

SURVEY DATES: Snow-tracking stint 1: 6 and 7 January 2001
Snow-tracking stint 2: 5 February 2001
Remote camera active: 20 days (7 January 2001 - 27 January 2001; malfunction precluded full camera session)

SURVEY CONDITIONS : Snow-tracking conditions were sub-optimal on all survey dates and sites during this project; consistently low snow cover and infrequent snowfall hampered tracking surveys. Conditions on the Grass Creek site were the worst of all 9 sites surveyed. South and west facing slopes were snow-free at low- and mid-elevations, and cool slopes at higher elevations supported a maximum snow depth of only about 30cm. This paucity of snow lead to relatively high abundances of ungulates on the site during the entire winter, which in turn caused areas of trampled snow upon which tracking was difficult. This site lies directly in the rain shadow of the Absaroka Mountains, and thus is chronically dry. This effect was exacerbated by a winter 2000 - 2001 snow pack only about 50% of normal. We suspect snow-tracking is a more productive technique on this site under normal precipitation regimes. However, forest cover is naturally patchy across much of this site, and that natural patchiness is accentuated by past and current timber harvests here. This leads to significant areas of wind-disturbed and wind-hardened snow, which will reduce the effectiveness of snow-tracking on this site in general.

The remote camera station generated some photographs, although not of target species. Based on photograph dates and camera condition at retrieval, it is likely that the camera malfunctioned after about 20 days following placement.

OBSERVATIONS OF LYNX: No observations of lynx were recorded at this site.

HABITAT OBSERVATIONS:

General - The Grass Creek site lies on the southeastern terminus of the Absaroka Mountains and ranges in elevation from 2200 - 3050m, sloping generally upward from east to west. Topography is rough and is characterized by steep V-cut drainages with occasionally dramatic relief, including cliff sets between stream bottoms and ridgelines.

Forest cover is naturally fragmented, with large sagebrush-grasslands interspersed between timbered areas. Forest becomes more contiguous as elevation increases, and is most contiguous on the western boundary of the site. Lodgepole pine dominates forested areas, with Engelmann spruce and subalpine fir becoming more common at higher elevations and in more mesic sites. Aspen stands occur infrequently. Past and current timber harvests occur throughout the site, further fragmenting forest in general and stands of mid- to late-seral stage in particular. Structurally diverse stands with large coarse-woody debris were observed only infrequently.

This site lies directly in the rain shadow of the Absaroka Mountains / Yellowstone Plateau, and thus is rather dry. Streams that drain large basins, such as Grass Creek and Cottonwood Creek, are small relative to streams in comparable settings elsewhere.

Prey species: Although both snowshoe hare and red squirrel were observed on this site, their abundances were notably low and their distributions fragmented. Alternative prey species such as desert cottontail, white-tailed jackrabbit, and blue grouse were not observed, but likely occur here. Wild ungulates were rather abundant, suggesting at least a moderate availability of carrion.

Competitors: Tracks of both mountain lion and coyote were observed, with the latter being rather common and widespread. Based on general habitat, bobcat and possibly red fox probably occupy this site as well. Low snow pack and abundant snow-free slopes suggest that generalist carnivores can range throughout most of this site in winter. Such access may be reduced in years of heavier precipitation. This area is remote from human occupation and doesn't appear to receive much recreational use, lessening the probability of domestic dog presence here.

Other species: No significant observations. Wolverine, fisher, and American marten were not observed.

Other: Several recent and regenerating clearcuts occur on this site. Aspen stands appeared to be composed mainly of mature trees with little reproduction except in range exclosures. Winter recreational

use appeared to be rather low, likely due to a combination of remote location and chronically low snow pack.

PHOTOGRAPHS: None.

SURVEY DATES: Snow-tracking stint 1: 8 January 2001
Snow-tracking stint 2: 3, 7, and 8 February 2001
Remote camera active: 31 days (8 January 2001 - 8 February 2001)

SURVEY CONDITIONS : Snow-tracking conditions were sub-optimal on all survey dates and sites during this project; consistently low snow cover and infrequent snowfall hampered tracking surveys. Although this site supported contiguous snow cover, it was thin and heavily weathered (see Photo B-3).

The remote camera station was functional and generated several photographs, although not of target species.

OBSERVATIONS OF LYNX: No observations of lynx were recorded at this site.

HABITAT OBSERVATIONS:

General - The Lander site lies near the southeastern terminus of the Wind River Mountains and ranges from 2070 - 3170m in elevation, sloping upward from east to west. Deeply incised drainages separated by steep ridges occur at lower elevations; this landscape transitions into a smooth and even slope extending from mid- to high elevations.

Forest cover is moderately fragmented at low elevations, becoming more contiguous as elevation increases. Lodgepole pine dominates at all elevations (Photo B-1, B-2), with Engelmann spruce, subalpine fir, aspen, whitebark pine, and limber pine present in lesser and varying amounts (Photo B-3). Tree species richness and stand structural diversity are highest at low, and again at high, elevations. The mid-elevational zone is dominated by doghair stands of lodgepole pine with low structural complexity. Most forest stands appear to be early- to mid-seral in development, with mature stands encountered only infrequently. A significant number of regenerating clearcuts are present on this site (Photo B-1), likely representing mid- to late-seral stands that have been recently removed. Large coarse-woody debris was observed only periodically.

Because this area lies in the rain shadow of the Wind River Mountains it is rather dry and supports a low snow pack, especially relative to sites on the western slope of the range.

