UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

ESTABLISHMENT RECORD

FOR

BUNCHGRASS MEADOWS RESEARCH NATURAL AREA

WITHIN

COLVILLE NATIONAL FOREST

PEND OREILLE COUNTY

WASHINGTON

☆ U.S. GOVERNMENT PRINTING OFFICE: 1983 - 425-976 - 415/6115

FS-6200-7 (10/73)

Establishment Record

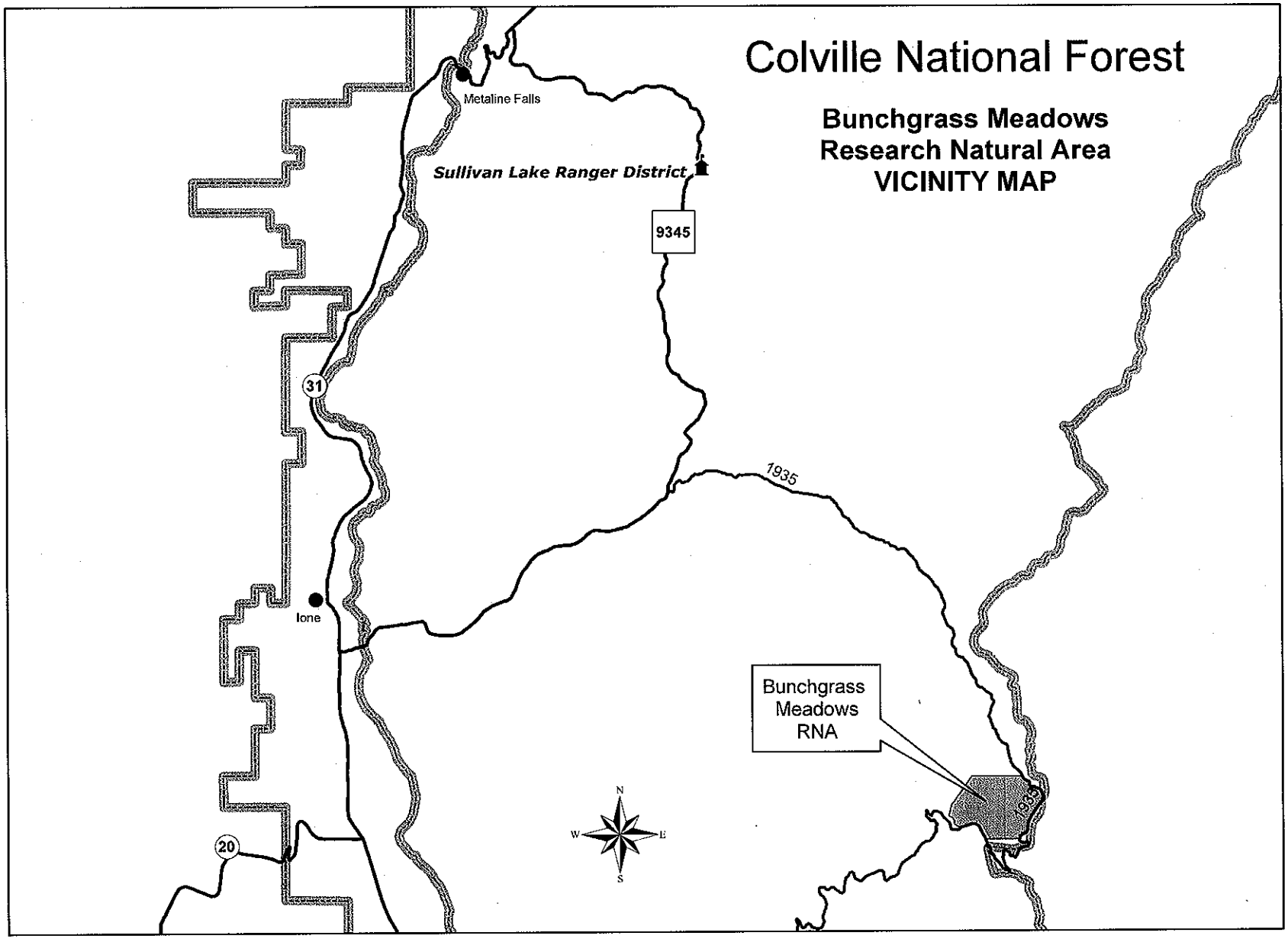
for the

Bunchgrass Meadows Research Natural Area

within the

Colville National Forest,

Pend Oreille County, Washington


Colville National Forest
Bunchgrass Meadows
Research Natural Area
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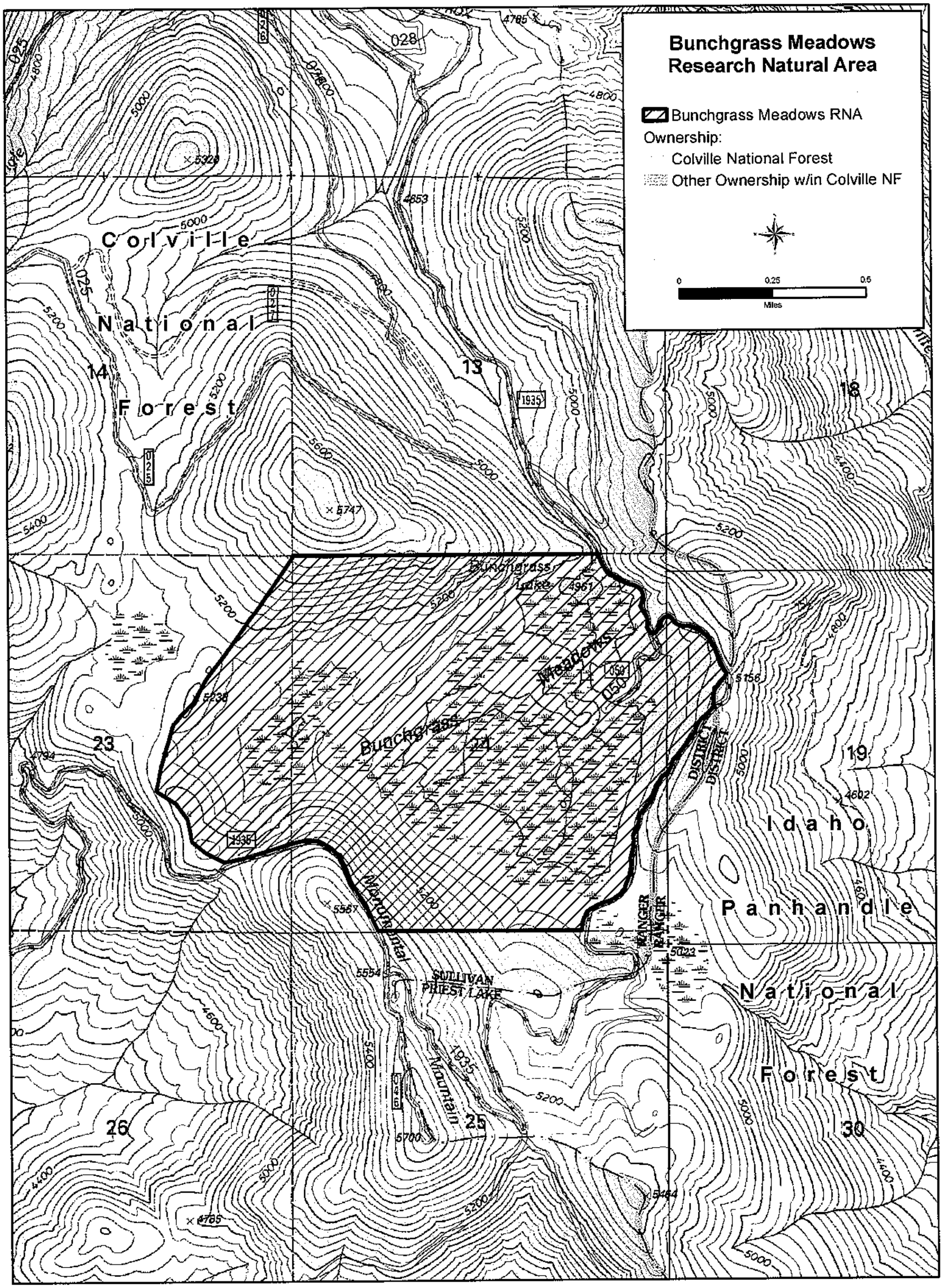
Bunchgrass Meadows
Research Natural Area
Bunchgrass Meadows RNA
Ownership:
Colville National Forest
Other Ownership w/in Colville NF
0
0.25
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Miles
Colville
National
Forest
Idaho
Panhandle
National
Forest
Bunchgrass
Lake
Bunchgrass
Meadows
SULLIVAN
PRIEST LAKE
RANGER
DISTRICT
Monumental
Mountain
13
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5747
5587
5554
5700
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4961
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5464
4602

Legal Description for Bunchgrass Meadows Research Natural Area

A tract of land located in Secs. 23 and 24, T. 37 N., R. 44 E., and Sec. 19, T. 37 N., R. 45 E., Willamette Meridian, Pend Oreille County, State of Washington; as per map drawn May 4, 2001, on file in the Supervisors Office of the Colville National Forest, Boundary Management unit, being more particulary described as follows:

Base of bearings is the geodetic meridian as predicated on the North American Datum of 1927(NAD27), as derived by mapping grade GPS observations. Aluminum monuments were set at selected angle points in this description and consist of a one inch outside diameter aluminum piston drive monument with a three and one quarter inch aluminum cap marked U.S. Dept. of Agriculture U.S. Forest Service, Bunchgrass Research Natural Area, 1999 with the appropriate angle point number.

Commencing at the Sec. corner common to secs. 13,14,23, and 24, T. 37 N., R. 44 E., which is an aluminum pipe with aluminum cap marked and set by PLS 20679, in 1979, with approximate geodetic coordinates of 48°42'00.1" North, and 117°11'01.7" West.

Thence;

S.34°01'W., 99.8 meters to a post,
S.34°05'W., 182.0 meters to a post,
S.38°43'W., 45.8 meters to a post,
S.31°51'W., 78.2 meters to a post,
S.33°00'W., 10.3 meters to Angle Point 1, in the bottom of the draw,
S.35°00'W., 102.0 meters to a post,
S.37°41'W., 139.2 meters to a post,
S.27°51'W., 118.9 meters to a post,
S.44°15'W., 128.1 meters to a post,
S.12°06'W., 115.3 meters to a post,
S.18°19'W., 83.3 meters to a post,
S.09°19'W., 100.3 meters to a post,
S.58°48'E., 103.8 meters to a post,
S.37°54'E., 80.0 meters to a post,
S.12°17'E., 103.9 meters to a post,
S.48°48'E., 75.7 meters to a post,
S.64°03'E., 89.8 meters to a post,

S.50°28'E., 14.1 meters to Angle Point 2, also 15.24 meters (50 feet) offset northwesterly from the centerline of Forest Road No. 1935000,

Thence parallel with and offset northerly of the road 15.24 meters (50 feet) in a generally easterly direction,

to Angle Point 3, on the section line 15.24 meters (50 feet) easterly of the point where Forest Road No. 1935000 intersects the section line between sections 24 and 25,

Thence S.89°23'E., 440.8 meters, along the marked and posted section line to the one quarter corner between sections 24 and 25, monumented with with an aluminum pipe and aluminum cap marked and set by PLS 20679 in 1997,

Thence N.89°33'E., 409.3 meters, along the marked and posted section line, to Angle Point 4, 15.24 meters (50 feet) westerly of where the section line intersects Forest Road No. 1935000,

Thence parallel with and offset westerly of the road 15.24 meters (50 feet) in a generally northerly direction,

to Angle Point 5, on the section line 15.24 meters (50 feet) westerly of the point where Forest Road No. 1935000 intersects the section line between sections 13 and 24,

Thence N.89°38'W., 495.9 meters, along the marked and posted section line to the one quarter corner corner between sections 13 and 24, monumented with an aluminum pipe and aluminum cap marked and set by PLS 20679 in1997,

Thence N.89°46'W., 809.5 meters, along the marked and posted section line, to the Sec. corner common to secs. 13, 14, 23, and 24, T. 37 N., R. 44 E., hereinfore described and being the point of beginning.

Said tract contains 287.9 hectares more or less, determined graphically with AutoCad.

Supplemental Statement:
There is a possible conflict with several historically used dispersed recreation sites near Angle Point 2 (Dispersed Site No. 2) and at another site with geodetic coordinates 48°41'11.1" North and 117°10'23.4" West (Dispersed Site No. 1), which reside wholly or in part inside the RNA boundaries. See Plat for details.

Remnants of an old telephone line can be seen inside the meadows.

Steel posts with metal RNA signs are set where noted. Along existing roads, offset 15.24 meters (50 feet) from the centerline of the traveleled way, numerous RNA signs have been attached to existing trees at spacing intervals of approximately 200 feet.

General Description: Bunchgrass RNA can be accessed from the intersection of Couny Road No. 9345(Sullivan Lake) with Forest Road No. 1935000(Harvey Creek), and following it approximately 14 kilometers to the point of intersection crossing the section line betweeen sections 13 and 24, T. 37 N., R.44E., and near Angle Point 5 of this description. Elevation ranges from approximately 1500 meters to 1680 meters.

I certify that the above boundary description of the Bunchgrass RNA was prepared by me or under my direct supervision.

/s/ Hugh Michael Harbin — May 11, 2001
Forest Land Surveyor, Colville National Forest — Date

ADMINISTRATIVE

SIGNATURE PAGE

for

RESEARCH NATURAL AREA ESTABLISHMENT RECORD

Bunchgrass Meadows Research Natural Area

Colville National Forest

Pend Oreille County, Washington

The undersigned certify that all applicable land management planning and environmental analysis requirements have been met and that boundaries are clearly identified in accordance with FSM 4063.21, Mapping and Recordation, and FSM 4063.41, Establishment Record Content, in arriving at this recommendation.

Prepared by Kathleen E. Ahlenslager 5/8/2008
Kathleen E. Ahlenslager, Forest Botanist Date
Colville National Forest

Recommended by Roberta B. Estes 5/7/2008
Roberta Estes, Acting District Ranger Date
Newport and Sullivan Lake Ranger Districts

Recommended by Rick Brazell 5/8/08
Rick Brazell, Forest Supervisor Date
Colville National Forest

Concurrence of Bov J. Eav 6/10/08
Bov Eav Date
Station Director, Pacific Northwest Research Station

DECISION NOTICE / DESIGNATION ORDER

AND

FINDING OF NO SIGNIFICANT IMPACT

Bunchgrass Meadows Research Natural Area

USDA Forest Service
Sullivan Lake Ranger District
Colville National Forest
Pend Oreille County
Washington

Introduction

The purpose of establishing the Bunchgrass Meadows Research Natural Area (RNA) is to contribute to a series of RNAs designed to "illustrate adequately or typify for research or education purposes, the important forest and range types in each forest region, as well as other plant communities that have special or unique characteristics of scientific interest and importance" (36 CFR 251.23).

