

# SALMO RESEARCH NATURAL AREA

*Supplement No. 19<sup>1/</sup>*

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The Research Natural Area described in this supplement is administered by the Forest Service, an agency of the U.S. Department of Agriculture. Forest Service Research Natural Areas are located within Ranger Districts, which are administrative subdivisions of National Forests. Normal management and protective activities are the responsibility of District Rangers and Forest Supervisors. Scientific and educational uses of these areas, however, are the responsibility of the research branch of the Forest Service. Scientists interested in using areas in Oregon and Washington should contact the Director of the Pacific Northwest Research Station (P.O. Box 3890, Portland, Oregon 97208) and outline activities planned. If extensive use of one or more Forest Service Research Natural Areas is planned, a cooperative agreement between the scientist and the Forest Service may be necessary. The Forest Supervisor and the District Ranger administering the affected Research Natural Area will be informed by the Research Station Director of mutually agreed on activities. When initiating work, a scientist should visit the administering Ranger Station to explain the nature, purpose, and duration of planned studies. Permission for brief visits to observe Research Natural Areas can be obtained from the District Ranger.

The Research Natural Area described in this supplement is part of a Federal system of such tracts established for research and educational purposes. Each Research Natural Area constitutes a site where natural features are pre-

served for scientific purposes and natural processes are allowed to dominate. Their main purposes are to provide:

1. Baseline areas against which effects of human activities can be measured;
2. Sites for study of natural processes in undisturbed ecosystems; and
3. Gene pool preserves for all types of organisms, especially rare and endangered types.

The Federal system is outlined in "A Directory of the Research Natural Areas on Federal Lands of the United States of America."<sup>3/</sup>

Of the 96 Federal Research Natural Areas established in Oregon and Washington, 45 are described in "Federal Research Natural Areas in Oregon and Washington, 45 are described in "Federal Research Natural Areas in Oregon and Washington: A Guidebook for Scientists and Educators" (see footnote 1). Supplements to the guidebook describe additions to the system.

The guiding principle in management of Research Natural Areas is to prevent unnatural encroachments or activities that directly or indirectly modify ecological processes. Logging and uncontrolled grazing are not allowed, for example, nor is public use that might impair scientific or educational values. Management practices necessary for maintenance of ecosystems may be allowed.

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<sup>3/</sup>Federal Committee on Ecological Reserves. A directory of the Research Natural Areas on Federal lands of the United States of America. Washington, DC: U.S. Department of Agriculture, Forest Service; 1977.

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<sup>1/</sup>Supplement No. 19 to "Federal Research Natural Areas in Oregon and Washington: A Guidebook for Scientists and Educators," by Jerry F. Franklin, Frederick C. Hall, C. T. Dyrness, and Chris Maser ( Pacific Northwest Forest and Range Experiment Station 1972).

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Federal Research Natural Areas provide a unique system of publicly owned and protected examples of undisturbed ecosystems where scientists can conduct research with minimal interference and reasonable assurance that investments in long-term studies will not be lost to logging, land development, or similar activities. In return, a scientist wishing to use a Research Natural Area is obligated to:

1. Obtain permission from the appropriate administering agency before using the area;<sup>4/</sup>
2. Abide by the administering agency's regulations governing use, including specific limitations on the type of research, sampling methods, and other procedures; and
3. Inform the administering agency on progress of the research, published results, and disposition of collected materials.

The purpose of these limitations is to:

1. Insure that the scientific and educational values of the tract are not impaired;
2. Accumulate a documented body of knowledge about the tract; and
3. Avoid conflict between studies.

Research must be essentially nondestructive; destructive analysis of vegetation is generally not allowed, nor are studies requiring extensive modification of the forest floor or extensive excavation of soil. Collection of plant and animal specimens should be restricted to the minimum necessary to provide voucher specimens and for other research needs. Under no circumstances may collecting significantly reduce population levels of species. Collecting must also be carried out in accordance with applicable State and Federal agency regulations. Within these broad guidelines, appropriate uses of Research Natural Areas are determined by the administering agency.

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<sup>4/</sup>Six agencies cooperate in this program in the Pacific Northwest: U.S. Department of Agriculture-Forest Service; U.S. Department of the Interior-Bureau of Land Management, Fish and Wildlife Service, and National Park Service; U.S. Department of Energy; and U.S. Department of Defense.

