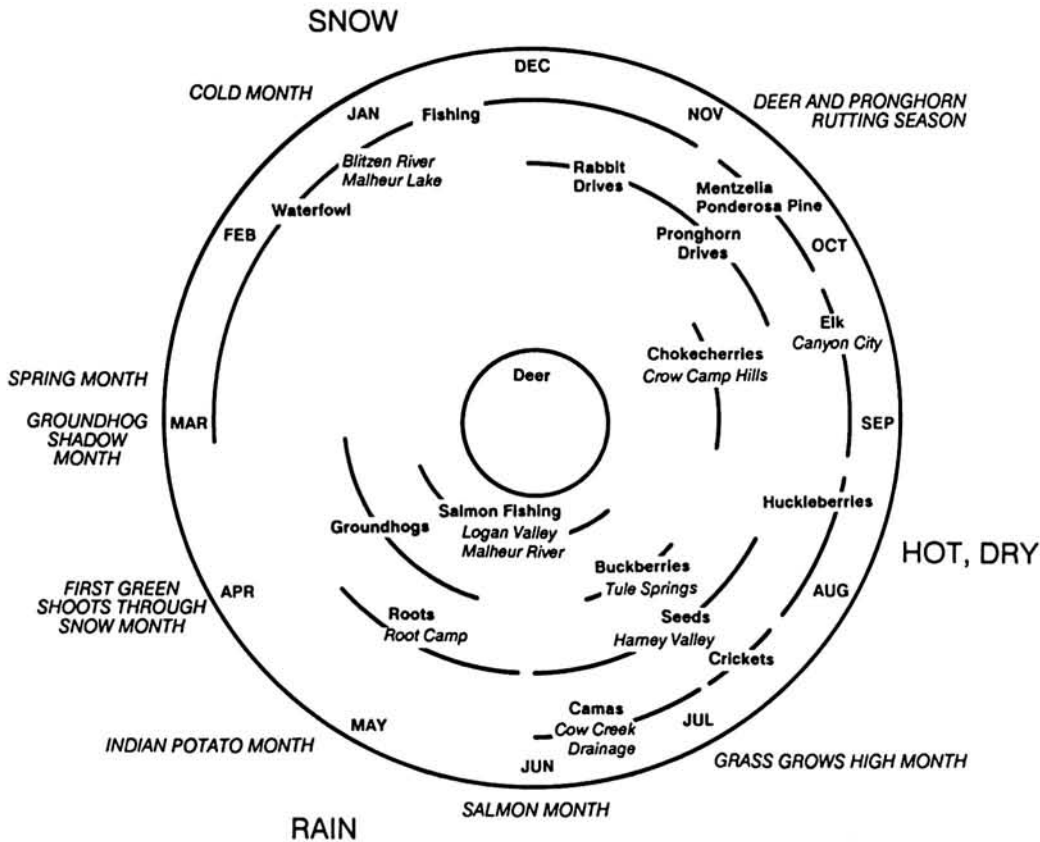


Fig. 2. Harney Valley Paiute seasonal round.

3) (hereafter referred to as the "Root Camp"). These groups converged upon the area in late April of each year to engage in root digging, socializing, and trade for a period of about six weeks. Communicating through sign language, they traded goods including horses, furs, buckskins, blankets, beads, roots, and obsidian. They also arranged marriages, raced horses, gambled, exchanged news, and played games.

From the Root Camp, the Harney Valley Paiute moved on to the salmon fishery on the Malheur River. The availability of resources at the Root Camp and at the salmon fishery, and the concentration of people who gathered to utilize these resources, may well

have induced the development of trade among inhabitants of the Northern Great Basin and the Columbia Plateau (Couture 1978).

When the salmon run ended, families dispersed to hunt birds, deer, and elk, and to gather roots, seeds, and fruits as they became available. Camas grew profusely in the northeastern part of the Harney Valley. At the same time that camas bulbs were collected, diatomaceous earth for body paint was procured in the surrounding hills. Whiting (1950) reported that families from the *hunibui*-eater band to the north met the Harney Valley Paiute in Cow Creek Meadows in mid-July to gather crickets. Fruit collected at this time included squaw currant,



Fig. 3. Participants in spring Root Camp.

golden currant, hawthorn ("blackberries"), and rose hips. Mule's ears and balsamroot were among the first seeds to ripen, with tumbling mustard (an introduced plant) ripening later. Families searched for yellow-bellied marmots ("groundhogs") throughout the summer along the banks of the Silvies River and in the nearby rimrock. They travelled as far away as Dixie Butte near Canyon City, where women collected huckleberries while men hunted for elk. One woman reported having travelled as a child to Tule Springs in the Alvord Basin to collect buckberries.

