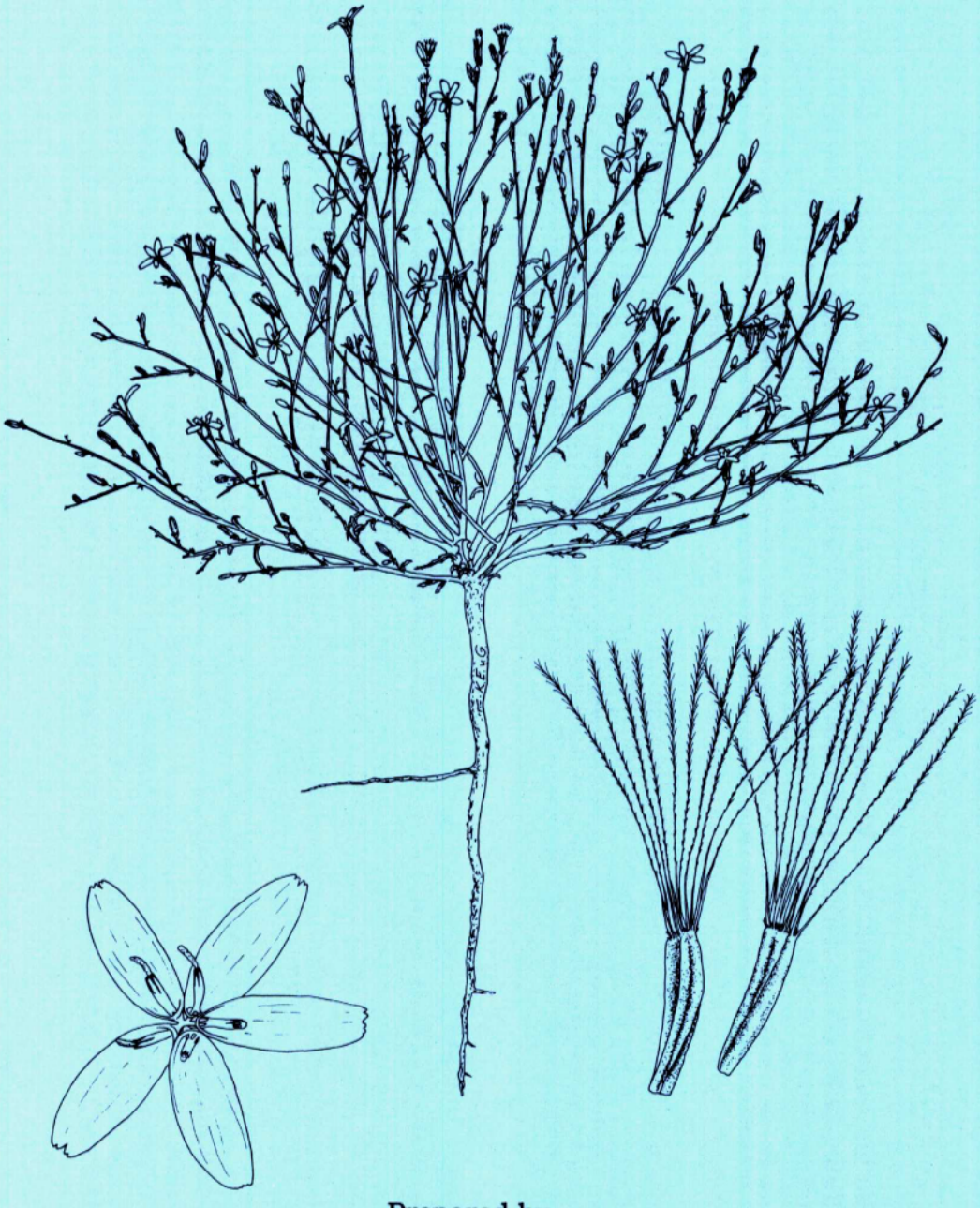
MALHEUR WIRE LETTUCE

(Stephanomeria malheurensis)

RECOVERY PLAN



Prepared by
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U.S. FISH & WILDLIFE SERVICE
DEPARTMENT OF THE INTERIOR

STEPHANOMERIA MALHEURENSIS

RECOVERY PLAN

Prepared by
Dr. Robert L. Parenti

for
Region 1
U.S. Fish and Wildlife Service
Portland, Oregon

Approved: _____
Regional Director, U.S. Fish and Wildlife Service

March 24, 1991
Date

EXECUTIVE SUMMARY OF THE RECOVERY PLAN FOR MALHEUR WIRELETTUCE

Current Status: This species is federally listed as endangered and is known from only a single 70-acre location within the 160-acre Critical Habitat in Harney County, Oregon. The population size of this annual plant has ranged in numbers from 1 to 1050.

Habitat Requirements and Limiting Factors: The Malheur wirelettuce inhabits the top of a broad hill on azonal soils derived from volcanic tuff layered with thin crusts of limestone. The site is dominated by big sagebrush and cheatgrass. The population is threatened by competition from cheat grass, grazing, fire, and surface mining for zeolites.

Recovery Objective: Downlisting

Recovery Criteria: The Malheur wirelettuce may be downlisted when the 160-acre Critical Habitat is secure from the threats of fire, mining, grazing, and introduced exotic species for five years and flowering plants produce seeds in at least four separate locations within the Critical Habitat.

Actions Needed:
1. Secure and manage critical habitat.
2. Conduct research on the biology of the species.
3. Establish additional plants/populations.

Recovery Costs ($1,000):

Year	Need 1	Need 2	Need 3	Total
1985	8.5	0.0	0.0	8.5
1986	8.5	0.0	4.0	12.5
1987	3.0	21.0	7.0	31.0
1988	3.0	21.0	2.5	26.5
1989	3.0	21.0	1.5	25.5
1990	3.0	27.5	1.5	32.0
1991	6.0	24.0	1.5	31.5
1992	6.0	23.0	1.5	30.5
1993	3.0	44.3	3.5	50.8
1994	3.0	42.3	3.5	48.8
1995	3.0	36.5	1.5	41.0
1996	6.0	12.0	8.0	26.0
1997	6.0	11.5	9.5	27.0
1998	3.0	7.5	11.5	22.0
1999	3.0	1.0	9.5	13.5
2000	3.0	1.0	8.5	12.5
2001	3.0	1.0	10.5	14.5
2002	3.0	1.0	10.5	14.5
2003	3.0	1.0	10.5	14.5
Total Cost	80.0	432.8	109.5	622.3

Date of Recovery: Downlisting should be initiated in 2003, if recovery criteria are met.