# SALMO RESEARCH NATURAL AREA<sup>5/</sup>

*Abies lasiocarpa*,<sup>6/</sup> *Tsuga heterophylla*, and *Thuja plicata* forests in rugged topography, the habitat of mountain caribou, in northeast Washington.

The Salmo Research Natural Area (RNA) was established January 8, 1973. This 563-ha (1,390-acre) area represents *Abies lasiocarpa*, *Tsuga heterophylla*, and *Thuja plicata* forests common to northeast Washington, northern Idaho, and northwest Montana. It is located in the northeast corner of Washington in Pend Oreille County (fig. 1). The RNA is entirely within the Colville National Forest and includes portions of Sections 9, 10, 11, 14, 15, 16, and 22, T. 40 N., R. 45 E., Willamette Meridian (fig. 2), at lat. 48°58' N. and long. 117°5' W.

The RNA is within the Salmo-Priest Wilderness.

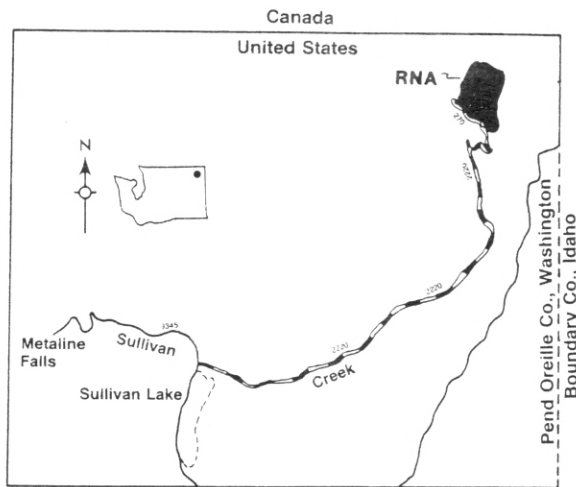


Figure 1.—Access routes to Salmo Research Natural Area.

<sup>5/</sup>Much of the material in this supplement was taken from the Establishment Report for Salmo Research Natural Area, by Ronald J. Young, September 26, 1972, on file at the Forestry Sciences Laboratory, Research Work Unit 4151, 3200 Jefferson Way, Corvallis, OR 97331.

<sup>6/</sup>Scientific and common names of all plants appear in table 1.

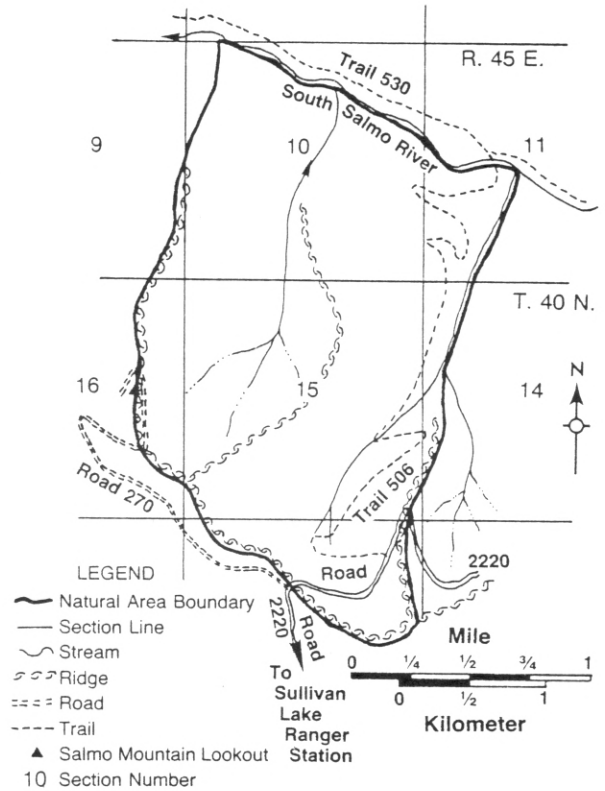


Figure 2.—Salmo Research Natural Area.

## Access and Accommodations

From Metaline Falls, Washington, proceed east and south on County Road 9345 for 12.5 km (7.8 mi) to the junction of 9345 and Forest Service Road 22. Follow 22 for 9.1 km (5.7 mi) to the junction of 22 and 2220. Proceed in a northeast direction on 2220 for 22.4 km (14 mi), to the divide between Sullivan Creek and South Fork Salmo River (fig. 3). At this point 2220 turns east and Forest Trail 506 heads north off 2220 for 0.8 km (0.5 mi) down the road. Trail 506 winds down through the Salmo RNA to the South Salmo River where it joins Trail 530 on the north side of the river (see fig. 2). Access to the RNA is good during summer (after June), but the road is closed by snow during late autumn, winter, and spring. The RNA is accessible to the south boundary in winter by snowmobile. Public accommodations are available in Metaline Falls; a summer campground is located at Sullivan Lake.