An evaluation by the Regional RNA Committee in 1973, pursuant to direction in Forest Service Manual (FSM) 4063.04b, identified Bunchgrass Meadows RNA as suitable and desirable to represent a high elevation mountain meadow and associated bog, marsh area, subalpine permanent bog, a subalpine fir/Cascades azalea plant community, masked shrew, and northern bog lemming types for inclusion in the national RNA network. Bunchgrass Meadows RNA also provides habitat for several other species of rare plants, animals, and fish.

In the Forest Plan an area of 642-acres (260-hectares) was identified for Bunchgrass Meadows RNA. The Record of Decision for the Forest Plan recommended establishment of all proposed RNAs. The Forest Plan FEIS stated that the RNA Committee recommended acquiring an adjoining 155-acre (63-hectare) private parcel. This was accomplished on May 25, 1989. As directed in FSM (Forest Service Manual) 4063.1, the boundaries of the proposed RNA were enlarged to 797 acres (323 hectares) in order to protect the integrity of the sphagnum bog. These additional acres would allow conditions within the interior of the RNA to remain largely unmodified.

How the proposed Bunchgrass Meadows RNA contributes to the RNA network by providing examples of these community types is discussed in the Land and Resource Management Plan (Forest Plan) Final Environmental Impact Study (FEIS) for the Colville National Forest (p. III-131-136) and the State of Washington Natural Heritage Plan (2005).

In 1996 after discussions with the ranger district, the boundary was changed to parallel Road

1935 at a distance of 50 feet from the center-line of the roadway keeping the road outside of the RNA boundary to better protect the integrity of the RNA. The surveyed boundary of Bunchgrass Meadows RNA encompasses an area of 711.4 acres (287.9 hectares).

Decision

It is my decision to select Alternative A of the *Bunchgrass Meadows Research Natural Area Establishment and Forest Plan Amendment Environmental Assessment* and establish the 711.4 acres (287.9 hectares) Bunchgrass Meadows RNA. It shall comprise 711.4 acres (287.9 hectares) of land in Pend Oreille County, Washington on the Colville National Forest (Sullivan Lake Ranger District). The Bunchgrass Meadow RNA is located approximately twelve miles (19 km) southeast of Ione, Washington, in portions of Sections 23 and 24, Township 37 North, Range 44 East, and Section 19, Township 37 North, Range 45 East, Willamette Meridian. See Establishment Record "Location" and location map, attached.

The existing Special Use Permit with the Natural Resources Conservation Service to operate and maintain a SNOTEL site at Bunchgrass Meadows would continue. Access to the site (by the permit holder only) would continue to be with snowmobiles in the winter season, and by foot from Forest Road 1935 in the snow-free season.

This decision establishes a 711.4 acre (287.9 hectare) Bunchgrass Meadows RNA, which is to be managed according to direction provided in the Colville National Forest Land and Resource Management Plan (pp. 4-89 to 4-91). Reference should also be made to the Forest Plan FEIS for the Colville National Forest (pp. III-131 to III-136). Alternative A was selected because it provided the best long-term protection and recognition of the sphagnum bog and associated vegetative community types.

This formal designation of the 711.4-acre (287.9-hectare) RNA will amend the Forest Plan to change the allocation of the Bunchgrass Meadows area from "proposed" to "established" RNA (Management Area 4). This decision also includes minor adjustments to the boundaries of Management Area 4 in the Forest Plan, so as to be consistent with the RNA. The Forest Plan is also amended to allow for a recommendation to withdraw the 711.4-acre (287.9-hectare) RNA from mineral entry.

This decision is being made under the 2008 Forest Service planning regulations (36 CFR 219) which allow plan amendments to be made using the procedures from the 1982 planning regulations during the three-year transition period (36 CFR 219.14(b)(2). This amendment is being made using the 1982 procedures.

This is a non-significant amendment of the Forest Plan (FSM 1926.51-52) because:

1. The proposed action does not significantly alter the multiple-use goals and objectives for long-term land and resource management.
2. The adjustments of management area boundaries do not cause significant changes in the multiple-use goals and objectives for long-term land and resource management.
3. Changes in standards and guidelines are minor.
4. There are no opportunities identified for additional projects or activities that will contribute to achievement of the management prescription.

5. The changes would not significantly alter the long-term relationship between levels of multiple-use goods and services originally projected.
6. The changes would not have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period.

Public Involvement

Bunchgrass Meadows, was identified in the Forest Plan as a proposed RNA based on the relatively undisturbed conditions in the area in 1988. Comments on the Forest Plan received from interested and affected members of the public supported establishment of an RNA. At that time, a proposed Bunchgrass Meadows RNA provided the most appropriate site of a mid-elevation sphagnum bog for inclusion in the national RNA network.

Designation of proposed RNAs was considered during development of the Forest Plan and FEIS (p. II-117). Site conditions and public concerns were reviewed. General conditions and environmental effects of designation are much the same as described on pages II-117, III-131 to III-136 of the FEIS.

Scoping began with the 1988 Forest Plan. A scoping letter was mailed to the public in 1993. The Bunchgrass Meadows RNA proposal has been listed in the quarterly Schedule of Proposed Actions since spring, 1993. The only issue brought forth was that formal establishment of the RNA would restrict public access for berry picking, horseback riding, and ATV (All Terrain Vehicle) / snowmobile use of the area. However, this issue was not deemed a "significant" issue because RNA establishment would not restrict recreational berry picking, hiking, or horseback riding, and use of All Terrain Vehicles, (including snowmobiles) in Bunchgrass Meadow is already prohibited under the Forest Plan. Although the management prescription for Research Natural Areas in the Colville National Forest Plan states that plant collection is prohibited in RNAs, recreational berry picking will not affect the wetland values this RNA is designed to protect.

Other Alternatives Considered

Alternative B (No Action) would continue management of the proposed Bunchgrass Meadows RNA according to direction the Forest Plan until the Forest Plan is revised. This alternative would not meet guidelines in the Forest Plan for formal establishment of proposed RNAs.

Consistency with the Forest Plan and Legal Requirements

Forest Plan

The selected actions described above comply with the Colville National Forest Land and Resource Management Plan (Forest Plan), including amendments.

- The selected actions meet all standards and guidelines prescribed in Chapter 4 of the Forest Plan for Management Area 4, Research Natural Area (Forest Plan pages 4-89-91),
- The actions are consistent with Forest-wide Standards and Guidelines found on Forest Plan pages 4-35 through 4-60.

- The action would have no effect, and therefore is consistent with direction contained in Regional Forester's Forest Plan Amendment #2 and with INFISH (Inland Native Fish Strategy) direction.

The project is feasible and reasonable, and it results in applying management practices that meet the Forest Plan overall direction of protecting the environment while producing goods and services.

Legal Requirements

a. **National Forest Management Act of October 22, 1976 (NFMA):** Provisions of NFMA applicable to this project require the following: (a) resource plans and permits, contracts, and other instruments shall be consistent with the land management plan; (b) insure consideration of the economic and environmental aspects of management, to provide for outdoor recreation, range, timber, watershed, wildlife, and fish; and (c) provide for diversity of plant and animal communities. All of these considerations and requirements are addressed in the EA (see pages 5-8). Therefore, project actions are consistent with NFMA.

Finding of No Significant Impact

Based upon an environmental analysis documented in an environmental assessment, this decision (Alternative A) is not a major federal action that would significantly affect the quality of the human environment. Therefore, an environmental impact statement is not required. This determination is based on the following factors (40 CFR 1508.27):

Context.

*Although this is an addition to the national network of RNAs, both short-term and long-term physical and biological effects are limited to the local area (see EA page 8).

Intensity.

*Beneficial and adverse impacts were examined and they are not significant (see EA page 8).

*There are no known effects on public health and safety.

*Unique characteristics of the geographic area would be highlighted and better protected by formal RNA establishment. There would be no adverse effect to park lands, prime farmlands, wetlands, or wild and scenic rivers. No significant adverse effects are anticipated to any environmentally sensitive or critical areas (see EA pages 5-8).

*There are no effects on the quality of the human environment that were found to be highly controversial.

*Effects on the human environment are not uncertain, do not involve unique or unknown risks.

*The action is not likely to establish a precedent for future actions with significant effects.

*This action, when added to other actions, has no significant cumulative impact to natural resources or other components of the human environment (see EA page 8).

*There are no known effects on historical or cultural resources, or actual or eligible National Register of Historic Places sites (see EA page 8).

*The decision will not adversely affect any federally listed or proposed endangered or threatened species or regionally sensitive species of plants or animals or their critical habitat (see EA page 6).

*The proposed action is consistent with Federal, State, and local laws and requirements imposed for the protection of the environment.

Implementation

Implementation of this decision shall not occur within seven days following publication of the legal notice of the decision in the newspaper of record: *The Seattle Post-Intelligencer*.

Appeal Opportunities

This decision is subject to appeal pursuant to Title 36 CFR (Code of Federal Regulations) part 217 in effect prior to November 9, 2000 (see 36 CFR parts 200-295, revised as of July 1, 2005). Other than Forest Service Employees, any person or any non-Federal organization or entity may challenge a decision covered by this part and request a review by the Forest Service line officer at the next administrative level.

Any written notice of appeal of the decision must be fully consistent with 36 CFR 217.9, "Content of a Notice of Appeal." It is the responsibility of those who appeal a decision to provide a Reviewing Officer sufficient narrative evidence and argument to show why the decision by the lower level officer should be changed or reversed. At a minimum, an appeal must include the following:

1. State that the document is a Notice of Appeal filed pursuant to 36 CFR part 217;
2. List the name, address, and telephone number of the appellant;
3. Identify the decision about which the requester objects;
4. Identify the document in which the decision is contained by title and subject, date of the decision, and name and title of the Deciding Officer;
5. Identify specifically that portion of the decision or decision document to which the requester objects;
6. State the reasons for objecting, including issues of fact, law, regulation, or policy, and, if applicable, specifically how the decision violates law regulation, or policy;
7. Identify specific change(s) in the decision that the appellant seeks.

It is the responsibility of persons making an appeal to submit it by the close of the appeal period. The appeal must have an identifiable name attached or verification of identity will be required.

The notice of appeal must be filed hard-copy to:

Regular Mail
Chief, USDA Forest Service,
ATTN: EMC APPEALS,
Mail Stop 1104
1400 Independence Ave SW,
Washington, DC 20250-1104,

FedEx, UPS, Courier
Chief, USDA Forest Service
Ecosystem Management Coordination
Attn: Appeals
Yates Bldg., 3CEN
201 14th Street, SW
Washington DC 20024

The appeal must be postmarked or delivered within 45 days of the date the legal notice for this decision appears in the *Seattle Intelligencer* newspaper. The publication date of the legal notice in the *Seattle Intelligencer* is the exclusive means for calculating the time to file an appeal and those wishing to appeal should not rely on dates or timeframes provided by any other source.

The Forest Supervisor of the Colville National Forest will notify the local public of this decision with a legal notice in the *Colville Statesman Examiner* and *Newport Miner* newspapers, and mail a copy of the Decision Notice/Designation Order to all persons interested in or affected by the decision.

Contact Person
For more information on Bunchgrass Meadows RNA, contact Kathy Ahlenslager, Forest Botanist, Colville National Forest at 509-684-7178.

LIZ AGUILAR
Acting Regional Forester
Pacific Northwest Region (R6)

7/8/08
Date

ENVIRONMENTAL ASSESSMENT

ENVIRONMENTAL ASSESSMENT

Bunchgrass Meadows Research Natural Area Establishment and Forest Plan Amendment

USDA Forest Service
Colville National Forest
Sullivan Lake Ranger District
Pend Oreille County, Washington

Proposed Action

The proposed action is to establish a 711.4-acre (287.9-hectare) Bunchgrass Meadows Research Natural Area (RNA) and to manage it according to the direction provided in the Land and Resource Management Plan (Forest Plan) for the Colville National Forest (pages 4-89 to 4-91). Information and analysis is also provided in the Final Environmental Impact Statement (FEIS) of the Forest Plan (page III-133), to which this analysis is tiered.

A 642-acre (260-hectare) Bunchgrass Meadows proposed RNA was identified in the Forest Plan to be managed according to direction provided in the Forest Plan. The Record of Decision for the Forest Plan recommended establishment of all proposed RNAs. The FEIS states that the RNA Committee recommends acquiring an adjoining 155-acre (63-hectare) private parcel. This property was acquired in 1989. As directed in FSM 4063.1, the boundaries of the RNA were enlarged to 797 acres (323 hectares) in order to protect the integrity of the RNA.

In 1996 after discussions with the ranger district, the boundary was changed to parallel Road 1935 at a distance of 50 feet from the center-line of the roadway keeping the road outside of the RNA boundary to better protect the RNA. The surveyed boundary of Bunchgrass Meadows RNA encompasses an area of 711.4 acres (287.9 hectares). The proposed action, formal designation of the 711.4 acres (287.9 hectares) RNA by the Regional Forester, would amend the Forest Plan.

Forest Plan direction is that a recommendation be made to the USDI Bureau of Land Management (BLM) for withdrawal of the RNA from mineral entry (page 4-90). BLM makes the withdrawal decision after prescribed agency and public review. Should the lands be withdrawn, no new mining claims could be established. Existing claims could not be developed without a determination that valid existing rights had been established within each claim at the time of withdrawal.

Purpose and Need for Action

The purpose of establishing the Bunchgrass Meadows RNA is to contribute to a series of RNA's designated to "illustrate adequately or typify for research or education purposes, the important forest and range types in each forest region, as well as other plant communities that have special or unique characteristics of scientific interest and importance" (36 CFR 251.23).

A primary consideration in the selection of RNAs is the presence of multiple elements. Bunchgrass Meadows RNA contains three ecological communities, two sensitive plant species (Photo 1), and habitat for 12 threatened, endangered or sensitive animals or fish:

I. Terrestrial Ecosystems (WDNR 2005)
    a. subalpine fir/beargrass forest
    b. subalpine fir/Cascades azalea woodland
II. Wetland and Aquatic Ecosystems (WDNR 2005)
    a. subalpine sphagnum bog
III. Sensitive Plant Species (USDA FS 2004b; WDNR 2006 and 2006a)
    a. meadow pussytoes (*Antennaria corymbosa*)
    b. beaked sedge (*Carex rostrata*)
IV. Threatened, Endangered and Sensitive Animal Species (USDA FS 2004a)
    a. Endangered
        1. woodland caribou (*Rangifer tarandus caribou*)
    b. Threatened
        1. Canada lynx (*Lynx canadensis*)
        2. bull trout (*Salvelinus confluentus*)
        3. grizzly bear (*Ursus arctos)*
    c. Sensitive
        1. gray wolf (*Canis lupus*)
        2. Townsend's big-eared bat (*Corynorthinus townsendii*)
        3. American peregrine falcon (*Falco peregrinus anatum*)
        4. wolverine (*Gulo gulo luteus*)
        5. northern bald eagle (*Haliaeetus leucocephalus*)
        6. fisher (*Martes pennanti*)
        7. redband trout (*Onchorhynchus mykiss*)
        8. great gray owl (*Strix nebulosa*)

An evaluation by the Regional RNA Committee, pursuant to direction in Forest Service Manual 4063.04b, of the need for RNA's identified these types as suitable and desirable for inclusion in the national network. Establishment of the Bunchgrass Meadows RNA provides long-term protection and recognition of these types.