Recovery plans delineate reasonable actions which are believed to be required to recover and/or protect listed species. Plans are published by the U.S. Fish and Wildlife Service, sometimes prepared with the assistance of recovery teams, contractors, State agencies, and others. Objectives will be attained and any necessary funds made available subject to budgetary and other constraints affecting the parties involved, as well as the need to address other priorities. Recovery plans do not necessarily represent the views nor the official positions or approval of any individuals or agencies involved in the plan formulation, other than the U.S. Fish and Wildlife Service. They represent the official position of the U.S. Fish and Wildlife Service **only** after they have been signed by the Regional Director or Director as **approved**. Approved recovery plans are subject to modification as dictated by new findings, changes in species status, and the completion of recovery tasks.

Literature Citation: U.S. Fish and Wildlife Service. 1990. *Stephanomeria malheurensis* (Malheur Wirelettuce) Recovery Plan. Portland, Oregon. 34 pp.

ADDITIONAL COPIES MAY BE OBTAINED FROM:

Fish and Wildlife Reference Service
5430 Grosvenor Lane, Suite 110
Bethesda, Maryland 20814
301/429-6403
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1-800-582-3421

The fee for the Plan varies depending on the number of pages of the Plan.

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Malheur Wirelettuce (*Stephanomeria malheurensis*)

I. INTRODUCTION

A. Brief Overview

The first discovery of Malheur wirelettuce, *Stephanomeria malheurensis*, was made in 1966 when seeds of this species were collected along with those from a population of its ancestral plant, *Stephanomeria exigua* ssp. *coronaria*. These two taxa are found together at the northern end of the range of the ancestral taxon. Further studies by Dr. Leslie Gottlieb of the University of California, Davis, demonstrated consistently distinguishable field characters and reproductive isolation between these two taxa, thus recognizing *Stephanomeria malheurensis* as a species new to science (Gottlieb 1973, 1977a, 1977b, 1978, 1979). Malheur wirelettuce was added to the Federal list on November 10, 1982 (47 FR 50 885), and critical habitat was designated at that time.

Stephanomeria malheurensis has been found only at one 70-acre location near Malheur National Wildlife Refuge in Harney County, Oregon, since its discovery in 1966. The species' habitat is situated on top of a dry, broad hill on a soil derived from volcanic tuff layered with some limestone.

The genetic adaptability of the species has not yet been proven. Seeds of *S. malheurensis* do not require a cold treatment as do the *S. exigua* ssp. *coronaria* seeds, its progenitor. This would allow current year seeds to germinate after a late summer-early fall rain, and to be killed by the harsh winters of the high desert.

Fall germination was observed by Al Franklin in 1979 (personal communications).

The extremely restricted range and low numbers of this plant make the species vulnerable to even small land disturbances in and around its habitat. Potential zeolite mining in the area endangers the continued existence of this species (Griffith and Hohn 1979). Communications with the company involved indicate mining is not imminent and that it wishes to cooperate with the U.S. Fish and Wildlife Service to conserve the species.

B. Description

Stephanomeria malheurensis is an annual up to 5 dm. tall, with a basal rosette of glabrous leaves; stem single, much branched, with scale-like leaves; heads numerous clustered or single on short peduncles; florets 5-11 per head, the ligules pink, white, or rarely orange-yellow.

Stephanomeria malheurensis grows sympatrically with its parental species, S. exigua ssp. coronaria. The two are very similar in most morphological features, but, under uniform conditions, can be distinguished by several qualitative characters. The difference in achene length is sometimes a useful, but not always reliable, character differentiating the two species in the field. The achenes are slightly longer on the Malheur wirelettuce. Also, achenes of Malheur wirelettuce are 1 1/2 to 2 X heavier than those of S. exigua ssp. coronaria. Smaller but still significant differences were found in inner bract length, floret length, and floret number (Figure 1). Stephanomeria exigua ssp. coronaria is an obligate outcrosser and S. malheurensis is self-pollinating (Gottlieb 1973, Gottlieb and Bennett 1983).

Stephanomeria malheurensis has approximately 20% more white flowers than does S. exigua ssp. coronaria. Pappus bristles in S.

malheurensis are connate in groups of 2-4 at the base, whereas in S. exigua ssp. coronaria the pappus is divided only on the upper 1/2 or 2/3.

C. Historic Distribution and Population Status

Reference Appendix A for a listing of the Malheur wirelettuce, Stephanomeria malheurensis, geographic distribution, and Figure 2, a map showing critical habitat. Stephanomeria malheurensis is known only from its type locality near Narrows, Harney County, Oregon. This type locality is within the South Narrows Area of Critical Environmental Concern managed by the Bureau of Land Management. On this site it is interspersed with the northernmost population of its ancestral plant, Stephanomeria exigua ssp. coronaria. Stephanomeria exigua ssp. coronaria is an ecologically diverse plant with a wide geographical range extending southward to the islands off the coast of Santa Barbara, California.