Prey: Snowshoe hare and red squirrels were observed in conifer stands throughout this site. Track densities were low to moderate; the most tracks of each species occurred in structurally diverse conifer stands at the lowest and highest elevation zones. Mid-elevation, doghair stands of lodgepole pine supported low densities of potential lynx prey. Although not observed during this project, blue grouse likely occupy this site as well. There are significant concentrations of wintering ungulates at low elevations to the north and east of this site, suggesting at least a moderate availability of carrion in the general area.

Competitors: Tracks of mountain lion, bobcat, and coyote were rather widespread at low- to mid-elevations. Although not observed during this study, red fox may also occupy the lowest portions of this site. Contiguous snow cover and the lack of maintained roads and trails suggest that generalist carnivores may be restricted from the highest elevations of this site in winter. Because of the generally low human presence here, domestic dogs probably occur at very low frequency.

Other species: Two trails made by American marten were recorded near the camera station. No wolverine or fisher were observed.

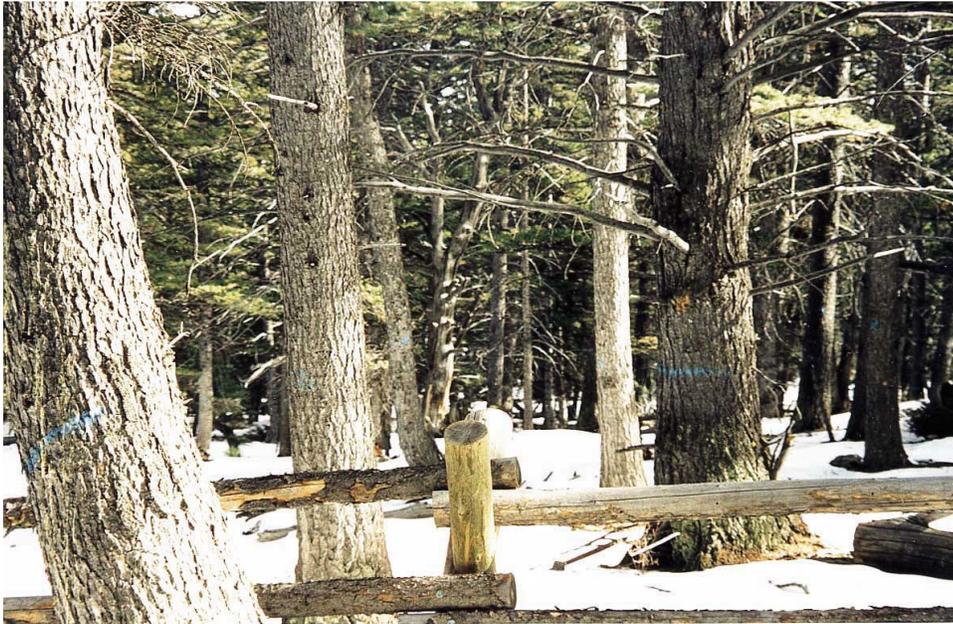
Other: Timber extraction activity has been rather high on this site, with numerous clearcuts present (Photo B-1). Aspen stands are composed mainly of mature trees, with apparently little regeneration. Road densities are low, public access to the site is rather difficult in winter, and snow pack is only minimally able to support snow machines and skiers; not surprisingly, we observed very little recreational use here.

PHOTOGRAPHS

B-1. Regenerating clearcut on the Lander site.



B-2. Late-seral stand of lodgepole pine on the Lander site. Stands of this stage were rare; early- to mid-seral stands were most common, with many stands in doghair configuration.



B-3. Mixed stand of lodgepole pine, Engelmann spruce, and subalpine fir on the Lander site. Note the locally patchy and heavily weathered snow cover.



SURVEY DATES: Snow-tracking stint 1: 28, 29, and 30 December 2000
Snow-tracking stint 2: 20 and 21 February 2001
Remote camera active: 54 days (29 December 2000 - 21 February 2001)

SURVEY CONDITIONS : Snow-tracking conditions were sub-optimal on all survey dates and sites during this project; consistently low snow cover and infrequent snowfall hampered tracking surveys.

The remote camera station was functional and generated several photographs, although not of target species.

OBSERVATIONS OF LYNX: No observations of lynx were recorded at this site, although one probable lynx trail was encountered just to the west closer to the Big Sandy site on 30 December 2001 (described in Appendix D).

HABITAT OBSERVATIONS:

General - The Blucher Creek site lies near the southeastern terminus of the Wind River Mountains and ranges from 2430 - 2630m in elevation, sloping generally upward from south to north. Aside from a significant canyon constraining the Sweetwater River, topography is mostly flat and rolling.

As with most sites surveyed during this project, forest contiguity increases with elevation. Lodgepole pine clearly dominates this site, with many stands in classic doghair configuration: extremely high densities of even-aged trees only 10 - 13cm DBH and 8 - 11m tall, with live branches present only on the top 1 - 2m of the stem. Mammal tracks were only rarely encountered in such stands. Late-seral stands of conifers are very rare here. A significant number of regenerating clearcuts are present on this site, likely representing mid- to late-seral stands that have been recently removed. Large coarse-woody debris was observed only infrequently. Aspen stands, composed mainly of mature individuals, occur infrequently throughout the site.

Because of its windward position on the west slope of the Wind River Mountains, this site appeared to regularly receive more precipitation than rain-shadow sites such as Grass Creek or Lander.

In most respects, habitat at this site is rather similar to that at the Big Sandy site (see Appendix D).

Prey: Snowshoe hare and red squirrel were encountered throughout the site, but were nowhere abundant. Although not observed during this project, blue grouse likely occupy this site as well.

Competitors: Tracks of mountain lion, bobcat, and coyote were recorded here, with the latter species being frequently encountered on the extensive network of snow machine trails dissecting the site. Our observations suggest that these trails are used as travel corridors by coyotes, and likely extend coyote winter range into formerly snowbound areas. Similar effects may be occurring with bobcat and mountain lion. Because of the high recreational use of this area, domestic dogs probably occur at a relatively high frequency.

