

INVENTORY OF GIANT WESTERN REDCEDAR GROVES ON THE  
CLEARWATER NATIONAL FOREST: 1998 SURVEY

by

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## ABSTRACT

This report documents a two-year inventory of western redcedar (*Thuja plicata*) groves on the Clearwater National Forest. "Grove" refers to a stand dominated by trees greater than five feet in diameter at breast heightñ structural stage for which the term "remnant" has been proposed by the Idaho Conservation Data Center (CDC). The inventory builds on similar work done on the Idaho Panhandle National Forests, thus including most of the range of western redcedar in Idaho. The field survey was guided by potential grove locations identified in an earlier study conducted by Tracy Parker at the University of Idaho. Each grove was searched for and, if found, was evaluated based on size, number of giant western redcedar, degree of disturbance, and surrounding communities. If the site was thought to have significant conservation value, a standardized form was used to record information including directions to the site, description of the site, a list of "elements" (plant communities and rare plants) occurring there, condition, disturbance, size, and landscape context. In addition to the remnant cedar grove, the site usually included adjoining, mid- to late-seral stands. This information was then stored as a site basic record (SBR) in the Conservation Site database maintained by the Idaho CDC. Photos were taken, and the precise location and boundaries of each site were mapped on a 7.5-minute USGS quadrangle, transferred to base maps at the CDC, and digitized for a GIS data layer. Plant cover data were recorded to describe the major plant community present. Twenty-one groves were documented in the Conservation Site database, of which five are protected and 16 are not. This report summarizes the information compiled on western redcedar groves on the Clearwater National Forest and makes recommendations for managing and protecting these sites. There is a need for an additional land management designation for protecting such small examples of rare plant communities. SBRs for all remnant western redcedar Conservation Sites, and maps of the sites, are included in appendices to this report.

## ACKNOWLEDGMENTS

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## INTRODUCTION

Within the cedar-hemlock forests of the Pacific Northwest, there exist small enclaves of very old western redcedar (*Thuja plicata*). These stands have escaped repeated, catastrophic fires and the commercial logging that has characterized the region for a century. Trees 5 to 11 feet in diameter generally occur in stream bottoms as isolated individuals, in streamside stringers, or in small stands commonly referred to as "groves". The term grove comes from the wide spacing of the trees and their open, park-like understory. Groves of giant western redcedar are very rare. Those that remain provide opportunities for research, reference areas for extremely advanced forest succession, and habitat for rare plants. Although groves located along roads and pack trails have long been used as campsites, they are also valued by the public for nature trails, solitude, and education.

Western redcedars greater than 5 ft in diameter are the oldest trees in the northern Rocky Mountains, with estimated ages of 1,000 to 2,000 years (Parker 1979). They can attain diameters greater than 10 ft—much larger than their largest conifer associates, western larch (*Larix occidentalis*) and western white pine (*Pinus monticola*). It is impossible to accurately determine the age of large western redcedars because heart-rot fungi render them hollow. Using a conservative method based on growth rates of individuals of various sizes, Parker (1986) estimated the age of a western redcedar 8.9 feet in diameter at breast height (dbh, 4.5 ft) to be 2,820 years.

The first inventory of western redcedar groves in the northern Rocky Mountains was conducted by Tracy Parker and Fred Johnson between 1979 and 1982 (Parker 1986). Through an exhaustive survey of land management agencies and timber companies, Parker collected the approximate locations of 166 potential groves throughout northeastern Washington, northern Idaho, and northwestern Montana. Fifty-three Idaho sites were ultimately visited, twelve of them on the Clearwater National Forest. However, suitable groves were not found at all sites. Minimum criteria used by Parker to define a grove were: several trees greater than 5 ft dbh, and an area of at least 0.1 acre. At each suitable grove, Parker recorded condition, community composition, elevation, and landform. In addition, she took detailed data on regeneration and stand structure at selected groves.