The Bunchgrass Meadows area was identified in the Forest Plan as a proposed RNA based on the relatively undisturbed conditions of these types in the area in 1987 and 1988. Forest Plan comments received from interested and affected members of the public supported establishment of an RNA in the area. Bunchgrass Meadows was determined at that time to provide the most appropriate site for inclusion in the national network for protection of the types identified above. Designation of future RNAs for protection of this type was considered during Forest Plan development (p. II-117). Since the Forest Plan was released in 1988, site conditions and public concerns have been reviewed; no important changes have occurred.

Decisions to be Made

Decisions to be made as a result of this environmental analysis are:

- Whether or not to formally establish the Bunchgrass Meadows Research Natural Area, amend the Forest Plan thus changing the designation from "proposed RNA" to "established RNA," and making minor modifications to the Management Area 4 boundaries to coincide with the RNA boundary.

- Weather or not to request that the Bunchgrass Meadow be withdrawn from mineral entry.

Public Involvement

Bunchgrass Meadows, was identified in the Forest Plan as a proposed RNA based on the relatively undisturbed conditions in the area in 1988. Comments on the Forest Plan received from interested and affected members of the public supported establishment of the RNA. At that time, a proposed Bunchgrass Meadows RNA provided the most appropriate site of a mid-elevation sphagnum bog for inclusion in the national RNA network.

Scoping began with the 1988 Forest Plan. A scoping letter was mailed to the public in 1993. The Bunchgrass Meadows RNA proposal has been listed in the quarterly Schedule of Proposed Actions since spring, 1993. The issues brought forth are described and discussed below.

Because site conditions have not changed appreciably since 1993 and issues were adequately identified at that time, it is unlikely that public concerns have changed, with the exception that OHV (Off-Highway Vehicle) use has increased across the Colville National Forest. Therefore, with addition of the OHV issue, additional formal scoping is not deemed necessary.

Issues

Issue Statement	Discussion	Issue Disposition
1. RNA establishment may reduce access for berry picking.	RNA establishment would not result in closure of any roads that are not already closed, and the RNA would not be closed to people picking berries.	This is not a significant issue because berry picking would not affect the wetland values the RNA is designed to protect, and would not be restricted by RNA establishment.
2. RNA establishment may limit horseback riding.	RNA establishment would not result in any reduction in road or trail access, and the RNA would not be closed to people riding horses.	This is not a significant issue because horseback riding would not be restricted by RNA establishment.
3. RNA establishment may eliminate ungroomed snowmobile trail access or off-road OHV use of the area.	The RNA area, which is Management Area 4 in the Forest Plan, already has a decision in place (Forest Plan Record of Decision, 12/29/1988) that closed the RNA area to off-road vehicle use. While formal establishment of the RNA may result in increased enforcement efforts, the decision to close the area to off-road vehicle travel is not a result of this proposal.	This is not a significant issue because closure to off-groomed-trail snowmobile use or off-road OHV travel is not a result of RNA establishment.

Issue Statement	Discussion	Issue Disposition
4, RNA establishment may restrict access to the SNOTEL facility.	The SNOTEL site is currently accessed via a user-created vehicle route (wheel tracks) between Road 1935 and the SNOTEL facility. The Natural Resources Conservation Service needs occasional vehicle access to the site for maintenance purposes during the summer, and snowmobile access for occasional snow course readings during the winter. Snowmobile access could be restricted to the existing vehicle route without adversely affecting the use of the SNOTEL facility.	This is not a significant issue because occasional low impact use by the Natural Resources Conservation Service for SNOTEL purposes (as is presently occurring) would continue to be allowed.
5. RNA establishment and subsequent withdrawal from mineral entry would eliminate mineral exploration and development in the RNA area.	There are no known patented mining claims within the RNA, nor is there any evidence of mineral exploration or development in or adjacent to the area. There are abandoned mining claims near the northeast corner of the RNA, but there is no record of any mineral exploration on these claims. The potential for salable minerals is considered low.	This is not a significant issue because potential for future mineral-related activity is low.

Alternatives

Alternative A, Proposed Action

Alternative A would designate a 711.4-acre (287.9-hectare) area as the Bunchgrass Meadows RNA. The Forest Plan included an area of 642 acres (260 hectares) for Bunchgrass Meadows with the intent of acquiring an additional 155-acre (63-hectare) private parcel from Burlington Northern (page 4-33). This land was acquired in 1989 and is described in the attached Establishment Record. The portion of the acquired area suitable for inclusion in the RNA was allocated to Management Area 4. This alternative would provide long-term protection for the area. The area would be recommended for withdrawal from mineral entry.

Management of the RNA is included in the Forest Plan (pages 4-89 to 4-91). It prohibits off-road vehicle use, scheduled timber harvest including salvage and/or firewood harvest, the issuing of special use permits and rights-of-way grants, and new physical improvements for recreation.

Road access in the Bunchgrass Meadows RNA was identified as an issue though scoping. The designation of Bunchgrass Meadows as an RNA would not restrict use of Road 1935. The Forest Plan (page 4-33) states that a protection system will be developed for Bunchgrass Meadows, which includes barriers and use restrictions. Off-road vehicles previously gained access to the meadows by the spur Road 1935050, but in 1993 Road 1935050 was decommissioned and boulders were placed at the end of it to prevent access. In 2007 36 CFR 261.50(a) and 36 CFR 261.56 were designated to restricted off road and trail use by motorized vehicles.

The existing Special Use Permit with the Natural Resources Conservation Service to operate and maintain a SNOTEL site at Bunchgrass Meadows would continue. Access to the site (by the permit holder only) would continue to be with snowmobiles in the winter season, and by foot from Forest Road 1935 in the snow-free season.

Alternative B, No Action

This alternative would continue management according to direction in the Forest Plan (pages 4-89 to 4-91) for proposed RNAs until the Forest Plan is revised. Only short-term protection of the area, dependent on the life of the Forest Plan, would be provided. In the short-term, management of the area would be the same as in Alternative A. The environmental consequences of Alternative B, the "No Action" alternative, are described in the FEIS for Colville National Forest Plan (page, IV-135).

Differences between the Alternatives

Alternative A (Establish RNA)	Alternative B (No Action - Do not establish RNA)
Purpose and Need: Bunchgrass Meadows RNA would be established. Forest community types of subalpine fir/Cascades azalea woodland, subalpine fir/beargrass forest, grand fir/big huckleberry forest, mid-elevation permanent pond, and mid-elevation sphagnum bog would contribute to the series of RNA's designated to "illustrate adequately or typify for research or education purposes, the important forest and range types in each forest region, as well as other plant communities that have special or unique characteristics of scientific interest and importance.	Bunchgrass Meadows RNA would not be established. Forest community types of subalpine fir/Cascades azalea woodland, subalpine fir/beargrass forest, grand fir/big huckleberry forest, mid-elevation permanent pond, and mid-elevation sphagnum bog would not contribute to the series of RNA's.
Issues:	
Access for berry picking would not be affected under either alternative.	
Opportunity for horseback riding would not be affected under either alternative	
Enforcement efforts to restrict off-trail snowmobile or off-road vehicle use may be increased.	Enforcement efforts to restrict off-trail snowmobile or off-road vehicle use would not be increased solely as a result of RNA establishment. (However, enforcement efforts may increase for reasons not related to the RNA.)
NRCS access to the SNOTEL facility will not be affected under either alternative.	
The request would be made to withdraw 711 acres (287.9 hectares) from mineral entry.	The request would not be made to withdraw the area from mineral entry.

Existing Conditions and Environmental Effects

Recreation

Existing Condition: The Bunchgrass Meadows RNA does not contain any developed trails or developed recreational facilities. The area is used occasionally for dispersed recreational activities such as berry picking, hiking, horseback riding, wildlife viewing, hunting, etc.

The area, including the RNA area, is occasionally used for OHV and snowmobile riding. The RNA area, which is Management Area 4 in the Forest Plan, has a decision in place (Forest Plan Record of Decision, 12/29/1988) that closed the RNA area to off-road vehicle use. Illegal motorized access is gained through the unmaintained road to the Natural Resources Conservation Service (NRCS) SNOTEL weather station. The only reason for the road is for NRCS use, so access control measures to limit use of the road to the NRCS will be taken.

Effects of Alternative A or B: Neither alternative would result in closure of any roads that are not already closed. The RNA would not be closed to people picking berries, hiking, riding horses, viewing wildlife, hunting, or any other low-impact dispersed recreational activity. Formal establishment of the RNA (Alternative A) may result in increased enforcement efforts to restrict use of the RNA to OHVs and snowmobiles.

Mining

The environmental consequences of Alternative A, with regards to mining, are described in the FEIS for Colville National Forest (pages III-136, IV-86 and IV-87.). This alternative would result (subject to BLM's decision) in the withdrawal of 711.4 acres (287.9 hectares) of land having low potential for uranium and tungsten from mineral entry. Except for possible valid existing rights, there would be no risk for direct or indirect impacts from mineral exploration and development within the RNA.

For Alternative B, no additional acreages would be withdrawn. The basin would remain open to mineral entry. Potential mineral exploration or development in these areas offers a very low risk of indirect impacts to the meadow and its features.

Invasive Plants

The RNA is for the most part free of invasive plants, however Road 1935 on the periphery of the RNA is an avenue for their introduction. Restricting OHV use from the meadow should prevent direct invasive seed transport to the RNA.

Fish, Wildlife and Sensitive Plants

Management for Threatened, Endangered and Sensitive wildlife within the Selkirk Mountains Ecosystem is directed toward providing suitable habitat conditions and the necessary seclusion needed for these species to survive. Although the RNA is a small area, the improved seclusion and habitat protection provided in this area would contribute positively to other efforts (i.e. road

closures) to reduce encounters between humans and these wildlife species within the general area. Habitat improvement is generally not appropriate in RNAs. In regard to the Woodland Caribou Guidelines, the management of Bunchgrass Meadows as a RNA is consistent with the management of woodland caribou habitat.

No federally threatened, endangered or proposed plant species are known or suspected to occur with the RNA. Establishment and management of this area as a RNA would provide a high level of protection for the sensitive plant species occurring there.

Range Management

The LeClerc Allotment is adjacent to the RNA; however, the RNA is not currently within the bounds of the grazing allotment, and there are no permitted livestock in the Bunchgrass Meadows area. Grazing is not a tool to maintain the vegetative communities at Bunchgrass Meadows. Any problems concerning trespassing cattle will be quickly corrected and the situation monitored. The current permit holder is responsive to moving the cattle when they trespass. Because grazing is not currently permitted within the Bunchgrass Meadows area, formal establishment of the RNA would not affect livestock grazing.

Special Use Permits

An existing special use permit issued on September 9, 2003 to the Natural Resources Conservation Service (NRCS) authorizes the operation and maintenance of a SNOTEL site at Bunchgrass Meadows. This SNOTEL site provides research data. The USDA Natural Resources Conservation Service (NRCS) has maintained this permanent snowcourse and SNOTEL site within Bunchgrass Meadows RNA Since 1936. The purpose of the authorized activity is "making snow surveys and related measurements pursuant to the Memorandum of Agreement effective October 1, 1988, between the USDA - Soil Conservation Service (Oregon and Washington State Offices) and USDA - Forest Service (Region 6); Ref. Forest Service Manual 1541.1, R6 supplement 1500-906, August 1, 1990." Although the Forest Plan states that Special Use Permits are not to be issued in Management Area 4, it also states that the Forest Service will protect cooperative snow courses, as required by current agreement with the NRCS.

The Forest Plan states that research facilities installed within RNAs will blend with the natural surroundings. The snowcourse is marked only by a limited number of metal signs which are not readily apparent to visitors to the meadows. The SNOTEL site is located on the eastern edge of the meadows and is masked by trees along the meadow.

Access for the two scheduled winter visits is by over snow machines (i.e. snowmobile, snowcat) on Road 1935 to the SNOTEL site, while the one scheduled summer visit is accessed by vehicle on Road 1935, then by foot and ATV to the site. An approximately 200-yard (183 meter) "wheel track" trail connects Road 1935 to the SNOTEL site.

Under both Alternatives A and B, the Special Use Permit for the SNOTEL site would continue, and access to the site would continue to be as described above. Therefore, neither alternative would have any effect on the Special Use Permit with the NRCS.

A military training permit was issued by the Colville National Forest in 1966 and terminated in 1986, when a Memorandum of Understanding was signed. The Memorandum of Understanding was closed in 1990, when a supplement was signed. It was in effect until December 31, 2000. Bunchgrass Meadows RNA is no longer within the permit area for the Air Force Survival School. Training areas that were located on the east side of the Pend Oreille River were dropped due to threatened and endangered wildlife concerns in the permit issued March 23, 2001.

Other Resources (soil, water, heritage, fuels and fire suppression, visual quality)

The establishment of this RNA would have no negative effects on the resources of soil, water, heritage, fuels and fire suppression, or visual quality.

Effects Summary

There are no adverse irreversible or irretrievable environmental effects. There are no significant cumulative effects of establishing the RNA. In addition, the management protection proposed for the RNA is expected to conserve and maintain the basic soil and water resources of the area through the lack of disturbance. Bunchgrass Meadows is the headwaters of Harvey Creek, a major subwatershed of the Sullivan Creek watershed.

Possible outcomes of selecting Alternative B would include resubmitting the RNA for establishment at a later date, or another proposed area with similar forest and range types would be submitted in the future in order to include these types in the national network. There are no significant cumulative effects of this alternative. There is a low potential that management activities in the higher portion of the basin could negatively impact the meadow and the features of interest.

