

# CANADA LYNX HABITAT INVENTORY - ST. JOE DIVIDE, IDAHO

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## INTRODUCTION

The Canada lynx (*Lynx canadensis*) is a wide ranging forest carnivore. Large feet and long legs distinguish the medium-sized cat as a species that is highly adapted to travel in deep snow characteristic of the boreal and western montane and subalpine regions of North America. Lynx is a specialized predator and uses environments dominated by coniferous or mixed coniferous-deciduous forest with dense undergrowth, but may also utilize open forest, rocky areas, and tundra to forage for abundant prey (Groves et al. 1997; Ruediger et al. 2000).

In Idaho lynx are predicted to occur in montane and subalpine coniferous forest habitats (at generally greater than 4,000 feet elevation) as far south in the west as the northern Salmon River and Lemhi mountains and east and south on the Yellowstone Highlands and Caribou Range (McKelvey et al. 2000; Wisdom et al. 2000). Several lynx occurrences are known from the Coeur d'Alene River, St. Joe River, and St. Maries River basins (Idaho Conservation Data Center 2003). Additional references on the occurrence, ecology, and conservation of lynx in Idaho include Clark et al. (1989); Idaho Conservation Effort (1998); Koehler and Aubry (1994); Koehler and Hornocker (1979); Lewis and Wenger (1998); Rust (1946); and Terra-Berns et al. (2000). Gaines et al. (2000) and Carrol et al. (2001) provide recent insight to issues concerning lynx habitat conservation planning.

Lynx prey primarily on snowshoe hare (*Lepus americanus*). Thus lynx foraging and denning habitat selection is closely tied to the distribution and quality of snowshoe hare cover and forage habitats. Lynx home range size and population densities vary with the abundance of prey. Population densities are usually less than 0.25 lynx per square mile. In western North America home range sizes have been estimated as 15 to 147 square miles (Groves et al. 1997; Ruediger et al. 2000; Ruggiero et al. 2000). Washington State Department of Natural Resources (1996) and Quade (1999) identify three primary habitat components for lynx in the Pacific Northwest: (1) foraging habitats that support snowshoe hare and provide hunting cover, (2) denning sites, and (3) dispersal/travel cover. Ruediger et al. (2000) provide a revised approach to lynx habitat classification. In this approach habitat is either suitable or unsuitable. Suitable habitats include denning and forage habitat.

The US Fish and Wildlife Service listed lynx as threatened in March 2000 (U. S. Fish and Wildlife Service 2000 and see U. S. Fish and Wildlife Service 1994; 1997; 1998; 1999). USDI Bureau of Land Management and US Fish and Wildlife Service (2000) and Ruediger et al. (2000) recognize habitat inventory and monitoring as important contributions to the conservation of lynx. The objective of this study is to delineate and describe suitable lynx habitats on Bureau of Land Management (BLM) lands within lynx analysis units (LAUs) on the Upper Columbia-Salmon Clearwater District of northern Idaho. The study is ongoing. In 2000, work was completed in the upper Latour and West Fork Pine Creek drainages (Rust 2000). In 2001, work was completed in the Pine Creek drainage (Rust 2002).

## METHODS

The study area encompasses Bureau of Land Management lands within the following lynx analysis units: Bitterroot Divide South, Bussel Creek (minor extent), Freezeout, Grandmother Mtn., Latour Creek, Lost Rocket, Pine Creek, St. Joe Divide West, and St. Joe Divide East. This area occurs within the Coeur d'Alene River, St. Joe River, and St. Maries River basins, east of Coeur d'Alene, Idaho.

We conducted lynx habitat field inventory work in stands targeted as suitable using (1) criteria summarized by Washington State Department of Natural Resources (1996), Ruggiero et al. (2000), and Quade (1999) (Box 1) and (2) vegetation maps prepared by Upper Columbia-Salmon Clearwater District (2000) and Landscape Dynamics Lab (2002). Lynx habitat field determinations were crosswalked from the Washington State Department of Natural Resources (1996) classification system to the more recent classification of Ruediger et al. (2000) using the convention shown in Box 1. Vegetation covertype mapping units are classified using the system identified by Landscape Dynamics Lab (2002) (Table 1).

**General definition of lynx habitat:** sites capable of maintaining  $\geq 180$  trees per acre (tpa) or  $\geq 70$  percent canopy cover of mature trees, with (in either case) tree foliage extending at least 3.3 feet above the mean annual average snow depth.

Lynx habitat components:

LCAS		WDNR	Description
Unsuitable		Non-Lynx Habitat	Areas generally avoided by lynx. For example, natural openings created by meadows or lakes that are not capable of meeting the general definition of lynx habitat.
		Temporary Non-Lynx Habitat	Areas temporarily avoided by lynx. Early- to mid-seral sites that are capable of supporting forest vegetation that meets the general definition of lynx habitat.
Suitable	Forage habitat (high quality)	Forage Habitat	Habitat where lynx consistently find high densities of snowshoe hare, especially in winter. Stands with at least 40 (but often 75 - 80) percent canopy cover provided by small diameter stems and branches that extend at least 3.3 feet above the mean snow level. Forage habitat provides snowshoe hare with insulating cover, protection from predators, and browse. Snowshoe hare winter browse consists of woody stems ( $\leq 0.25$ inch diameter), bark, and coniferous foliage. Snowshoe hare often prefer to browse on hardwoods (especially willows) over conifers.
	Forage habitat (low quality)	Travel Habitat	Forested habitats that provide limited snowshoe hare forage habitat and limited denning habitat. Tree canopies are at least 3.3 feet taller than the average snow depth. Tree canopies provide $\geq 70$ percent cover.
	Denning habitat	Denning Habitat	Habitat where lynx prefer to den. Mid- and late-seral stands with abundant jack-strawed dead and down trees exceeding 6 inches in diameter. Canopy cover is usually $> 60$ percent. North- to northeast-facing slopes.

**Box 1.** Classification of lynx habitats. Lynx habitats identified by Washington Department of Natural Resources (1996) (WDNR), Ruggiero et al. (2000), Quade (1999), and Ruediger et al. (2000) (LCAS) are summarized.

**Table 1.** Summary of vegetation coertype classification. Vegetation coertype classes occurring within the lynx analysis units on Upper Columbia-Salmon Clearwater District are listed by map unit code and with percent of occurrence. Covertypes are classified as suitable lynx habitat (S); unsuitable, temporary non-lynx habitat (U); or unsuitable, non-lynx habitat (N). Data are drawn from Landscape Dynamics Lab (2002). The coertype classification is modified from Landscape Dynamics Lab (2002).

Map Code	Coertype Name	Suitability	Percent
3101	Foothills Grassland	N	< 0.1
3104	Montane Parklands and Subalpine Meadows	N	1.8
3202	Warm Mesic Shrubland	U	4.4
4102	Broadleaf Forest	N	< 0.1
4201	Engelmann Spruce (>66 percent cover)	S	2.9
4203	Lodgepole Pine (> 66 percent cover)	S	7.0
4206	Ponderosa Pine (> 66 percent cover)	N	0.5
4207	Grand Fir (> 66 percent cover)	S	3.3
4208	Subalpine Fir (> 66 percent cover)	S	6.8
4210	Western Red Cedar (> 66 percent cover)	S	2.0
4211	Western Hemlock (> 66 percent cover)	S	3.3
4212	Douglas-fir (> 66 percent cover)	N	7.3
4215	Western Larch (> 66 percent cover)	N	3.2
4220	Mixed Subalpine Forest (subalpine fir, mountain hemlock, Douglas-fir, Engelmann spruce, lodgepole pine)	S	8.2
4221	Mixed Mesic Forest (western redcedar, western hemlock, Douglas-fir, Engelmann spruce, western larch, grand fir, lodgepole pine, western white pine)	S	21.2
4222	Mixed Xeric Forest (ponderosa pine, Douglas-fir, lodgepole pine)	N	0.6
4223	Douglas Fir-Lodgepole Forest (> 80 percent cover)	S	2.1
4225	Douglas-fir-Grand Fir Forest (> 80 percent cover)	S	10.3
4226	Western Red Cedar-Grand Fir Forest (> 80 percent cover)	S	3.2
4227	Western Red Cedar-Western Hemlock Forest (> 80 percent cover)	S	0.5
4228	Western Larch-Lodgepole Forest (>80percent cover)	S	3.0
4229	Western Larch-Douglas-fir Forest (> 80 percent cover)	S	4.8
4301	Mix Needleleaf/Broadleaf Forest	S	0.1
5000	Water	N	< 0.1
6101	Needleleaf Dominated Riparian (> 66 percent relative cover)	S	0.8
6102	Broadleaf Dominated Riparian (> 66 percent relative cover)	N	< 0.1
6103	Needleleaf-Broadleaf Riparian Forest (> 25 percent and < 66 percent broadleaf, > 25 percent and < 66 percent needleleaf relative cover)	S	< 0.1
6104	Mixed Riparian (forest and non-forest)	S	0.2
6201	Graminoid and Forb Dominated Riparian (<15percent total shrub cover)	N	< 0.1
6202	Shrub Dominated Riparian	U	0.2
6203	Mixed Non-Forest Riparian	U	0.1
7300	Exposed Rock (talus)	N	1.3
7800	Mixed Barren Land	N	0.5