The Natural Heritage Program/Conservation Data Center network recognizes different seral and structural stages of community types in its work of inventorying plant communities and setting conservation goals. Because of their great age, western redcedar groves are rare elements of biodiversity. While the plant associations represented may be common and widespread, the stands represent a rare seral/structural stage of these associations. Unfortunately, nearly all known occurrences of western redcedar groves are too small to be suitable preserves in themselves. However, some groves are contiguous with mid- or late-seral stands of western redcedar which help buffer against edge effects and provide some potential for eventual replacement of the giant trees. They may also be part of a larger site containing communities, plants, or animals of interest, often

interspersed with anthropogenic features. The landscape context of a grove is an important attribute determining its value as a preserve.

The Idaho Conservation Data Center (CDC) tracks areas with conservation value using the Conservation Site module within the Biological and Conservation Data System (BCD). A database record ("site basic record" or SBR) stores information on location, quality, and extent of a site and links it to records containing information on the plant communities, rare plants, and rare animals it contains. The site location and boundaries are digitized and stored in a GIS database.

In 1997, the CDC, in cooperation with the Clearwater National Forest, set out to survey all of the sites tentatively identified during Parker's study (Lichthardt 1998). The survey was continued in 1998. This survey and inventory are the initial steps in designing a conservation strategy for western redcedar groves in northern Idaho and is being augmented by similar surveys on the Idaho Panhandle National Forests. Groves considered to have important conservation value were documented and entered into the CDC's Conservation Site database, and the first precise mapping of these sites was done.

## METHODS

### **Preexisting documentation**

Our interest in giant western redcedar groves was inspired by Parker's earlier work and her research and reconnaissance formed the basis for our survey. Potential western redcedar groves identified during Parker's survey of land management agencies and timber companies are listed and numbered in Parker (1986), regardless of whether they were visited, and legal locations are given to section (Appendix A). Approximate locations are mapped at a scale of 1:126,720 on National Forest maps stored at the Research Herbarium, College of Forestry, Wildlife, and Range Sciences at the University of Idaho (Appendix B).

Our goals were, for each Clearwater National Forest site, to determine whether a suitable grove existed at the site and, where appropriate, to document the site using Natural Heritage Program/CDC methods. Twelve out of 48 potential groves on the Clearwater National Forest had been previously visited. For these, suitability had been assessed and plant cover data recorded, but no detailed map was provided. Groves indicated on the map as unsuitable were not revisited except in one case.

### **Target stands**

In contrast to Parker's study, our interest was not limited to stands with classic grove-like characteristics, but included any stands dominated by western redcedar greater than 5 ft dbh, and in relatively undisturbed condition. As in Parker's study, stringers of giant trees

along streams were not considered suitable. Also, in our survey we paid particular attention to any rare plant species associated with the stands.

The Idaho CDC has developed standards for forest structural condition in order to classify seral stages of forest associations. Tree size classes used in these standards correspond closely with those used in Ecodata methods (Bourgeron *et al.* 1991). Conveniently for the present study, CDC standards break out an additional class of trees greater than 48 inches dbh—so called "remnant" trees. As our survey indicated, trees of this size represent a rare and distinct structural stage of the *Thuja plicata* alliance. Five trees per acre of this size are required to qualify as a remnant stand. Therefore suitable groves as defined by Parker would all be considered remnant stands using these standards.

A subjective assessment of the quality of the site (remnant stand plus surrounding unmanaged communities) was made. Factors considered in determining the conservation value of a stand were:

- ï Size of the remnant stand
- ï Size of the entire site, including adjoining old-growth
- ï Density of trees larger than 5 ft dbh
- ï Seral/structural stage of adjoining or encompassing stands
- ï Amount of fragmentation of surrounding landscape
- ï Amount of disturbance in the remnant stand itself