Other species: Two trails of American marten were observed along Blucher Creek itself. No wolverine or fisher were observed here.

Other: There has been much timber harvesting within this site, and regenerating clearcuts are rather abundant. Aspen stands are composed mainly of mature trees, with apparently little regeneration. There is high recreational use of this site; the Continental Divide Snowmobile Trail runs the length of the site, and many user-created trails are present.

PHOTOGRAPHS: None.

SURVEY DATES: Snow-tracking stint 1: 26, 27, and 28 December 2000
 Snow-tracking stint 2: 18 and 19 February 2001
 Remote camera active: 54 days (27 December 2000 - 19 February 2001)

SURVEY CONDITIONS : Snow-tracking conditions were sub-optimal on all survey dates and sites during this project; consistently low snow cover and infrequent snowfall hampered tracking surveys.

The remote camera station was functional and generated several photographs, although not of target species.

OBSERVATIONS OF LYNX: One probable lynx trail was recorded just north of this site during the 30 December 2000 approach to the Blucher Creek site (Blucher Creek tracking stint #1). One possible lynx trail (Photos D3-7) was recorded in this site during tracking stint #2 (18 February 2001).

TRACK SET #1 - POSSIBLE LYNX - 18 FEBRUARY 2001 (PHOTOS D-3 - D-7)

Location: Southern terminus of Muddy Ridge, northwest of the Leckie gauging station and about 1.2 km west of the Big Sandy River. LAT 42 35 30 // LONG 109 18 10

Description: A single trail of a walking animal was intercepted in rolling topography dominated by stands of doghair lodgepole pine, interspersed with recent clearcuts and aspen inclusions. Substrate was heavily weathered snow with about 3cm of hoar frost on the surface; tracks penetrated only through hoar to snow surface. Trail was estimated to be 24 hours old at time of encounter.

Msrmts (cm):	Stride =	86 / 89 / 89 / 91 / 94 / 94 / 94 / 99 / 102 / 104;	mean = 94.2
	Straddle =	20 / 20 / 20 / 22 / 22 / 22 / 22 / 22 / 22 / 23;	mean = 21.5
	Print length =	10 / 10 / 10 / 10 / 10 / 10 / 10 / 10 / 10 / 10;	mean = 10.0
	Print width =	10 / 10 / 10 / 10 / 10 / 10 / 10 / 10 / 10 / 10;	mean = 10.0

Supporting observations: Toes and interdigital pads were only barely apparent, in contrast to obvious toes and interdigital pads in nearby mountain lion prints. The animal walked through tight brush and low branches, repeatedly traveling under branches only 35 - 50cm above the snow surface without substantially modifying its gait. The animal also walked along several leaning saplings only 7.5cm in diameter for several meters at a time. This trail was encountered at sunset immediately prior to a snowstorm; further supporting observations were not collected.

TRACK SET #2 - PROBABLE LYNX - 30 DECEMBER 2000

Location: On USDA Forest Service (Bridger-Teton National Forest) land just north and east of the Big Sandy site proper, approximately 6.4km north-northwest of Leckie on the divide between Dutch Joe Creek and the west fork of Squaw Creek. LAT N 42 38 04 // LONG W 109 13 33

Description: A single trail of a walking animal was intercepted in gently rolling topography dominated by mixed stands of lodgepole pine, Engelmann spruce, and subalpine fir, interspersed with aspen inclusions and small openings. Substrate varied and included a packed and heavily disturbed snow machine trail, weathered snow with hoar frost on surface, and soft drifted snow. Trail was estimated to be 48 hours old at time of encounter.

Msrmts (cm):	Stride =	61 / 62 / 64 / 64 / 64 / 64 / 65 / 66 / 66 / 67;	mean = 64.3
	Straddle =	17 / 18 / 18 / 18 / 18 / 18 / 18 / 18 / 18 / 18;	mean = 17.9
	Print length =	8 / 8 / 9 / 9 / 9 / 9 / 9 / 9 / 9 / 9 / 9 / 9;	mean = 8.8
	Print width =	10 / 10 / 10 / 10 / 10 / 10 / 10 / 10 / 10 / 10 / 11;	mean = 10.1

Supporting observations: This trail was followed in both directions from point of interception, but surface disturbances precluded observation of long trail segments and collection of supporting evidence.

HABITAT OBSERVATIONS:

General - The Big Sandy site encompasses the main stem of the Big Sandy River in the vicinity of Leckie, on the west slope of the Wind River Mountains. It ranges from 2440 - 2800m in elevation, and slopes

upward from south to north. Topography is generally flat to rolling, with significant slopes occurring only on the flanks of Muddy Ridge.

Forest contiguity increases with elevation, and forest cover is predominantly lodgepole pine. Many stands are in classic doghair configuration: extremely high densities of even-aged trees only 10 - 13cm DBH and 8 - 11m tall, with live branches present only on the top 1 - 2m of the stem (Photo D-2). Mammal tracks were only rarely encountered in such stands. Late-seral stands of conifers are very rare here. Many regenerating clearcuts were observed (Photo D-1), and are assumed to represent mid- to late-seral stands recently removed from the site. Large coarse-woody debris was observed only infrequently. Aspen stands, composed mainly of mature individuals, occur infrequently throughout the site.

Because of its windward position on the west slope of the Wind River Mountains, this site appeared to regularly receive more precipitation than rain-shadow sites such as Grass Creek or Lander.

In most respects, habitat at this site is rather similar to that at the Blucher Creek site (see Appendix C).