The concentration of resources at Malheur Lake fostered social gatherings. Our consultants among the Burns Paiute confirm Whiting's (1950) statements that large numbers of people congregated there in late summer to harvest *waada* seeds, to fish, and to hunt migratory fowl. Other seeds also were harvested there, including saltbush, giant wild rye, Indian rice grass, and blazing star.

In early fall, families collected ponderosa

pine nuts and cambium in the forests to the north. Many went to Crow Camp Hills south of present-day Buchanan to pick chokecherries. Communal rabbit drives and pronghorn drives also were held in early fall (Whiting 1950:19).

By November, in preparation for winter, the families had gathered their cached goods together and set up tule mat houses near springs on the shore of Malheur and Harney lakes. Whiting (1950:19) noted that the average size of winter camps was from three to 10 households. The winter camp was the scene of many activities, including hunting, fishing, and gathering, as well as the manufacture of basketry and rabbit-skin robes. Winter fishing was done predominantly near The Narrows between Malheur and Harney lakes. Marshy areas surrounding the lakes provided habitat for migratory waterfowl and other birds; rabbits, ground squirrels, and deer were hunted in the uplands.

#### SPRING PLANT COLLECTION

The spring plant collecting area was a highly significant part of the larger seasonal round. At specific sites, the roots of various species were collected. These included sego lily, bitterroot, yampa, wild onion, biscuitroot, and several species of lomatium. Desert celery and mint leaves also were collected for food. Medicinal plants collected for their leaves included sagebrush, yarrow, and showy penstemon. Juniper berries were used medicinally. Paiute consultants were aware of the poisonous properties of larkspur and death camas.

The plant collecting area utilized in the spring season is located on the plateau northeast of Harney Valley. Geologically, the area is a fault block rising from the valley floor at 4,100 ft. to an elevation of 4,800 ft. The plateau is composed of basalt flows, lava rims, undulating uplands, and

extensive areas of exposed bedrock or soils which are relatively shallow. There are few streams. Superimposed on this geologic template is sagebrush steppe of the Northern Great Basin type; here typical Great Basin biota extend north out of the hydrologic Great Basin into the Malheur River drainage.

The microclimate of this upland is characterized by harsh, cold winters and dry summers. The moisture distribution is bimodal. One peak occurs from November to January, when precipitation falls as snow; the second peak occurs in May and June, when precipitation is usually rain, but may fall as snow. Hard frosts have little effect on the native plant species; however, growth is limited in the long cold spring. Most herbaceous growth occurs in a relatively short period in late spring and is terminated by exhaustion of soil moisture in the early summer.

The Root Camp plateau is covered by a mosaic of big-leaf sagebrush/bunchgrass<sup>2</sup> on the deeper well-drained soils, juniper shrub woodland where perched water is available, and dwarf sagebrush/bunchgrass on the shallow soils above a layer of clay or bedrock. The dwarf sagebrush/bunchgrass communities are edaphic climaxes on the shallow stony lithosols which are thin-soiled and underlain by a distinctive substrate of unstable weathering basalt. These communities are a product of rigorous environmental factors: intense frost action and heaving in the winter, standing water in the late spring as snow melts, and hot dry summers. However, long after the soil surface is completely dry, water remains in the subtending basalt.

The plant collecting area is 54 square miles in size, but not all of that area is utilized for food collection. The food plants are found in communities which reflect soil composition and the water-holding capacity

of the substrate. Less than half the area supports the plant communities the Paiute use for food. The remainder of the area is utilized for other activities, including campsites and hunting. The locations where food plants are found are predictably the same every year; however, different proportions of the plants grow in each location depending on minor variations in topography and water availability. The perennial root plants harvested by the Paiute are available primarily during a six-week period in the spring. The same plant species are sought by the Paiute in each area; however, no prior study in this area has examined annual use patterns or the effects of use on subsequent yields. Table 2 shows use patterns we observed during the last ten years, and those reported to us by current Paiute harvesters.

We have divided the Root Camp into five large study areas based on current utilization patterns. Each of the study areas includes several subareas which are periodically utilized (Table 2). Most subareas are checked each year by the gatherers; utilization of the subareas is dependent on the relative density, size, and frequency of the plants.

As mentioned earlier, the Root Camp has long been the scene of important social interactions. Among the people who currently gather roots at the Root Camp, the social nature of the occasion is still important. While the majority of the diggers are from the local area, we have encountered Indians at the Root Camp from as far away as Warm Springs and Owyhee, Oregon; Yakima, Washington; Fort Hall, Idaho; Fort Bidwell, California; and Fort McDermitt, Nevada. Camps are set up by some families, and there is visiting back and forth between camps. Families that have traveled some distance may stay a week or more. Partic-