### **Data recorded**

Stands of remnant western redcedar considered to have significant conservation value, were documented using Western Heritage Task Force Site and Community Survey Methods (Bourgeron *et al.* 1991). A Site Survey Form (Form I, Appendix C) was used to give directions to the site, write a narrative description, list the "elements" (plant communities and rare plants) occurring there, and rank it with respect to protection urgency, management urgency, and biodiversity significance. Other data fields included information on condition, disturbance, size, and landscape context. These data were then used to populate a Site Basic Record (SBR, Appendix D). The "site" sometimes consisted of only the grove itself, but more typically included adjoining old growth or buffer areas. Boundaries of each site were mapped on USGS 7.5-minute quadrangle maps included with corresponding SBRs in Appendix D. The size of the grove was estimated on the ground. The size of the site was estimated from a topographic map. Site boundaries were digitized and added to the Conservation Site data layer in the Idaho Fish and Game GIS. Data from a similar inventory on the Idaho Panhandle National Forests will also be added to the Conservation Site Database.

In most cases, structure and community composition of a representative sample of the grove were described using plot methods (Bourgeron *et al.* 1991). A circular, tenth-acre plot was situated to be as representative as possible of the community, and ocular

estimates of cover, by species, were recorded. Stand structure was described by recording canopy cover by size class.

To quantify the size and density of giant trees present, we measured the diameter at breast height (approximately 4.5 ft) of western redcedar greater than 5 ft in diameter. If trees this size were especially numerous, we tried to measure the largest trees, then estimated the number of additional trees greater than 5 ft dbh. Trees with more than one bole were not measured, unless noted. These data were recorded in the "managed area comments" field in the SBR (Appendix D).

Photos were taken at most sites and a set of slides is stored at the Idaho Department of Fish and Game, Conservation Data Center in Boise and at the Clearwater National Forest Supervisor's Office. The occurrence of any plant species tracked by the CDC was recorded and mapped using standard methods.

## RESULTS

Thirty-five groves and potential groves identified by Parker (1986) were visited during 1997 and 1998 (Appendix E). Five groves could not be located, two proved too difficult to access, and four were presumed logged or mismapped, based on Forest Service records. Four additional groves were found that were not identified on Parker's maps. Of the 39 sites visited, 21 were thought to be of sufficient size and condition to be documented as Conservation Sites (Table 1). In addition to those on the Clearwater National Forest, one of the sites documented was on the Nez Perce National Forest, and one on Potlatch land. Four of the National Forest sites are already protected and the Potlatch site has unofficial protection. All were entered into the Conservation Site database as Site Basic Records (Appendix D). Canopy cover by species was recorded at 18 groves and data are stored at the Idaho CDC. Three of the groves documented in 1997 were deleted from the database. After reconsideration it was decided their size or condition of the surrounding vegetation diminished their conservation value.

Stands dominated by trees greater than 5 ft in diameter are rare, and with a few notable exceptions, small. The stands surveyed range in size from 0.25 to 15 (100) acres. The 100-ac site is an exceptional stand on Potlatch land. Although the requisite 5-ft diameter criterion seems arbitrary, it succeeds very well in distinguishing a very rare subset of old-growth cedar. Although small, many groves are surrounded or adjoined by stands of old-growth cedar that serve as buffer areas and contain trees that could potentially replace the current giants. During our 1998 survey, we designed sites to include mid- to late-seral stands surrounding a grove of remnant trees. Acreages given in Table 1 are for the entire site. At three sites—Black Canyon, Papoose Creek, and Lodge Creek—several groves are grouped into a single site which also contains younger stands. At Black Canyon and Lodge Creek, roads and campgrounds also occur between remnant stands. Most of the sites documented in 1997 include only the grove itself.



Stands this old tend to occupy a particular type of site, although a range of sites were encountered. Typical sites are very moist or wet sites, generally on river terraces, toeslopes, and streambanks. An ample supply of moisture from the water table or subsurface seepage has likely protected them from wildfire as well as increasing their growth rate. They are commonly found on landtypes that consist of undulating slopes with subsurface water movement that were formed by mass wasting. They are seldom found on steep slopes, unless on the sides of a v-shaped stream bottom. Those that are not on level stream terraces tend to be in basin-like situations where several small streams converge.