Prey: Snowshoe hare and red squirrel were encountered throughout the site, but were nowhere abundant. Although not observed during this project, blue grouse likely occupy this site as well.

Competitors: Coyote tracks were commonly observed, but only 1 bobcat trail and no mountain lion trails were recorded. Coyote tracks were commonly observed on snow machine trails; such trails likely extend coyote winter range into formerly snowbound areas. Similar effects may be occurring with bobcat and mountain lion, although these species appear to be relatively rare here. Because of the high recreational use of this area, domestic dogs may occur at a relatively high frequency.

Other species: American marten were not seen on site, but 3 separate marten trails were observed on USDA Forest Service land to the north and east. No wolverine or fisher were observed here.

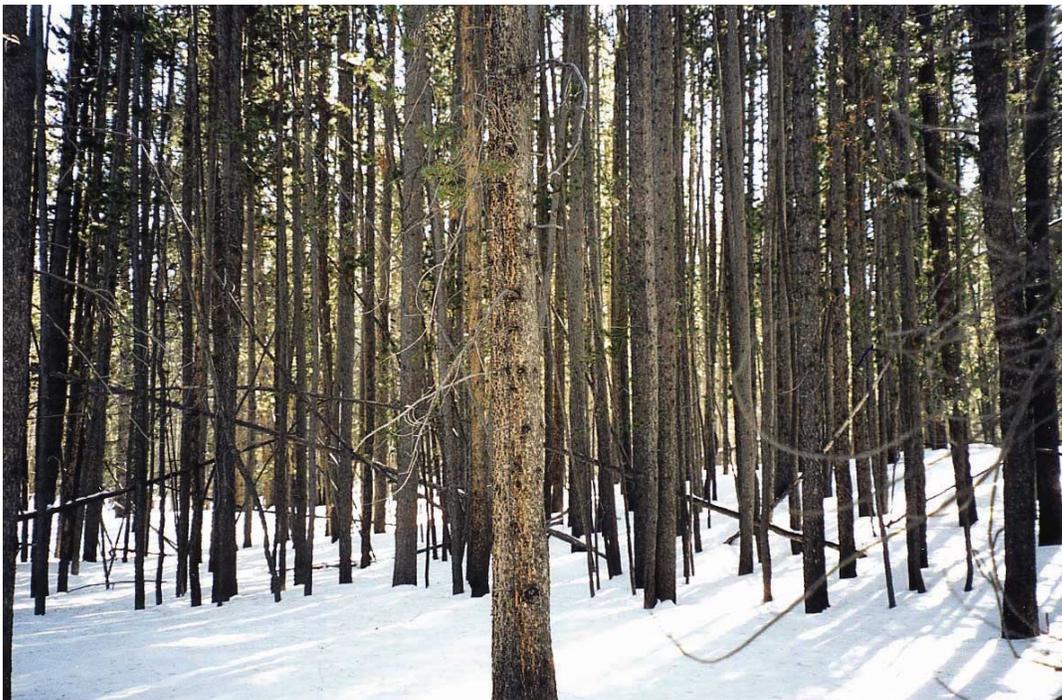
Other: There has been much timber harvesting within this site, and regenerating clearcuts are rather abundant (Photo D-1). Aspen stands here are composed mainly of mature trees, with little regeneration. The Continental Divide Snowmobile Trail runs just north of this site, and several user-created trails dissect the area and are heavily used.

PHOTOGRAPHS

D-1. Regenerating clearcut on the Big Sandy site. Clearcuts were common in this area.



D-2. Doghair stand of lodgepole pine on the Big Sandy site. Such stands covered large portions of the site.



D-3, 4, 5. Track set #1, possible lynx, on the Big Sandy site. D-5 shows the trail of this animal walking under a branch only about 35cm above the snow surface.

(3)



(4)



(5)



D-6, 7. Track set #1, possible lynx, on the Big Sandy site. D-6 shows the trail of this animal traversing a leaning sapling only about 7.5cm diameter. D-7 shows a 50cm-tall gap in tight brush that the animal traveled through apparently unimpeded.

(6)



(7)



SURVEY DATES: Snow-tracking stint 1: 2, 3, and 4 January 2001
Snow-tracking stint 2: 11, 12, and 13 February 2001
Remote camera active: 158 days (3 January 2001 - 10 June 2001; camera was reloaded and reset on 11 February 2001 and allowed to run until 10 June 2001)

SURVEY CONDITIONS : Snow-tracking conditions were sub-optimal on all survey dates and sites during this project; consistently low snow cover and infrequent snowfall hampered tracking surveys. By virtue of its relatively high elevation and windward position on the west slope of the Wind River Mountains, this site appears to receive deeper and more frequent snowfall than others. Tracking conditions here were generally poor, but were the best of any of the 9 sites surveyed during this project.

The remote camera station was functional and generated several photographs, although not of target species (Photo E-1, E-2). One photograph (E-1) of a bobcat was acquired here. This camera was reloaded and allowed to run until 10 June 2001.

OBSERVATIONS OF LYNX: No observations of lynx were made at this site.

HABITAT OBSERVATIONS:

General - The Scab Creek site is on the west slope of the Wind River Mountains about 16km north northeast of the town of Boulder, and is bordered on the north and east by the USDA Forest Service (Bridger-Teton National Forest) Bridger Wilderness Area. The site ranges from 2440 - 2930m in elevation and slopes generally upward from west to east. Topography is rough, with very steep slopes and many rock outcrops on the western edge of the site.

This site is heavily forested and supports more mixed stands of Engelmann spruce and subalpine fir than any other site (Photo E-3, E-4), although lodgepole pine is still abundant. There are more conifer stands in mid- to late-seral stages here than in other sites, with some very large trees and relatively abundant coarse woody debris. Tree-fall canopy gaps were commonly observed in such stands, and clusters of saplings in these gaps contribute much structural diversity to the mid- and understory (Photo E-3, E-4). Aspen stands occur infrequently throughout the site.