We used both stand level and fixed area sampling techniques to document the composition and structure

of targeted stands. Stand level point observation data are intended to rapidly accumulate a large number of geographically-referenced points where knowledge of the vegetation is linked to base environmental data such as elevation, slope aspect, and slope gradient. On a walking route through an area selected for study, data on the plant association, ecological condition, seral status, and the physical environment are collected. New data are collected as a new plant association is encountered or with any significant change in the environmental parameters (slope, aspect, elevation), structural condition, seral status, or ecological condition. Quantitative composition and structure data were collected on 0.1 acre plots using the methods of Bourgeron et al. (1991) and USDA Forest Service (1992). We used conventions modified from Hall et al. (1995) to classify forest stand structural condition and seral status. Geographical positioning system data were collected for plot locations using a Garmin navigation grade unit.

The focus of field reconnaissance was to inventory lynx habitat on BLM lands. The condition and status of lynx habitats on adjacent lands (not managed by the BLM) may, however, influence management on Bureau lands. For this reason, an effort is made to interpolate results across entire LAUs. Interpolation of habitat conditions was conducted using vegetation coverages for the area (Upper Columbia-Salmon Clearwater District 2000; Landscape Dynamics Lab 2002), Landsat TM imagery, digital ortho-photography, general patterns in the environmental distribution of sampled habitats, panoramic photographic series, and reconnaissance field notes.

## RESULTS

Lynx habitat field inventories occurred in Ahrs Canyon, upper Rochat Creek, and upper Street Creek drainages within St. Joe River Basin in August 2002. For purposes of discussion these sample areas are referred to as Ahrs Canyon and Rochat-Street Creek. Thirty-seven plots (including both stand level point observation and fixed area ecology plots) were located in 24 stands that total (approximately) 1,364 acres. The cumulative extent of stands visited during the 2000 through 2002 field seasons is shown in Figure 1. A detailed summary of 2000 through 2002 field inventory results is provided in Appendix 1.

Additional information on stand composition and structure was acquired through the use of geo-referenced photo-points. Field observations and information provided by Upper Columbia-Salmon Clearwater District (2000) and Landscape Dynamics Lab (2002) were combined to interpolate the occurrence of lynx habitats within the lower Rochat Creek, Street Creek and Ahrs Canyon drainages. The cumulative extent of lynx habitats interpolated through 2000 and 2002 field work is shown in Figure 2.

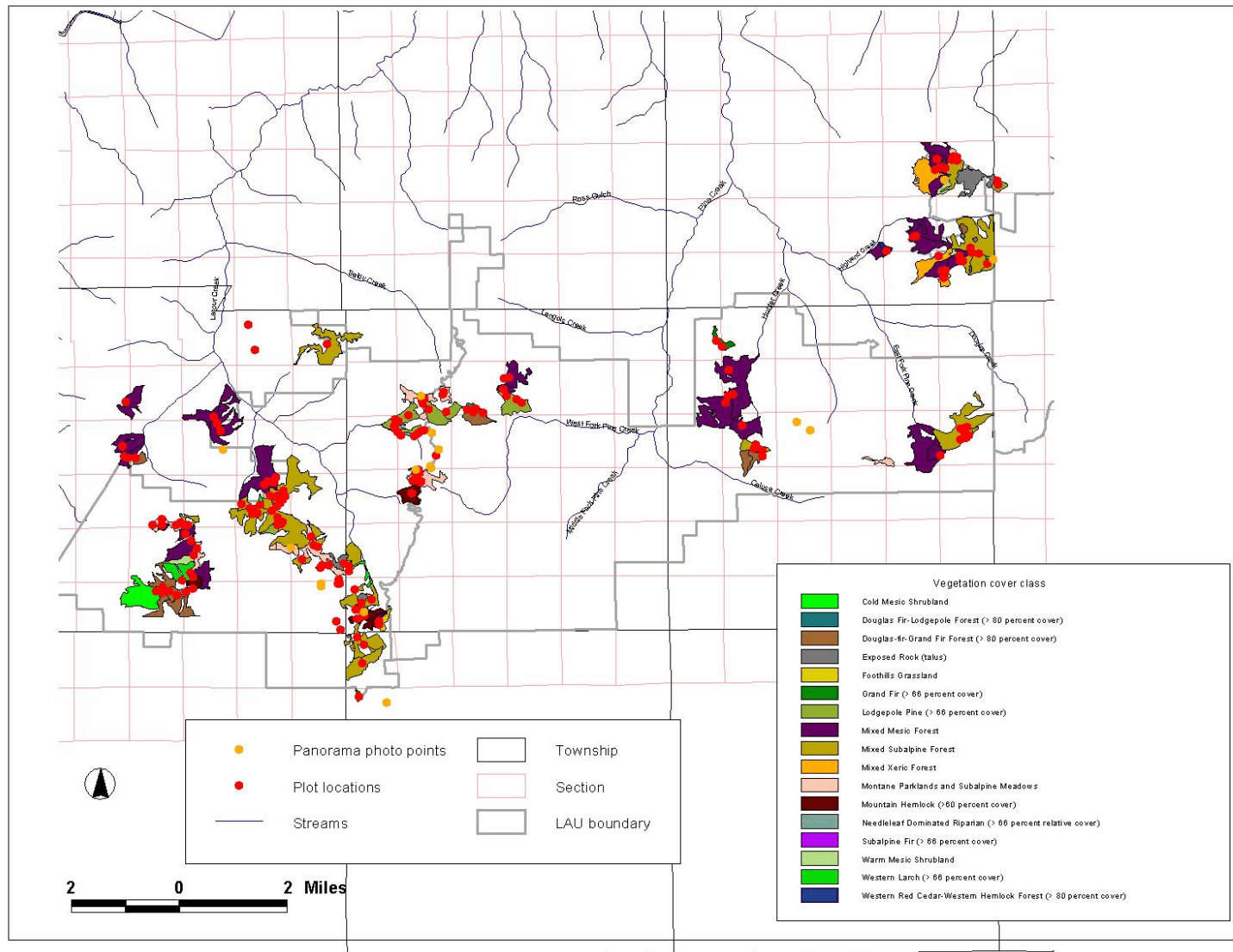
Snowshoe hare were not observed during the 2002 field season. Snowshoe hare browse, however, was observed on plots located in both Ahrs Canyon and Rochat-Street Creek. Locations of snowshoe hare browse observations of 2000 through 2002 field seasons are shown in Figure 2. As observed in previous years within the study area, snowshoe hare winter browse was most frequently observed on *Salix scouleriana*, but also occurred on *Holodiscus discolor*, and *Acer glabrum*.

Vascular plant species observed within the study area during the 2000 through 2002 field seasons are listed in Appendix 2.