Very large western redcedar often occur as scattered individuals along river bottoms and streams. Such stands vary in their grove character depending on the concentration of large trees and their distance from the stream. Walde is an example of a site in a v-shaped stream bottom. It was documented as a Conservation Site because the remnant trees were dense and extended up the sides of the drainage.

### Understory composition

Because remnant western redcedar groves are largely restricted to wet sites, the pervasive plant association is western redcedar/ladyfern (*Thuja plicata*/*Athyrium filix-femina*; Table 2)ñladyfern being the wettest understory union associated with western redcedar. Although other understory unions were typically present, ladyfern was usually dominant. Other associations and phases present included:

- ï Western redcedar/ladyfernñmaidenhair fern phase (*Thuja plicata*/*Athyrium filix-femina*ñ*Adiantum pedatum*),

**Table 1. Conservation Sites for remnant western redcedar groves (Appendix D). Sites with an asterisk were not identified on Parker's maps.**

SBR No.(1)	Site Name	Size (ac)	Protection (2)	Plot No.
<b>Clearwater National Forest:</b>				
<u>Lochsa District</u>				
368	Pete King Creek	4.5	none	97TP003
364	Walde	5.0	none	-
<u>North Fork District</u>				
366	Aquarius Trail	0.4	RNA	-
281	Black Canyon	90.0	none	97TP007, 010
274	Can Creek South	6.0	none	97TP008
275	Cedars Campground South	3.0	none	97TP009
261	China Creek	30.0	none	98TP002
448	Heritage	50.0	SIA	98TP012
363	Hornby Creek	2.0	none	97TP002
262	Isabella Creek	25.0	none	97TP006
124	June Creek*	230.0	none	98TP003
199	Lodge Creek	130.0	none	98TP004
<u>Palouse District</u>				

666	Giant western redcedar	23.0	SIA	-
332	Morris Creek	33.0	SIA	-
<u>Pierce District</u>				
310	Cabin Creek	20.0	none	98TP010
341	Eldorado Creek	1.5	none	-
103	Upper Lolo Creek	90.0	none	98TP007
<u>Powell District</u>				
273	Papoose Creek	25.0	none	98TP009
<b>Nez Perce National Forest:</b>				
260	Falls Point South	10.0	none	-
<b>Private:</b>				
278	Walker's Park	120.0	unofficial	98TP006
<b>State land:</b>				
012	Moscow Mountain*	45.0	TNC	97TP001

1 Site basic record.

2 SIA = Special Interest Area (botanical); RNA = Research Natural Area; TNC = project of The Nature Conservancy. **Table 2. Understory unions and rare plants represented in remnant cedar grove Conservation Sites.**

SBR

No.(1)	Site Name	Understory unions(2)	Rare plants
<b>Clearwater National Forest:</b>			
<u>Lochsa District</u>			
368	Pete King Creek	Athfil, Asacau	<i>Carex hendersonii</i> 035, <i>Cypripedium fasciculatum</i> 048
364	Walde	Athfil, AsacauñTaxbre	
<u>North Fork District</u>			
366	Aquarius Trail	Athfil	<i>Cardamine constancei</i> 029
278	Black Canyon	Athfil, Gymdry, CliuniñMenfer	<i>Botrychium minganense</i> 044, <i>B. lanceolatum</i> 042
274	Can Creek South	Athfil, Gymdry	
275	Cedars Campground South	Athfil, Asacau	
261	China Creek		<i>Cypripedium fasciculatum</i>
448	Heritage	Asacau, AsacauñTaxbre	<i>Cypripedium fasciculatum</i> 024, <i>Thelypteris nevadensis</i> 001, <i>Eburophyton austinae</i> 024
363	Hornby Creek	Athfil	
262	Isabella Creek	Oplhor	<i>Thelypteris nevadensis</i> 002
124	June Creek	Athfil	<i>Syntheris platycarpa</i> 024
199	Lodge Creek	Athfil	<i>Corydalis caseana hastata</i>