D. Current Distribution and Population Status

Since this species is an annual, its numbers vary greatly from year to year, depending largely on the amount of precipitation prior to and during the spring growing season. In 1974 and 1975, early seedling populations of both Stephanomeria species at the site (Table 1) numbered 7,625 and 35,000, respectively. Field work in August 1979 showed only 24 individuals of Stephanomeria. In addition, Gottlieb (1980), discussed the effects of a 1972 controlled burn which swept through part of the site by accident. Cheatgrass, Bromus tectorum has invaded the burnt area, much to the detriment of Stephanomeria. The 1981 field reports indicated that Stephanomeria malheurensis was low in numbers (about 50) and

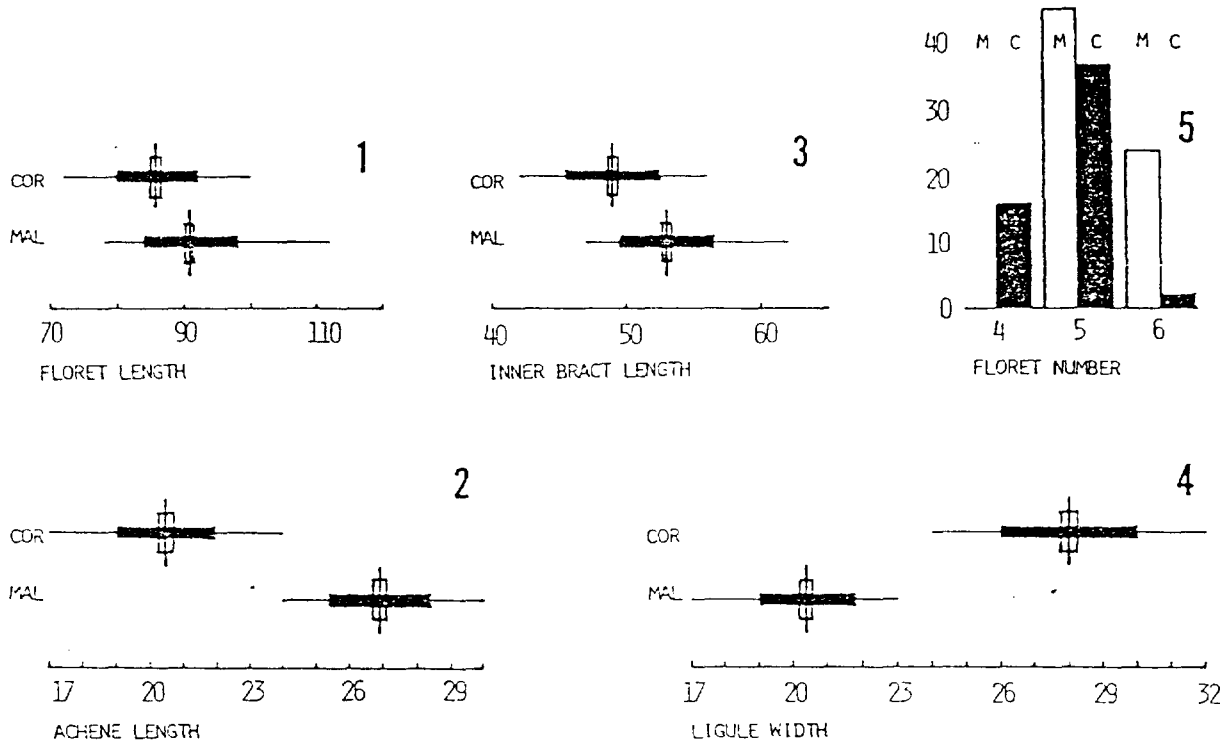

Figure. 1. Comparisons of several morphological characters in S. exigua ssp. coronaria and "Malheurensis" showing for Fig. 1 range, mean, and one standard deviation and one standard error on each side of the mean. The measurements of length and width were made with an ocular micrometer in which 6 divisions equals 1 mm; the data are reported in micrometer divisions. (Gottlieb 1973)

MALHEUR WIRELETTUCE

Harney County, Oregon

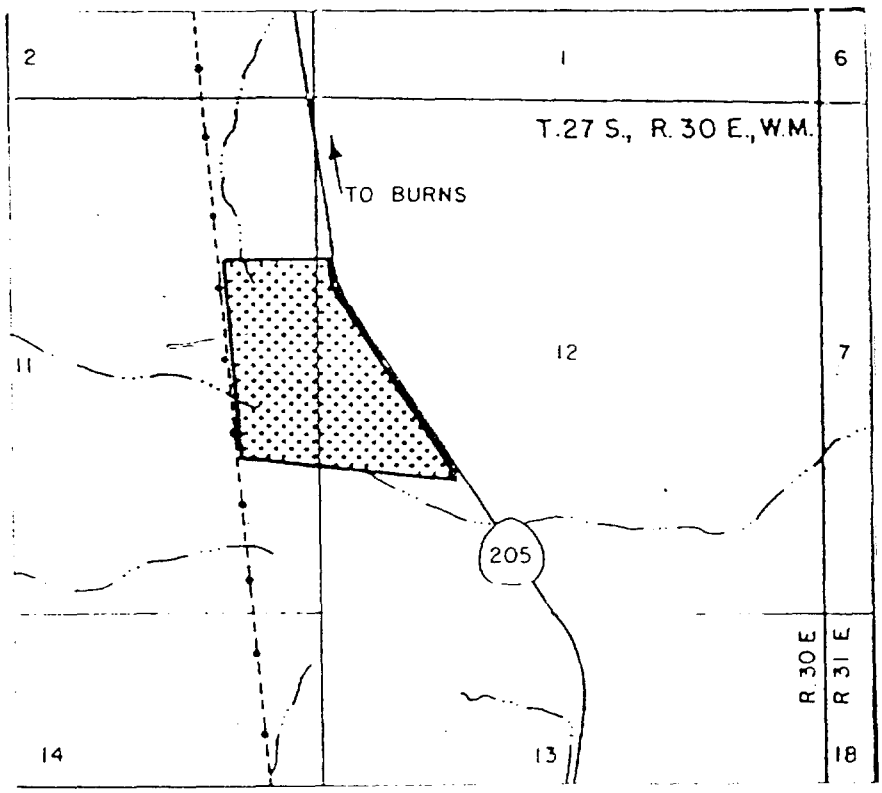

Figure 2. Map showing location of critical habitat of Malheur wirelettuce.

Table 1. Current Distribution and Population Status

Year	Number of Stephanomeria	Number of S. Malheurensis	Source
1966			
67			
68	100	3*	4
69	5000	150*	4
70	5000	150*	4
71	25000	750*	4
72	500	15*	4
73			
74	7625	228*	2
75	35000	1050*	6
76			
77			
78	375	20+	2
79	24	less than 1*	1
80			
81		50+	7
82	12	9+	3
83			
84			
85			
86		0	

* = Gottlieb estimates 2 to 3 percent of Stephanomeria plants are S. malheurensis (Gottlieb 1979 p. 267).