Because of its windward position on the west slope of the Wind River Mountains and its relatively high elevation, this site appears to regularly receive more precipitation than any other site surveyed during this project.

Prey: Both snowshoe hare (Photo E-2) and red squirrel were abundant in this site, with red squirrel tracks reaching the highest density here of any site surveyed. Large middens and extensive trail networks were especially common in stands of late-seral conifers. Although not observed during this project, blue grouse likely occupy this site as well. There are significant concentrations of wintering ungulates along the low elevation periphery of this site, suggesting at least a moderate availability of carrion.

Competitors: Bobcat, mountain lion, and coyote tracks were numerous in the lower elevation portions of the site near ungulate winter ranges. Only 1 bobcat trail was encountered at higher elevations, and a photograph (E-1) of a bobcat was acquired at the camera site. Contiguous and deep snow cover, and the lack of maintained roads and trails, suggest that generalist carnivores may be restricted from the highest elevations of this site in winter. Because of the virtual absence of people here in the winter, domestic dogs probably occur at very low frequency.

Other species: Three separate marten trails were observed in this site. No wolverine or fisher were observed here.

Other: Timber harvesting appears to be minimal here. Difficult public access, rough topography, and relative lack of roads apparently preclude recreational use of this site in winter. We observed no signs of human presence here during these surveys.

PHOTOGRAPHS

E1, 2. Photographs of a bobcat (1) and snowshoe hares (2) acquired at the remote camera station on the Scab Creek site. These are a subset of all photos acquired from this station.

(1)



(2)



E-3, 4. Portions of late-seral stands of mixed Engelmann spruce and subalpine fir on the Scab Creek site. This stand type was more common here than at any other site surveyed during this project.

(2)



(3)



SURVEY DATES: Snow-tracking stint 1: 18 March 2000
Snow-tracking stint 2: Not performed due to poor tracking conditions; effort committed to other sites.
Remote camera active: 78 days (18 March 2000 - 5 June 2000)

SURVEY CONDITIONS : Snow-tracking conditions were sub-optimal on all survey dates and sites during this project; consistently low snow cover and infrequent snowfall hampered tracking surveys. Open slopes and ridgelines on this site are subject to high wind, and consequently support very little snow cover. This paucity of snow leads to a relatively high abundance of ungulates on the site during the entire winter, which in turn results in areas of trampled snow upon which tracking was difficult. Only the Grass Creek and Water Canyon sites had worse tracking conditions than this site.

The remote camera station was functional and generated several photographs (F-1, F-2), but not of target species.

OBSERVATIONS OF LYNX: No observations of lynx were made at this site.

HABITAT OBSERVATIONS:

General - The Rock Creek site encompasses several south-flowing tributaries of LaBarge Creek northwest of the town of Viola, and is centered roughly on Lake Mountain. It ranges from 2200 - 2900m in elevation, and slopes generally upward from southeast to northwest. Topography is rough; the landscape consists of several incised drainages (including Rock Creek, Long Hollow, and Sheep Creek) separated by broad, steep-sided ridges.

Forest cover is naturally fragmented across this site, with significant patches of shrub-steppe separating forested areas. As with the Ham's Fork site, forest here can be best described as occurring in broad "stringers" extending down drainages and cool, mesic slopes from the more contiguous forest on USDA Forest Service (Bridger-Teton National Forest) land to the north and west. Higher elevations of the site and cool, mesic drainages support some structurally diverse stands of mid- to late-seral conifers; several such stands occur on the headwaters of Rock Creek itself. Although forested areas are typically dominated by lodgepole pine, mixed stands of Engelmann spruce and subalpine fir are locally abundant. Large aspen stands occur in stream bottoms, and willow communities dominate the margins of some of the larger streams.

Perhaps due to a rain-shadow effect from the Overthrust Belt / Wyoming Range, this site appears to be rather dry compared to other sites in the vicinity. Open slopes and ridgelines consistently receive high winds, and consequently support many snow-free patches.

In most respects, habitat at this site is rather similar to that at the Ham's Fork site (see Appendix G). However, the snow pack appears to be consistently shallower, and snowfall less frequent, here than at Ham's Fork.

Prey: Tracks of both snowshoe hare (see also Photo F-1) and red squirrel were encountered in conifer stands, with red squirrel being the more abundant of the 2. Several cottontail trails were intercepted along the lowest portion of Rock Creek, and 2 separate flocks of blue grouse were flushed on the survey route during camera retrieval on 5 June 2000. Ungulates are concentrated along LaBarge Creek in winter, suggesting at least a moderate availability of carrion.

Competitors: Of all potential mammalian carnivores here, only coyote tracks were observed. Bobcat and mountain lion almost assuredly occupy this site as well, and red fox may occur at lower elevations along LaBarge Creek. There are many open slopes and ridgelines that receive high winds, and thus hold very little snow; these areas may allow generalist carnivores to range into higher elevations than would be possible with heavier snow loads. Because human presence is not especially high here, domestic dogs probably occur at very low frequencies.

Other species: No American marten, wolverine, or fisher were observed here. Tracks of both beaver and muskrat were documented on the margins of Rock Creek.

Other: This site appears to have received only a small to moderate amount of timber extraction activity. Deciduous shrubs and trees are heavily browsed in this site. There are many saplings 1m - 2m tall that had developed “medusa heads” on terminal branches and subsequently died. Only a moderate amount of recreational activity was seen near LaBarge Creek; human presence here appears to be low in winter.