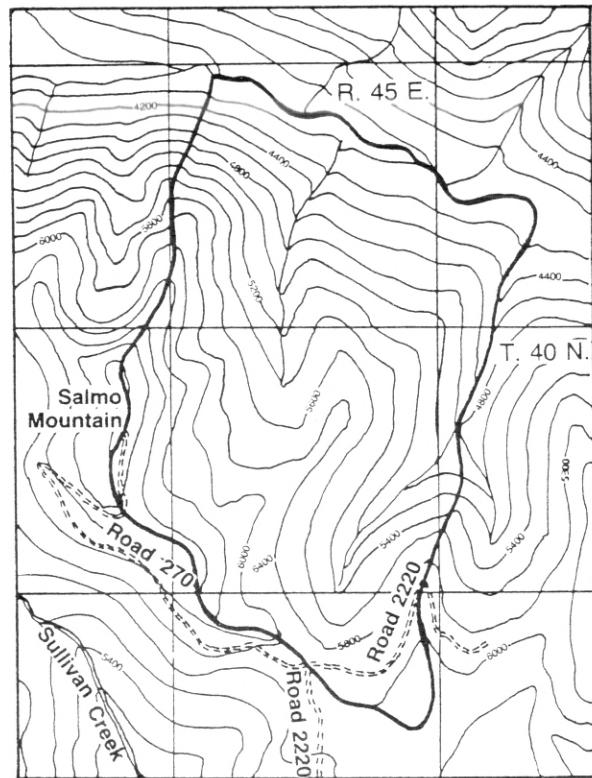


Figure 3.—Topographic map of Salmo Research Natural Area. Contour interval: 12 m (40 ft).

Table 1—Scientific and common names of plants found in Salmo Research Natural Area<sup>1/</sup>

Scientific name	Common name
<b>Trees:</b>	
<i>Abies grandis</i> (Dougl.) Forbes	Grand fir
<i>Abies lasiocarpa</i> (Hook.) Nutt.	Subalpine fir
<i>Larix occidentalis</i> Nutt.	Mountain larch
<i>Picea engelmannii</i> Parry ex Engelm.	Engelmann spruce
<i>Pinus albicaulis</i> Engelm.	Whitebark pine
<i>Pinus contorta</i> Dougl.	Lodgepole pine
<i>Pinus monticola</i> Dougl. ex D. Don	Western white pine
<i>Pseudotsuga menziesia</i> (Mirb.) Franco	Douglas-fir
<i>Taxus brevifolia</i> Nutt.	Western yew
<i>Thuja plicata</i> Donn.	Western redcedar
<i>Tsuga heterophylla</i> (Raf.) Sarg.	Western hemlock
<b>Shrubs:</b>	
<i>Alnus sinuata</i> (Regel) Rydb.	Sitka alder
<i>Menziesia ferruginea</i> Smith	Fool's huckleberry
<i>Oplopanax horridum</i> (Smith) Miq.	Devil's club
<i>Pachistima myrsinites</i> (Pursh) Raf.	Mountain-box
<i>Rhododendron albiflorum</i> Hook.	Cascades azalea
<i>Rubus pedatus</i> J. E. Smith	Fiveleaved bramble
<i>Sorbus scopulina</i> Greene	Cascade mountain-ash
<i>Sorbus sitchensis</i> Roemer	Sitka mountain-ash
<i>Vaccinium membranaceum</i> Dougl.	Big huckleberry
<b>Herbs:</b>	
<i>Athyrium filix-femina</i> (L.) Roth.	Lady-fern
<i>Clintonia uniflora</i> (Schult.) Kunth	Queencup beadlily
<i>Dryopteris austriaca</i> (Jacq.) Woyнар	Mountain wood-fern
<i>Dryopteris filix-mas</i> (L.) Schott	Male fern
<i>Gymnocarpium dryopteris</i> (L.) Newn.	Oak-fern
<i>Leptarrhena pyrolifolia</i> (D. Don) R. Br.	False saxifrage
<i>Parnassia fimbriata</i> König.	Fringed grass-of-Parnassus
<i>Polystichum munitum</i> (Kaulf.) Presl	Holly-fern
<i>Saxifraga arguta</i> (D.) Don	Brook saxifrage
<i>Streptopus streptopoides</i> (Ledeb.) Frye & Rigg	Twisted-stalk
<i>Tellima grandiflora</i> (Pursh) Dougl.	Fringecup
<i>Xerophyllum tenax</i> (Pursh) Nutt.	Beargrass

<sup>1/</sup> Nomenclature follows Hitchcock and Cronquist (1976).