+ = Actual counts of S. malheurensis.

SOURCE DATA

1. Gottlieb letter to Chad Bacon dated 9/30/1980.

2. Gottlieb letter to Janet Hohn dated 9/29/1980.

3. Thompson letter to Robert Parenti dated 10/01/1982.

4. Gottlieb 1974 Genetic Stability in a Peripheral Isolate of Stephanomeria exigua ssp. coronaria That Fluctuates in Population Size. Genetics 76:551-556 (attached).

5. Gottlieb 1979 In Solbrig et al.

6. Gottlieb 1977 Journal of Ecology.

7. Bureau of Land Management, Burns District Bureau botanist.

exotic cheatgrass invasion was still a severe problem. Data from the Bureau of Land Management, Burns District botanist indicates a reduction of plants from earlier seasons, to zero plants in 1986. Soils analysis in 1985 also indicated no residual Stephanomeria seeds. Natural fluctuations in small population size may be the cause of the possible extinction.

Even though there has been virtually no monitoring of plants since 1982, recent counts suggest a continuing decline in both species of Stephanomeria. Counts in 1987 indicate that plant numbers have continued to decline from the 1982 figures. Nine Stephanomeria exigua ssp. coronaria plants and one Stephanomeria malheurensis plant were reported for 1987. None were found in 1990.

Soils were collected in areas where known Stephanomeria plants had been found in the past. The soils were examined for Stephanomeria seeds without success.

E. Habitat

The site of the only population of this species is within the high desert environment typical of the northern portion of the Great Basin. The substrate of the habitat of this species consists of an azonal soil derived from volcanic tuff layered with thin crusts of limestone (Gottlieb 1973). The surrounding soils, however, are derived from basalt. The site is on the top of a broad hill about 500 feet above the surrounding flats (Gottlieb 1979).

The species is within the widespread Oregon steppe and shrub steppe communities which dominate the entire southeastern quarter of Oregon (Franklin and Dyrness 1973). The location of this population is on a broad hill overlooking a sagebrush-rabbitbrush desert. The immediate site itself is dominated by big sagebrush Artemisia tridentata, common or gray rabbitbrush Chrysothamnus

nauseosus, green rabbitbrush Chrysothamnus viscidiflorus, and, more recently, cheatgrass Bromus tectorum (Gottlieb 1973; Griffith and Hohn 1979).

Stephanomeria malheurensis seems to be one of the few species able to survive on and around the otherwise barren harvester ant hills at the site (Wright and Youtie 1978). The animal community of this high desert region is dominated by black-tailed jackrabbits Lepus californicus, pocket mice and kangaroo rats (family Heteromyidae), several species of songbirds including Brewer's sparrows Spizella breweri, and coyotes Canis latrans.

F. Reasons for Declines and Current Threats

On November 10, 1982, Malheur wirelettuce was listed as an endangered species in a final rule published by the U. S. Fish and Wildlife Service for the following reasons:

1) The lone population of this species is vulnerable to any substantial habitat alteration and faces the potential threat of surface mining for zeolites on and near the site where it occurs.

2) It is immediately threatened by competition with an exotic grass, Bromus tectorum.

3) It is immediately threatened by grazing of native herbivores (probably black-tailed jackrabbits).

In addition to the above, the following have been identified as possible threats to the plant:

1) The larvae of an unidentified insect may be foraging on the plant.

2) Natural fluctuations in small population size may lead to extinction.

3) Possible allelopathic (inhibitory) affects by introduced plants, i.e. cheatgrass, (Bromus tectorum).

G. Conservation Efforts

Field reports and monitoring of plant numbers was begun by the Bureau of Land Management Burns District botanists in 1980. From 1983 - 1985 monitoring was essentially non-existent due to the lack of a botanist on the District. The addition of a botanist in 1985 to the Burns staff has enhanced the monitoring on a seasonal basis. The area has been fenced to protect the population.

In 1985, a group of high school students from the Portland area, under the direction of a Bureau seasonal botanist, hand weeded between seven and eight acres of cheatgrass. This cleared area will probably serve as a "seed bed" for the reintroduction of Malheur wirelettuce seeds.

Allelopathic and other interference studies for Stephanomeria malheurensis are being done at Boise State University under the guidance of Dr. Robert Parenti of the U.S. Fish and Wildlife Service, Boise Field Station.

II. RECOVERY

A. Objective

The primary objective of the Malheur wirelettuce recovery plan is to restore the population to threatened status. Stephanomeria malheurensis may be considered for downlisting to threatened when 160-acres of critical habitat is secure from threats of fire, mining, grazing from domestic and native herbivores, and introduced exotic species for five years, and flowering plants produce seeds in at least four separate locations within the secured 160-acre critical habitat. No delisting objective can be established at this time.

B. Narrative

1. Maintain and enhance the existing population and habitat.

The most immediate need in assuring the survival of Stephanomeria malheurensis is the protection of the existing plants and their habitat on the only site known at this time. This will require a well-coordinated monitoring program involving staff from Federal agencies, the academic and research communities as well as concerned local citizens. Because the only known wild-growing plants occur on Bureau of Land Management land, the protection of the plants and surrounding habitat critical to the recovery effort can only be accomplished with the cooperation and assistance of the Bureau of Land Management and other parties that may be involved.

11. Secure critical habitat from threats of surface mining.

An Area of Critical Environmental Concern (ACEC) was designated and all present and future mining claims withdrawn.

12. Hand rogue cheatgrass from areas of high density.

Since cheatgrass has been identified as a major threat to S. malheurensis as an exotic species that competes for water, and that is possibly allelopathic, reducing its influence is necessary. Hand rogue cheatgrass throughout growing season within 1-2 ft. radius of existing Stephanomeria malheurensis plants.