Agencies and Persons Consulted

Agency personnel consulted in designing and analysis of this project include:

Kathy Ahlenslager, Forest Botanist
Paula Barreras, retired Forest Geologist
Tim Bertram, former Sullivan Lake Ranger District Wildlife Biologist
Jay Berube, retired Forest Ecologist
Travis Fletcher, Range Specialist
Nancy Glines, Soil Scientist
Bud Kovalchik, retired Area Ecologist
Rodney Lentz, Area Mining Geologist
Daniel Mattson, retired Forest Archaeologist
Jim McGowan, Forest Wildlife Biologist
Penny Miller, former Information Assistant, now Rocky Mountain Research Station Program Assistant
Jim Parker, Forest Environmental Coordinator
Connie Smith, former Forest Environmental Coordinator, now Region 3 Appeals Assistant
Bert Wasson, retired Forest Hydrologist

Agencies and tribes consulted on this project include:

Big Bend Economic Development Council
Colville Tribal Council
Idaho Panhandle National Forest
Natural Resources Conservation Service
Okanogan-Wenatchee National Forest
Spokane Tribal Council
U.S Bureau of Land Management
U.S. Environmental Protection Agency
U.S Fish and Wildlife Service
Washington Department of Natural Resource, Natural Heritage Program
Washington State Department of Wildlife

Individuals that commented on this project include:

Mike Borysewicz
Duane Dipert
Tim Hays
Jack Knosbruck
Gayle McKellar
Katie May Mogen
William Riley
Tom Rogers
Curt Soper, the Nature Conservancy
William Steele
A.K. Stirling
Karen Sullens, Backcountry Horsemen of Washington
James Taylor
Maurice Vial
Joe Walicki, Washington Wilderness Coalition
John Walker, Colville Driftriders Snowmobiling Club
Clint Watkins

TEXT

Introduction

Bunchgrass Meadows Research Natural Area (RNA) is located in the Selkirk Mountains of northeastern Washington, east of the Pend Oreille River. It is on the Colville National Forest and is administered by the Sullivan Lake Ranger District. The area is 12 miles (19 km) southeast of Ione. The 711.4 acre (287.9 hectare) RNA consists of bog and fen communities, meandering streams and ponds, and forested slopes. The RNA is not within a designated wilderness, wild and scenic river, national recreation area, or other Congressionally designated area.

In an August 16, 1970, memo to the Colville Forest Supervisor, Bob Smart, Earle Layser, an Environmental Biologist, recommended an inventory of a five acre (two hectare) bog/sedge meadow within Bunchgrass Meadows as a potential botanical area (Layser 1970). Two years later in 1972, Layser wrote a letter to the files describing the area as "the most unique biological area on the Colville National Forest (Layser 1972)."

In a November 2, 1972 letter to Smart, Charles Wellner of the Northern Region RNA committee stated that the committee was especially interested in the area and wanted to take another look at it (Ward 1980). That year, personnel on the Colville National Forest evaluated several management alternatives for the area in conjunction with an analysis of the Harvey Creek Planning Unit (Javorka 1972a).

The Northern Region RNA committee discussed the area on May 30, 1973 and documented their findings in a July 11, 1973 letter to Ed Javorka, Multiple Use Coordinator. The RNA committee was unanimously in support of RNA status and felt the area was unique, ecologically valuable and in need of protection. They recommended including as much diversity as possible when establishing the boundary and suggested expanding the boundary through land exchange or cooperative agreements to include a privately owned parcel. They stated that cattle grazing and uncontrolled public use are incompatible with the unique ecological values of the area (Ward 1980).

In 1980 the Pacific Northwest Region Natural Area Committee recommended Bunchgrass Meadows RNA for the Colville National Forest (Greene 1980). In 1985 Reid Schuller recommended it as a Washington Natural Heritage Program Natural Area Preserve (Schuller 1985).

Justification

Justification Statement

A number of strong justifications exist for establishment of the Bunchgrass Meadows RNA. Wetlands throughout Washington have been increasingly impacted by human activities, such as livestock grazing, water diversions and development. Montane forests are also frequently managed for silvicultural purposes. Identification and protection of the remaining pristine wetlands in these areas is essential.

Within the Canadian Rockies Ecoregion, there are few examples of wetland ecosystems represented within the RNA system and no examples of mid-elevation permanent ponds,

sphagnum bogs or drainage basins (WDNR 2007a). This RNA is designed to include not only the sphagnum bogs, but the hydrological processes and geological features which support the dynamic natural ecosystem of Bunchgrass Meadows.

Individuals from the fields of botany, wetland ecology, wildlife biology, geology and hydrology have visited the RNA, and have contributed to the information contained in this Establishment Record. All strongly support RNA designation of the area. The site has attracted inventory efforts by the Washington Natural Heritage Program and the Washington Native Plant Society.

The Bunchgrass Meadows RNA should be recognized and valued because of the high quality condition of the watershed in which it is located in comparison to similar ecosystems in other locations, and because of the overall size and biological diversity of the wetland ecosystem compared to other areas. Overall, it provides an outstanding example of a mid-elevation permanent pond and sphagnum bog in the Canadian Rockies Ecoregion.

Principle Distinguishing Features

One of the unique features of Bunchgrass Meadows is the combination of physical features, elevation, land surface, relief and water regimen present for this geographic area. The occurrence of a moist to wet and low relief ground surface at a moderately high elevation creates habitat capable of supporting plants and animals typical of sites from higher elevations and more northerly latitudes than are generally found in this region.

The Bunchgrass Meadows RNA is an area of significant ecological interest. In particular, the area is an excellent example of a high elevation sphagnum bog with true bog and fen communities, including islands of Engelmann spruce (*Picea engelmannii*) and subalpine fir (*Abies lasiocarpa*).

The forested slopes surrounding the meadows are dominated by a subalpine fir/Cascade azalea (*Abies lasiocarpa/Rhododendron albiflorum*) plant association. The meadows contain small ponds and meandering streams. Three permanent ponds occupy two acres (1 ha) within the meadows. These are fed in part by a small stream, a spring, and through flow which have created a series of organic debris dams which are set back from the ponds 100 feet (31 m) or more. The stream meanders eastward into the main portion of Bunchgrass Meadows. The northeastern corner of the RNA is the headwaters for Harvey Creek. An ecologcial evaluation of Bunchgrass Meadows is included in this document (Appendix 1).

Objectives

The Forest Service Manual 4063 states the objectives for the establishment of RNAs as follows (USDA FS 2005):

1. Preserve a wide spectrum of pristine representative area that typify important forest, shrubland, grassland, alpine, aquatic, geological, and similar natural situations that have special or unique characteristics of scientific interest and importance that, in combination, form a national network of ecological areas for research, education, and maintenance of biological diversity.
2. Preserve and maintain genetic diversity.
3. Protect against serious environmental disruptions.

4. Serve as reference areas for the study of succession.
5. Provide onsite and extension educational activities.
6. Serve as baseline areas for measuring long-term ecological changes.
7. Serve as control areas for comparing results from manipulative research.
8. Monitor effects of resource management techniques and practices.

Land Management Planning

Bunchgrass Meadows RNA was recommended for establishment in the Colville National Forest Land and Resource Management Plan (LRMP) and is described in the Final Environmental Impact Statement of the LRMP (USDA FS 1988).

The area recommended in the LRMP was the 642 acres (260 hectares) managed by the Colville National Forest with a recommendation that an additional privately held 155 acres (63 hectares) in section 23 of T37N R44E, be acquired and included in the RNA to fully protect the obviously unique values of the area. Colville National Forest acquired the privately held parcel on May 25, 1989. With that acquisition, the RNA was expanded to 711.4 acres (287.9 hectares). As part of the Decision Notice establishing the RNA, the LRMP for the Colville National Forest will be amended to include the additional 155 acres (63 hectares) of the Bunchgrass Meadows RNA.

Bunchgrass Meadows is included within the Harvey Creek Roadless Area, which is managed for multiple use according to the Washington State Wilderness Act of 1984, in accordance with land management plans pursuant to Section 6 of the Forest and Rangeland Renewable Resources Act of 1974 (USDA FS 1988).

The RNA was included in an agreement with the U. S. Air Force dated June 18, 1969, which provided for use of this area as part of a survival training area for USAF flight personnel through the training center at Fairchild Air Force Base near Spokane, Washington (USDA FS 1988). With the issuance of a new permit on March 26, 2001, this area is no longer within the permit area for the Air Force Survival School due to threatened and endangered wildlife concerns.

Management Prescription

Bunchgrass Meadows RNA is included, along with other RNAs in the Land and Resource Management Plan for Colville National Forest under Management Area 4 (USDA FS 1988). Management Area 4 (Appendix 2) includes goals and management standards for resource elements. Such activities as livestock grazing, logging and mining will be prohibited. Recreational use will not be encouraged. No roads will be constructed and there will be no reconstruction of old roads. Existing trails can be maintained, but no new trails are permitted.

Use or Control of Fire and Grazing

Management and protection of the Bunchgrass Meadows RNA will be directed toward maintaining natural features and natural ecological processes. Since fire and livestock grazing are not tools to protect and preserve the natural environment of this RNA, it should be protected

from fire and livestock grazing. The Land and Resource Management Plan for the Colville National Forest (USDA FS 1988) stated the following in case of wildfire:

> "Unless plans approved by the station director provide for letting natural fires burn, aggressive containment using low impact methods should be used. High impact methods will be used only to prevent a total loss of the Research Natural Area. Mop-up should be minimized with natural burnout being the preferred method.
>
> Initial attack and suppression methods will be designed to maintain RNA characteristics."

ECOLOGICAL EVALUATION

APPENDIX 1

Appendix 1. Ecological Evaluation.

Physical Site Description and Climatic Conditions

Location
Bunchgrass Meadows RNA is located within Colville National Forest on the Sullivan Lake Ranger District in Pend Oreille County of Washington (Map 1). It lies within the Selkirk Mountains of northeastern Washington about 12 miles (19 km) southeast of Ione.

The center of the RNA is at latitude 48° 41' 30" north and longitude 117° 11'15" west. The Universal Transverse Mercator (UTM) system coordinates are 5393000m Northing and 486500m Easting, as shown on the USGS 7.5 minute topographic Monumental Mountain quadrangle map of 1967, photo-revised in 1986 (Map 2). Bunchgrass Meadows RNA includes parts of the following sections: T37N, T44E, Section 23, East 1/2; T37N, T44E, Section 24; and T37N, R45E, Section 19, West 1/2 of Northwest 1/4. Aerial photos of July 30, 2000 show Bunchgrass Meadows on flight lines 40-154-208 and 40-154-209.

Size
The total area of Bunchgrass Meadows RNA is 711.4 acres (287.9 hectares).

Elevation
Elevations within the RNA range from 4961 feet (1513 m) to 5500 feet (1677 m) elevation.

Access
Bunchgrass Meadows is accessible by Forest Service Road 1935, a seasonally-open dirt and gravel road, which is only accessible by snowmobile during the winter. The road connects to County Highway 9345 one and a half miles (2.4 kilometers) south of Sullivan Lake. Bunchgrass Meadows is about ten miles (16 kilometers) south of this intersection (Map 1). Access to the RNA is shown on USDA Forest Service maps of the Colville National Forest.

Climate
An existing special use permit issued on September 9, 2003 to the Natural Resources Conservation Service (NRCS) directs the operation and maintenance of a SNOTEL site at Bunchgrass Meadows (DiRienz 2006). The purpose of the authorized activity is "making snow surveys and related measurements pursuant to the Memorandum of Agreement effective October 1, 1988, between the USDA - Soil Conservation Service (Oregon and Washington State Offices) and USDA - Forest Service (Region 6); Ref. Forest Service Manual 1541.1, R6 supplement 1500-906, August 1, 1990."

At the SNOTEL site measurements are taken of snow depth and other characteristics that estimate seasonal streamflows. The permit authorizes the NRCS to "perform all work necessary to keep data collection stations reasonably clear of vegetation and debris, including dangerous trees, within will interfere with the authorized activities."

The NRCS has maintained a snow course under a Special Use Permit since 1936 and a SNOTEL (telemetered snow site) since 1979. These sites provide vital data on snowpack conditions for

summer streamflow forecasts. The site is located at the edge of the meadow and has an insignificant effect on the RNA ecosystem (Davis 1979, USDA FS and USDA SCS 1988, and DiRienz 1992). The sites are visited occasionally for maintenance and measurement of snow conditions.

The climate for northeastern Washington is influenced by air masses from the continent and the Pacific Ocean that cross the area. Winters are rather long and occasional outbreaks of cold air from the Canadian arctic result in low temperatures. Air from over the ocean has a moderating influence throughout the year. Summers are warm with light rainfall.

The primary factors influencing climate are latitude, topography, distance from the ocean, the prevailing westerly winds, and the development and movement of weather systems over the North Pacific. The Rocky Mountains protect eastern Washington from outbreaks of cold air, although some enter each winter. Cooling and condensation occur as air from the northeast rises over the 5,000 to 7,000 foot (1524 to 2134 m) peaks of the Selkirk range. This serves to increase the amount of cloudiness, precipitation, and the number of lightning storms as compared to other areas east of the Cascade Mountains. Throughout the year, maritime air from the Pacific has a moderating influence while extreme temperatures are observed with drier air from the interior (Phillips and Durkee 1972).

Data from the NRCS SNOTEL site in Bunchgrass Meadows indicates average monthly precipitation for the period 1984 to 1995 varied from 41 to 60 inches (1.0 to 1.5 m) with 70 percent of that precipitation in the form of snow. Average monthly temperatures may range from a summertime high of about 55°F (13°C) to a wintertime low of about 15°F (-9°C) (USDA NRCS 1996).

Month	**Precipitation (inches / cm)**
January	5.69 / 14.45
February	3.76 / 9.55
March	4.69 / 11.91
April	4.25 / 10.80
May	4.56 / 11.58
June	4.30 / 10.92
July	2.25 / 5.72
August	1.61 / 4.09
September	1.96 / 4.98
October	3.08 / 7.82
November	7.66 / 19.46
December	5.44 / 13.82
TOTAL	49.25 / 125.10

Ecological Description

Ecoregion

Bunchgrass Meadows RNA lies within the Canadian Rockies Ecoregion (WDNR 2007b).

Plant Community Types

Although the vegetation of the RNA has not been studied or type-mapped in detail, the following are estimates by cover types (Berube 1991, Richardson 1992) (Map 3) using several classifications.

	Estimated Area Acres (Hectares)
2007 Washington Natural Heritage Plan (2007a)	
Subalpine fir/Cascade azalea	398 (161)
Subalpine fir/beargrass	82 (33)
Subalpine fir/big huckleberry	18 (7)
Subalpine sphagnum bog	299 (122)
TOTAL	711.4 (287.9)
Forested Plant Associations (Williams, Lillybridge, Smith 1990)	
Subalpine fir/Cascade azalea	253 (102)
Subalpine fir/Cascade azalea-beargrass	145 (59)
Subalpine fir/beargrass	82 (33)
Subalpine fir/big huckleberry	18 (7)
Aquatic, riparian, or wetland	299 (122)
TOTAL	711.4 (287.9)
Society of American Foresters Cover Types (Eyre 1980)	
High Elevations	
Englemann Spruce - Subalpine Fir (Type 208)	473 (192)
Middle Elevations, Interior	
Lodgepole Pine (Type 218)	25 (10)
Non-forested	299 (121)
TOTAL	711.4 (287.9)
Kuchler Types (Kuchler 1964)	
Lodgepole Pine - Subalpine Forest (Type 8)	25 (10)
Western Spruce - Fir Forest (Type 14)	473 (192)
Non-forested	299 (121)
TOTAL	711.4 (287.9)

The forested plant associations occurring in the Bunchgrass Meadows RNA (Williams, Lillybridge, and Smith 1990) are described below:

A. Subalpine Fir/Cascade Azalea (*Abies lasiocarpa/Rhododendron albiflorum*)

This plant association typifies cool-moist upper slopes on northerly aspects with deep, slow melting snowpacks. The overstory is dominated by subalpine fir, lodgepole pine (*Pinus contorta*) and western larch (*Larix occidentalis*). The understory is a dense layer of Cascade azalea, occurring in 100% of the plots with an average cover of 22%. Other important understory species include grouse huckleberry (*Vaccinium scoparium*), big huckleberry (*V. membranaceum*), low huckleberry (*V. myrtillus*) and rusty menziesia (*Menziesia ferruginea*). Herbs are poorly represented. Fires are relatively infrequent in these wet sites.

