IDAHO DEPARTMENT OF FISH AND GAME

Virgil Moore, Director

Project F15AF00962

Idaho Panhandle Forest Carnivores

Final Report

Performance Period
10 July 2015 through 30 June 2017

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September 2017
Boise, Idaho

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FEDERAL AID IN WILDLIFE RESTORATION
ANNUAL PROJECT PERFORMANCE REPORT

1. **State:** Idaho

   Grant number: F15AF00962 Section 6 Cooperative Agreement

   Grant name: Idaho Panhandle Forest Carnivores

2. **Report Period:** 10 July 2015 to 30 September 2017

   Report due date: 30 September 2017

3. **Location of work:** Idaho counties Benewah, Kootenai, Shoshone, Bonner, Boundary and adjacent lands in British Columbia (Map 1).

4. **Objectives:**

   1) Determine status of individual wolverine, lynx, and fisher which were identified from 2010-2014 in the Idaho Panhandle and adjoining mountain ranges. Determine if wolverine, lynx and fisher continue to occur in areas these species were detected from 2010-2014.
   FY16: 30 cameras, 8 bait stations, 1 track survey
   FY17: 30 cameras, 0 bait stations, 1 track survey

   2) **FY17:** Deploy 6 un-baited remote cameras in southern half of IDFG Panhandle Region (deployment only; checking of cameras outside of grant scope).

5. **If the work in this grant was part of a larger undertaking with other components and funding, present a brief overview of the larger activity and the role of this project.**

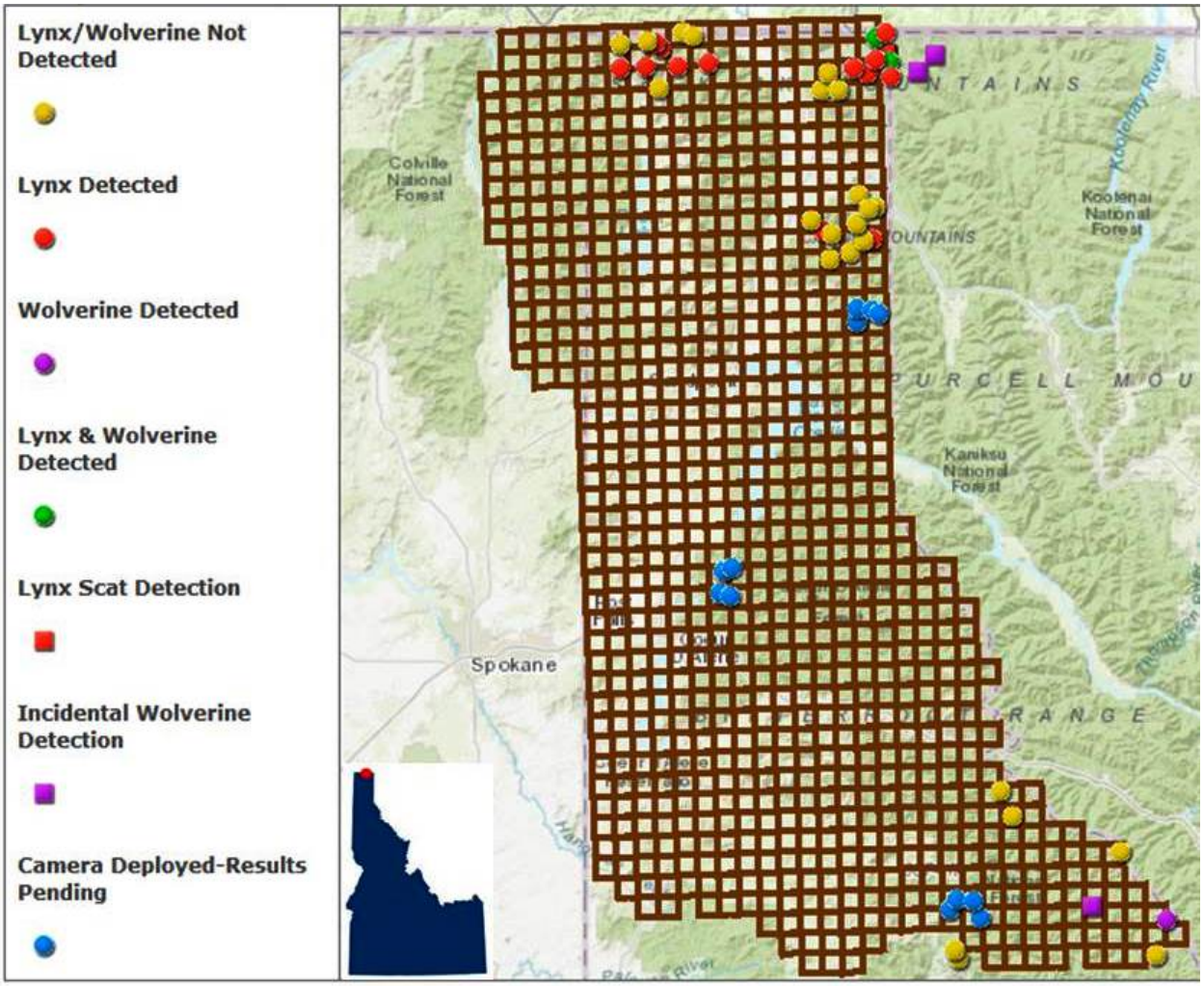
   This work was not part of a larger undertaking for the current report period.