13. Control predation from native herbivores and domestic grazers.

The area was fenced to keep livestock from the Area of Critical Environmental Concern. The fence needs to be maintained. Experimental populations within the ACEC are protected by rodent proof fencing. Enclosures around wild population need to be built.

14. Protect site from range fires.

There usually is a rapid invasion by exotics (cheatgrass) in a sagebrush area following fire. Apparently Stephanomeria does not compete well with cheatgrass. A buffer zone or fire lane was established and is being maintained around the critical habitat of S. malheurensis to enhance the plant's survival.

2. Conduct systematic searches for new populations.

Even though the immediate area has been surveyed for additional S. malheurensis plants, it is necessary to examine similar habitat in nearby areas for new plants.

21. Identify potential habitats.

By identifying areas of greatest potential, (soil types, associated species, progenitor, etc.) coordinated field searches can be more effectively employed.

22. Search the habitats identified in 21.

Helicopter surveys and/or other survey methods (horseback, foot, etc.) for S. malheurensis will be made at appropriate times of the year in the most likely habitats, with emphasis on areas closest to the present extant population.

23. Create and maintain an identification file for new populations and/or sites.

This would include photographic, sketch and/or written description of S. malheurensis and characteristics by which to separate it from S. exigua ssp. coronaria. This is desirable to ensure the ability of botanists to recognize the species in the field at any stage of growth.

3. Secure new colonies.

Any new colonies found on private or public land should be secured by long term administrative agreements with the landowners.

31. Solicit landowner support/cooperation.

Landowners of any newly discovered site should be apprised of the nature of the recovery efforts that may be needed on their land and their willingness to participate in agreements to protect S. malheurensis should be ascertained. General habitat management/rehabilitation needs should be discussed with the landowner.

32. Protect additional wild populations on public land.

If new populations are discovered and confirmed as S. malheurensis, the areas where they occur should be protected by appropriate means.

33. Develop Habitat Management Plan to protect any newly found plants.

Locating and securing new populations/habitats are only the initial steps in the recovery effort. The proper management of these populations must follow if the recovery objectives are to be achieved. Habitat Management Plans must be written based on a broad base of information collected.

34. Implement Habitat Management Plans.

Careful coordination is necessary between the Bureau of Land Management, U.S. Fish and Wildlife Service, and the private sector to protect S. malheurensis by implementing site by site Habitat Management Plans.

4. Determine population trends and identify limiting factors.

Since ecosystems are dynamic, populations will naturally change in size, number and location through time. The environmental status of the population, including successional changes and any manmade disturbances, should be monitored throughout recovery actions. A method for accomplishing this should be outlined and initiated. The management techniques applied should be based on the conclusions of recovery actions/research.

41. Establish baseline studies.

As part of the plan to monitor the populations, it is essential to gather baseline data. Outlines of the kinds of data that can be gathered are given by Lawrence (1950), Pelton (1951), and Penfound (1952). These references, as well as more recent papers, such as Werner (1976), Harper and White (1974), and Werner and Caswell (1977), are recommended as guides for experimental design. The emphasis in early references (1950-1952) is on studies of ecological histories. Generally those studies sought to understand distribution of species, species response to environmental demands, adaptation and speciation. The total structure and dynamics of communities are the focal point leading to a sound basis for an understanding of vegetation problems.

411. Known plant location.

It is important to know where the populations have been discovered and currently occur. Knowledge of previous uncontrolled burns is important to determine the effect fires had on pre-fire populations, and to what degree exotic species followed the fire. Historic quadrats and transects would also help in determining the extent of

earlier populations and as a base-point for recovery activities.

412. Map any additional new plant sites as well as old sites.

Given the importance of new populations to the continued existence of the species, all new sites should be carefully mapped, the maps being maintained to illustrate the current status. Map scale should be a minimum of 1:24000, and of sufficient detail to enable relocation and follow-up monitoring. Specific locations of environmental changes, sampling sites and photopoints should be mapped and identified.

413. Establish permanent plots and photopoints.

The purpose of permanent sampling stations is to monitor changes within and between populations over time. Increases or decreases of populations size will be detectable, thus permitting an assessment of the changes within the population over time. Markers should be installed at suitable points for photographing the S. malheurensis populations/plants on a continuing basis.

414. Conduct periodic monitoring.

Photographs from permanent photographic points should be taken annually. These should be repeated each year at approximately the same time to better identify any changes from year to year and season to season. Censusing is necessary to determine the effectiveness of management activities and provide information for possible recovery plan revisions. Permanent reference points established earlier should be continually used to allow for effective censusing. Censusing should include frequency of plant occurrence, cover estimates, and the number of plants to determine if minimum population numbers for management activities have been reached. Other data to be gathered include growth and flower development rates, number of seeds and seedheads and other pertinent data needed to construct life history tables. The census should be conducted while the plants are blooming and after seed set. Censusing intervals may depend on flower production, seeds produced and varying climatic conditions influencing the total health and vigor of the colony.

42. Identify limiting factors.

Knowing what limits the growth, reproduction and expansion of an organism is important for developing and implementing a

management program. Any physical, chemical, or biological factor suspected of limiting some aspect of S. malheurensis' growth or reproduction should be investigated.

421. Examine effects of allelopathy.

How large a role, if any, inhibitors play in vivo should be determined for S. malheurensis. Preliminary studies (Schneider, 1983) indicate inhibitory activity by extracts of Bromus tectorum on selected plants. Other associated species could be tested, as well, to determine if any inhibitory effects exist.

422. Examine effects of competition.

Competition with associated species could be a factor in the suppression and growth retardation of S. malheurensis. Understanding these relationships may aid in preserving and enhancing the species. Results of these studies are especially important at the time of new plant establishment when competition is most limiting.