## Environment

The Salmo RNA is located on a steep, dissected, north-facing slope. Slopes range from 20 to 80 percent and average 40 percent. Elevations range from 1158m (3,800 ft) at the South Salmo River to 2080 m (6,823 ft) on Salmo Mountain (fig. 3).

Most of the RNA lies within a belt of Cambrian rock, known as the Monk Formation, consisting primarily of phyllite with some quartzitic limestone included. On the west boundary of the RNA is a contact line between the Monk Formation and Gypsy Quartzite Formation. The two different bedrock types result in contrasts in soils and vegetation.

The Salmo drainage was extensively glaciated, by both continental glaciers and alpine glaciers. Evidence of glaciation exists up to 1829 m (6,000 ft) in the form of thick valley till deposits and steep truncated slopes facing the Salmo River. Glacial till was deposited in side drainages. Stream erosion of this material as deep as 9 to 12 m (30 to 90 ft) has resulted in the deeply entrenched streams.

After glaciation, the entire area was covered with layers of loess and volcanic ash, which today vary in depth from 5 to 77 cm (2 to 30 in), depending on slope position.

Climate of northeastern Washington has been described by Laysner (1980) and for adjacent Idaho by Ross and Savage (1967). A more definitive work on climate of western white pine forests, of which the forests of the Salmo are a part, is given in Haig and others (1941). The following brief description of climate is largely from Ross and Savage (1967).

The climate of the Salmo RNA is influenced both by moist, maritime air from the Pacific Ocean and by continental air. Prevailing western winds, especially in autumn and winter, bring a flow of mild, moist air from the Pacific Ocean that results in cloudy, humid winters with heavy snowfall. Winters are among the cloudiest in the Nation. Occasionally each winter, high pressure systems develop that cause cold, dry, continental air from the north

and east in Canada to spill over the mountains resulting in clear, cold weather. Sharp cold fronts, usually originating in the Gulf of Alaska, accompanied by gusty winds, infrequently cause windthrow and tree breakage. At approximately 20-year intervals, sudden drops in temperature following a cold front in autumn, before plants have hardened off, may cause severe browning of foliage and even death of trees. During the summer months, westerly winds weaken and continental climate prevails. Rainfall, cloud cover, and relative humidity are at a minimum in summer. Daily temperature variation is much greater than in winter. July and August frequently are months of critical fire weather.

The following climatic data for Sullivan Lake 21 km (13 mi) southwest of the RNA are only suggestive of the climate at the Salmo RNA (U.S. Department of Commerce 1965):

### Temperature

Mean annual	7 °C	(44 °F)
Mean January maximum	-1 °C	(31 °F)
Mean January minimum	-8 °C	(17 °F)
Mean July maximum	28 °C	(83 °F)
Mean July minimum	9 °C	(48 °F)
Mean April to October	13 °C	(55 °F)
Mean November to March	-2 °C	(29 °F)
Maximum	38 °C	(101 °F)
Minimum	-32 °C	(-26 °F)

### Precipitation

Mean annual	68 cm	(26.8 in)
Mean January	9 cm	(3.5 in)
Mean July	2 cm	(0.9 in)
Mean April to October	9 cm	(11.5 in)
Mean November to March	39 cm	(15.3 in)
Mean annual snowfall	246 cm	(97.0 in)

It is estimated that at the RNA, precipitation ranges from 14 to 152 cm (45 to 60 in) annually and occurs primarily in the form of snow, which reaches depths of over 254 cm (100 in) and persists into July. Temperature extremes are estimated to range from -43 to 32 °C (-11 to 90 °F).

## Flora

The Salmo RNA contains primarily old-growth timber with lesser areas of pole and sapling-sized stands resulting from wildfires, the most recent in 1926. The high precipitation and the great variation in elevation lead to a diverse flora.