B. Subalpine Fir/Cascade Azalea-Beargrass (*Abies lasiocarpa/Rhododendron albiflorum-Xerophyllum tenax*)

The association typifies cool-moist to cold-wet upper slopes on westerly slopes in areas of high precipitation. Subalpine fir dominates the overstory and understory with scattered Engelmann spruce (*Picea engelmannii*). Undergrowth is characterized by a dense layer of shrubs with Cascade azalea and beargrass as the most common species. Other common shrubs include big huckleberry (*Vaccinium membranaceum*), Utah honeysuckle (*Lonicera utahensis*), mountain ash (*Sorbus scopulina*), pachistima (*Paxistima myrsinites*) and rusty menziesia (*Menziesia ferruginea*). Herbs are poorly represented. Fires are relatively infrequent in these wet sites.

C. Subalpine Fir/Beargrass (*Abies lasiocarpa/Xerophyllum tenax*)

This association is typically found on south or west aspects with relatively rocky, acid soils. It is characterized by open patchy stands of subalpine fir over a dense shrub layer of mostly beargrass and big huckleberry (*Vaccinium membranaceum*). Engelmann spruce (*Picea engelmannii*), western hemlock (*Tsuga heterophylla*) and western redcedar (*Thuja plicata*) may also be present. Common shrubs include mountain ash (*Sorbus scopulina*) and big huckleberry (*Vaccinium membranaceum*). Herbs are inconspicuous.

D. Subalpine Fir/Big Huckleberry (*Abies lasiocarpa/Vaccinium membranaceum*)

This association typifies cool, relatively dry sites within the subalpine fir series. Subalpine fir dominates the overstory and understory tree layers. Western larch (*Larix occidentalis*) and Douglas-fir (*Pseudotsuga menziesia*) also occur. Common shrubs include big huckleberry (*Vaccinium membranaceum*), pachistima (*Paxistima myrsinites*, prince's pine (*Chimaphila umbellata*, shiny-leaf spirea (*Spiraea betulifolia*) and Utah honeysuckle (*Lonicera utahensis*). Pinegrass (*Calamagrostis rubescens*) is usually abundant in the undergrowth. Fires are relatively frequent.

The eight aquatic, riparian, and wetland plant associations found in the RNA (Kovalchik and Clausnitzer 2004) are described as follows:

A. Bluejoint Reedgrass (*Calamagrostis canadensis*)

The bluejoint reedgrass plant association was observed on two sites in Bunchgrass Meadows. One site was on some of the large drier, well-developed bog moss dams. Here soils are a deep moss and graminoid peat. The soil surface is saturated in June, lowering to about 12 inches (30

cm) below the soil surface in September. The other site is more common and occurs at the margin of the meadows on the transition to uplands. Here the soils are silt with a high portion of fine organic matter. The water table was 25 inches (65 cm) below the soil surface in August. Bluejoint reedgrass is the dominant plant. Other graminoids include leafy tussock sedge (*Carex aquatilis*), inflated sedge (*C. vesicaria*), tall cottongrass (*Eriophorum angustifolium* ssp. *subarcticum*) and slender muhlenbergia (*Muhlenbergia filiformis*). Forbs include small bedstraw (*Galium trifidum)*, elephanthead (*Pedicularis groenlandica*), purple marshlocks (*Comarum palustre*), and violets (*Viola* spp.).

B. Leafy Tussock Sedge (*Carex aquatilis*)

Aquatic sedge plant association is common in the large, flat fen within the large southeast part of Bunchgrass Meadows. It intergrades with the Northwest Territory sedge (*Carex utriculata*) plant association on wetter sites and the blue-joint reedgrass (*Calamagrostis canadensis*) plant association on drier ones. Soils are deep sedge peat. Sphagnum moss is not abundant. The site is shallowly flooded in June with the water table about 2 inches (5 cm) above the soil surface. It lowers to 6 to 22 inches (15 to 55 cm) below the soil surface in September. The soils surface remains wet season long. Aquatic sedge is dominant. Other graminoids include bluejoint reedgrass (*Calamagrostis canadensis*), Northwest Territory sedge (*Carex utriculata*) and tall cottongrass (*Eriophorum angustifolium* ssp. *subarcticum*). Forbs include small beadstraw (*Galium trifidum*) and purple marshlocks (*Comarum palustre*).

C. Mud Sedge (*Carex limosa*)

This plant association occurs on very wet sites above bog moss dams. Soils are deep sedge peats. The site is shallowly flooded about 6 inches (15 cm) above the soil surface early in the summer. The water table remains near the soil surface season long and lowers to about 4 inches (10 cm). The peat soil below the rooting zone is moderately fluid, so that the site often feels "quaking." Mud sedge dominates other herbaceous plants which include tall cottongrass (*Eriophorum angustifolium* ssp. *subarcticum*), leafy tussock sedge (*Carex aquatilis*), beaked sedge (*Carex rostrata*) and scheuchzeria (*Scheuchzeria palustris*). Mosses are poorly represented due to the rather permanently flooded nature of the site.

D. Beaked Sedge (*Carex rostrata*)

This was the first recorded sighting of beaked sedge in Washington. It is unusual that so rare a plant dominates these sites. In Bunchgrass Meadows, this plant association occurs on three small areas on quaking sedge mats behind bog moss dams. The water table is at or slightly above the soil surface throughout the growing season. The first eight inches (20 cm) of soil is essentially a sedge root mat. Subsurface soil is a liquid sedge peat. Beaked sedge dominates the site. Mud sedge (*Carex limosa*), Northwest Territory sedge (*C. utriculata*), great sundew (*Drosera anglica*), tall cottongrass (*Eriophorum angustifolium* ssp. *subarcticum*), buckbean (*Menyanthes trifoliata*) and elephanthead (*Pedicularis groenlandica*) are present in small amounts.

E. Holm's Rocky Mountain Sedge (*Carex scopulorum* var. *prionophylla*)

This plant association occurs in a complex mix of plant associations on large moderately sloping, subirrigated bogs that extend along the southern edges of all three basins. This situation is especially prominent along the southern boundary of the middle basin. Soils are a deep moss and sedge peat. Sphagnum moss is abundant. The water table is at the soil surface in June and

lowers to 12 inches (30 cm) below the soil surface in September, yet soils remain saturated at the soil surface throughout the growing season. The soil surface is undulating due to the clumpy nature of saw-leaved sedge and its tendency to build sedge peat mounds. Saw-leaved sedge is dominant. Other graminoids include winter bentgrass (*Agrostis scabra*), alpine timothy (*Phleum alpinum)*, bluejoint reedgrass (*Calamagrostis canadensis*), mud sedge (*Carex limosa*), and few-flowered spikerush (*Eleocharis quinqueflora*). Forbs include Canby's licorice-root (*Ligusticum canbyi*), elephanthead (*Pedicularis groenlandica*), arrowleaf groundsel (*Senecio triangularis*), hooded ladies-tresses (*Spiranthes romanzoffiana*) and violets (*Viola* spp.).

F. Northwest Territory Sedge (*Carex utriculata*)

These flat fen sites are similar to the leafy tussock sedge (*Carex aquatilis*) sites, except for the dominance of bladder sedge. The plant association is very prominent in the large northeastern and southeastern meadows. Soils are deep moss and sedge peat. Sphagnum moss is abundant. This plant association intergrades with the aquatic sedge plant association on similar sites, tall cottongrass (*Eriophorum angustifolium* ssp. *subarcticum*) plant association on boggier sites and bluejoint reedgrass (*Calamagrostis canadensis*) plant association on streambanks or the transition to uplands. Bladder sedge is the dominant graminoid. Other graminoides include bluejoint reedgrass (*Calamagrostis canadensis*), aquatic sedge and mud sedge (*Carex limosa*). Small bedstraw (*Galium trifidum*) is present on both plots. No other forbs were present.

G. Timber Oatgrass (*Danthonia intermedia*)

The timber oatgrass plant association is a narrow band of meadow that occurs at the edge of upland forest. The loamy mineral soil appears to be glacial flour. The site is the driest of all the riparian plant associations in Bunchgrass Meadows, yet the water table was only 15 inches (38 cm) below the soil surface in August, because of an impenetrable clay pan. Still, the soil in the rooting zone was only moist, despite the relatively shallow water table. Timber oatgrass dominates the vegetation. Other herbs include winter bentgrass (*Agrostis scabra*), alpine pussytoes (*Antennaria umbrinella*), asters (*Symphyotrichum* spp.), bluejoint reedgrass (*Calamagrostis canadensis*), common horsetail (*Equisetum arvense*), alpine speedwell (*Veronica wormskjoldii*), violets (*Viola* spp.), fan-leaf cinquefoil (*Potentilla flabellifolia*), Drummond's cinquefoil (*P. drummondii*), Canby's licorice-root (*Ligusticum canbyi*) and tailcup lupine (*Lupinus caudatus*).

H. Tall Cottongrass (*Eriophorum angustifolium* ssp. *subarcticum*)

This plant association occurs on several sites. It may be found in small ponded areas behind moss dams or form extended stands on flat temporarily shallowly flooded terrain in what otherwise is beaked sedge (*Carex rostrata*) or leafy tussock sedge (*C. aquatilis*) fen terrain. Water tables are about 2 inches (5 cm) above the soil surface in the early summer, but may lower to 6 inches (15 cm) below the soil surface in September. Soils are deep sedge and sphagnum peats. Tall cottongrass is dominant. Associated species include Northwest Territory sedge (*C. utriculata*), mud sedge (*C. limosa*), purple marshlocks (*Comarum palustre*), great sundew (*Drosera anglica*), hooded ladies-tresses (*Spiranthes romanzoffiana*) and buckbean (*Menyanthes trifoliata*). Few-flowered spikerush (*Eleocharis quinqueflora*) is often a codominant with the tall cottongrass.

I. Engelmann Spruce/ Holm's Rocky Mountain Sedge (*Picea engelmannii/Carex scopulorum* var. *prionophylla*)

This wetland plant association occurs on several tree islands within the open meadows, as well as on boggy subirrigated slopes along the margins of Bunchgrass Meadows. Soils on the islands are loams derived from glacial flour. A dome of decomposed granite starts at 23 inches (60 cm). Here the water table is about 14 inches (35 cm) below the surface in June, but unknown in August. In the boggy subirrigated sites the soil is a deep moss and sedge peat. The surface is undulating due to saw-leaved sedge. Sphagnum moss is abundant. The water table is at the soil surface in June and about eight to 16 inches (20 to 40 cm) below the surface in August. The peat remains saturated at the surface through the growing season. Engelmann spruce and lodgepole pine (*Pinus contorta*) dominate the tree layer. Saw-leaved sedge is the dominant herb. Bluejoint reedgrass is well represented. Other herbs include large-leaved avens (*Geum macrophyllum*), small-flowered woodrush (*Luzula parviflora*), mitrewort (*Mitella* spp.), Drummond's cinquefoil (*Potentilla drummondii*), hooded ladies-tresses (*Spiranthes romanzoffiana*), twisted stalk (*Streptopus amplexifolius*) and violets (*Viola* spp.). Dwarf huckleberry (*Vaccinium caespitosum*), big huckleberry (*V. membranaceum*) and dwarf bilberry (*V. myrtillus*) are common.

J. Farr's Willow/Few-flowered Spikerush (*Salix farriae/ Eleocharis quinqueflora*)

This plant association is adjacent to flat tall cottongrass sites, where the terrain is slightly hummocky. Shrubs are prominent on the relatively "dry" hummocks. Diamondleaf willow (*Salix planifolia,* an ecological equivalent of Farr's willow) is abundant. Bog birch (*Betula glandulosa*) is codominant on one plot. Tall cottongrass (*Eriophorum angustifolium* ssp. *subarcticum*) and/or few-flowered spikerush are the dominant graminoids. Other common herbs include blue-joint reedgrass (*Calamogrostis canadensis*), mud sedge (*Carex limosa*), beaked sedge (*C. rostrata*), small bedstraw (*Galium trifidum*), purple marshlocks (*Comarum palustre*), and hooded ladies-tresses (*Spiranthes romanzoffiana*). Soils are deep sedge and moss peats. Sphagnum moss is abundant. The water table is about 2 inches (5 cm) above the soil surface in early summer and then about 20 inches (50 cm) below it in September, although the soil is saturated year-long.

Description of the Values of the Research Natural Area

There are no federally listed (or proposed for listing) endangered or threatened plants documented from the RNA. Two sensitive plant species are known from the RNA (Kovalchik 1992, USDA FS 2008; WDNR 2008a): meadow pussytoes (*Antennaria corymbosa*) and beaked sedge (*Carex rostrata*). The single occurrence for meadow pussytoes in Washington is at Bunchgrass Meadows. There are only four other locations for beaked sedge in Washington. Streamside sphagnum (*Sphagnum riparium*) and Jensen's sphagnum (*Sphagnum jensenii*), are ranked "S1," critically imperiled comprising five or fewer occurrences, in Washington (WDNR 2008a).

Flora

In the absence of a systematic study of the flora of the RNA, observations from botanists include 137 vascular and 11 non-vascular plants, compiled in the list below. Scientific nomenclature follows Hitchcock and Cronquist (1973) and the PLANTS Database (USDA NRCS 2008). Further botanical inventory of the area is highly recommended, as it would likely lead to new

discoveries, as well as expanded distributions of sensitive plant populations. The vegetation of Bunchgrass Meadows RNA includes 151 vascular and non-vascular plant taxa. A key to the sources of the sightings follows at the end of the list.