423. Determine abiotic requirements.

A quantitative evaluation of how S. malheurensis budgets its water is useful to know when water becomes an important limiting factor. Annual rainfall distribution may affect germination and survival and should be related to population numbers and reproduction. Light needs should be examined to determine if shading by shrub layer limits growth and/or reproduction. Temperature and moisture requirements for germination should also be investigated. There is evidence that S. malheurensis does not require a cold treatment, thus may germinate in the fall if the soil temperature and moisture tiggers have been satisfied (Gottlieb 1973, 1977). It has been found to germinate in September (Franklin 1981). An analysis of soils taken from established colonies can provide insight into population maintenance and establishment. It would also enhance efforts to locate suitable potential vacant habitats for planting seeds and seedlings. This information would also help identify areas where currently unknown populations might occur. An analysis should include those elements which characterize a soil series: particle size, texture, mineralogy, organic matter, structure, soil depth and pH. Slope and exposure of known habitats should also be included in the studies. Microsite characteristics may also affect germination and should be determined to assess requirements for reestablishment or habitat enhancement.

424. Determine biotic factors affecting population expansion.

Seed abundance, viability, longevity, and dispersal affect expansion of the population and continued emergence over time. Field and greenhouse studies of percent viability and seed abundance and longevity in the soil seed bank should be done to learn how long the species can survive between periods of favorable germination or survive climatic conditions. The census data collection can be expanded to include additional population data. The number of seeds per seed head and number of seed heads will give annual reproduction data. Studies may be conducted on seed dispersal mechanisms, distance dispersed from the mother plant, and germination and survival of progeny to determine potential of population expansion and characteristics of successful microsites.

43. Determine impacts of threats.

Natural populations are often cyclical in numbers from year to year. Human and biotic activities also impact this natural variation. Studies are needed to separate the effects of these influences and to determine impacts relative to human impacts.

431. Determine impacts of small mammals.

Experimental work in the field could help determine plant-animal interactions. This could be accomplished by an experimental design in which some Stephanomeria plants were fenced and some not fenced. Plant survival to maturity and the number of heads produced by surviving plants would indicate the impact of grazing by small mammals.

432. Determine impacts of insects.

Damage associated with insects eating the floral parts, fruits, stems, and leaves of S. malheurensis should be evaluated. The insect(s) should be identified and a prescribed program for controlling them implemented if this seems to be a serious problem.

433. Determine impacts of herbicides.

Spraying vegetation in the vicinity of S. malheurensis, where drift or residual effects may harm the plant, should be prevented. After "safe" distances, techniques and chemicals for spraying are determined in relation to S. malheurensis and its potential habitat, signs should

be erected to provide a safe buffer zone. Workshops with highway spray crews should be held periodically to alert them to the problem of spraying in the vicinity of S. malheurensis. This would be implemented as part of the Habitat Management Plan. Spraying to control grasses without harming S. malheurensis may be a possible mechanism for competitor reduction. Season of application and herbicide selection should be experimentally determined.

434. Examine impacts of mining.

Although mining may not occur on the S. malheurensis site, pollution and other ecological disturbances associated with mining in the immediate area may affect the plant. Gottlieb has commented that the species will not survive if mining or other human activities disturb its single natural habitat. The mining company has a legal right to mine its claim (1872 Mining Law) however, it must file a plan of operation. Approval by the Bureau of Land Management of the plan of operation is contingent upon compliances with Section 7 of the Endangered Species Act. The Habitat Management Plan should address the conflicts associated with mining activities and determine the best direction to take for the full protection of S. malheurensis.

435. Examine impacts of fire.

Experimental burning plots should be established to determine the effects of fire at different seasons on the growth and reproduction of Malheur wirelettuce.

44. Determine delisting criteria

Research needs to be done on the population dynamics of the Malheur wirelettuce so minimal population sizes needed for long term genetic stability can be determined. Upon completion of this research, delisting objectives can be set for the Malheur wirelettuce.

5. Establish additional plantings/populations.

To reduce the likelihood of extinction, additional populations should be established at several locations within the known range of Malheur wirelettuce.

51. Establish seed bank facility.

Positive action must be taken to reduce the loss of genetic vigor and quality by the taking of plants or any other means of plant loss. One method of reducing this potential loss is establishing a reservoir of seeds for each colony to be used in new population establishment or reestablishment in the event of loss and to maintain genetic integrity.

511. Determine impacts of harvest on existing plants.

Since only one S. malheurensis site is known at this time it is important that propagules be taken in such a way that the donor plants are not reduced. Possible impacts of seed collection or the removal of plants from natural populations must be closely monitored to detect any effect the harvest may have on the populations.

512. Develop criteria for storage of seeds.

To ensure high seed viability, storage of the propagules should use the latest technology in seed storage. The storage facility should also have agreements in place for storage of part of the sample in another location, i.e. U.S. Department of Agriculture. The facility should have the capacity to conduct germination tests as part of the storage program.

513. Select storage facility.

Dr. Gottlieb, University of California, Davis, and the Berry Botanic Garden in Portland, Oregon already have seed storage facilities. Facilities should be selected using criteria identified in Task 512.

514. Collect seeds.

As soon as the facility has been selected and a contract approved, seed should be collected from wild populations if available at appropriate times.

515. Store seeds.

As soon as Tasks 512, 513, and 514 have been done, the collected seed should be put into storage as soon as feasible to ensure high seed viability.

516. Determine seed viability.

Seeds collected from wild and cultivated populations should be tested for germinability and viability. Tests used should minimize mortality as much as possible. When seed viability drops below 50 percent, additional wild seed should be collected and put into storage.

52. Identify suitable sites for reestablishment.

The identification of proper sites within its known range for reestablishment efforts is extremely important. Selected sites must possess as nearly as possible the same habitat characteristics as identified during earlier investigations of the extant populations.

53. Determine facilities for propagation.

One way to establish additional populations in the wild that uses only a small amount of the seed from the seed bank, is to germinate the seeds in a nursery and transplant young seedling into the wild. Because this is not a cultivated species special requirements may need to be meet by the grower to grow seedlings for transplant. Thus facilities which could adequately propagate the species should be determined.

531. Develop criteria for selecting propagation facility.

One of the selection criteria is that the propagation facility have staff with the knowledge as to the proper soils, watering schemes, light sources and temperature needs necessary for achieving full seed germination and seedling establishment. Many of these needs have been identified and are in use by Gottlieb and the Berry Botanic Garden. Also the facility should have enough space to be able to produce a large supply of viable seeds from greenhouse/garden plantings to be used for growing seedlings for introduction into the wild.