The following Society of American Foresters cover types (Eyre 1980) occur in the RNA:

<u>SAF cover type</u>	<u>Estimated percent of RNA</u>
206 Englemann spruce-subalpine fir	60
208 Whitebark pine	Trace
212 Western larch	5
215 Western white pine	5
224 Western hemlock	10
227 Western redcedar-western hemlock	10
228 Western redcedar	5
Nonstocked and rocky	5
<b>Total</b>	<b>100</b>

In terms of Kuchler types (Kuchler 1964), the RNA contains the following:

<u>Kuchler type</u>	<u>Estimated percent of RNA</u>
13 Cedar-hemlock-pine forest ( <i>Thuja-Tsuga-Pinus</i> )	35
15 Western spruce-fir forest ( <i>Picea-Abies</i> )	60
Nonstocked and rocky	5
<b>Total</b>	<b>100</b>

The most meaningful classification of the vegetation (fig. 4) is by habitat types (Daubenmire and Daubenmire 1968) as follows:

<u>Habitat type</u>	<u>Estimated percent of RNA</u>
<i>Abies lasiocarpa/Menziesia ferruginea</i>	50
<i>Abies lasiocarpa/Xerophyllum tenax</i>	10
<i>Tsuga heterophylla/Pachistima myrsinites</i>	30
<i>Thuja plicata/Oplopanax horridum</i> and <i>Thuja plicata/Athyrium filix-femina</i>	5
Nonstocked and rocky	5
<b>Total</b>	<b>100</b>

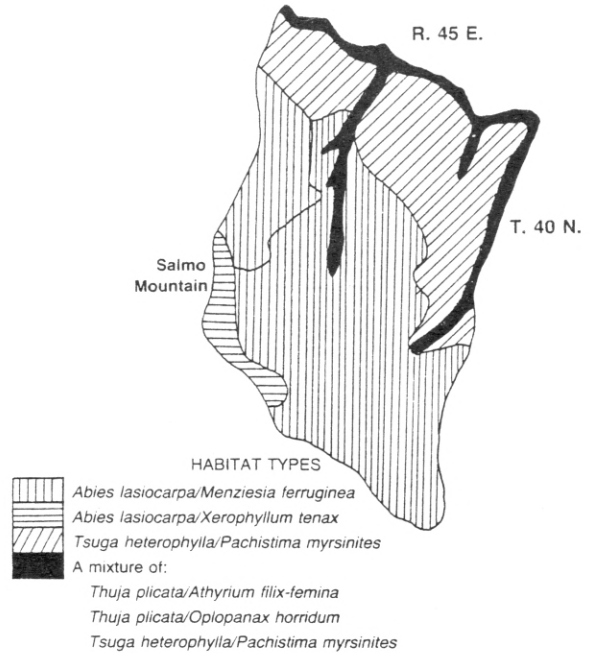


Figure 4.—Habitat types of Salmo Research Natural Area.

The predominant habitat type on upper slopes is *Abies lasiocarpa*/*Menziesia ferruginea*, which is characterized by a dense shrub cover of *Rhododendron albiflorum*, *Menziesia ferruginea*, *Alnus sinuata*, *Vaccinium membranaceum*, *Sorbus sitchensis*, and *Sorbus scopulina*. The *Rhododendron* component of the understory (fig. 5) has a limited distribution in this part of Washington, Idaho, and Montana and occurs only near the border with Canada. Its abundance in the Salmo RNA is of interest.

A rather limited area of *Abies lasiocarpa*/*Xerophyllum tenax* habitat type occurs on upper slopes and ridges, primarily on Salmo Mountain. This habitat type usually has an open understory of *Xerophyllum tenax* (fig. 6) and open to dense stands of *Abies lasiocarpa* (fig. 7), *Picea engelmannii* (fig. 8), *Pinus contorta*, and *Pinus albicaulis*.

The major habitat type on lower slopes is *Tsuga heterophylla*/*Pachistima myrsinites* (fig. 9). Seral stages of this habitat are productive mixed forests of *Tsuga heterophylla*, *Thuja plicata*, *Pinus monticola*, *Pseudotsuga menziesia*, *Abies grandis*, *Larix occidentalis*, and *Pinus contorta*. Where this habitat type is near climax, it contains mainly *Tsuga heterophylla* and *Thuja plicata* with scattered *Taxus brevifolia* in the understory. The understory is a rich mixture of shrubs and forbs. Uncommon herbs such as *Streptopus streptopoides* occur here. Ferns are abundant and include species that are less common for the region, such as *Dryopteris austriaca*, *D. filix-mas*, and *Polystichum munitum*. Mosses are abundant, especially *Rhytidiadelphus triquetrus* which forms extensive carpets on the forest floor (Young 1972).