Following is a more detailed summary of the 2002 field season sample areas:

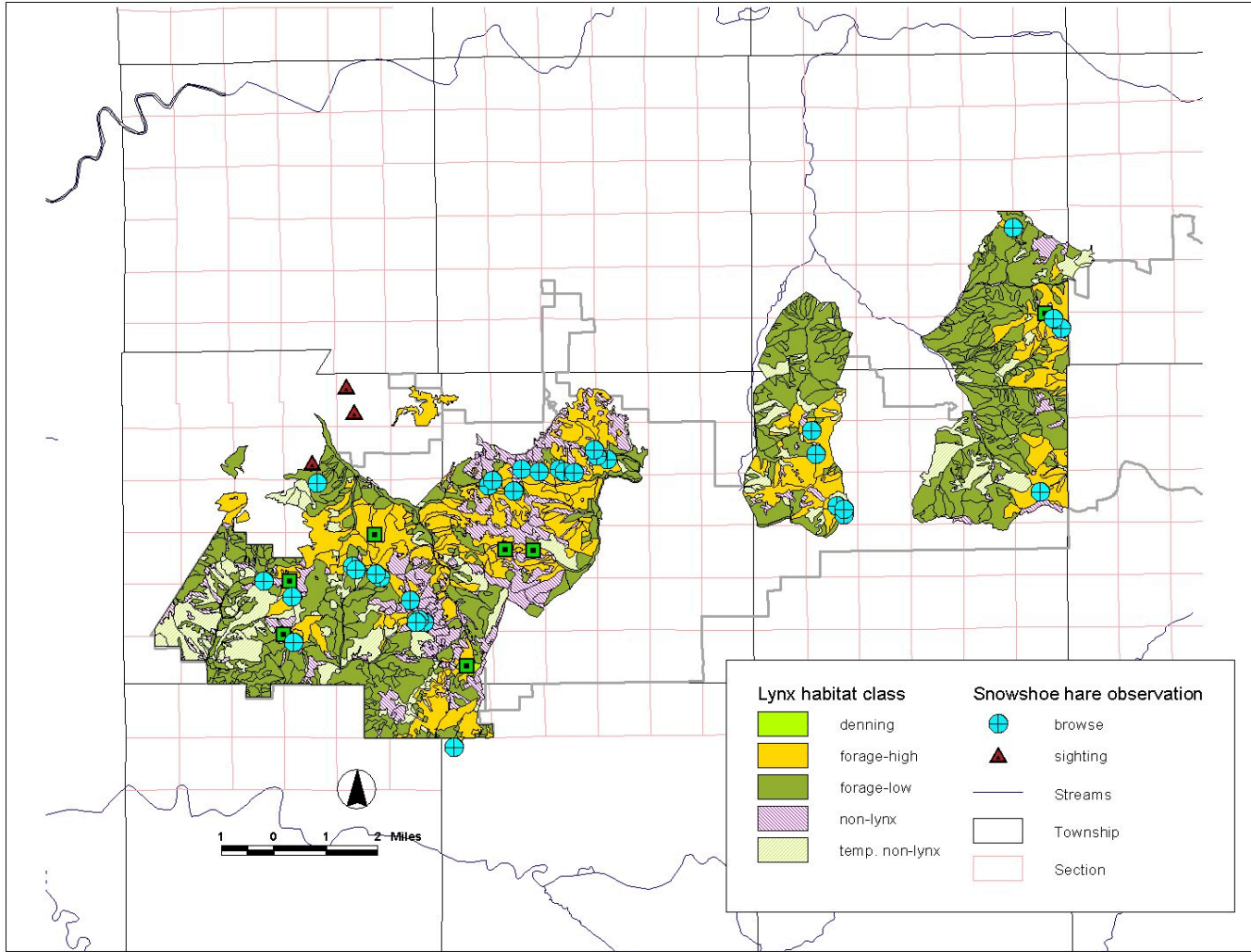
Ahrs Canyon: Twelve stands were sampled in the 2002 field season. The area is predominantly suitable lynx habitat classified as low quality forage (using conventions of Ruediger et al. (2000); see Box 1). Twenty-five percent of the stands were classified as poor high quality forage habitat. Hare browse was observed in one stand.

Nine plant associations were sampled in the Ahrs Canyon area. *Tsuga mertensiana/Xerophyllum tenex* (both *Xerophyllum tenex* phase and *Luzula hitchcockii* phase) was most frequently observed and was



**Figure 1.** Summary of lynx habitat inventories within Latour Creek and Pine Creek LAUs. The locations of 2000 through 2002 field season sample plots, panoramic photo points, and sampled stands are shown.





**Figure 2.** Lynx habitats within the Latour Creek and Pine Creek LAUs. Lynx habitat classes are interpolated from 2000 through 2002 field observations. Stands actually sampled are shown in Figure 1. Snowshoe hare and small potential denning site observation points are shown in relation to observed and interpolated lynx habitat.

sampled in five stands. The remaining associations were sampled only once. The *Tsuga mertensiana*/*Xerophyllum tenex* association occurs on mid- to upper-slope positions of broad, south- to southwest-facing slopes.

The multi-layered stands of the drainage are predominantly late-seral. Structural conditions range from stands dominated by large-diameter trees to stands dominated by medium-sized trees. *Tsuga mertensiana* and *Pseudotsuga menziesii* are the dominant overstory species. *Tsuga mertensiana*, *Abies lasiocarpa*, *Pseudotsuga menziesii*, or *Abies grandis* may be present in understory tree strata depending on site conditions. Common understory shrubs include *Salix scouleriana*, *Vaccinium membranaceum*, *Pachystima myrsinites*, *Lonicera utahensis*, and *Spiraea betulifolia*. Common and characteristic understory herbs and graminoids within the drainage include: *Xerophyllum tenex*, *Carex geeyeri*, *Carex rossii*, *Clintonia uniflora*, and *Smilacina stellata*.

Rochat-Street Creek Summary: Twenty-two stands were sampled in the 2002 field season. The predominant lynx habitat condition is low quality forage. Fifty percent of the stands sampled, however, were classified as poor to excellent high quality forage habitat. Hare browse (recent and old) was observed in four stands.

Twelve plant associations were sampled in the Rochat-Street Creek area. *Tsuga mertensiana*/*Xerophyllum tenex*, *Xerophyllum tenex* was sampled on ten stands and was most frequently observed. *Abies grandis*/*Vaccinium globulare* was observed in two stands; the remaining associations were sampled only once. *Tsuga mertensiana*/*Xerophyllum tenex*, *Xerophyllum tenex* is widely distributed within the area on mid- to upper-slope positions of steep to gentle, broad slopes, and (occasionally) ridgetops. The association is found on all aspects.

Multi-layered stands within the area are predominantly mid-seral, moderately open (25 to 66% canopy cover), and dominated by medium-sized trees. *Tsuga mertensiana*, *Larix occidentalis*, *Pinus monticola*, *Pinus contorta*, and *Pseudotsuga menziesii* are dominant overstory species within the area. *Pseudotsuga menziesii*, *Abies lasiocarpa*, *Tsuga mertensiana*, *Pinus monticola*, or *Abies grandis* may be present in understory tree strata depending on site aspect and elevation. Common shrubs within the area include *Salix scouleriana*, *Vaccinium membranaceum*, *Spiraea betulifolia*, *Pachystima myrsinites*, *Lonicera utahensis*, and *Menziesia ferrugineum*. Common and characteristic herbaceous species include *Xerophyllum tenex*, *Carex geeyeri*, *Carex rossii*, *Pyrola secunda*, *Viola orbiculata*, *Clintonia uniflora*, *Arnica cordifolia*, and *Epilobium angustifolium*. Ungulate and bear sign were frequently observed. All stands sampled in the area are in pristine condition.

## DISCUSSION

Lynx utilize a wide range of different habitats throughout the year. Lynx population dispersal and growth are limited, however, by the availability and quality of winter forage habitat. The value, or functionality, of winter forage habitat is dependent on the availability and proximity of denning habitat. Factors that contribute to the distribution and extent of lynx habitats within the study area include: relatively steep gradients in atmospheric and soil moisture availability and soil temperature; disturbance history, particularly the relatively severe fire season of 1910; the mix of public and private land ownerships; and a history of relatively extensive timber harvesting and mining.

The diversity of forest stand structural and seral conditions present within the study area provide a range of lynx winter forage habitats of varying suitability. Due to the continual change in forest stand composition and structure, the availability of suitable lynx forage habitats is spatially and temporally dynamic. Patterns in the distribution and characteristics of forage habitat observed in Ahrs Canyon, upper Rochat Creek, and Street Creek drainages were similar to those observed in previous years within the study area (Rust 2000; Rust 2002). Non-suitable, shrub-dominated stands are, however, comparatively more abundant in the Street Creek drainage.