Table 2  
 UTILIZATION OF ROOT CAMP AREAS BY BURNS PAIUTE  
 1975 - 1987

Area	'75	'76	'77	'78	'79	'80	'81	'82	'83	'84	'85	'86	'87
<b>Main Camp</b>													
1	X	X		X		X	X*	X*	X	X*	X	X	X
2		X				X*	.			.			
3	X					.	.	.		.			
4 (Control)						.	.	.		.			
<b>Golden Carpet</b>													
1				X	X	X	X*	X*	X	X*	X	X	X
2						X*	X*	X*	X	X*	X	X	X
<b>Gravel Pit</b>													
1					X	X*	.	X*	Closed				
2						.	.	X*	Closed				
3		X							Closed				
<b>Upland Flats</b>													
1						X*	X*	.	X	X*	X	X	X
2						X*		.					
3		X	X		X								
4					X								
<b>Hidden Meadows</b>													
1				X				X	X			X	X
2					X	X		X					

X Indicates use by Paiute informants during the spring gathering season.

\* Indicates a botanical survey was performed in this sub-area during the spring season.

Gravel Pit area was closed to access beginning in 1983.

ular campsites are used by the same families or groups year after year. People who live nearby generally make day trips to the root camp, bringing a picnic lunch.

The gatherers usually inspect several areas, deciding where the roots look "best" (biggest, and occurring in soft, easy-to-dig soil) before deciding where to dig. The women determine whether the roots are "ripe" by checking taste and ease of peeling. They generally dig in groups of two or three, dispersing and regrouping. Most of the women use metal digging sticks patterned after the traditional wooden digging sticks used in earlier times. Roots are gathered in the morning, peeled at midday, cleaned at a water source, and spread to dry in the wind and sun while the harvesters share a picnic lunch and socialize. Those camping overnight may dig roots again in the late afternoon or early evening.

As we observed gathering behavior, it became apparent that people are not selecting edible plants in proportion to their availability in the environment. Bitterroot grows throughout the area, and it is consistently harvested. In some cases it is taken exclusively, even though bitterroot is never the most numerous species. When a period of warm weather, which encourages the growth of bitterroot, is followed by a sharp cold spell, the caudex of the plant contracts and the leaves shrivel. This makes the plant difficult to find and to dig. Yet it is still the object of search. The harvest varies from gatherer to gatherer. Some of the women we interviewed prefer to dig Henderson's lomatium in the limited areas in which it grows. It is a palatable root, and they recognize the high return on investment of time and energy. Others prefer to dig Bolander's yampah. Because of the long and



fragile attachment of the bulb, the difficulty in digging yampah increases later in the season. The yield of yampah for time and energy expended in gathering is relatively low. However, according to nutritional analyses, it is a resource high in dietary mineral values. Still other gatherers choose a wider selection, but tend to gather a higher proportion of bitterroot when it is available.

The roots gathered in the spring are preserved in several ways. Roots are peeled as soon as is practical after they are gathered. After gathering the plants, the women often will find a shady spot near a stream, then spend the warm part of the afternoon peeling and washing the roots they gathered in the morning. Much of the peeling is done using only the hands, although occasionally a paring knife may be employed. One woman recalled using a curved stone tool to peel roots, and also to remove bark from willows used for basket making.<sup>3</sup> The primary method of preserving roots is air-drying, preferably in a sunny spot out of doors, exposed to breezes. Bitterroot, in particular, turns an undesirable pink color and becomes bitter if improperly dried. In unfavorable weather, roots may be taken home and oven-dried. Some of the women have begun to freeze roots in home freezers until they are to be eaten. Dried roots may be stored whole or ground to a flour using manos and metates or mortars and pestles. Several of the Burns Paiute women use manos and metates reclaimed from the Root Camp and carried to their homes on the reservation. These implements also are used by these women for the processing of chokecherries in the fall.

There is evidence of other such cultural survivals on the Burns Paiute reservation. Some of the older people continue to use local plant species for medicinal purposes,

and for manufacture of objects such as baskets, cradleboards, and other items for their own use and, in some cases, for sale. A number of wild plant species are tolerated, encouraged, or even transplanted to yards and fields on the reservation. Species transplanted include Indian plum, chokecherry, golden currant, squaw currant, and wild rose. Those encouraged or tolerated include willow, red-osier dogwood, balsamroot, blazing star, giant wild rye, juniper, bulrush, cattail, biscuitroot, and wild onion.

A renewed interest is being shown in these uses of plants. Some of the women have been involved in teaching youngsters in the schools and in the Head Start program about edible wild plants. "Root Feasts" have been held in the schools in recent years. Spring root feasts have been held at the tribal community center, and Indians from the Burns reservation have travelled to the Warm Springs reservation to participate in root feasts there. A film, *The Earth Is Our Home*, was produced in 1978 by Oregon Educational and Public Broadcasting System and the Oregon Committee for the Humanities, in cooperation with the Burns Paiute Tribe. It depicts surviving traditional practices and is used as a teaching tool on the Burns Paiute reservation.