Figure 5.—*Rhododendron albiflorum* in bloom in *Abies lasiocarpa*/*Menziesia ferruginea* habitat type.



Figure 6.—Beargrass in bloom in *Abies lasiocarpa*/*Xerophyllum tenax* habitat type.





*Figure 7.—Long narrow spires of Abies lasiocarpa fir in Abies lasiocarpa/Menziesia ferruginea habitat type in Salmo Research Natural Area.*



*Figure 8.—Abies lasiocarpa and Picea engelmannii near road 2220 in the southeast corner of Salmo Research Natural Area.*



*Figure 9.—View from Salmo Mountain toward South Fork Salmo River showing lower slopes of Salmo Research Natural Area.*

Two less extensive habitat types are *Thuja plicata*/*Oplopanax horridum* and *Thuja plicata*/*Athyrium filix-femina*. These occur in the RNA in a narrow band along streams and in other very moist places. The *Thuja plicata*/*Athyrium filix-femina* habitat type is somewhat more extensive than *Thuja plicata*/*Oplopanax horridum*. Several saxifrages, including such species as *Leptarrhena pyrolifolia*, *Tellima grandiflora*, *Parnassia fimbriata*, and *Saxifraga arguta*, are found in these types (Young 1972).

Lillybridge and Williams developed a revised classification of forested plant associations of the Colville National Forest. In the Salmo RNA their types compare with Daubenmire and Daubenmire (1968).<sup>2/</sup>

In summary, in the Salmo RNA the revised classification recognizes the importance of *Rhododendron albiflorum* as an indicator species in the *Abies lasiocarpa* series and divides Daubenmire's *Tsuga heterophylla*/*Pachistima myrsinites* habitat type into several associations. The *Thuja* associations remain the same.

Arboreal lichens are abundant in the old-growth trees of the Salmo RNA. Layser (1978) reported that the following species have been collected there: *Alectoria americana*, *A. fremon-tii*, *A. sarmentosa*, *Hypogymnia enteromorpha*, *H. physodes*, *Letharia vulpina*, *Lobaria pulmonaria*, and *Platismatia glauca*. Mountain caribou are dependent on arboreal lichens for winter food (Layser 1974).

Table 2 shows stand tables for four 0.04-ha (0.1-acre) plots taken in various habitat types in the RNA. Although no *Pinus monticola* occurred on these plots, large trees of this species occur in the RNA. The largest tree measured was a *Thuja plicata* 148 cm (58 in) in diameter at breast height. A few measurements of diameters and tree heights made on the plots were as follows:

Species	Diameter at	
	breast height Centimeters (in)	Total height Meters (ft)
<i>Abies lasiocarpa</i>	76 (30)	50 (165)
<i>Tsuga heterophylla</i>	87 (34)	43 (140)
<i>Tsuga heterophylla</i>	76 (30)	43 (140)
<i>Thuja plicata</i>	148 (58)	46 (150)
<i>Thuja plicata</i>	51 (20)	26 ( 85)

Basal area on these plots ranges from 57 to 228 m<sup>2</sup>/ha (247 to 994 ft<sup>2</sup>/acre).

A systematic inventory of plant species has never been made in the Salmo RNA. Layser (1980), Daubenmire and Daubenmire (1968), and Lillybridge and Williams (see footnote 7) should be consulted by anyone interested in vegetation of the area.

<sup>2/</sup>Unpublished draft manuscript, June 1984, "Forested plant associations of the Colville National Forest," by Terry R. Lillybridge and Clinton K. Williams, Okanogan National Forest, Okanogan, WA 98840. Types are as follows:

**Daubenmire and Daubenmire**

*Abies lasiocarpa*/*Menziesia ferruginea*  
*Abies lasiocarpa*/*Xerophyllum tenax*  
*Tsuga heterophylla*/*Pachistima myrsinites*

*Thuja plicata*/*Oplopanax horridum*  
*Thuja plicata*/*Athyrium filix-femina*

**Lillybridge and Williams**

*Abies lasiocarpa*/*Rhododendron albiflorum*  
 Same  
*Tsuga heterophylla*/*Rubus pedatus*  
*Tsuga heterophylla*/*Gymnocarpium dryopteris*  
*Tsuga heterophylla*/*Rhododendron albiflorum*  
*Tsuga heterophylla*/*Clintonia uniflora*  
 Same  
 Same