Palouse District

666	Giant Western Redcedar	Asacau, Athfil, Gymdry,	<i>Botrychium minganense</i> 045, <i>Corydalis caseana hastata</i> 069
332	Morris Creek	Athfil, Gymdry, Asacau, AsacauñTaxbre, AsacauñMenfer	<i>Botrychium minganense</i> 038, <i>B. simplex</i> 001 <i>Corydalis caseana hastata</i> 037
<u>Pierce District</u>			
310	Cabin Creek	Asacau, Gymdry, Adiped, Athfil, AthfilñAdiped	<i>Corydalis caseana hastata</i>
341	Eldorado Creek	Athfil	
103	Upper Lolo Creek	Athfil, Asacau	<i>Botrychium minganense</i>
<u>Powell District</u>			
273	Papoose Creek	Athfil, Gymdry	<i>Habenaria orbiculata</i>

Continued

**Table 2 continued.**

SBR

No.(1)	Site Name	Understory unions(2)	Rare plants
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**Nez Perce National Forest:**

199	Falls Point	Athfil	<i>Corydalis caseana hastata</i> 066
260	Falls Point South	Athfil, Asacau	<i>Corydalis caseana hastata</i> 067 <i>Syntheris platycarpa</i> 035

**State land:**

012	Moscow Mountain	Cluini, Asacau, Athfil	
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**Private land:**

278	Walker's Park	Athfil, Asacau	<i>Corydalis caseana hastata</i>
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1 Site basic record.

2 Follows Cooper *et al.* (1991) except *Thuja plicata*/*Dryopteris* spp. which follows Steele (1971). The phase is the type phase unless indicated otherwise.

- ï Western redcedar/devil's club (*T. plicata*/*Oplopanax horridum*; one stand)
- ï Western redcedar/oakfern (*T. plicata*/*Gymnocarpium dryopteris*),
- ï Western redcedar/wild ginger (*T. plicata*/*Asarum caudatum*),
- ï Western redcedar/wild gingerñPacific yew phase (*T. plicata*/*Asarum caudatum*ñ*Taxus brevifolia*),
- ï Western redcedar/queencup beadlilyñmenziesia phase (*T. plicata*/*Clintonia uniflora*ñ*Menziesia ferruginea*).

- ï Western redcedar/shield fern (*T. plicata*/*Dryopteris* spp.; one stand)

All but the western redcedar/shield fern association are widespread and common. Western redcedar/shield fern is a globally rare (G1) plant association described by Steele (1971). It only occurred in one stand.

### **Stand structure**

Western redcedar stands of this advanced age have developed certain characteristics which were the focus of Parker's work. In a classic grove you find little tree reproduction in the understory. The understory is open, and dominated by ferns. The upper canopy tends to be exclusively composed of western redcedar (Table 3). Trees, most of them larger than 3 ft in diameter, are well-spaced, their crowns filling the upper canopy, except where one has died or been wind-thrown. Canopy openings are apparently too small to release the inconspicuous understory shrubs. Such typical groves tend to be under 2 acres in size. During our survey, several stands of remnant western redcedar were found that lacked this typical grove-like character or also included other physiognomic types. The structure of remnant stands is reflected in tree cover by size class and cover by life form (Table 3). Overall, a range of structural conditions were encountered including:

Table 3.

- ï scattered giants within early to mid-seral stands,
- ï a mixture of mid- to late-seral forest with inclusions of groves of extremely large trees (1998, Plot #9, Papoose Creek), and
- ï large stands dominated by remnant trees, but widely spaced and mixed with medium and large trees of both seral and climax species (1998, Plot #3, June Creek).