Lynx forage habitats were observed primarily on up-slope positions of major ridges and watershed divides. Stands classified as winter forage habitat are primarily mid-seral and dominated by medium-sized (9.0 - 20.9 inch dbh) trees. These stands are in the stem exclusion and understory re-initiation stages of stand development (using the terminology of Oliver and Larson 1996). Stands in the early stages of stem exclusion typically possess remnant lynx winter forage habitat characteristics (suitable hare forage and understory cover) and are currently progressing toward a less suitable condition. As relatively dense pole-sized trees compete for limited growing space, foliage is increasingly more concentrated in the upper portion of the canopy, leaving an open understory of shade tolerant, medium-height shrubs and perennial forbs.

Stands in the late stages of stem exclusion (to early stages of understory re-initiation) are progressing toward more suitable lynx winter forage habitat conditions. The mortality of overstory trees allows increasing understory establishment of conifers (which provide understory hiding cover for hare) and re-initiation of growth of deciduous shrub forage. In many stands bark beetle mortality in lodgepole pine is promoting stand understory re-initiation processes and increasing the availability of lynx winter forage habitat conditions.

## CONCLUSION

Lynx are specialized predators adapted to life in deep snow characteristic of mountainous regions of western North America. Lynx are known to occur in the Coeur d'Alene, St. Joe, and St. Maries river basins. USDI Bureau of Land Management and US Fish and Wildlife Service (2000) identify habitat inventory and monitoring as important contributions to the conservation of lynx. The objective of this multi-year study is to delineate potential lynx habitats on Bureau of Land Management lands within lynx analysis units on the Upper Columbia-Salmon Clearwater District. Lynx forage and denning habitats and a snowshoe hare prey base were observed and documented in Ahrs Canyon, upper Rochat Creek, and upper Street Creek drainages, within Latour Creek LAU.

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Appendix 1. Detailed summary of field inventory results. Selected data collected on ecology plots during the 2000 through 2002 field seasons are listed with data for spatially associated vegetation map polygons. Data for the *polygon label* and *assigned cover class* are from Upper Columbia-Salmon Clearwater District (2000) or (for entries beginning "stjo") Landscape Dynamics Lab (2002). Lynx habitat classes are defined in Box 1. Cover class codes correspond to Table 1. Plant association codes and classification follows Cooper et al. (1991). The plant community nomenclature applied here is: plant association refers to the potential natural vegetation that occupies a habitat type. Keys to structural and ecological condition codes are given at the end of the table.

Plot id	Plant association	Series	Seral status	Structural condition	Ecological condition	Polygon label	Lynx habitat class	Assigned cover class	Observed cover class
000728-1051	TSME/MEFE, XETE		mid	mt	A	ROP239	non-lynx	7300	7300
000728-1135	TSME/MEFE, XETE		early mid	tbdae	A	ROP239	non-lynx	7300	7300
000728-1216	TSME/MEFE, MEFE		mid	mt	A	ROP239	non-lynx	3203	3203
000728-1322	TSME/STAM, MEFE		mid	mt	A	ROP399	forage-low	4208	4220
000728-1520	TSME/MEFE, LUHI		mid	mt	A	ROP399	forage-high	4208	4220
000728-1713	TSME/XETE, LUHI		late	lt	A	ROP399	non-lynx	7300	3104
000728-1734	TSME/MEFE, LUHI		late	lt	A	ROP399	forage-high	4220	4220
000728-1808	TSME/XETE, LUHI		late	lt	A	MAS077	non-lynx	3104	3104
000731-1532	ABGR/COOC		mid	mt	AB	MAS077	forage-low	4221	4221
000731-1655	THPL/CLUN, CLUN		mid	mt	A	MAS077	forage-high	4208	4221
000731-1735	TSME/CLUN, MEFE		mid- to late	lt	A	MAS083	forage-high	4221	4221
000731-1818	TSME/CLUN, MEFE		mid- to late	lt	A	MAS077	forage-high	4221	4221
000731-1909	ABGR/COOC		mid	mt	A	MAS033	forage-high	4225	4225
000801-1722	TSME/CLUN, MEFE		mid	mt	A	MAS033	forage-high	4220	4220
000801-1848		XETE	late	hedae	A	MAS056	non-lynx	3104	3104
000801-1946	CAAQ		late	hedae	A	MAS070	non-lynx	3104	3104
000801-2017	TSME/MEFE, XETE		mid	po	A	MAS068	forage-high	4220	4220
000802-0931	TSME/XETE, XETE		mid	mt	A	MAS101	forage-high	4220	4220

Plot id	Plant association	Series	Seral status	Structural condition	Ecological condition	Polygon label	Lynx habitat class	Assigned cover class	Observed cover class
000802-1051	TSME/XETE		early to mid	tbdau	A	MAS104	non-lynx	3203	3203
000802-1131	TSME/MEFE, XETE		mid	mt	A	MAS101	forage-high	4220	4220
000802-1157	TSME/MEFE, LUHI		mid	mt	A	MAS676	forage-high	4208	4220
000802-1225	TSME/MEFE, LUHI		mid	mt	A	MAS654	forage-high	4220	4220
000802-1415	TSME/XETE, LUHI		mid	mt	A	MAS654	forage-high	4220	4220
000802-1443	TSME/CLUN, XETE		mid	mt	A	MAS114	forage-high	4220	4220
000802-1550		ANSI	late	tbdac	A	MAS717	forage-high	4220	4220
000802-1636	TSHE/CLUN, MEFE		mid	mt	A	MAS573	forage-high	4220	4220
000802-1719	TSHE/CLUN, MEFE		mid	mt	A	MAS163	forage-high	4220	4221
000802-1759	TSHE/GYDR		mid	lt	A	MAS408	forage-high	4220	4221
000802-1818	TSHE/CLUN, CLUN		mid	mt	A	ROP399	forage-high	4220	4221
000802-1848	THPL/CLUN, XETE		mid	mt	A	ROP899	forage-high	4220	4221
000802-1919	TSHE/CLUN, CLUN		mid-late	mt	A	ROP399	forage-high	4220	4221
000802-1951	TSME/MEFE, XETE		mid	mt	A	MAS077	forage-high	4220	4220
000802-2008	TSME/XETE, LUHI		mid	mt	A	MAS083	forage-high	4220	4220
000803-1619	TSME/MEFE, XETE		late	lt	A	MAS052	forage-high	4229	4220
000803-1920		XETE	late	hedae	A	MAS070	non-lynx	3104	3104
000803-1956		FEVI	late	hedae	A	MAS101	non-lynx	3104	3104
000804-1255	TSME/LUHI		pnc	lt	A	MAS101	non-lynx	3104	3104
000804-1349	TSME/XETE, XETE		late	mt	A	MAS101	non-lynx	3104	3104
000804-1359	ABLA/XETE, VASC		mid	lt	A	MAS163	non-lynx	3104	3104
000804-1436	TSME/XETE, XETE		late	lt	A	MAS163	forage-high	4208	4204
000804-1532	TSME/XETE, XETE		late	lt	A	MAS573	forage-high	4208	4204

Plot id	Plant association	Series	Seral status	Structural condition	Ecological condition	Polygon label	Lynx habitat class	Assigned cover class	Observed cover class
000804-1654		FEVI	late	hedae	A	MAS163	non-lynx	3104	3104
000804-1747		XETE	late	hedae	A	ROP417	non-lynx	3104	3104
000804-1848		XETE	late	hedae	A	ROP420	non-lynx	3104	3104
000823-1040	TSME/XETE, LUHI		mid	mt	A	ROP948	forage-high	4220	4203
000823-1250	TSME/XETE, XETE		mid	mt	A	ROP488	forage-high	4220	4203
000823-1315	TSME/XETE, XETE		mid to late	mt	A	ROP500	forage-high	4220	4203
000823-1350	TSME/MEFE, MEFE		late	lt	A	ROP490	forage-high	6101	6101
000823-1515	TSME/MEFE, XETE		mid	po	A	ROP985	forage-high	4208	4208
000823-1540	TSHE/GYDR		late	lt	A	ROP984	forage-high	6101	6101
000823-1645	TSME/CLUN, XETE		early-mid	mt	A	ROP199	forage-high	6101	6101
000823-1720	TSME/XETE, XETE		early	mt	A	ROP808	forage-high	4220	4203
000823-1745	TSME/CLUN, MEFE		early mid	mt	A	ROP810	forage-high	4220	4203
000823-1830	TSME/CLUN, XETE		early mid	mt	A	ROP810	forage-high	4220	4203
000823-1930	TSME/XETE, XETE		early mid	mt	A	ROP813	forage-high	4220	4203
000824-0925	TSME/XETE, VASC		late mid	mt	AB	ROP830	forage-high	4220	4203
000824-1005	TSME/XETE, XETE		early mid	mt	AB	ROP401	forage-high	4220	4203
000824-1200	TSME/XETE, XETE		early mid	mt	A	ROP401	forage-high	4220	4203
000824-1305	TSME/XETE, XETE		early mid	mt	B	ROP405	forage-high	4203	4225
000824-1335	TSME/CLUN, CLUN		mid	lt	A	ROP399	forage-high	4220	4223
000824-1405	TSME/CLUN, CLUN		early mid	mt	A	ROP837	forage-high	3203	3203
000824-1605	TSHE/CLUN, CLUN		early mid	mt	A	ROP399	forage-high	4203	4225
000824-1650	TSNE/CLUN, CLUN		early mid	mt	A	ROP900	forage-high	4221	4203
000824-1735	ABGR/CLUN, XETE		early mid	mt	A	ROP325	forage-high	4221	4203