Scientific Names	Common Names	Sources of Sightings
VASCULAR PLANTS		
TREES		
Abies grandis	grand fir	6, 7
Abies lasiocarpa	subalpine fir	1, 3, 9
Larix occidentalis	larch	1
Picea engelmannii	engelmann spruce	1, 3, 6, 9
Pinus contorta	lodgepole pine	1, 6, 9
Pinus monticola	western white pine	3
Populus tremuloides	trembling aspen	9
Pseudotsuga menziesii	Douglas-fir	1
Tsuga heterophylla	western hemlock	9
SHRUBS		
Alnus viridis ssp.*sinuata*	wavey-leaved alder	9
Betula glandulosa	bog birch	1, 2, 3, 6, 9
Kalmia microphylla	alpine laurel	1, 2, 4, 6
Menzeisia ferruginea	fool's huckleberry	6, 9
Paxistima myrsinites	mountain lover	9
Rhododendron albiflorum	white-flowered rhododendron	6, 9
Ribes lacustre	swamp gooseberry	1, 6
Rubus lasiococcus	dwarf bramble	9
Rubus parviflorus	thimbleberry	9
Salix barclayi	Barclay's willow	7
Salix commutata	variable willow	1, 2
Salix planifolia	diamondleaf willow	1, 6
Sorbus scopulina	Cascade mountain ash	9
Vaccinium caespitosum	dwarf huckleberry	1, 6
Vaccinium membranaceum	big huckleberry	6, 9
Vaccinium myrtillus	dwarf huckleberry	6
Vaccinium scoparium	whortleberry	9
HERBS		
Achillea millefolium	yarrow	1
Agrostis gigantea	redtop	2
Agrostis humilis	alpine bentgrass	2
Agrostis scabra	rough bentgrass	6, 7
Agrostis humilis	alpine bentgrass	6
Alopecurus alpinus	alpine foxtail	7
Anaphalis margaritacea	pearly everlasting	9
Antennaria corymbosa	meadow pussytoes	1, 7

Scientific Names	Common Names	Sources of Sightings
Antennaria microphylla	rosy pussytoes	2, 9
Antennaria umbrinella	umber pussytoes	6
Aquilegia flavescens	yellow columbine	9
Arnica mollis	hairy arnica	2, 7
Athryrium filix-femina	ladyfern	1, 6
Bromus ciliata	fringed brome	9
Calamagrostis canadensis	bluejoint	1, 6, 9
Carex aquatilis	leafy tussock sedge	1, 9
Carex aquatilis var. *dives*	Sitka sedge	6
Carex arcta	northern clustered sedge	2
Carex athrostachya	slender-beaked sedge	6
Carex aurea	golden sedge	2
Carex canescens	gray sedge	1, 3, 6, 7, 9
Carex echinata	star sedge	2, 3, 6, 10
Carex hoodii	Hood's sedge	10
Carex illota	sheep sedge	6
Carex interior	inland sedge	9
Carex laeviculmis	smooth-stemmed sedge	1
Carex lenticularis var. *limnophila*	pond sedge	7
Carex leporinella	Sierra hare sedge	10
Carex limosa	mud sedge	1, 6, 7, 9
Carex magellanica ssp. *irrigua*	boreal bog sedge	2, 3
Carex pachystachya	thick-headed sedge	1, 6
Carex rossii	Ross sedge	6, 9
Carex rostrata	beaked sedge	3, 6
Carex scopulorum var. *prionophylla*	Holm's Rocky Mountain sedge	1, 6, 7
Carex spectabilis	showy sedge	9
Carex utriculata	Northwest Territory sedge	3, 6, 9
Carex vesicaria	inflated sedge	2, 6
Castilleja miniata	scarlet paintbrush	9
Comarum palustre	purple marshlocks	1, 6, 7, 9
Danthonia intermedia	timber oatgrass	1, 2, 6
Drosera anglica	great sundew	1, 2, 3, 6, 7, 9
Eleocharis quinqueflora	few-flowered spike-rush	1, 2, 6
Elymus canadensis	nodding wildrye	1
Elymus glaucus	western wildrye	6, 9
Epilobium ciliatum var. *glandulosum*	fringed willowherb	6
Epilobium glaberrimum	smooth willow-herb	6
Equisetum arvense	common horsetail	6
Eriophorum angustifolium ssp. *subarcticum*	tall cottongrass	1, 2, 6, 7, 9
Eriophorum chamissonis	Chamisso's cottongrass	7
Festuca occidentalis	western fescue	9
Fragaria vesca	wood's strawberry	9
Fragaria virginiana	blueleaf strawberry	9
Galium trifidum	small beadstraw	6

Scientific Names	Common Names	Sources of Sightings
Geum macrophyllum	large-leaved avens	1, 2, 9
Geum macrophyllum var. *perincisum*	large-leaved avens	6
Hieracium albiflorum	white-flowered hawkweed	9
Hieracium scouleri var. *albertinum*	western hawkweed	9
Juncus drummondii var. *subtriflorus*	Drummond's rush	6
Juncus ensifolius	dagger leaf rush	1, 2, 9
Juncus parryi	Parry's rush	9
Juncus mertensianus	Merten's rush	1, 2, 7
Leptarrhena pyrolifolia	leatherleaf saxifrage	1, 7
Lewisia pygmaea	least lewisia	6
Ligusticum canbyi	Canby's licorice root	1, 6, 9
Lupinus caudatus	tailcup lupine	6
Lupinus latifolius	broadleaf lupine	2
Lupinus polyphyllus	large-leaved lupine	6
Lupinus burkei ssp. *burkei*	largeleaf lupine	9
Luzula parviflora	small-flowered woodrush	6
Lycopodium complanatum	ground cedar	9
Lycopodium sitchense	Alaska clubmoss	7
Menyanthes trifoliata	bogbean	6, 7
Muhlenbergia filiformis	slender muhly	6
Muhlenbergia richardsonis	mat muhly	1
Pedicularis bracteosa	bracted lousewort	1, 2
Pedicularis groenlandica	elephant's head	1, 4, 6, 7, 9
Pedicularis racemosa	leafy lousewort	9
Phleum alpinum	timothy grass	1, 2, 6, 7, 9
Platanthera dilatata	leafy whie bog-orchid	1, 2, 7
Poa leptocoma	bog bluegrass	6
Potentilla diversifolia	diverse-leaved cinquefoil	7
Potentilla drummondii	Drummond's cinquefoil	2, 6
Potentilla flabellifolia	fan-leaf cinquefoil	6
Potentilla gracilis	northwest cinquefoil	1, 2
Pyrola asarifolia	pink pyrola	1, 2
Ranunculus aquatilis	white water crowfoot	10
Ranunculus eschscholtzii	subalpine buttercup	7
Ranunculus uncinatus	little buttercup	6
Saxifraga oregana	Oregon saxifrage	7
Scheuchzeria palustris	scheuchzeria	1, 6, 7
Senecio hydrophilus	water ragwort	1
Senecio triangularis	arrowleaf grounsel	6, 9
Sibbaldia procumbens	sibbaldia	1, 2, 7, 9
Spiranthes romanzoffiana	ladies tresses	1, 6, 7, 9
Stellaria crispa	crisped starwort	6
Stellaria calycantha	northern starwort	7
Streptopus amplexifolius var. *chalazatus*	clasping-leaved twisted-stalk	6
Symphyotrichum boreale	northern bog aster	2

Scientific Names	Common Names	Sources of Sightings
Symphyotrichum lanceolatum ssp. *hesperium* var. *hesperium*	white panicle aster	1
Symphyotrichum spathulatum	western mountain aster	6
Tiarella trifoliata	cool-wort foamflower	1
Tiarella trifoliata var. *unifoliata*	cool-wort foamflower	6
Trientalis europaea ssp. *arctica*	arctic starflower	2, 7, 10
Trisetum canescens	tall trisetum	6
Trisetum wolfii	Wolf's trisetum	2
Urtica dioica	stinging nettle	6
Valeriana sitchensis	Sitka valerian	9
Veratrum viride	false hellebore	6
Veronica serpyllifolia	thyme-leaved speedwell	6
Veronica wormskjoldii	alpine speedwell	6, 7
Viola adunca	blue violet	2, 3
Xerophyllum tenax	beargrass	9
NON-VASCULAR PLANTS		
LIVERWORTS		
Chiloscyphus pallescens var. *fragilis*	liverwort	7
Lophozia guttulata	liverwort	7
Pellia endiviifolia	liverwort	7
MOSSES		
Aulacomnium palustre	aulacomnium moss	7
Rhizomnium magnifolium	grandleaf rhizomnium moss	7
Sanionia uncinatus	symmetric sanionia moss	7
Sphagnum angustifolium	sphagnum	4, 5, 7, 8
Sphagnum jensenii	Jensen's sphagnum	7, 8
Sphagnum magellanicum	Magellan's sphagnum	4, 5, 7, 8
Sphagnum riparium	streamside sphagnum	4, 5, 7, 8
Sphagnum russowii	Russow's sphagnum	4, 5, 7, 8
Sphagnum subsecundum	sphagnum	5, 7, 8
Sphagnum teres	sphagnum	4, 5, 7, 8
Sphagnum warnstorfii	Warnstorf's sphagnum	4, 5, 7, 8

Sources of Sightings

1 Ahlenslager, Kathy and Bud Kovalchik. 1992. Plants sighted on July 21, 1992, filed at the Colville National Forest Supervisor's Office, Colville, WA. 3 pp.

2 Althauser, Nick, Sheryl Althauser and Tony Basabe. 1979. A summary of searches for rare, threatened and endangered plant taxa for the Colville National Forest, filed at the Colville National Forest Supervisor's Office, Colville, WA. 36 pp.

3 Althauser, Nick and Sheryl Althauser. 1979. Site Survey Summary Form for Bunchgrass Meadows (included with *Carex paupercula* sighting information), filed at the Colville National Forest Supervisor's Office, Colville, WA. 6 pp.
4 Andrus, Richard E. and Earle F. Layser. 1971. *Sphagnum riparium* Angstr., a new record for the western United States. The Bryologist 74(2): 211.
5 Andrus, Richard E. and Earle F. Layser. 1976. *Sphagnum* in the northern Rocky Mountains of the United States. The Bryologist 79(4): 508-511.
6 Kovalchik, Bud. 1990. Species found in Ecology Plots, filed at the Colville National Forest Supervisor's Office, Colville, WA.
7 Layser, Jr., Earle. 1969. Flora of Pend Oreille County, Washington. Washington State University Cooperative Extension, Pullman, WA. 146 pp.
8 Layser, Earle F. 1972. Sphagnum from Bunchgrass Meadows; Pend Oreille County, Washington. Memo to Forest Supervisor dated December 18, 1972, filed at the Colville National Forest Supervisor's Office, Colville, WA. 1 pp.
9 Schuller, Reed. 1982. Site Survey Form for Bunchgrass Meadows, filed at the Colville National Forest Supervisor's Office, Colville, WA. 12 pp.
10 Weinman, Fred and Anne Weinmann. 2004. Species sighted July 23, 2003.

Fauna

There are no systematic studies of the wildlife of the RNA, but a list of vertebrates and invertebrates observed in the RNA is included below. Of the 43 vertebrate species known from the RNA, eight are mammals, three are herptiles, one is a fish and 31 are birds. Two invertebrate species also occur there (Burke 1993).

The RNA is within the ranges of several threatened and endangered species (McGowan 1996 and 2006). Woodland caribou (*Rangifer tarandus caribou*) are listed as Endangered by the U. S. Fish and Wildlife Service. Threatened species potentially ranging within the RNA are Canada lynx (*Lynx canadensis*), grizzly bear (*Ursus arctos),* and bull trout (*Salvelinus confluentus*). Bunchgrass Meadows RNA is within the designated recovery habitat for woodland caribou and grizzly bears (US Fish and Wildlife Service 1993; 1993a). This RNA is also within the range of eight USFS sensitive species: gray wolf (*Canis lupus*); northern bald eagle (*Haliaeetus leucocephalus*), wolverine (*Gulo gulo*); American peregrine falcon (*Falco peregrinus anatum*); great gray owl (*Strix nebulosa*); Townsend's big-eared bat (*Corynorthinus townsendii*); fisher (*Martes pennanti*); and redband trout (*Onchorhynchus mykiss ssp*).

Moose are recorded from the RNA. Several other mammal species are expected to occur in the RNA, but have not been sighted. These include mule deer, white-tailed deer, elk, black bear, cougar, golden eagle and barred owl (Burke, 1993).

Western cutthroat trout were at one time found in Bunchgrass Lake and the area was once a spawning area for this species (Layser 1972). Downstream, rainbow trout can also be found. The lake was last stocked in 1948. There are no plans to stock in the future.

Twenty two invertebrate species occur in Bunchgrass Meadows. In Washington several of the damselflies and dragon flies known from the RNA occur only in northeastern Washington. Bunchgrass Meadows is the only occurrence in the continental United States for the delicate

emerald (*Somatochlora. franklini*) and it is one of two sites in the continental United States for Whitehouse's emerald (*S. whitehousei*).

The vertebrates and invertebrates of Bunchgrass Meadows RNA include 44 vertebrates and 22 invertebrates. A key to the sources of the sightings follows at the end of the list.

Scientific Names	Common Names	Sources of Sightings
VERTEBRATES		
Mammals		
Alces alces	moose	7
Arvicola richardsoni	Richardson water vole	3
Eutamias ruficaudus	red-tailed chipmunk	2
Martes americana	pine marten	2
Sorex vagrans	wandering shrew	1, 2
Sorex cinereus	masked shrew	1, 2
Spermophilus columbianus	Columbian ground squirrel	2
Spermophilus lateralis	golden-mantled ground squirrel	2
Synaptomys borealis	northern bog lemming	2, 4, 4
Zapus princeps	western jumping mouse	1, 2
Herptiles		
Bufo boreas	boreal toad	2, 4
Rana pretiosa	western spotted frog	2, 4
Thamnophis elegans	wandering garter snake	2, 4
Fish		
Salmo clarki	west slope cutthroat trout	3, 4
Birds		
Piconiiformes (Herons and Their Allies)		
Ardea herodias	great blue heron	2
Falconiformes (Hawks)		
Accipiter gentilis	northern goshawk	2
Buteo jamaicensis	red-tailed hawk	2
Circus cyaneus	marsh hawk	2
Falco sparverius	sparrow hawk	2
Galliformes (Gallinaceous Birds)		
Dendragapus obscurus	blue grouse	2
Charadriiformes (Shorebirds, Gulls and Alcids)		
Actitis macularia	spotted sandpiper	2, 4
Gallinago gallinago	common snipe	2, 4
Piciformes (Woodpeckers)		
Colaptes auratus	common flicker	2
Passeriformes (Perching Birds)		
Carduelis pinus	pine siskin	2
Cathaeus guttatus	hermit thrush	2, 4
Catharus ustulatus	Swainson's thrush	2, 4
Ixoreus naevius	varied thrush	4

Scientific Names	Common Names	Sources of Sightings
Corvus corax	common raven	2
Cyanocitta stelleri	Steller's jay	2
Dendroica coronata	yellow-rumped warbler	2, 4
Dendroica townsendi	Townsend's warbler	2
Junco hyemalis	dark-eyed junco	2
Loxia curvirostra	red crossbill	2
Melospiza melodia	song sparrow	2
Nucifraga columbiana	Clark's nutcracker	2
Perisoreus canadensis	gray jay	2
Parus gambeli	mountain chickadee	2
Piranga ludoviciana	western tanager	2
Regulus satrapa	golden-crowned kinglet	2
Turdus migratorius	robin	2
Tyrannus tyrannus	eastern kingbird	2
Sialia currucoides	mountain bluebird	2
Spizella passerina	chipping sparrow	2
Zonotrichia leucophrys	white-crowned sparrow	2
INVERTEBRATES		
Zygoptera (damselflies)		
Lestidae (spreadwings)		
Lestes disjunctus	common spreadwing	5
Lestes dryas	emerald spreadwing	5
Lestes forcipatus	sweetflag spreadwing	5
Lestes unguiculatus	lyre-tipped spreadwing	5
Coenagrionidae (pond damsels)		
Coenagrion resolutum	taiga bluet	5
Enallagma boreale	boreal bluet	5
Anisoptera (dragonflies)		
Aeshnidae (darners)		
Aeshna interrupta	variable darner	5
Aeshna juncea	sedge darner	5
Aeshna palmate	paddle-tailed darner	5
Aeshna sitchensis	zigzag darne	5
Corduliidae (emeralds)		
Somatochlora albicincta	ringed emerald	5
Somatochlora franklini	delicate emerald	5
Somatochlora minor	ocellated emerald	5
Somatochlora semicircularis	mountain emerald	5
Somatochlora walshii	brush-tipped emerald	5
Somatochlora whitehousei	Whitehouse's emerald	5
Libellulidae (skimmers)		
Leucorrhinia glacialis	crimson-ringed whiteface	5
Leucorrhinia hudsonica	Hudsonian whiteface	5
Sympetrum corruptum	variegated meadowhawk	5

Scientific Names	Common Names	Sources of Sightings
Sympetrum danae	black meadowhawk	5
Sympetrum obtrusum	white-faced meadowhawk	5
Sympetrum pallipes	striped meadowhawk	5
Mollusks (Snails)		
Eupulmonata		
Agriolimacidae (keel slugs)		
Deroceras laeve	meadow slug	2
Stylommatophora		
Arionidae (round back slugs)		
Magnipelta mycophaga	spotted slug	2

Sources of Sightings

1 Burke, Tom. 1980. Memo on occurrence of mammal cells in proposed Research Natural Areas, April 23, 1980, filed at the Colville National Forest Supervisor's Office, Colville, WA. 1 pp.