PHOTOGRAPHS

F-1, 2. Photographs of snowshoe hare (1) and black bear (2) acquired at the camera station on the Rock Creek site. These are a subset of all photographs acquired from this station.

(1)



(2)



SURVEY DATES: Snow-tracking stint 1: 19 and 20 December 2000
Snow-tracking stint 2: 30 and 31 January, and 1 February, 2001
Remote camera active: 170 days (20 December 2000 - 8 June 2001; camera was reloaded and reset on 1 February 2001 and allowed to run until 8 June 2001)

SURVEY CONDITIONS: Snow-tracking conditions were sub-optimal on all survey dates and sites during this project; consistently low snow cover and infrequent snowfall hampered tracking surveys. This site appears to receive deeper and more frequent snowfall than most of the others. Tracking conditions here were generally poor, but were better than at all other sites except Scab Creek. Open slopes and ridgelines on this site are subject to high winds, and consequently support very little snow cover.

The remote camera was functional and generated several photographs, including one photograph (G-1, G-2) of an individual *Lynx* spp. at the station on 21 March 2001 (see discussion below).

OBSERVATIONS OF LYNX: One photograph (G-1, G-2) from the remote camera shows an individual felid at the camera station on 21 March 2001. This individual is clearly either a bobcat or lynx. The coat appears to be heavily spotted, and ear tufts are not especially prominent; both of these characters suggest bobcat. The facial ruff is somewhat heavy (compare to bobcat in photograph E-1), possibly suggesting lynx; however, it is reasonable to expect bobcat in winter pelage to show such a ruff. We conclude that this photo is most likely of a bobcat, which is supported by the many bobcat trails recorded at this site during this study.

No observations of lynx were made at this site.

HABITAT OBSERVATIONS:

General - The Ham's Fork site encompasses South Fork Mountain on the southern terminus of Commissary Ridge, which itself lies on the southern terminus of the Overthrust Belt / Wyoming Range in Lincoln County. The site is approximately 32km north of the town of Kemmerer, ranges from 2300 - 2830m in elevation, and slopes generally upward from all sides to the crest of South Fork Mountain. Topography is variable, ranging from steep slopes to gently rolling ridgetops.

Forest cover is naturally fragmented throughout the site, with large areas of shrub-steppe separating forested areas. Forest here can be best described as occurring in broad "stringers" extending down drainages and cool, mesic slopes from the more contiguous forest on USDA Forest Service land to the north. Higher elevations of the site, as well as the east face of South Fork Mountain, support many structurally diverse stands of mid- to late-seral conifers. Although forested areas are typically dominated by lodgepole pine, mixed stands of Engelmann spruce and subalpine fir are locally abundant (Photo G-3, G-5).

Open slopes and ridgelines appear to consistently receive high winds, and consequently support many snow-free patches.

In most respects, habitat at this site is rather similar to that at the Rock Creek site (see Appendix F). However, the snow pack appears to be consistently deeper, and snowfall more frequent, here than at Rock Creek.

Prey: Tracks of snowshoe hare and red squirrel were abundant throughout this site, and were especially common in stands of late-seral conifers (Photo G-3, G-5). Based on track encounters, this site probably had the highest abundance of snowshoe hare of any site surveyed during this project. Red squirrel tracks were almost as abundant here as on Scab Creek. Although not observed during this project, blue grouse likely occupy this site as well. Because of the relatively high coverage of shrub-steppe, species such as desert cottontail and white-tailed jackrabbit may occur in significant densities here.

Competitors: Based on track encounters, bobcat was the most common mammalian carnivore at this site, followed by coyote. Also, as discussed previously, photograph G-1 likely shows a bobcat at the camera station. One mountain lion trail was seen. Red fox were not observed, but may occur along the low-

elevation periphery of this site. Open slopes and ridgelines receive high winds, and thus hold very little snow; these areas may allow generalist carnivores to range into higher elevations than would be possible with heavier snow loads. Because human presence is not especially high here, domestic dogs probably occur at very low frequencies.

Other species: No wolverine, fisher, or American marten were seen here.

Other: Some recent clearcuts were observed (Photo G-4), but the site appears to receive little timber extraction activity. Deciduous shrubs and trees are heavily browsed in this site (Photo G-6). There are many saplings 1 - 2m tall that had developed “medusa heads” on terminal branches and subsequently died. Aspen stands are dominated by mature trees with very little reproduction, and are commonly in the process of converting to conifer overstories. Only a moderate amount of recreational activity was seen.

PHOTOGRAPHS

G-1, 2. Photograph of an individual felid (likely a bobcat) at the camera station on the Ham’s Fork site.

(1)



(2)



G-3. Coarse-woody debris in a late-seral stand of mixed conifers on the Ham's Fork site.



G4. Recent clearcuts on the Ham's Fork site.



G-5. Late-seral stand of Engelmann spruce and subalpine fir on the Ham's Fork site.



G6. Heavily browsed shrub on the Ham's Fork site. This degree of browsing was common on deciduous shrubs and trees on this site.



SURVEY DATES: Snow-tracking stint 1: 27 and 29 December 1999
Snow-tracking stint 2: 30 January 2000
Remote camera active: 34 days (27 December 1999 - 30 January 2000)

SURVEY CONDITIONS : Snow-tracking conditions were sub-optimal on all survey dates and sites during this project; consistently low snow cover and infrequent snowfall hampered tracking surveys. Tracking conditions here were adequate, but became poor along the southernmost and easternmost edges of the survey route where wind disturbance was high and snow-free areas were common.

The remote camera station was functional and generated several photographs, but not of target species.

OBSERVATIONS OF LYNX: One possible lynx trail (Photo H-1) was encountered in this area during tracking stint 2 (30 January 2000).