Plot id	Plant association	Series	Seral status	Structural condition	Ecological condition	Polygon label	Lynx habitat class	Assigned cover class	Observed cover class
000824-1815	ABGR/CLUN, CLUN		late	lt	A	ROP325	forage-high	4221	4221
000824-1855	TSME/CLUN, MEFE		early late	lt	A	ROP839	forage-high	4221	4221
000824-1930	TSHE/CLUN, XETE		late	lt	B	ROP839	forage-high	4221	4221
000825-0845		XETE	late	hedae	A	ROP838	non-lynx	7300	3104
000825-0935		FEVI	late	hedae	A	ROP830	non-lynx	7300	3104
000825-1020		CAGE	late	hedae	A	ROP830	non-lynx	7300	3104
000825-1130		FEVI	late	hedae	A	ROP325	non-lynx	3104	3104
000825-1450	TSHE/ASCA, ASCA		late mid	mt	AB	ROP325	forage-low	4221	4221
000825-1525	TSHE/CLUN, CLUN		mid	mt	B	ROP325	forage-low	4221	4221
000825-1615	ABGR/CLUN, PHMA		late mid	mt	AB	ROP325	forage-high	4221	4221
000825-1700	TSHE/CLUN, CLUN		early mid	mt	A	ROP325	forage-high	4221	4221
000825-1730	THPL/CLUN, CLUN		mid	mt	A	ROP187	forage-high	4221	4221
000825-1800	TSHE/ASCA, ASCA		early mid	mt	B	TWI293	forage-high	4221	4221
000825-1900	TSHE/CLUN, MEFE		mid	mt	B	TWI293	forage-high	4221	4221
000825-1935	TSME/XETE, MEFE		mid	po	A	TWI324	forage-high	4225	4220
000826-0655	TSME/XETE, MEFE		mid	po	B	TWI324	forage-high	4225	4220
000826-0720	ABGR/ACGL, ACGL		early	tbdau	C	TWI324	temp. non-lynx	3203	3203
000826-0755	ABGR/ACGL, ACGL		mid	mt	A	TWI794	forage-high	4225	4225
000826-0825	TSME/XETE, MEFE		mid	mt	B	TWI794	forage-high	4225	4220
010912-1447	TSHE/CLUN, CLUN		mid	mtdae	AB	TWI794	forage-low	4221	4221
010912-1539	TSHE/CLUN, CLUN		mid	mtmbu	AB	TWI324	forage-low	4221	4221
010912-1618	TSHE/CLUN, CLUN		mid	mtmbu	AB	TWI324	forage-high	4221	4221
010913-0945	TSME/XETE, XETE		mid	mtmbe	AB	TWI317	forage-high	4220	3203

Plot id	Plant association	Series	Seral status	Structural condition	Ecological condition	Polygon label	Lynx habitat class	Assigned cover class	Observed cover class
010913-1006	TSME/XETE, XETE		mid	mtmbe	AB	TWI317	forage-high	4220	3203
010913-1103	TSME/XETE, XETE		mid	mtmbe	AB	TWI317	forage-low	4220	3203
010913-1121	TSME/XETE, XETE		mid	mtmbe	AB	TWI332	forage-low	4220	3203
010913-1508	ABLA/XETE, XETE		mid	mtmbe	A	TWI332	forage-low	4220	4220
010913-1528	ABLA/PHMA		mid	mtdae	A	TWI316	forage-low	4220	4220
010913-1551	TSME/XETE, XETE		mid	mtmbe	AB	TWI316	forage-low	4220	4220
010913-1657	TSME/XETE, VASC		mid	mtdae	B	TWI314	forage-low	4208	4302
010914-1149	ABGR/ACGL, PHMA		mid	mtdae	AB	TWI314	forage-low	4220	4220
010914-1246	ABGR/ACGL, PHMA		mid	ltdae	AB	TWI314	forage-high	4220	4221
010914-1323	ABLA/PHMA		mid	ltdae	AB	TWI314	forage-low	4220	4221
010914-1349	ABGR/ACGL, PHMA		mid	ltmau	AB	TWI711	forage-high	4222	4222
010914-1503	THPL/SHUN, MEFE		mid	ltdae	AB	TWI290	forage-low	4221	4221
010914-1614	PSME/PHMA, PIPO		mid	ltmau	AB	TWI290	forage-high	4222	4222
010914-1633	ABGR/COOC		mid	mtmbe	B	TWI748	forage-low	4221	4221
010914-1656	ABGR/ACGL, PHMA		mid	mtmbu	AB	TWI294	forage-high	4222	4222
010914-1723	TSME/XETE, XETE		mid	mtmbu	AB	TWI295	forage-high	4221	4220
010914-1745	ABLA/XETE, VAGL		mid to late	mtmbu	B	TWI310	forage-high	4222	4220
010914-1814	TSME/XETE, XETE		mid to late	mtmbu	A	TWI310	forage-high	4220	4220
010914-1850	TSME/XETE, XETE		mid to late	mtmbu	B	TWI310	forage-high	4220	4220
010915-1025	ABLA/XETE, XETE		mid	pombe	AB	TWI717	forage-high	4220	4220
010915-1539	TSME/MEFE, XETE		mid to late	mtmbu	A	TWI302	forage-high	4220	4220
010915-1620	TSME/MEFE, XETE		mid	mtmbu	A	TWI251	forage-high	4220	4220
010915-1659	TSME/XETE, XETE		mid	mtmbu	A	TWI289	forage-low	4220	4220

Plot id	Plant association	Series	Seral status	Structural condition	Ecological condition	Polygon label	Lynx habitat class	Assigned cover class	Observed cover class
010915-1800	TSME/XETE, XETE		mid	mtdau	A	TWI289	forage-high	4221	4221
010913-0946	TSME/XETE, XETE		mid-late	mtmbu	A	TWI289	forage-low	4220	3203
010915-1030	TSME/XETE, XETE		mid	pombe	A	TWI709	forage-low	3203	4302
010913-1105	TSME/XETE, XETE		mid	mtmbe	A	MAS238	forage-low	4220	3203
010913-1500	TSME/XETE, XETE		mid	mtmae	A	MAS238	forage-high	4220	4220
010913-1700	TSME/XETE, XETE		mid	mtmbe	A	MAS243	forage-low	4208	4302
010914-1445		PSME	mid	mtmbe	A	MAS255	forage-low	4221	4221
010914-1520	ABGR/ACGL, PHMA		mid	ltmbu	A	MAS243	forage-low	4221	4221
010914-1640	ABIGRA SERIES		mid	mtdau	A	MAS255	forage-high	4221	4221
010914-1730	TSME/XETE		mid	mtdau	A	MAS264	forage-high	4221	4220
010914-1810	TSME/XETE, XETE		mid	mtdau	A	MAS804	forage-high	4221	4220
010915-1500	TSME/MEFE, MEFE		mid	mtmbu	A	MAS804	forage-high	4220	4220
010915-1535	TSME/MEFE, MEFE		mid	pombu	AB	MAS752	forage-high	4220	4220
010915-1621	TSME/XETE		early-mid	mtmbu	A	MAS269	forage-high	4220	4220
010915-1715	TSME/XETE, XETE		mid	missing	A	MAS804	forage-high	4220	4220
020820-1218	TSME/XETE,XETE		mid	mtmbu	A	ROP928	non-lynx	4225	4215
020820-1351	TSME/XETE,XETE		mid	mtmbu	A	ROP929	forage-high	4203	4221
020820-1519	TSME/XETE,XETE		mid	mtmae	A	ROP989	forage-low	4220	4221
020820-1624	ABGR/CLUN,XETE		mid	mtmbu	A	ROP970	forage-low	4225	4225
020820-1658	ABGR/VAGL		mid	mtmbe	A	ROP452	forage-low	4222	4225
020820-1740	ABGR/VAGL		mid	ltobu	A	ROP452	temp non-lynx	4222	4225
020820-1803	ABGR/CLUN,XETE		mid	mtmae	A	ROP969	forage-low	4225	4225
020820-1832	ABGR/CLUN,PHMA		early-mid	tbdau	A	ROP447	temp non-lynx	3202	3203