**Table 2—Number of trees by diameter class, habitat type, and species tallied on four 1/10-acre plots, Salmo Research Natural Area**

D.b.h.	Habitat type:	<i>Abies lasiocarpa/ Menziesia ferruginea</i>		<i>Thuja plicata/ Athyrum filix-femina Tsuga heterophylla/ Pachistima myrsinites</i>			<i>Thuja plicata/ Athyrum filix-femina</i>		<i>Tsuga heterophylla/ Pachistima myrsinites</i>	
	Elevation: Slope percent: Species: <sup>1/</sup>	AB	PI	TH	TS	AB	TH	TS	TH	TS
	1 772 m (5,850 ft) 25									
	1 575 m (5,200 ft) 50									
	1 454 m (4,800 ft) 35									
	1 257 m (4,150 ft) 5									

<u>Centimeters</u> <u>(inches)</u>	<u>Number of trees</u>									
5 (2)	2									6
10 (4)	5	1	1				1			3
15 (6)	3									1
20 (8)	2		2				1			
25 (10)	1		1							2
31 (12)	1									2
36 (14)	2		1		1				1	2
41 (16)									2	1
46 (18)			2							
51 (20)				1					2	1
56 (22)										1
61 (24)		1								
66 (26)	1	1					1			
71 (28)				2						
76 (30)	1	1					2			1
81 (32)			1				1			
87 (34)				1			1			
92 (36)										
97 (38)				1			2			
102 (40)										
107 (42)							3			
112 (44)							1			
148 (58)							1			
All	18	4	8	5	1		12	2	5	20

<sup>1/</sup> AB = *Abies lasiocarpa*, PI = *Picea engelmannii*, TH = *Thuja plicata*, TS = *Tsuga heterophylla*.

## Fauna

The RNA is habitat for mountain caribou (Layser 1974), which recently have been listed as endangered by the U.S. Fish and Wildlife Service. Grizzly bear, another endangered species, once frequented the area and still pass

through the RNA (Layser 1978). Even gray wolf may roam the area. Other species, which are unusual in Washington, are wolverine, marten, and Canadian lynx (table 3) (Lauckhart 1970). A list of birds believed to use the area is in table 4.

**Table 3—Mammals of Salmo Research Natural Area<sup>1/</sup>**

Order	Scientific name	Common name
Insectivora	<i>Sorex palustris</i> <sup>2/</sup>	Northern water shrew
Chiroptera	<i>Lasionycteris noctivagans</i>	Silver-haired bat
Carnivora	<i>Canis lupus</i>	Gray wolf
	<i>Felis concolor</i>	Mountain lion
	<i>Gulo luscus</i>	Wolverine
	<i>Lynx canadensis</i>	Lynx
	<i>Martes americana</i>	Marten
	<i>Martes pennanti</i>	Fisher
	<i>Mustela frenata</i>	Long-tailed weasel
	<i>Ursus americanus</i> <i>Ursus arctos</i>	Black bear Grizzly bear
Rodentia	<i>Clethrionomys gapperi</i>	Gapper's red-backed mouse
	<i>Lepus americanus</i>	Snowshoe rabbit
	<i>Marmota caligata</i> *	Hoary marmot
	<i>Ochotona princeps</i>	Pika
	<i>Spermophilus columbianus</i>	Columbian ground squirrel
	<i>Spermophilus lateralis</i> *	Golden-mantled ground squirrel
	<i>Tamiasciurus hudsonicus</i>	Red squirrel
Artiodactyla	<i>Alces alces</i> <sup>3/</sup>	Moose
	<i>Odocoileus hemionus</i>	Mule deer
	<i>Odocoileus virginiana</i> *	White-tailed deer
	<i>Rangifer tarandus</i> <sup>4/</sup>	Mountain caribou

\*Indicates presence verified by sight, sound, or sign.

<sup>1/</sup> Mammals listed are believed to use the area at some time of year. Information supplied by Fred Higginbotham (Wildlife Biologist, Sullivan Lake Ranger District, Colville National Forest, Metaline Falls, WA 99153). Adapted from a list compiled by Earle F. Layer in 1971, on file at Sullivan Lake Ranger District.