2 Burke, Tom. 1993. Letter to Jan Lerum and Penny Miller dated March 30, 1993 commenting on the draft establishment records for Bunchgrass Meadows and Halliday Fen RNAs, filed at the Colville National Forest Supervisor's Office, Colville, WA. 4 pp.

3 Layser, Earle. 1972. Letter to the files dated September 6, 1972, regarding Natural Area, filed at the Colville National Forest Supervisor's Office, Colville, WA. 3 pp.

4 Layser, Earle F. and Burke, Thomas E. 1973. The northern bog lemming and its unique habitat in northeastern Washington. Murrelet 54(1):7-8.

5 Paulson, Dennis. 2006. Damselfly and dragonfly database of collections from Bunchgrass Meadows.

6 Poelker, R. J. 1972. The Shiras moose in Washington. State Game Department, Olympia, WA. 1 pp.

7 USDA Forest Service. 1996. Sullivan Lake Ranger District files. Metaline Falls, WA.

Geology

Rodney Lentz (1993), Area Mining Geologist, describes the geology of Bunchgrass Meadows as follows:

The regional geology of northeastern Washington shows that it is a complicated history of diverse geologic processes which range from stable, craton-margin sedimentation to possible continental collision and accretion (Alt and Hyndman 1987). Bedrock beneath more than half of this region is composed of medium- to coarse-grained rocks of granitic composiition. East of the Columbia River these consist of numerous quartz monzonite, granodiorite and granite intrusives which together make up the Kaniksu Batholith.

The batholith intrudes older marine sediments which were deposited more than 400 million years ago on the margin of a stable land mass to the east. Deformation and metamorphism accompanying the intrusion folded and faulted the sediments and converted them to siltite, argillite, quartzite, phyllite and weakly recrystallized limestone and dolomite. This

metasedimentary belt, stretching from well into Canada to Spokane, is known as the Kootenay Arc.

Intense regional metamorphism toward the end of the Mesozoic Era (140 million years ago) gently upwarped and recrystallized the rocks. Where temperatures and pressures were greatest, sediments and volcanics were metamorphosed to feldspathic quartzite, mica schists, marbles, amphibolites and gneisses. Low grade metamorphism elsewhere produced meta-conglomerates, phyllites and greenstones. Contemporaneous with uplift was the came invasion by granitic plutons like those to the east.

Bunchgrass Meadows RNA is underlain largely by the Kaniksu Batholith. In this area the Kaniksu is composed of a Cretaceous-aged, medium- to coarse-grained hornblende-biotite granodiorite known as the Priest Lake Granodiorite (Stoffel et al. 1991). This intrusive is exposed in the surrounding mountains and low hills.

A pendant of meta-sedimentary rocks of the Proterozoic Priest River Group bounds the RNA to the north and forms the steep-walled outlet valley of Harvey Creek (Park and Cannon 1943, Stoffel et al. 1991). Black, fine-grained, biotite quartzite is exposed along the access road at the basin outlet, but the pendant consists mainly of meta-argillite and meta-dolomite (Stoffel et al. 1991).

Quarternary alluvial and lucustrine deposits, in part, probably glacially derived, overlie bedrock within and around the margins of the basin. Exposed in road cuts along the east basin margin are sand and gravel deposits which include clasts of gravel- and cobble-sized, rounded granitic and angular meta-sedimentary rock. Peat deposits were noted in two five-foot-deep test holes, H1 and H2, sited in the meadow. They are interbedded with lacustrine and fluvial, organic-bearing clays, silts and sands. Peat potentially underlies all marshy areas. The test holes suggest, however that peat deposits may be more substantial near the center of the largest meadow.

Uranium resource studies conducted in the area do not identify the Priest Lake Granodiorite as a favorable host rock for uranium deposits (Nash 1979, Castor et al. 1982). However, uranium is known to concentrate in organic-rich surficial deposits in northeastern Washington (Johnston et al. 1987). Consequently, a composite peat sample from the RNA was analyzed for uranium and showed no anomalous uranium concentration.

A reconnaissance geologic and geochemical study of the Colville National Forest by A. R. Grant (1982) analyzed stream sediment and rock samples. Of the six samples, Grant considered two anomalous, one for uranium and another for tungsten. Lentz collected an additional stream sediment sample, BG-1, from Harvey Creek below the RNA. It showed no anomalous components using the criteria of Grant.

Soils

Paula Barreras (1996), Forest Geologist for the Colville National Forest, describeed the soils for Bunchgrass Meadows RNA based on information available in the State Soil Survey Report (WDNR 1986) and the Soil Survey of Pend Oreille County, Washington (USDA SCS 1992).

Soils in the Bunchgrass Meadows RNA include sapric (muck) soils in areas of poor drainage; silt loams on the toe of slopes, seeps and in the upland mountain side slopes; and stony fine sandy loam on the upland mountain side slopes. Specific soils of the Bunchgrass Meadows RNA are shown on Map 4 and described as follows:

Upland Basins

Borosaprists is a black moist highly decomposed organic soil, with very little plant fiber. It has a high bulk density and very low water content at saturation. This soil was formed in decomposed organic materials and has very poor drainage.

Uncas Muck Soils Series is a very dark grayish brown moist silt loam formed in well-decomposed organics. This soil also has very poor drainage and is a Histic Vitraquands.

Both soils have very short rooting depths and are rich in calcium. This is due to the constant presence of water. There is a peat soil below the shallow rooting zone. Water is removed so slowly from these soils that they are periodically saturated during the growing season or may remain wet for long periods of time.

Toe of Slopes

Manly Soil Series is a brown silt loam formed in ash mantled glacial till. This soil is well-drained and a Xeric Vitricryands.

Mountain Side Slopes

Prouty Soil Series is a yellow brown silt loam formed on ash mantled colluvium and residuum from granitic rocks. This is a well-drained Andic Cryochrepts.

Roaring Soil Series is a brown silt loam formed on ash mantled coarse glacial outwash. This is a well-drained Andic Cryochrepts.

Aquolls Soil Series is a grayish brown silt loam. Formed adjacent to drainage ways in alluvial deposits of ash mantled glacial till or weathered bedrock. This is a poorly drained soil with rooting depths limited by a seasonal high water table.

Brickel Soil Series is a dark brown to dark grayish brown stony fine sandy loam formed in ash and loess mantled colluvium form glacial till and granitic rocks. This soil is moderately well-drained and is a Vitrandic Cryoborolls.

Vassar is a brown silt loam formed in residuum and ash mantled colluvium from granite, gneiss and schist. This is a well-drained Typic Vitricryands.

Generally on these mountain side slopes, water is removed readily, but not rapidly. Water is available for plants throughout most the growing season.

Topography

Bunchgrass Meadows lies within the upper reaches of the Harvey Creek watershed which is a tributary to Sullivan Lake, Sullivan Creek and the Pend Oreille River. Surrounding ridges

include Monumental Mountain (5600 feet, 1707 m) on the south, an unnamed ridge (5747 feet, 1752 m) to the north, and connecting ridges (5238 feet, 1597 m) to the west and (5156 feet, 1572m) to the east. The lowest elevation within the RNA, Bunchgrass Lake, is at 4961 feet (1513 m) elevation towards the northern boundary. The highest point is about 5500 feet (1677 m) elevation (Wasson 1994). Total relief is 550 feet (168 m).

Aquatic/Riparian
The meandering stream that arises and flows through the meadow and small groves of trees is unique to the area and forms the headwaters of Harvey Creek, which is tributary to Sullivan Lake and Sullivan Creek before entering the Pend Oreille River and eventually the Columbia River. The fish-bearing stream within Bunchgrass Meadows provides both suitable spawning and rearing habitat (USDA FS 1991) for pure westslope cutthroat trout (CES 1996).

Rare Elements and Rare Plant Communities (WDNR 2007a)
The following known high-quality or rare plant communities and wetland ecosystems of Washington occur in the RNA:

Subalpine Fir/Cascade Azalea (*Abies lasiocarpa/Rhododendron albiflorum*)
Subalpine Fir/Beargrass (*Abies lasiocarpa/Xerophyllum tenax*)
Bluejoint Reedgrass (*Calamagrostis canadensis*)
Leafy Tussock Sedge (*Carex aquatilis*)
Mud Sedge (*Carex limosa*)
Holm's Rocky Mountain Sedge (*Carex scopulorum*)
Northwest Territory Sedge (*Carex utriculata*)
Engelmann Spruce/ Holm's Rocky Mountain Sedge (*Picea engelmannii/Carex scopulorum* var. *prionophylla*)

Resource Information

Mineral Resources

The mineral resources of this RNA were evaluated by Rodney Lentz (1993), Area Mining Geologist for the USDA Forest Service. Exploration and mine development in northeastern Washington began about the turn of the century. Soon the region's mining districts became significant producers of precious and base metals and some non-metals such as limestone, dolomite, magnesite and quartzite. Sand and gravel or quarry rock became important locally as communities and roadways became established. Many mines in the region closed before or during the depressions years of the 1930's, never to reopen. Important exceptions are the Republic gold district, the Metaline zinc-lead and limestone district, the Addy dolomite and quartzite district, and the Spokane uranium district. All of these districts include, or until recently, included producing mines.

There are no known patented mining claims within the RNA. No evidence of mineral exploration or development was noted in or adjacent the area during the field evaluation. Neither is there a record of any mineral exploration on the now abandoned mining claims near the northeast corner of the proposed RNA nor on either side of the Colville/Kaniksu National Forest boundary. Existing mineral inventories and analysis indicate that none of the parcels are

prospectively valuable for leasable mineral, including oil and gas, coal or geothermal resources (Lentz 1993).

Salable minerals including sand, gravel, stone and peat are present in the lands of the RNA. The quality of the materials, however, varies considerably. Due to the isolation of the RNA and/or quality of available materials, there is no apparent market for these commodities at the present time, nor in the foreseeable future. Consequently, the potential for development of salable minerals is considered low. While gravel materials present within the RNA may be suitable for road maintenance aggregate, similar material is available outside the RNA and could be used if needed without substantially increasing haul costs.

A request for a mineral withdrawal has been made in accordance with FSM 2860 and ED no. 2, 2861.2. The proposed withdrawal is not located in any known mining district. The Metaline zinc-lead district is located approximately six miles to the northwest of the RNA.

Grazing

This RNA is not currently within the bounds of a Forest Service grazing allotment, and there are no permitted livestock in the Bunchgrass Meadows area: Therefore, livestock grazing on National Forest lands is not affected by the establishment of this RNA.

Prior to 1982 the Bunchgrass Meadows area was included in the LeClerc Creek Allotment, but currently this area is removed from the boundaries of the allotment. It is unknown when livestock grazing began on the ranges in the area of Bunchgrass Meadows RNA. It is estimated that grazing was first permitted in the early 1920s with sheep as the main type of livestock. From 1940 to 1944 grazing use on the LeClerc Creek Allotment was converted from sheep to cattle (USDA FS 1982).

When the meadows were grazed as part of the LeClerc Creek Allotment, use occurred annually from approximately August 1st until the first frosts of the season. The meadows have not had salt placed in them since 1981 or grazed since 1982 (USDA FS 1982).

Grazing in the RNA in 1972 was described as moderate to heavy, except in the forested areas where cattle access was physically limited and forage quality is low. The south and southwest margins of the meadow were uniformly grazed. Only the most boggy, wet portions have been ungrazed. Scattered groves of subalpine fir and Engelmann spruce along the margins of the meadows on slightly drier ground were badly trampled by cattle that used these shady areas to rest and get out of the sun. The forested islands along the perimeter of the meadow contain a high proportion of grasses and more palatable plants. These areas were overgrazed. Although cattle grazed the streambanks, not much damage was observed in these areas (Javorka 1972).

Jere Dennis, the only permittee authorized to graze livestock on the LeClerc Creek Allotment, is required to remove cattle from the Bunchgrass Meadows area, if they drift in from the adjacent allotment. The permittee is expected to remove their cattle from the RNA as soon as possible, but within seven days from notification (USDA FS 1993). Cattle no longer access the Bunchgrass Meadows area (Fletcher 2006). The last observations of cattle in the RNA were in 1993 (Bertram 1993).

Plants
Timber harvesting is another forest activity affected by the establishment of this RNA. Scheduled timber harvest is not permitted in RNA areas (USDA FS 1988). In addition, salvage and/or firewood harvest is not appropriate. The 498 acres (202 ha) of forest in the RNA were removed from the Forest's suitable timber base. This area was logged by the Panhandle Lumber Company in the early 1920s and burned in a fire in 1926 (USDA FS 1988). Although the management prescription in the Forest Plan prohibits plant collection, recreational berry picking would be allowed, as it would not affect the wetland values protected by RNA establishment.