Plot id	Plant association	Series	Seral status	Structural condition	Ecological condition	Polygon label	Lynx habitat class	Assigned cover class	Observed cover class
020820-1918	TSME/XETE,XETE		mid	mtmau	A	ROP450	forage-low	4225	4225
020820-1956	TSME/MEFE,MEFE		mid	mtdau	A	ROP929	forage-high	4203	4233
020821-1110	VAME/XETE		late	maobe	A	ROP390	non-lynx	3104	3104
020821-1158	TSME/XETE,XETE		early-mid	pooau	A	ROP390	temp non-lynx	3104	3104
020821-1221	TSME/XETE,XETE		mid	mtobu	A	ROP388	forage-high	4229	4220
020821-1251	TSME/XETE,XETE		mid	mtmbu	A	ROP388	forage-high	4229	4221
020821-1330	TSME/XETE,XETE		mid	mtmau	A	ROP388	forage-high	4229	4220
020821-1501	HODI/CARU		late	mbnae	A	ROP386	non-lynx	3104	3104
020821-1540	VAME/XETE		late	lsnae	A	ROP386	non-lynx	3104	3104
020821-1627		CARU	late	hedae	A	ROP386	non-lynx	3104	3104
020821-1720	TSME/XETE,XETE		mid	mtmbu	A	ROP385	forage-high	4222	4221
020821-1754	VAME/FEVI		mid	mbmae	A	ROP386	non-lynx	3104	3104
020821-1830	TSME/MEFE,XETE		mid-late	mtmbu	A	ROP386	forage-high	3104	4233
020821-1851	TSME/XETE,XETE		mid	mtdau	A	ROP892	forage-high	3203	4220
020822-1531	TSME/XETE,LUHI		mid	mtmbu	A	stjo001	forage-high	4220	4204
020822-1622	TSME/XETE,VASC		late	ltmau	A	stjo002	forage-high	4215	4204
020822-1835	TSME/XETE,XETE		late	ltmbu	AB	stjo004	forage-low	4215	4220
020822-1856	TSME/XETE,XETE		mid - late	mtoau	AB	stjo005	non-lynx	4208	4220
020822-1925	TSME/MEFE,XETE		mid	mtmbu	A	stjo006	forage-high	4210	4220
020823-1002	TSME/XETE,VASC		mid-early	mtmau	A	ROP946	forage-high	4220	4220
020823-1027	TSME/XETE,XETE		mid	mtmbu	A	ROP946	forage-high	4220	4220
020823-1102	TSME/XETE,XETE		mid	mtmbu	A	ROP944	forage-high	4220	4220
020823-1144	ABGR/ACGL,ACGL		late	ltmbu	A	stjo007	forage-high	4212	4207

Plot id	Plant association	Series	Seral status	Structural condition	Ecological condition	Polygon label	Lynx habitat class	Assigned cover class	Observed cover class
020822-1220	TSME/XETE,LUHI		late	gtmbu	A	stjo002	forage-low	4215	TSME
020822-1326	TSME/MEFE,LUHI		late	gtmau	A	stjo002	denning	4215	4204
020822-1441	XETE/CAGE		late	hedae	A	stjo003	non-lynx	7300	3101

### Structural Condition

A five character string incorporating code for height, canopy cover, and canopy layering (strata) is given as follows:

	Code	Description
Height classes:		
Herbland	he	herbland. Grasses and herbs the only lifeform present.
Shrubland	ls	low shrub. Shrubs are 0 - 1.5 feet tall.
	ma	medium shrub. Shrubs are 1.6 - 2.5 feet tall.
	mb	medium tall shrub. Shrubs are 2.6 - 4.0 feet tall.
	ta	tall shrub. Shrubs are 4 - 6.5 feet tall.
	tb	very tall shrub. Shrubs are $\geq 6.5$ (and $< 16.5$ ) feet tall.
Forest	--	trees, if present, are $< 1$ inch diameter at breast height (dbh); grasses, herbs, or shrubs may be dominant (refer to previous classes).
	sa	sapling tree. 20 trees per acre 1 - 4.9 inches dbh. <sup>1</sup>
	po	pole tree. 15 trees per acre 5 - 8.9 inches dbh.
	mt	medium tree. 10 trees per acre 9 - 20.9 inches dbh.
	lt	large tree. 10 trees per acre 21 - 31.9 inches dbh.
	vt	giant tree. 5 trees per acre $> 31.9$ inches dbh.
Cover classes:	na	$< 10$ percent canopy cover.
	oa	$\geq 10$ and $< 15$ percent canopy cover.
	ob	$\geq 15$ and $\leq 25$ percent canopy cover.
	ma	$> 25$ and $\leq 40$ percent canopy cover.
	mb	$> 40$ and $\leq 66$ percent canopy cover.
	da	$> 66$ percent cover.
Shrub strata	n	no strata.
	e	one stratum with $< 30$ percent difference in height.
	u	Two or more strata (of the same life form) with $> 30$ percent difference in height. If shrubland, a second shrub strata must have $\geq 25$ percent cover. If herbland or grassland, a second herb or grass strata must have $\geq 10$ percent cover (including cryptograms).

### Ecological Condition

Code	Description
A	Pristine condition. Evidence of post-industrial human-caused disturbance is absent. Exotic species are absent.
B	Little evidence of post-industrial human-caused disturbance is present. Stand composition and structure is predominantly natural. Exotic species are only common ( $\leq$ one percent cover).
C	Post-industrial human-caused disturbance is apparent. Stand composition and structure is altered. Exotic species are well represented to abundant (5 - 25 percent cover).
D	Evidence of post-industrial human-caused disturbance is prevalent. Stand composition and structure is altered. Native species are present, but are in peril of loss. Increasers dominate the stand. Invader species are a significant compositional component.
F	Native stand composition, structure, and function are significantly altered. Re-establishment of native stand composition, structure, and function will require large energy inputs.

<sup>1</sup> This applies to the largest trees present. A class is determined by the average diameter at breast height (dbh) of the number of trees per acre indicated.

Appendix 2. Vascular plant species observed during the 2000 through 2002 field seasons within Latour Creek and Pine Creek LAUs. Species are listed alphabetically by life form. Distribution within the study area is indicated by study site. Nomenclature follows Hitchcock and Cronquist (1973).