532. Select propagation facility.

Dr. Gottlieb, University of California, Davis, and the Berry Botanic Garden in Portland, Oregon already have propagating facilities. Facilities should be selected using criteria identified in Task 532.

54. Prepare sites for planting.

A high preference will be given to sites which appear to still possess the necessary habitat conditions and are located on public lands so that additional plantings can be readily protected. Initial competition should be reduced by removing vegetation that is determined to be detrimental to the reestablishment of S. malheurensis, especially cheatgrass. A method or plan for competitor reduction should be previously determined and adhered to.

55. Plant sites.

Only wild collected seed should be used if possible. If wild seeds are not available, then those seeds that have been in cultivation for the fewest number of generations should be given priority for establishing new plants/populations in the wild. Once the sites are prepared (task 54), the propagation facility that was selected (Task 532) should be contracted to grow seedlings using seeds stored in the seed bank (Task 514). Once seedling have reached the appriopiate transplant size , the seedling should be tansplanted at the appriopiate time in the spring for establishment of a population at the newly prepared wild sites.

56. Monitor plantings.

As new populations are established, programs to manage and protect them should be developed and implemented to help insure the continued existence of each population. In this way the eventual success of the recovery effort can be assured. The monitoring program should be patterned similar to monitoring program described in Task 414.

C. LITERATURE CITED

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III. IMPLEMENTATION SCHEDULE

The Implemntation Schedule that follows outlines actions and estimated cost for the Stephanomeria malheurensis recovery program. It is a guide for meeting the objective discussed in Part II of this Plan. This schedule indicates task priority, task numbers, task descriptions, duration of tasks, the responsible agencies, and lastly, estimated costs. These actions, when accomplished, should bring about the recovery of the species and protect its habitat. It should be noted that the estimated monetary needs for all parties involved in recovery are identified and, therefore, Part III reflects the total estimated financial requirements for the recovery of this species.

Priorities in Column 1 of the following implementation schedule are assigned as follows:

Priority 1 - An action that must be taken to prevent extinction or to prevent the species from declining irreversibly.

Priority 2 - An action that must be taken to prevent a significant decline in species population/habitat quality, or some other significant negative impact short of extinction.

Priority 3 - All other actions necessary to provide for full recovery of the species.

Recovery Plan Implementation Schedule for Malheur Wirelettuce

PRIOR-ITY #	TASK #	TASK DESCRIPTION	TASK DURA-TION (YRS)	RESPONSIBLE PARTY	TOTAL COST	ESTIMATES ($1,000) FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	COMMENTS
1	11	Secure critical habitat from threats of surface mining	2	BLM	5						BLM designated as botanical area (ACEC)
1	12	Hand rouge cheat grass from around plants	Ongoing	BLM* FWS-EHC	9.5 5.7	0.5 0.3	0.5 0.3	0.5 0.3	0.5 0.3	0.5 0.3	Started in 1985 with volunteers
1	13	Control predation from native herbivores & domestic grazing	Ongoing	BLM	18	3	3				Critical Habitat fenced to exclude livestock. Four rodent proof exclosures built around experimental plantings.
1	14	Protect site from range fires	Ongoing	BLM* FWS-EHC	19 3.8	1 0.2	1 0.2	1 0.2	1 0.2	1 0.2	Fire breaks constructed around Critical Habitat & being maintained.
2	414	Conduct census	Ongoing	BLM	19	1	1	1	1	1	Census started in 1985 & done yearly.
		Cost need 1 (Secure & manage critical habitat)			80	6	6	3	3	3	
2	411	Map known plant locations	3	BLM* FWS-EHC	4.5 1.5						Known populations mapped
2	421	Examine effects of allelopathy	9	BLM* FWS-EHC	27 4.5	3 0.5	3 0.5	3 0.5	3 0.5	3 0.5	Research started by Boise State University in 1987.
2	422	Examine effects of competition	9	BLM* FWS-EHC	72 9	8 1	8 1	8 1	8 1	8 1	Research currently being conducted by Boise State.
2	424	Determine biotic factors affecting population expansion	9	BLM* FWS-EHC	104.1 81.6	2 3	2 3	2 3	2 3	2 3	Same as above.

Recovery Plan Implementation Schedule for Malheur Wirelettuce

PRIORITY #	TASK #	TASK DESCRIPTION	TASK DURATION (YRS)	RESPONSIBLE PARTY	TOTAL COST	COST ESTIMATES ($1,000) FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	COMMENTS

Cont. = The action will be implemented on an annual basis once the action is begun.

Ongoing = Currently being implemented and will continue until action is no longer necessary for recovery.

* = Lead Agency

TOTAL COST = Projected cost of task from start to task completion.

BLM = U.S. Bureau of Land Management

FWS-EHC = U.S. Fish & Wildlife Service, Region 1 Division of Endangered Species and Habitat Conservation.

Recovery Plan Implementation Schedule for Malheur Wirelettuce

PRIOR-ITY #	TASK #	TASK DESCRIPTION	TASK DURA-TION (YRS)	RESPONSIBLE PARTY	TOTAL COST	COST ESTIMATES ($1,000) FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	COMMENTS
2	423	Determine abiotic requirements	6	BLM* FWS-EHC	19 12	3 2	2 2	2 2	2 2	2 2	Same as above.
2	412	Map additional new plant sites	3	BLM* FWS-EHC	3 1.5	1 0.5	1 0.5	1 0.5			No new population
2	413	Establish permanent plots & photopoints	2	BLM* FWS-EHC	10 0.6			5 0.3	5 0.3		
2	431	Determine impacts by small mammals	3	BLM* FWS-EHC	7 1.5			3 0.5	3 0.5	1 0.5	
2	432	Determine impacts of insects	3	BLM* FWS-EHC	7.5 3			3 1	3 1	1.5 1	
2	433	Determine impacts of herbicides	3	BLM* FWS-EHC	1.5 8.5			0.5 3.5	0.5 3	0.5 2	
2	434	Examine impacts of mining	3	BLM	1.5			0.5	0.5	0.5	
2	435	Examine impacts of fire	3	BLM* FWS-EHC	9 3			3 1	3 1	3 1	
		Conduct searches for new populations									
2	21	Identify potential habitats	3	FWS-EHC	12					4	
2	22	Search potential habitat	3	BLM* FWS-EHC	7.5 12						
2	23	Create/maintain an file of new sites	Cont.	FWS-EHC	8.5						
		Cost needs 2 (Conduct recovery research)			432.8	24	23	44.3	42.3	36.5	