Stands on upslope, more well-drained conditions (e.g., Cedars Campground South, June Creek), while still within the western redcedar/ladyfern habitat type, did not have a fern-dominated understory. The understory of stands is also dependent on the amount and nature of canopy openings, which are a function of disturbance as well as age of the trees. It can also be affected by an abrupt forest edge. At Walde, Aquarius Trail, and Can Creek South, wind-throw or disease has opened the canopy sufficiently to produce a sub-canopy of shrubs and conifer regeneration, at least in parts of the stands. At Cabin Creek and parts of Black Canyon, giant trees are widely scattered amongst much younger trees. Such stands do not have the classic grove-like structure often associated with remnant stands.

One of the unique features of giant cedar groves is their lack of western redcedar reproduction, in spite of the fact that western redcedar is shade tolerant. This was recognized by Tracy Parker and Fred Johnson during surveys conducted in the 1980s.

When western redcedar regeneration is present, it is primarily vegetative, through layering of lower branches or fallen boles ("veglings"; Parker 1979). In the stands we sampled, sapling and pole-sized cedar had low cover and seral species often contributed less than 5% cover (Table 3). Classic grove-like stands (1997-10, 1998-4,-6,-7,-9, and -12) can be recognized by a nearly complete lack of seral species and low cover of shrubs.

### **Rare plants**

In the Clearwater Mountains, several rare vascular plants occur in old-growth cedar habitats, although not all are restricted to such habitat. At the lower elevations, groves contain disjunct coastal species which are tied more to the local climatic conditions than to the forest seral stage. At elevations above 3500 ft, the local endemics Case's corydalis (*Corydalis caseana* var. *hastata*) and evergreen kittentails (*Syntheris platycarpa*) occur in western redcedar forests including remnant stands.

Old-growth and remnant western redcedar stands with fern understories are typical habitat for rare members of the genus *Botrychium*—fern allies known as grapeferns or moonworts—and remnant stands may provide optimum habitat, at least in the Clearwater region. Several subgenera of *Botrychium* are recognized. It is the members of subgenus *Botrychium*—all tiny, inconspicuous plants—that are rare. These species are extremely difficult to detect because of their very small size and the fact that populations often consist of only a few individuals. They often occur under a fern layer in the forest understory.

Moonworts were already known from three remnant cedar groves on the Forest: Mingan moonwort (*B. minganense*) from the Giant Western Redcedar Botanical SIA (EOR #045) and Swamp Creek Ridge (EOR #003), and both Mingan moonwort and least moonwort (*B. simplex*) from the Morris Creek Cedar Grove Botanical Special Interest Area (EOR #s 038 and 001). The cedar grove inventory located four additional *Botrychium* occurrences, two of them in one of the Black Canyon groves, in a western redcedar/ladyfern association on a terrace of the North Fork Clearwater River. Tentatively identified were Mingan moonwort (EOR #044), and lance-leaved moonwort (*B. lanceolatum*; EOR #042). The other two occurrences were both *B. minganense*, one at Austin Ridge, and one in upper Lolo Creek. These discoveries further establish remnant western redcedar groves as critical habitat for *Botrychium* species.

Case's corydalis is a local endemic characteristic of riparian sites in western redcedar forests above 3,400 ft. It has a global rank of G3 (rare or uncommon, but not imperiled) which generally denotes 21 to 100 occurrences. It requires partial sunlight and is more abundant in open situations. Case's corydalis occurs in nine of the groves surveyed. An exceptionally large population (EOR #067) occurs in a wet meadow associated with the Fall's Point South Cedar Grove on the Nez Perce National Forest. A local endemic, evergreen kittentails (*Syntheris platycarpa* 035), also occurs in this grove, but is not particularly abundant.

Several of the low-elevation groves contain plants associated with the inland-maritime environment. Henderson's sedge (*Carex hendersonii*) and Sierra woodfern (*Thelypteris nevadensis*) are coastal disjuncts that are rare in Idaho, and Constance's bittercress (*Cardamine constancei*) is a north-Idaho endemic. The Sierra woodfern occurrence is one of only two known inland populations.