Species	Ahrs Canyon	Butler Creek	Highland-Douglas Creeks	Latour Peak	Point 6168	Rochat Peak	Street-Roch at Creeks	Upper Hunter Creek	West Fork Pine Creek
<b>Trees</b>									
<i>Abies grandis</i>	✓	✓	✓				✓	✓	✓
<i>Abies lasiocarpa</i>	✓	✓	✓	✓	✓		✓	✓	✓
<i>Betula papyrifera</i>			✓						
<i>Larix occidentalis</i>		✓	✓	✓		✓	✓	✓	✓
<i>Picea engelmannii</i>	✓		✓	✓		✓	✓		✓
<i>Pinus contorta</i>	✓	✓	✓	✓	✓	✓	✓		✓
<i>Pinus monticola</i>		✓	✓	✓		✓	✓	✓	✓
<i>Pinus ponderosa</i>			✓			✓			✓
<i>Populus tremuloides</i>			✓			✓			
<i>Populus trichocarpa</i>	✓		✓						
<i>Pseudotsuga menziesii</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Rhamnus purshiana</i>						✓			
<i>Taxus brevifolia</i>								✓	✓
<i>Thuja plicata</i>		✓	✓			✓		✓	✓
<i>Tsuga heterophylla</i>			✓	✓		✓		✓	✓
<i>Tsuga mertensiana</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Shrubs</b>									
<i>Acer glabrum</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Alnus sinuata</i>		✓	✓	✓		✓		✓	✓
<i>Amelanchier alnifolia</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Berberis repens</i>			✓						✓
<i>Ceanothus velutinus</i>			✓		✓	✓	✓	✓	
<i>Holodiscus discolor</i>		✓	✓	✓		✓	✓	✓	✓
<i>Juniperus communis</i>						✓			

Species	Ahrs Canyon	Butler Creek	Highland-Douglas Creeks	Latour Peak	Point 6168	Rochat Peak	Street-Roch at Creeks	Upper Hunter Creek	West Fork Pine Creek
<i>Lonicera ciliosa</i>			✓						
<i>Lonicera utahensis</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Menziesia ferruginea</i>	✓	✓	✓	✓		✓	✓	✓	✓
<i>Pachistima myrsinites</i>	✓	✓	✓	✓		✓	✓	✓	✓
<i>Philadelphus lewisii</i>			✓			✓			
<i>Phyllodoce empetrifloris</i>					✓				
<i>Physocarpus malvaceus</i>	✓	✓	✓				✓	✓	
<i>Prunus emarginata</i>	✓		✓		✓	✓	✓		
<i>Ribes lacustre</i>				✓		✓			
<i>Ribes viscosissimum viscosissimum</i>		✓	✓	✓			✓		✓
<i>Rosa gymnocarpa</i>	✓	✓	✓	✓		✓	✓	✓	✓
<i>Rubus parviflorus</i>	✓	✓	✓	✓		✓	✓	✓	✓
<i>Salix scouleriana</i>	✓	✓	✓	✓		✓	✓	✓	✓
<i>Sambucus cerulea</i>						✓			
<i>Sambucus racemosa</i>	✓	✓				✓		✓	
<i>Sambucus spp.</i>	✓								
<i>Sorbus scopulina</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Sorbus sitchensis</i>				✓	✓	✓			
<i>Spiraea betulifolia</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Spiraea densiflora</i>					✓	✓			
<i>Symphoricarpos albus</i>	✓		✓						
<i>Vaccinium globulare</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Vaccinium membranaceum</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Vaccinium myrtillus</i>	✓			✓	✓	✓			
<i>Vaccinium scoparium</i>	✓		✓	✓	✓	✓	✓		✓

Species	Ahrs Canyon	Butler Creek	Highland-Douglas Creeks	Latour Peak	Point 6168	Rochat Peak	Street-Roch at Creeks	Upper Hunter Creek	West Fork Pine Creek
<b>Herbs</b>									
<i>Achillea millefolium</i>	✓		✓	✓	✓	✓	✓	✓	
<i>Aconitum columbianum</i>						✓			
<i>Actaea rubra</i>		✓				✓		✓	
<i>Adenocaulon bicolor</i>	✓	✓	✓			✓	✓	✓	✓
<i>Agastache urticifolia</i>	✓								
<i>Agoseris aurantiaca</i>	✓					✓	✓		
<i>Agoseris retrorsa</i>				✓	✓	✓			
<i>Anaphalis margaritacea</i>	✓	✓	✓	✓		✓			
<i>Anemone oregana</i>		✓		✓		✓		✓	✓
<i>Anemone piperi</i>	✓	✓	✓			✓	✓	✓	✓
<i>Antennaria microphylla</i>	✓	✓		✓	✓	✓	✓		
<i>Antennaria racemosa</i>		✓	✓			✓			
<i>Apocynum androsaemifolium</i>			✓			✓			✓
<i>Aquilegia flavescens</i>						✓			
<i>Arenaria capillaris</i>				✓	✓	✓			
<i>Arenaria congesta</i>				✓	✓	✓	✓		
<i>Arenaria kingii</i>	✓					✓	✓		
<i>Arenaria macrophylla</i>	✓	✓	✓	✓		✓	✓	✓	
<i>Arnica cordifolia</i>	✓	✓	✓	✓	✓	✓		✓	✓
<i>Asarum caudatum</i>		✓		✓		✓		✓	✓
<i>Aster foliaceus</i>	✓					✓			
<i>Aster integrifolius</i>						✓			
<i>Aster spp.</i>					✓	✓	✓		
<i>Besseyia rubra</i>							✓		
<i>Brickellia grandiflora</i>					✓	✓			
<i>Calochortus elegans</i>				✓	✓	✓	✓		



Species	Ahrs Canyon	Butler Creek	Highland-Douglas Creeks	Latour Peak	Point 6168	Rochat Peak	Street-Roch at Creeks	Upper Hunter Creek	West Fork Pine Creek
<i>Calochortus eurycarpus</i>	✓								
<i>Campanula rotundifolia</i>	✓	✓		✓	✓	✓	✓		
<i>Castilleja hispida</i>	✓								
<i>Castilleja hispida acuta</i>						✓			
<i>Castilleja miniata</i>		✓		✓					
<i>Castilleja miniata miniata</i>			✓			✓			
<i>Centaurea diffusa</i>								✓	
<i>Centaurea maculosa</i>			✓						
<i>Chimaphila menziesii</i>	✓	✓	✓			✓	✓	✓	✓
<i>Chimaphila umbellata</i>	✓	✓	✓	✓	✓		✓	✓	✓
<i>Chorallorhiza mertensiana</i>		✓							
<i>Chrysanthemum leucanthemum</i>		✓	✓						
<i>Circaea alpina</i>		✓							
<i>Cirsium arvense</i>			✓						
<i>Clintonia uniflora</i>	✓	✓	✓	✓		✓	✓	✓	✓
<i>Collinsia parviflora</i>							✓		
<i>Coptis occidentalis</i>		✓	✓	✓		✓	✓	✓	✓
<i>Corallorhiza maculata</i>		✓	✓						
<i>Corallorhiza mertensiana</i>	✓			✓					✓
<i>Dicentra formosa</i>						✓			
<i>Disporum hookeri</i>	✓	✓		✓		✓		✓	✓
<i>Epilobium angustifolium</i>	✓	✓	✓	✓	✓	✓	✓	✓	
<i>Epilobium glaberrimum</i>						✓			
<i>Epilobium spp.</i>					✓				
<i>Eriogonum flavum</i>						✓	✓		
<i>Eriogonum heracleoides</i>						✓			
<i>Eriogonum umbellatum</i>	✓						✓		

Species	Ahrs Canyon	Butler Creek	Highland-Douglas Creeks	Latour Peak	Point 6168	Rochat Peak	Street-Roch at Creeks	Upper Hunter Creek	West Fork Pine Creek
<i>Eriogonum umbellatum subalpinum</i>				✓	✓	✓			
<i>Erythronium grandiflorum</i>	✓		✓	✓	✓	✓	✓		
<i>Fragaria vesca</i>			✓					✓	
<i>Frasera</i> spp.	✓					✓			
<i>Galium triflorum</i>	✓	✓	✓	✓		✓		✓	✓
<i>Gayophytum</i> spp.							✓		
<i>Gentiana calycosa calycosa</i>						✓			
<i>Geum macrophyllum</i>		✓							
<i>Gilia aggregata</i>	✓								
<i>Goodyera oblongifolia</i>	✓	✓	✓	✓		✓	✓	✓	✓
<i>Habenaria saccata</i>						✓			
<i>Habenaria unalascensis</i>						✓			
<i>Hedysarum occidentale</i>				✓					✓
<i>Helianthella uniflora</i>			✓	✓		✓			✓
<i>Heuchera cylindrica glabella</i>			✓			✓			
<i>Hieracium albertinum</i>	✓								
<i>Hieracium albiflorum</i>	✓	✓	✓	✓	✓	✓		✓	✓
<i>Hieracium cynoglossoides</i>	✓			✓	✓	✓	✓		
<i>Hieracium gracile</i>	✓			✓	✓	✓			
<i>Hieracium pratense</i>		✓							
<i>Hypericum formosum</i>	✓								
<i>Hypericum formosum scouleri</i>				✓	✓	✓			
<i>Hypericum perforatum</i>	✓	✓	✓						
<i>Hypopitys monotropa</i>			✓			✓	✓	✓	
<i>Ligusticum canbyi</i>				✓		✓			
<i>Linnaea borealis</i>			✓					✓	✓
<i>Listera convallarioides</i>	✓	✓							