Recovery Plan Implementation Schedule for Malheur Wirelettuce

PRIOR-ITY #	TASK #	TASK DESCRIPTION	TASK DURA-TION (YRS)	RESPONSIBLE PARTY	TOTAL COST	COST ESTIMATES ($1,000) FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	COMMENTS
		Secure newly found colonies									
2	31	Obtain private landowner support	3	FWS-EHC	3						
2	32	Secure Federal sites	3	BLM* FWS-EHC	3 1.5						
2	33	Develop habitat management plans	2	BLM* FWS-EHC	2 1						
2	34	Implement habitat management plan	cont.	BLM* FWS-EHC	15 5						
		Establish seed bank facility									
3	511	Determine impacts of harvest on existing population	3	BLM	6						Task completed in 1988.
3	512	Develop criteria for storage of seeds	1	BLM FWS-EHC*	1 1						Task completed in 1986.
3	513	Select seed storage facility	1	FWS-EHC	1						Task completed in 1986
3	514	Collect seeds	Cont.	BLM FWS-EHC*	8.5 8.5	0.5 0.5	0.5 0.5	0.5 0.5	0.5 0.5	0.5 0.5	Collection started in 1987 and continues as needed.
3	515	Store seed	Cont.	BLM	5						Seeds put in Berry Garden seed bank in 1987.

Recovery Plan Implementation Schedule for Malheur Wirelettuce

PRIORITY #	TASK #	TASK DESCRIPTION	TASK DURATION (YRS)	RESPONSIBLE PARTY	TOTAL COST	COST ESTIMATES ($1,000) FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	COMMENTS
3	516	Determine seed viability	Cont.	FWS-EHC	8	0.5	0.5	0.5	0.5	0.5	Started in 1988.
		Establish additional plantings/populations									
3	44	Determine delisting criteria	2	FWS-EHC	4			2	2		
3	52	Identify suitable sites	3	BLM* FWS-EHC	8 3						
3	531	Develop criteria for selecting propogation facility	1	BLM FWS-EHC*	1 1						
3	532	Select Propogation facility	1	FWS-EHC	1						
3	54	Prepares sites for planting	2	BLM* FWS-EHC	5 2						
3	55	Plant sites	3	BLM* FWS-EHC	6 3						
3	56	Monitor plantings	Cont.	BLM* FWS-EHC	3 3						
		Cost Need 3 (Establish additional plants/populations)			109.5	1.5	1.5	3.5	3.5	1.5	
				Total Yearly Cost	622.3	31.5	30.5	50.8	48.8	41	

APPENDICES

APPENDIX A

Plant Locations

Legal Description

Harney County, Oregon, T27S, R30E, Sec. 11, SE1/4 of NE1/4, NE1/4 of SE1/4; Sec. 12, SW1/4 of NW1/4, NW1/4 of SW1/4, 27 miles south of Burns, the area west of Hwy. 205 between mileage markers 25 and 26. Approximately 160 acres.

Source Gottleib 750 7/2/75 (OSC - Type, NY); Chambers 3572 8/2/72 (OSC); Urban 76C*; Wright/'78; Youtie Report Franklin 1980; Parenti 1981.

* Annual Conference of the Oregon Rare and Engangered Plant Project

APPENDIX B

Plant List prepared by Karl Urban for Stephanomeria Study Site, south of Burns, Oregon

List 1: prepared August 10, 1974

Agropyron cristafum (rare)

Amsinckia tessellata

Artemesia tridentata

Aster canescens (rare)

Astragalus curvicarpus

Atriplex spinosa (rare)

Bromus tectorum

Cryptantha torreyana

C. nubigena

Chaenactis douglasii

Chrysothamnus viscidiflorus

Collinsia parviflora

Crepis occidentalis

Delphinium andersonii

Descurainia richardsonii

Elymus cinereus

Eriastrum sparsiflorum

Erigeron poliospermus (rare)

Eriogonum baileyi

E. vimineum

E. watsonii

Festuca idahoensis

Helianthus annuus (rare)

Lepidium perfoliatum

Meliotus albus (rare)

Mentzelia albicaulis

Nama densum

Nicotiana attenuata

Oenothera scapiodea (rare)

Oryzopsis hymenoides

Phacelia bicolor

Plectritis macrosera

Sitanion hystrix

Salsola kali

Solanum triflorum (rare)

Stephanomeria exigua ssp. *coronaria*

S. malheurensis (rare)

Tetradymia glabrata (rare)

Zigadenus paniculatus

Z. venenosus

Plant List 2 prepared by Karl Urban for Stephanomeria Study Site south of Burns, Oregon

Prepared May 24, 1975; Species also listed on List 1 not included.

Antennaria dimorpha (male)

Allium tolmiei

Collomia linearis

Cryptantha circumscissa

C. intermedia

Canbya aurea

Eatonella nivea

Fritillaria pudica

Gilia sinuata

Lomatium nevadense

Layia glandulosa

Microsteris gracilis

Mimulus nanus

Ranunculus testiculatis

APPENDIX C

AGENCIES ASKED TO PROVIDE REVIEW COMMENTS DURING AGENCY REVIEW

U.S. Fish and Wildlife Service - Endangered Species, Department of Interior, Washington, D.C. 20240

U.S. Fish and Wildlife Service, 911 NE 11th Avenue, Portland, Oregon 97232-4181

U.S. Forest Service, Region 6, P.O. Box 3623, Portland, Oregon 97208

Bureau of Land Management, Burns District, 74 South Alvord Avenue, Burns, Oregon 97720

Oregon Division of State Lands, 1445 State Street, Salem, Oregon 97310