### **Condition**

Easily accessible cedar groves are popular with the public and receive impacts from vehicles and camping. The understories and soil surface are especially affected. The Moscow Mountain grove has severe, localized disturbance from trampling and driving. Some groves (e.g., Walde, Falls Point, Walker's Park) border on clearcuts, which change the climate along the edge and introducing a variety of dry-site forbs and exotics. Hornby Creek (Appendix A) is an example of a grove with severe natural disturbance from windthrow. Most of the groves along main roads or trunk rivers have very large, old cut stumps.

### **Threats**

Many of the remaining groves of remnant cedar are not susceptible to cutting because of Forest Service policies mandating stream buffer zones. However, cutting up to the edge of a grove alters its understory composition and climate. The use of groves for campsite development and undeveloped campsites is a threat to those groves in proximity to roads. Can Creek South, a grove with high conservation value because of its size and age, could be susceptible to use and/or development as a campground because of its location on a large, roaded river terrace with inclusions of well-drained soils. Most of the groves surveyed are located in roaded watersheds containing plantations and managed timber stands.

### **Protection**

Five remnant cedar groves on the Clearwater National Forest have official protection, four as Special Interest Areas (SIA) and one within a Research Natural Area (RNA; Appendix E). Some groves are protected from harvest by their location within stream buffer zones, but if they are isolated by the logging of adjoining stands, they will lose their biodiversity value.

Two SIAs on the Palouse District, Morris Creek and Giant Western Redcedar, and the DeVoto Grove on the Lochsa District, are managed for interpretive use. As a result, the Giant Western Redcedar and DeVoto Groves have suffered significant disturbance. The Heritage Grove on the North Fork District, although accessible by trail, is otherwise undeveloped and receives little use. Because Forest Service policy requires that SIAs be managed for public enjoyment, this designation may be in conflict with preserving the special values of remnant cedar groves.

## RECOMMENDATIONS

These western redcedar groves are irreplaceable and should therefore be a high conservation priority. They offer opportunities for research and interpretation, and are highly valued by Forest visitors. They provide habitat for rare plants and are themselves important elements of biodiversity. Two years of survey have documented the rarity of such stands and shown that many have been significantly altered by recreational use and logging of adjoining stands. No policy currently exists to address remnant cedar groves in biological assessments. Five of the documented groves on the Clearwater National Forest have official status either as part of a Research Natural Area (RNA) or as Botanical Special Interest Areas (SIA). For the remaining groves some means of protection is needed. A conservation strategy is needed which would address remnant western redcedar groves throughout northern Idaho.

Current management designations do not allow for the protection and management of rare community types and even designated old-growth is not permanently exempt from harvest. Some of the sites we identified...Since most of the remnant cedar sites identified during this inventory are too small to be considered for RNA status, there appears to be no means of permanent protection through current management designations. Some National Forests in the Northern Region have specific programs designed to identify and preserve priority groves of giant cedar, using land classifications such as "Ancient Cedars" and "Old Growth Groves" (Parker and Johnson 1993). Without such a designation, groves and adjoining stands have no special status by which they can be addressed in planing documents. The following recommendations were made in the previous report (Lichthardt 1998), regarding management and management designations of remnant cedar grove sites:

- i Designate the Pete King Creek Cedar Grove as an SIA. This is a classic bottomland, old-growth cedar stand with a small core area of remnant cedar. This site is currently accessible by foot along a closed logging road. The site also includes two rare plant species and an historical grave site.
- ii Those sites that occur in riparian areas could be protected with management designation "M2". A Management Area designation of M2 is used to protect riparian values including old growth, aquatic ecosystems, water quality, fisheries, and wildlife habitats. Management practices such as timber harvesting, grazing, and recreation are allowed, but must protect and enhance these values (Clearwater National Forest 1987).
- ii Do not allow further development of remnant cedar sites, with the possible exception of interpretive signs at the Pete King Creek Cedar Grove.
- ii Do not allow logging of remnant cedar stands such as those documented during this inventory, or of adjacent forest. To preserve the internal environment of a

remnant stand it should be embedded within a parcel of mid- to late-seral forest at least 40 acres in size.