Bitterroot and biscuitroot have long been major trade items exported by the Harney Valley Paiute. With fewer people now involved in the collection process, the value of these roots has increased. Men are becoming involved in what traditionally was a women's pursuit as root gathering becomes more lucrative. In general, the men do not use traditional digging sticks, but pitchforks instead. In 1982, a gallon of cleaned, dried bitterroot sold for \$80, and four gallons of fresh biscuitroot for \$35.

Nutritional analysis of the plant species gathered at the Root Camp shows that these

Table 3  
NUTRITIONAL VALUE OF NATIVE FOODS COLLECTED AT ROOT CAMP  
(100 Grams Edible Portion)

Plant	Calories	Moisture (percent)	Protein (gm.)	Carbohydrates (gm.)	Ascorbic Acid (mg.)	Collection Rates (cal./hr.)
<i>Lomatium hendersonii</i> (2)	189.50	51.37	2.17	43.45	—	3,831
<i>Lewisia rediviva</i> (1)	98.76	74.49	2.48	21.57	27 (2)	1,374
<i>Lomatium cous</i> (2)	127.00	67.10	1.00	30.00	17	1,219
<i>Lomatium canbyi</i> (1)	127.11	66.55	2.51	28.43	20	143
<i>Lomatium nudicaule</i> (2)		87.80			66	—
<i>Perideridia gairdneri</i> (1)	350.45	10.61	6.21	79.25	3 (2)	172
<i>Camassia quamash</i> (1)	148.79	61.82	4.97	30.73	4 (2)	—
<i>Allium</i> spp. (3)	40.00		2.00	13.00	trace	—
<i>Fritillaria pudica</i>	64.02	81.46	2.80	13.00	0.41	—
Potato (for comparison) (4)	76.00	79.80	8.10	17.10	20	—

Nutritional values are from (1) Keely 1980; (2) Benson et al. 1973; (3) Merrill and Watt 1955; (4) Watt and Merrill 1975.

*Lomatium nudicaule*, *Camassia quamash*, *Allium* spp., and *Fritillaria pudica* are not presently collected at the Root Camp. Traditional *Camassia quamash* collection sites in Harney Valley are presently privately owned, and Paiute are excluded from collecting there.

Collection rates are computed from observed collecting practices of Burns Paiute at the Root Camp. Collection rate = (average number of plants collected per hour) x (average weight of individual plant) x (calories per gm.).

plants can provide a substantial contribution toward dietary needs. The caloric content, protein, carbohydrate, and ascorbic acid content of eight species currently gathered is shown in Table 3. Similar information is provided for the common white potato, for comparison.

### CONCLUSIONS

Although the behavior of contemporary Burns Northern Paiute has changed significantly from that of their ancestors, the contemporary Paiute have maintained some traditional attitudes and practices. Their activities are rewarding to them socially, and maintain cultural continuity with the past. Analysis of the contemporary gathering practices of these people in their spring collecting area, and of their interaction with the environment, contributes to an understanding of hunter-gatherer behavior in general.

Burns Paiute behavior has demonstrated resilience and persistence, common themes in the culture history of the Great Basin. By focusing on the way the Burns Paiute have

reacted to fluctuations and periodicities of resource availability, information can be elicited that will help archaeologists build models of past behavior. Previously, much of the interpretation of archaeological sites in the Northern Great Basin has been based on the analysis of artifacts, which led archaeologists to define many of them as hunting sites. We suggest that in some of these areas, at predictable times of the year, plant gathering was a primary focus of activity, and that an examination of alternative adaptive strategies for exploitation of the environment may provide clues to the utilization of sites.

The utilization of plant resources in the interior desert-steppe of the Northern Great Basin has received little attention. Contemporary Burns Paiute cultural patterns are the culmination of a long-term adaptation to the kind of environment Yellen (1977:270) described as "relatively severe, variable environments of low predictability." By continuing to collect data and to monitor modern Paiute collecting behavior, we hope to contribute to a better understanding of the

peoples of the Northern Great Basin both past and present.

### ACKNOWLEDGEMENTS

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### NOTES

1. The term "root," as used here, includes all underground storage organs (roots, tubers, bulbs, corms, rhizomes, etc.).

2. The primary plant species in the big-leaf sagebrush/bunchgrass community are big-leaf sagebrush (*Artemisia tridentata*), and bunchgrasses (*Agropyron spicatum*, *Festuca idahoensis*, and *Stipa thurberiana*); in the juniper shrub woodland *Juniperus occidentalis* is also present, and in the dwarf sagebrush/bunchgrass community are rock sage (*Artemisia arbuscula*) and grasses (*Agropyron spicatum* and *Poa secunda*).

3. Many obsidian flakes or "spokeshaves" which fit this general description were observed at one root camp location which now serves as a modern camping ground.

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