Species	Ahrs Canyon	Butler Creek	Highland-Douglas Creeks	Latour Peak	Point 6168	Rochat Peak	Street-Roch at Creeks	Upper Hunter Creek	West Fork Pine Creek
<i>Lomatium dissectum</i>						✓	✓		
<i>Lomatium spp.</i>				✓	✓				
<i>Lomatium triternatum</i>	✓					✓	✓		
<i>Lupinus argenteus argenteus</i>						✓			
<i>Lupinus polyphyllus</i>	✓			✓			✓		
<i>Lupinus polyphyllus burkei</i>			✓			✓			
<i>Lupinus spp.</i>			✓	✓	✓	✓			
<i>Microseris nutans</i>				✓	✓	✓			
<i>Microseris troximoides</i>				✓					
<i>Mitella pentandra</i>			✓	✓		✓		✓	
<i>Mitella stauropetala</i>		✓				✓			
<i>Montia cordifolia</i>				✓		✓			
<i>Osmorhiza chilensis</i>	✓	✓	✓	✓		✓		✓	
<i>Osmorhiza purpurea</i>				✓	✓				
<i>Pedicularis bracteosa</i>	✓	✓	✓	✓		✓	✓		✓
<i>Pedicularis contorta</i>	✓	✓		✓		✓	✓		✓
<i>Pedicularis groenlandica</i>						✓			
<i>Pedicularis racemosa</i>	✓	✓		✓		✓			
<i>Penstemon attenuatus</i>	✓			✓	✓		✓		
<i>Penstemon attenuatus attenuatus</i>		✓				✓			
<i>Penstemon fruticosus</i>	✓				✓	✓			
<i>Penstemon lyallii</i>	✓				✓	✓	✓		
<i>Phacelia hastata</i>			✓						
<i>Phlox diffusa</i>				✓	✓				
<i>Plantago major</i>			✓						
<i>Polemonium occidentale</i>	✓			✓	✓	✓			
<i>Polygonum bistortoides</i>				✓					

Species	Ahrs Canyon	Butler Creek	Highland-Douglas Creeks	Latour Peak	Point 6168	Rochat Peak	Street-Roch at Creeks	Upper Hunter Creek	West Fork Pine Creek
<i>Polygonum phytolaccaefolium</i>	✓			✓	✓	✓	✓		
<i>Prunella vulgaris</i>		✓	✓						
<i>Pterospora andromedea</i>	✓		✓			✓	✓		
<i>Pyrola asarifolia</i>	✓	✓	✓	✓		✓	✓	✓	✓
<i>Pyrola picta</i>								✓	
<i>Pyrola secunda</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Rumex occidentalis</i>		✓							
<i>Saxifraga adscendens</i>						✓			
<i>Saxifraga cernua</i>						✓			
<i>Saxifraga ferruginea</i>						✓			
<i>Sedum lanceolatum</i>						✓			
<i>Selaginella wallacei</i>						✓	✓		
<i>Senecio integerrimus</i>			✓			✓	✓		
<i>Senecio serra</i>			✓						
<i>Senecio spp.</i>					✓				
<i>Senecio triangularis</i>	✓	✓		✓		✓		✓	
<i>Silene menziesii</i>			✓						
<i>Silene parryi</i>	✓			✓	✓	✓			
<i>Silene scouleri</i>						✓			
<i>Smilacina racemosa</i>		✓	✓			✓	✓	✓	✓
<i>Smilacina stellata</i>	✓	✓	✓	✓		✓	✓	✓	✓
<i>Stellaria nitens</i>						✓			
<i>Stenanthium occidentale</i>						✓			
<i>Streptopus amplexifolius</i>				✓		✓			
<i>Synthyris missurica</i>						✓			
<i>Thalictrum fendleri</i>	✓					✓	✓	✓	✓
<i>Thalictrum occidentale</i>		✓	✓	✓		✓			

Species	Ahrs Canyon	Butler Creek	Highland-Douglas Creeks	Latour Peak	Point 6168	Rochat Peak	Street-Roch at Creeks	Upper Hunter Creek	West Fork Pine Creek
<i>Tiarella trifoliata</i>	✓	✓		✓				✓	✓
<i>Tiarella trifoliata unifoliata</i>		✓							
<i>Trautvetteria caroliniensis</i>						✓			
<i>Trifolium longipes</i>		✓	✓						
<i>Trifolium repens</i>		✓	✓						
<i>Trillium ovatum</i>	✓	✓		✓		✓	✓	✓	✓
<i>Valeriana sitchensis</i>	✓	✓	✓			✓			
<i>Veratrum viride</i>	✓		✓	✓	✓	✓		✓	
<i>Veronica americana</i>		✓							
<i>Veronica cusickii</i>					✓	✓			
<i>Viola glabella</i>		✓		✓		✓			
<i>Viola orbiculata</i>	✓		✓	✓	✓	✓	✓	✓	
<i>Viola spp.</i>		✓		✓					✓
<i>Xerophyllum tenax</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Grasses, sedges, and rushes</b>									
<i>Agropyron spicatum</i>			✓			✓			
<i>Agropyron spp.</i>					✓		✓		
<i>Bromus spp.</i>				✓				✓	✓
<i>Bromus vulgaris vulgaris</i>	✓	✓	✓						
<i>Calamagrostis canadensis</i>						✓			
<i>Calamagrostis purpurascens</i>	✓		✓			✓			
<i>Calamagrostis rubescens</i>	✓	✓	✓	✓		✓	✓		✓
<i>Calamagrostis tweedyi</i>			✓			✓			
<i>Carex aquatilis</i>						✓			
<i>Carex arcta</i>		✓							
<i>Carex concinnoides</i>		✓	✓			✓			
<i>Carex geyeri</i>	✓		✓	✓	✓	✓	✓	✓	

Species	Ahrs Canyon	Butler Creek	Highland-Douglas Creeks	Latour Peak	Point 6168	Rochat Peak	Street-Roch at Creeks	Upper Hunter Creek	West Fork Pine Creek
<i>Carex laeviculmis</i>		✓							
<i>Carex mertensii</i>						✓			
<i>Carex nigricans</i>	✓				✓	✓			
<i>Carex rossii</i>	✓	✓	✓	✓	✓	✓	✓		✓
<i>Carex spp.</i>					✓				
<i>Dactylis glomerata</i>			✓						
<i>Danthonia intermedia</i>				✓		✓	✓		
<i>Elymus glaucus</i>	✓		✓			✓	✓		
<i>Festuca idahoensis</i>				✓					
<i>Festuca idahoensis idahoensis</i>			✓			✓			
<i>Festuca occidentalis</i>		✓				✓	✓		
<i>Festuca viridula</i>	✓		✓	✓	✓	✓	✓		
<i>Juncus ensifolius</i>			✓						
<i>Juncus parryi</i>	✓			✓	✓	✓			
<i>Luzula hitchcockii</i>	✓			✓	✓	✓	✓		✓
<i>Luzula spicata</i>						✓			
<i>Phleum pratense</i>			✓					✓	
<i>Poa annua</i>						✓			
<i>Poa secunda</i>						✓			
<i>Trisetum spicatum</i>						✓			
<b>Ferns and fern allies</b>									
<i>Athyrium filix-femina</i>		✓				✓		✓	
<i>Cheilanthes feei</i>						✓			
<i>Cheilanthes gracillima</i>					✓	✓			
<i>Cryptogramma crista</i>	✓					✓			
<i>Dryopteris filix-mas</i>		✓		✓					
<i>Equisetum arvense</i>						✓			

Species	Ahrs Canyon	Butler Creek	Highland-Douglas Creeks	Latour Peak	Point 6168	Rochat Peak	Street-Roch at Creeks	Upper Hunter Creek	West Fork Pine Creek
<i>Gymnocarpium dryopteris</i>				✓		✓		✓	
<i>Polystichum lonchitis</i>	✓	✓		✓		✓		✓	✓
<i>Polystichum munitum</i>		✓				✓		✓	
<i>Polystichum munitum munitum</i>			✓	✓					
<i>Pteridium aquilinum</i>	✓	✓	✓			✓	✓	✓	✓
<i>Thelypteris nevadensis</i>						✓			