TRACK SET #3 - POSSIBLE LYNX - 30 JANUARY 2000 (PHOTO H-1)

Location: Near the head of Pine Creek, approximately 7.2 km north-northeast of the Pine Creek Ski Area.
LAT 42 09 17 // LONG 110 47 29

Description: Several segments of a trail made by a walking animal were intercepted on a ridgetop dominated by stands of mid-seral lodgepole pine, with occasional aspen inclusions and recent clearcuts. The above location references the point where the first segment was intercepted. Substrate was about 15cm of soft powder, at least 72 hours old, on top of a soft base of old and heavily weathered snow. The trail was made prior to the most recent snowfall, and thus prints were obscured; however, trail segments in protected areas (e.g., dense patches of saplings with high canopy closure) were adequately preserved to allow accurate stride and straddle measurements.

Msrmts (cm): Stride = 66 / 66 / 67 / 69 / 70 / 72 / 72 / 74 / 74 / 74; mean = 70.4
Straddle = 17 / 18 / 19 / 19 / 19 / 19 / 20 / 20 / 20 / 20; mean = 19.1
Print length = no measurement possible due to snowfall
Print width = no measurement possible due to snowfall

Supporting observations: Trail segments were followed into heavy thickets of saplings and downed trees; the animal repeatedly walked through tight brush and under branches suspended only 50cm above the snow surface without modifying its gait.

HABITAT OBSERVATIONS:

General - The Pine Creek site lies on the southern end of the Tump Range approximately 12km east of the town of Cokeville, and extends south from the USDA Forest Service (Bridger-Teton National Forest) boundary to the north ends of Dempsey and Rock Creek ridges. It ranges in elevation from 2100 - 2700m, and slopes generally upward from all sides to the main ridge crest. Topography is rather rugged, with an extremely steep mountain face along the west side of the site and incised streams alternating with ridges throughout the remainder.

Forest is naturally fragmented across this site, yet not to the degree seen on the Ham's Fork, Rock Creek, or Water Canyon sites. A moderate amount of clearcutting has occurred here, exacerbating the natural forest fragmentation. Structurally diverse stands of mid- to late-seral conifers are present on slopes and stream bottoms at higher elevations of the site. Although lodgepole pine clearly dominates the composition of most stands, mixed stands of Engelmann spruce and subalpine fir are relatively abundant. Aspen inclusions occur infrequently, and larger streams (such as Pine Creek) support healthy willow communities on their margins.

Prey: Tracks of snowshoe hare and red squirrel were commonly encountered in conifer stands along the entire survey route. Several blue grouse trails were intercepted along the highest 33% of the survey route during both tracking stints. Large herds of ungulates were concentrated on the southern edge of the site, suggesting at least a moderate availability of carrion.

Competitors: In order of track abundance, coyote, bobcat, and mountain lion were recorded on this site. Coyote and mountain lion were clearly more abundant at lower elevations; bobcat trails were documented at higher elevations, but always in close proximity to or following packed snow machine trails. Observations from here and elsewhere suggest that generalist carnivores use packed trails to range into formerly snowbound areas. Wind-scoured slopes and ridgetops on the southern and eastern edges of this site may perform a similar function. Red fox were not observed here, but likely occur at lower elevations. Domestic dogs probably occur at relatively high frequencies near the Pine Creek Ski Area, and possibly at higher elevations in association with skiers and snow machine users.

Other species: No American marten, fisher, or wolverine were observed here.

Other: This area has received a moderate to high amount of timber harvest activity, with regenerating clearcuts becoming increasingly common near the USDA Forest Service (Bridger-Teton National Forest) boundary. Much recreational activity occurs here, mostly in the form of on- and off-trail snow machine use. Both designated and user-created trails dissect most of the area.

PHOTOGRAPHS

H-1. Possible lynx trail recorded on the Pine Creek site on 30 January 2000. Description and measurements in report text.



SURVEY DATES: Snow-tracking stint 1: 28 December 1999
Snow-tracking stint 2: 29 January 2000
Remote camera active: 32 days (28 December 1999 - 29 January 2000)

SURVEY CONDITIONS : Snow-tracking conditions were sub-optimal on all survey dates and sites during this project; consistently low snow cover and infrequent snowfall hampered tracking surveys. Tracking and over-snow travel conditions were extremely poor on this site. Of all 9 sites surveyed during this project, only Grass Creek had worse snow conditions. Attempts to access this site from the south were unsuccessful; therefore, access and survey activities were shifted north to the USDA Forest Service (Bridger-Teton National Forest) lands immediately north of the site where snow conditions were much better. We suspect snow-tracking is a more productive technique on this site under more normal precipitation regimes. However, forest cover is naturally patchy across much of this site, leading to significant areas of wind-disturbed and wind-hardened snow. Also, this site sits at a lower elevation than any of the others, likely leading to chronically low snow accumulation. These features will reduce the effectiveness of snow-tracking on this site in general.

The remote camera station was functional and generated several photographs, although not of target species.

OBSERVATIONS OF LYNX: One probable lynx trail (Photo I-1, I-2) was encountered on this site during tracking stint #1 (28 December 1999). One possible lynx trail (Photo I-3, I-4) was encountered on this site during tracking stint #2 (29 January 2000).