In addition I recommend:

- i In the Forest Plan revision, a new management designation should be added that would provide for the management and protection of sites containing remnant cedar.
- ii A policy should be adopted that addresses the disposition of remnant cedar stands yet to be identified.
- iii A Conservation Strategy for remnant cedar groves should be given funding priority in FY 1999

Because current policy makes it difficult to log old-growth, there is a feeling among Forest managers that these ancient stands are not in jeopardy. However, this policy could change with a change in administration or in response to economic factors. Also, some of these stands are not large enough to be delineated forest stand maps, and therefore might not be designated as old-growth.

All of the remnant cedar stands documented in this report as Conservation Sites deserve protection. Additional sites will most likely be found in roadless areas and designated Wilderness. Wilderness sites are considered secure, but should be documented at the first opportunity. Groves in roadless areas will potentially have the highest conservation value and can only be protected by having some policy in place before the areas in which they are located come under review. Potential remnant cedar sites on the Clearwater National Forest that are not yet documented with field sampling include:

**Bear Creek Cedar Grove** is the southernmost large cedar grove in the Selway-Bitterroot Wilderness, occurring near the southern extent of the range of western redcedar in Idaho. The legal location is: T32N, R14E sections 23, 24, 27 and T32N, R15E sections 19, west half 20.

**Hidden Creek Campground** east bank (Appendix D). The river terrace on the east (unroaded) side of the North Fork Clearwater River has greater potential as a conservation site than groves on the west side, and would be easier to protect.

**East Fork Moose Creek** in the Selway-Bitterroot Wilderness (T33N, R14E sections 4 and 9, T34N, R14E section 23, and west half of 24, 27, 33) is an old-growth cedar stand that may qualify as a grove. It contains a Mingan's moonwort occurrence.

**Pollock Creek.** Chris Lorain noted western redcedar more than 6 ft in diameter at this Mingan's moonwort site (T40N, R12E, Sec. 30, NE 1/4) in 1989.



**Upper Hidden Creek.** T40N, R10E, SE 1/4 of the SE 1/4 of Section 32.

#### REFERENCES

- Bourgeron, P.S., R.L. DeVelice, L.D. Engelking, G. Jones, and E. Muldavin. 1991. WHTF site and community survey manual. Version 91C. Western Heritage Task Force, Boulder, CO. 24 p.
- Clearwater National Forest. 1987. Forest Plan. USDA Forest Service Northern Region.
- Cooper, S.V., K.E. Neiman, R. Steele, and D.W. Roberts. 1991. Forest habitat types of Northern Idaho: a second approximation. General Technical Report INT-236. USDA Forest Service Intermountain Research Station, Ogden, UT.
- Lichthardt, J. 1998. Inventory of giant western redcedar groves on the Clearwater National Forest. Unpublished report for the Clearwater National Forest on file at: Idaho Department of Fish and Game Conservation Data Center, Boise, ID. 11 p plus appendices.
- Parker, T. 1979. Natural regeneration of western redcedar. M.S. Thesis. University of Idaho, Moscow. 50 p.
- Parker, T. 1986. Ecology of western redcedar groves. PhD. Thesis. University of Idaho, Moscow. 187 p.
- Parker, T. and F.D. Johnson. 1993. Cedar groves: the ultimate old growth. Proceedings of a symposium on Interior Cedar-Hemlock-White Pine Forests: Ecology and Management. March 2-4, 1993. Department of Natural Resource Sciences, Washington State University, Pullman. p 53-55.
- Steele, R. 1971. Red alder habitats in Clearwater County, Idaho. M.S. Thesis. University of Idaho, Moscow. 88 p.

APPENDICES NOT AVAILABLE ON WEB