Watershed Values
Watershed values of the RNA area are high since this area is part of the headwaters of Harvey Creek, which is tributary to Sullivan Lake and Sullivan Creek before entering the Pend Oreille River and eventually the Columbia River. The area contributes high quality surface and subsurface water which supplies many downstream uses. Current activities in the area include timber management on adjacent private land, and recreation during summer and winter. The extent of these activities is low and the effects on the watershed are unnoticeable. Grazing has occurred in the past, but the area was removed from a grazing allotment in 1993 and livestock generally do not access the area (Wasson 1996).

Road 1935, which borders the RNA, needs additional maintenance (drainage and surfacing) for the logging traffic and wet season recreation use, however, the road is not currently contributing sediment due to its location on the watershed boundary. The short access road to the interpretive signs in the northeast quarter of section 25 presently impacts a riparian area and is recommended to be closed and rehabilitated. Snowmobiles use this road as a winter access to the meadows which may have adverse effects on wildlife. Currently, the hydrologic regime appears to be controlled by natural forces and the area is well vegetated (Wasson 1996).

The meandering stream that arises and flows through the meadow and small groves of trees is unique to the area. The deep pools and undercut banks covered with aquatic vegetation make good fish habitat. The fishable portion of Bunchgrass Meadows is estimated at three-fourths of a mile (1.2 km) long (Javorka 1972). The RNA forms the headwaters of Harvey Creek. The fish-bearing stream within Bunchgrass Meadows contains pure westslope cutthroat trout (CES 1996). In addition, it provides both suitable spawning and rearing habitat for this sensitive species (USDA FS 1991, USDA FS 2008).

Recreation Use
Another forest activity affected by the establishment of an RNA is recreation. To protect and preserve the natural environment in the RNA, recreation might either be curtailed, if degradation occurred or encouraged through interpretive signing (USDA FS 1988). The area is used for fishing and hunting. Recreational huckleberry picking occurs along the access road in upland areas.

Unauthorized vehicle use is occurring in the meadows along the bog margins in T37N R44E, section 23, NE 1/4 of the SE 1/4. Other parts of the meadow are also accessible to vehicle use. This activity has a deleterious effect on the bog. Snowmobiling occurs in the meadows.

Barriers to prevent vehicles entering the meadows were installed in 1993. All-terrain vehicles breached the barriers, so additional rock barriers were placed to control access in 1994 and 1995. In addition, an interpretive sign was installed to inform the public about the unique character of the meadows and the problems that vehicles create (Borysewicz 2007). Off-road and trail use of motorized vehicles within the RNA is prohibited by 36 CFR 261.50(a) and 36 CFR 261.56.

Wildlife
Designation of the Bunchgrass Meadows RNA would have no detrimental effects on wildlife or plant values. Because of the quality of this area for plant species which are sensitive within the state, the area has already proven itself to be important for biological and ecological studies. Establishment of the area as a RNA would ensure the continued protection of this ecosystem and the species which depend upon it.

Transportation/Road System
Establishment of this RNA will have no impact on the transportation system within the Colville National Forest. Any proposed roads within the sections encompassing or surrounding the RNA will be evaluated by the Sullivan Lake Ranger District for potential impact to the RNA. No recreational trails are planned within the RNA. Forest Service road 1935, a single lane native surface road, runs along the east side of the meadows.

Historical Information

Research/Education Use and Interest: History of Establishment
Research includes the establishment of permanent ecology plots in 1991 and a study to confirm the presence of northern bog lemmings in the RNA in 1972 (Layser and Burke 1972). The history of establishment of this RNA is included in the "Introduction" section of this report. The Washington Native Plant Society conducted field trips in the RNA in 1992 and 2006.

Cultural/Heritage
Cultural resource surveys did not locate any cultural sites within the RNA area. Bunchgrass Meadows is located on the Divide Trail, a known major north-south transportation route used by the Kalispel and other local tribes. The area of the RNA was probably a campsite and resource processing area along that trail (Mattson 1993). Several telephone poles remain from an old phone line to Monumental Lookout that crossed the meadows from the northeast to the southwest.

Disturbance History
The last recorded fire to burn through the Bunchgrass Meadows area was in 1926. This particular fire burned approximately 246,000 acres (97,124.5 hectares) within the Colville NF, primarily in north Pend Oreille and Stevens Counties. The meadow and surrounding forest is in Fire Regime IV, which means it has a "High Severity, Low Frequency" fire history with fires occurred every 75 to 200 years. The wetland has a relatively high fuel moisture and will probably not burn except under conditions of extreme drought and/or high severity fire. (Trimble 2007)

Occurrence of Exotic Species
The vascular plant list for the RNA does not include any exotic species.

Other Information

Permanent Research Plots and/or Photo Points
Retired plant ecologist Bernard Kóvalchik installed 16 permanent ecology plots in the RNA in 1992. The plot data resides in the Region 6 Area Ecology Database at the Okanogan-Wenatchee National Forest supervisor's office.

The Natural Resources Conservation Service has maintained a snow course under a Special Use Permit since 1936 and a SNOTEL (telemetered snow site) since 1979. These sites provide vital data on snowpack conditions for summer streamflow forecasts.

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Potential Research Topics

Administration and protection of Bunchgrass Meadows RNA will be the responsibility of the Colville National Forest. The District Ranger, Newport and Sullivan Lake Ranger Districts, has direct responsibility. Requests to conduct research in the RNA should be referred to the Director of the USDA Forest Service Pacific Northwest Research Station. The Director will evaluate research proposals and coordinate all RNA studies and research with the District Ranger. All plants and animal specimens collected in the course of RNA research will be properly preserved and maintained within university or federal agency herbaria or museums, as approved by the Director.

Records for the Bunchgrass Meadows RNA will be maintained in the following offices:

-Regional Forester, Portland, Oregon
-Pacific Northwest Research Station, Portland Oregon.
-Forest Supervisor, Colville National Forest, Colville, Washington

-District Ranger, Newport and Sullivan Lake Ranger Districts, Newport, Washington

The Pacific Northwest Research Station of the USDA Forest Service in Portland, Oregon will be responsible for maintaining the Bunchgrass Meadows RNA research data file and list of herbarium and species samples collected. All data will also be submitted to the Research Natural Area monitoring database at the Forestry Sciences Lab in Corvallis, Oregon.

Evaluation of Specific Management Recommendations

Potential or Existing Conflicts; Principal Management Issues

Off-road and trail use of motorized vehicles within the RNA has been a problem in the RNA. In 2008 it was prohibited by 36 CFR 261.50(a) and 36 CFR 261.56. Compaction from off-road vehicles within the RNA could potentially displace woodland caribou, and create snow compaction which could be detrimental to northern bog lemming habitat.

Special Management Area

All lands within the RNA are reserved National Forest System lands. This RNA is not within a congressionally designated area. The RNA is included within the Harvey Creek Roadless Area (USDA FS 1988), and the designated recovery habitat for woodland caribou and grizzly bears.

Photographs

Photo 1. Bunchgrass Meadows is an excellant example of a high elevation sphagnum bog.
Photo attribute: Kathy Ahlenslager

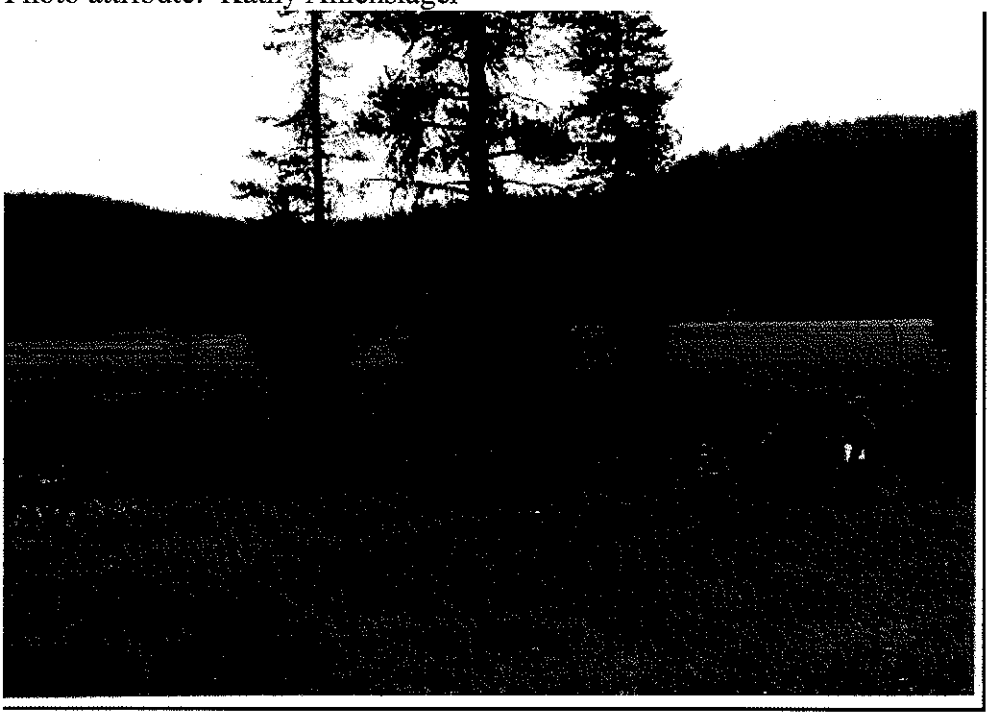
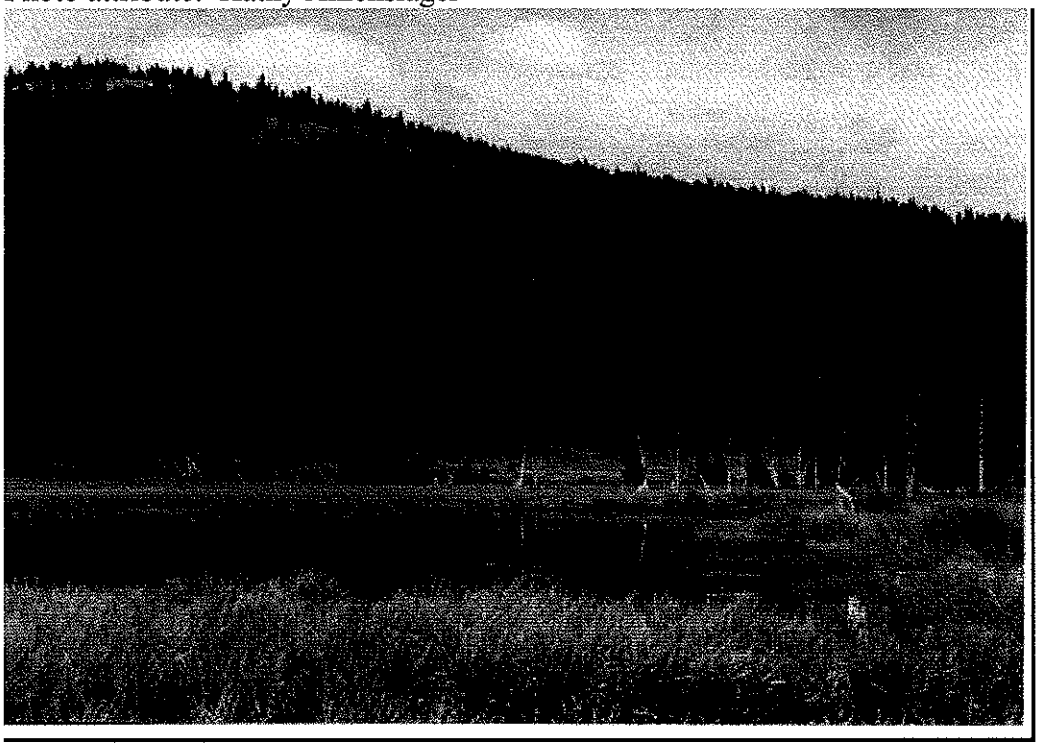


Photo 2. Beaked sedge (*Carex rostrata*), a sensitive plant species, grows on floating mats (foreground) at Bunchgrass Meadows.
Photo attribute: Kathy Ahlenslager

Photo 3. Water channels meander throughout Bunchgrass Meadows.
Photo attribute: Kathy Ahlenslager

Photo 4. Three permanent ponds occupy two acres (0.8 hectare) within Bunchgrass Meadows.
Photo attribute: Kathy Ahlenslager



APPENDIX 2

Appendix 2. Management Prescription: 4 (USDA FS 1988)

MANAGEMENT PRESCRIPTION: 4

EMPHASIS: Research Natural Area

MANAGEMENT GOAL: Provide opportunities for research in ecosystems influenced only by natural processes.

DESCRIPTION: Research Natural Areas (RNAs) contain examples of typical natural ecosystems or unique kinds of vegetation, animals and land which are reserved for scientific and educational purposes. RNAs are dedicated to non-manipulative and non-destructive research. Specific resource values and management activities will be prescribed in individual establishment reports.

Resource Element	Resource/Activity Standards and Guidelines
RECREATION	
Visual Management	Research facilities installed within RNA's will blend with the natural surroundings.
Developed Recreation	No new physical improvements for recreation purposes are permitted, unless needed to protect the values for which the RNA was established.
Off-Road Vehicles	Off-road vehicle use is prohibited.
WILDLIFE AND FISH	
Habitat Improvement	Habitat improvement is generally not appropriate. Protection and maintenance of unique values of the RNA is appropriate.
	Use appropriate RNA guidelines when studying wildlife, fish, and plants.
RANGE	
Range Management	Conditions of grazing will be followed as defined in the establishment report.
TIMBER	
Timber Harvesting	No scheduled timber harvest is permitted.
	Salvage and/or firewood harvest is not appropriate.
MINERALS	
Minerals Management	Recommend withdrawal from mineral entry. If withdrawn, validity examinations may be conducted on existing mining claims.
	Decisions to lease oil and gas, or other leasable minerals will be made through NEPA analysis. Saleable mineral disposal and stockpile sites are not appropriate.

Resource Element	Resource/Activity Standards and Guidelines
LANDS	
Land Ownership Adjustment	Retain National Forest System lands; acquire private lands needed to support the RNA program.
Special Uses	Rights-of-way grants are not appropriate.
	Special use permits will not be issued.
FACILITIES	
Roads	Construction of new roads is not appropriate.
Trails	Maintenance and reconstruction of existing trails is permitted. Construction of new trails not allowed.
Utility Corridors	Avoid locating utility corridors in this management area.
PROTECTION	
Wildfire	Unless plans approved by the Station Director provide for letting natural fires burn, aggressive containment using low impact methods should be used. High impact methods will be used only to prevent a total loss of the Research Natural Area. Mop-up should be minimized with natural burnout being the preferred method.
	Initial attack and suppression methods will be designed to maintain RNA characteristics.
Prescribed Fire	Planned ignitions may be used as a means of achieving RNA objectives.
Insect & Disease Control	Insect and disease control is appropriate to protect the uniqueness of the Research Natural Area.
Plant Collection	Plant collection will be prohibited in existing or proposed RNAs, unless expressly authorized in an approved research project.