TRACK SET #4 - PROBABLE LYNX - 28 DECEMBER 1999 (PHOTO I-1 AND I-2)

Location: In Water Canyon, approximately 2.4km east southeast of Highway 89 and 3.2km northwest of the crest of Pine Knoll. This location is on USDA Forest Service (Bridger-Teton National Forest) land about 3km north of the USDI Bureau of Land Management boundary. LAT 42 29 01 // LONG 110 54 27

Description: Multiple trail segments of a walking animal were intercepted in a willow-dominated stream bottom bordering uplands of sagebrush (north of stream on south-facing slope) and conifer (south of stream on north facing slope) communities. The above location is the point where the first trail segment was intercepted. Substrate varied from very soft, dry snow in conifer stands to hard-packed, crusted snow with much wind disturbance in open areas. No heavy snowfall had occurred on site for at least 15 days prior to this survey. A light snowfall of about 2cm occurred 7 days prior to survey. Trail segments of different ages were observed in the vicinity; the most recent was estimated to be 72 hours old. Most trail segments emerged from snowshoe hare runways in conifer stands to the south and converged on an elk carcass lying in streamside willows. The carcass had been heavily scavenged.

Msrmts (cm): Stride = 58 / 61 / 61 / 64 / 64 / 66 / 66 / 66 / 69 / 69; mean = 64.3
Straddle = 15 / 15 / 15 / 17 / 18 / 18 / 18 / 18 / 20 / 20; mean = 17.4
Print length = 8 / 8 / 8 / 8; mean = 8.0
Print width = 8 / 8 / 8 / 8; mean = 8.0

(Note: print length and width were taken on hard packed surfaces where track penetration was less than 1cm, and thus represent actual foot dimensions)

Supporting observations: Well-formed prints in protected areas showed only indistinct toes and interdigital pads, and were surrounded by a clear halo of disturbed snow caused by heavy fur on the foot. Mountain lion prints in comparable settings were observed about 1.2km away, and showed very crisp toes and interdigital pads. This animal walked for several meters on top of crusted snow that was unable to support more than about 20kg in weight. In softer snow, a distinct trough made by the lower leg was apparent behind tracks only 15cm - 20cm deep, indicating short legs. Urine scent posts with strong feline smell occurred near the scavenged elk carcass, as well as near a piece of elk hide about 200m from the carcass.

TRACK SET #5 - POSSIBLE LYNX - 29 JANUARY 2000 (PHOTO I-3 AND I-4)

Location: At head of Trough Hollow about 2km north of Water Canyon and 2km west of Pine Knoll. LAT 42 27 45 // LONG 110 54 40

Description: Two segments of a trail made by a walking animal were encountered in the bottom of a draw dominated by mid- to late-seral stands of mixed Engelmann spruce and subalpine fir. The above location is the point where the first segment was intercepted. Stands of lodgepole pine, aspen, and small openings were scattered throughout the area. This trail was made before a snowfall of at least 10cm, and thus the prints were obscured; however, trail segments in protected areas (e.g., dense patches of saplings with high canopy closure) were adequately preserved to allow accurate stride and straddle measurements.

Msrmts (cm): Stride = 66 / 66 / 66 / 67 / 67 / 69 / 69 / 69 / 69 / 69; mean = 67.6
Straddle = 15 / 15 / 15 / 15 / 15 / 18 / 18 / 18 / 18 / 19; mean = 16.6
Print length = no measurement possible due to snowfall
Print width = no measurement possible due to snowfall

Supporting observations: Because this trail was filled with snow, it was difficult to follow and thus we were able to collect only minimal supporting data. The animal apparently moved through several stands of tightly packed saplings, and may have traversed a small leaning log only about 7.5cm diameter for several meters.

HABITAT OBSERVATIONS:

General - The Water Canyon site lies on the west slope of the Overthrust Belt in Lincoln County, between the Gannet Hills and Porcupine Ridge. It ranges from 2100 - 2500m in elevation, and slopes generally upward from south to north. Topography is essentially rolling hills, with very steep slopes occurring only occasionally.

Forest cover on this site is naturally fragmented, with large areas of shrub-steppe interspersed between forested ridges and slopes. This fragmentation is especially severe at low elevations on the southern edge of the site. Lodgepole pine is the predominant forest type, with mixed stands of Engelmann spruce and subalpine fir occurring in cooler and more mesic areas. Mid- to late-seral stands with diverse physical structure occur along Trough Hollow, and presumably also in other areas of the site. Aspen stands occur very infrequently. Major streams, such as the Water Canyon drainage, support healthy margins of willows.

Lower elevations of this site are extremely dry, subject to persistent and high winds, and essentially untrackable. However, snow depth increases rapidly with elevation, and higher elevations of the site along the USDA Forest Service (Bridger-Teton National Forest) boundary support a relatively deep snow pack.

Prey: Both snowshoe hare and red squirrel tracks were frequently encountered in conifer stands, and snowshoe hare trails commonly extended into streamside willow communities. Blue grouse were not observed, but likely occupy this site. Ungulate tracks were common, suggesting at least a moderate availability of carrion. This is supported by the presence of an elk carcass being scavenged by the probable lynx in Water Canyon.

Competitors: Coyote, mountain lion, and bobcat trails were observed on this site, but were unexpectedly rare; we suspect these carnivores are more abundant to the south in lower and more open country. Relatively deep and contiguous snow cover, and a lack of packed roads and trails, may preclude generalist carnivores from using higher elevations of this site. Because of the relative lack of human presence here in winter, domestic dogs probably occur only occasionally.

Other species: No significant observations; American marten, wolverine, and fisher were not observed here.

Other: At higher elevations of this site, we observed very little timber extraction activity and recreational use. At lower elevations to the south, snow machine use is apparently somewhat higher, but the lack of harvestable timber likely precludes much timber extraction.

PHOTOGRAPHS

I-1, 2. Probable trail of lynx recorded on the Water Canyon site on 28 December 1999. Description and measurements in report text.

(1)



(2)



I-3, 4. Possible trail of a lynx recorded on the Water Canyon site on 29 January 2000. Description and measurements in report text.

(3)



(4)