<sup>2/</sup> Nomenclature follows Hall (1980).

<sup>3/</sup> Considered rare for State of Washington (Lauckhart 1970).

<sup>4/</sup> Rare or endangered species.

Table 4—Birds of Salmo Research Natural Area<sup>1/</sup>

Order	Scientific name	Common name
Falconiformes	<i>Aquila chrysaetos</i> <sup>2/</sup>	Golden eagle
Galliformes	<i>Bonasa umbellus</i> <i>Canachites canadensis</i> * <i>Dendragapus obscurus</i> *	Ruffed grouse Spruce grouse Blue grouse
Strigiformes	<i>Bubo virginianus</i> <i>Strix varia</i>	Great horned owl Barred owl
Micropodiformes	<i>Selasphorus rufus</i>	Rufous hummingbird
Piciformes	<i>Dryocopus pileatus</i> * <i>Picooides tridactylus</i>	Pileated woodpecker Northern three-toed woodpecker
Passeriformes	<i>Carpodacus cassinii</i> <i>Cinclus mexicanus</i> * <i>Corvus corax</i> * <i>Cyanocitta stelleri</i> * <i>Dendroica tigrina</i> <i>Ixoreus naevius</i> <i>Leucosticte tephrocotis</i> <i>Nucifraga columbiana</i> <i>Parus gambeli</i> <i>Parus hudsonicus</i> <i>Perisoreus canadensis</i> * <i>Pinicola enucleator</i> <i>Regulus calendula</i> <i>Vermivora peregrina</i>	Cassin's finch Dipper Common raven Steller's jay Cape May warbler Varied thrush Gray-crowned rosy finch Clark's nutcracker Mountain chickadee Boreal chickadee Gray jay Pine grosbeak Ruby-crowned kinglet Tennessee warbler

\*Indicates presence verified by sight or sound.

<sup>1/</sup> Birds listed are believed to use the area at some time of year. Information supplied by Fred Higginbotham (Wildlife Biologist, Sullivan Lake Ranger District, Metaline Falls, WA 99153). Adapted from a list compiled by Earle F. Layer in 1971, on file at Sullivan Lake Ranger District.

<sup>2/</sup> Nomenclature follows Peterson (1961).

## History of Disturbance

The RNA has been burned repeatedly by wildfires. The last major fire was in 1926, a bad year for fires when large areas were burned in northeast Washington and northern Idaho. Only the western part of the RNA burned in that year. As parts of the RNA have not burned for several hundred years, much of the RNA is near climax.

Strong, gusty winds, usually accompanying a sharp cold front or a summer thunderstorm, occasionally cause windthrow and wind breakage. Windthrow was common on the upper slopes on the area in 1949 and 1950 and resulted not only in windthrown trees but in a buildup of Engelmann spruce beetle (*Dendroctonus rufipennis*), and subsequent mortality of many *Picea engelmannii*. A severe windstorm in November 1978 broke tops from trees on lower slopes (fig. 10).

Insects and diseases cause disturbances, too. In addition to the Engelmann spruce beetle, the mountain pine beetle (*Dendroctonus ponderosae*) has caused substantial mortality to *Pinus monticola*. Larch casebearer (*Coleophora laricella*) affects growth rate of *Larix occidentalis*. White pine blister rust (*Cronartium ribicola*) is a killing disease of *P. monticola* and *P. albicaulis*. Indian paint fungus (*Echinodontium tinctorium*) causes severe heart rot in *Tsuga heterophylla* and frequently results in deterioration and breakage of trees.

Human activities have not had much affect on the RNA. Road 2220 cuts through a corner of the area and road 720 winds northwest along the ridge and up to the lookout on Salmo Mountain (fig. 2). The area in the immediate vicinity of the lookout has been disturbed; building trail 506 caused limited disturbance. Recreational use, especially camping along the Salmo River near the junction of trail 506 with trail 530, has resulted in some disturbance. Disturbance by humans is, however, minimal.



Figure 10.—Tops of *Tsuga heterophylla* trees broken off by 1978 windstorm.

## Maps and Aerial Photographs

Maps applicable to the RNA include: **Topographic**—7.5 Salmo Mountain, Washington, Idaho, British Columbia quadrangle, scale 1:24,000, issued by the U.S. Geological Survey in 1967; and **Geologic**—geologic map of the Sandpoint quadrangle, Idaho, scale 1:250,000 (Aadland 1979).

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