6. **Describe how the objectives were met.**

   Objective 1)

   Background:
   From 2010-2014 the Multi-species Baseline Initiative (MBI) conducted intensive forest carnivore surveys across the Idaho Panhandle and adjoining mountain ranges (Map 1, Lucid et al. 2016). From 2010-2014 we identified 3 individual male wolverines in the Selkirk (n = 1 male) and Saint Joe (n = 2 males) mountain ranges. We also identified 5 individual lynx from the Selkirk (n = 1 male), Purcell (n = 1 male and 2 females), and West Cabinet (n = 1 female) mountain ranges. Our goals during the reporting period for this grant (July 2015-September 2016) were to conduct targeted follow-up surveys to: 1) determine if wolverines and lynx continue to occur in areas where these species were detected from 2010-2014, 2) determine if

the same individual animals continue to occur where they were detected from 2010-2014, and 3) deploy additional remote cameras in areas where wolverine and lynx were not detected between 2010-2014.



Map 1. Study area map with lynx and wolverine detections. 5x5 km grid cells represent extent of 2010-2014 Multi-species Baseline Initiative survey. Targeted survey (colored circles) and incidental (colored squares) wolverine and lynx detections from 10 July 2015 to 30 July 2017 are shown. Incidental detections represent DNA verified detections during this time period and are not inclusive of all lynx and wolverine observations reported to IDFG in the study area. Public observations reported to IDFG can be queried at https://idfg.idaho.gov/species/.

Methods:

We used the MBI 5x5 km survey grid to stratify sampling (Lucid et al. 2016). We used Reconyx™ PC800 and PC900 cameras (Wisconsin, USA).

Un-baited remote cameras (n = 42). We focused our sampling effort on survey cells in or adjacent to cells where lynx were previously detected from 2010-2014. We deployed 30 cameras in 30 cells in the Selkirk (*n* = 10 cameras), Purcell (*n* = 10 cameras), and West Cabinet (*n* = 10 cameras) mountain ranges. We used ArcGIS to randomly select 1 location per cell which occurred on a forest road (active, decommissioned, or gated) or hiking trail. We attached cameras to trees within 100 meters of the random location. Cameras were deployed from August-November 2015 and images were downloaded during October and November 2016. Four cameras were taken down during this period and 2 had been stolen. The remaining 24 cameras were left deployed with new batteries and memory cards. Cameras were visited again in August 2017 and images were downloaded, camera batteries replaced, and the cameras remained deployed. The approximate deployment period for the remaining 24 cameras was 2 years. During summer 2017 we deployed 12 additional cameras in the West Cabinet (*n* = 4 cameras), Coeur d'Alene (*n* = 4 cameras), and Saint Joe (*n* = 4 cameras) mountain ranges.

Figure 1. Lynx visits bait station in Purcell Mountains.

Figure 2. Lynx detections at un-baited remote cameras.

Bait Stations (n = 21). Bait stations consisted of: 1) a meat attractant attached to a tree, 2) gunbrush hair snares under the meat attractant, and 3) a remote camera on an adjacent tree (Figure 3). See Lucid et al. 2016 Appendix IV for complete protocol. Bait stations were deployed during the 2015-2016 winter season for a period of 49-245 (mean = 132) days. Hair samples were sent to Wildlife Genetics International (WGI, Nelson, BC) for DNA analysis.

During the winter of 2015-2016 we deployed a bait station at each site where wolverine (*n* = 7 stations) or lynx (*n* = 2 stations) were detected at a bait station from 2010-2014 (no bait station detected both wolverine and lynx from 2010-2014). We deployed 1 additional bait station in the Saint Joe at a site not surveyed from 2010-2014. We deployed bait stations in the Selkirk (*n* = 3), Purcell (*n* = 1), West Cabinet (*n* = 1), and Saint Joe (*n* = 5) mountain ranges.

During the winter of 2016-2017 we deployed 11 bait stations in the Selkirk (*n* = 1), Purcell (*n* = 5), West Cabinet (*n* = 3), and Saint Joe (*n* = 2) mountains.

Figure 3. DNA collection from lynx visiting bait station

Snowtrack Surveys (n = 2). One snowtrack survey was conducted in the Purcell Mountains during the winter of 2015-2016 and repeated in winter of 2016-2017.

Wolverine Den Survey Investigations (n = 2). We received reports of 2 possible wolverine dens in the Saint Joe Mountains. One report was from IDFG biologists conducting aerial mountain goat surveys. The other report was from a member of the public who encountered possible wolverine tracks and a possible den hole while backcountry skiing.

Results:
We define a detection as an image or verified DNA detection of one animal per calendar day. For example, we would consider an image with 2 lynx as a 2 detections of that species. Detection counts do not differentiate individuals (i.e., multiple detections may be from one individual). Genetic results from the winter of 2015-2016 are included in this report. Genetic results from the winter of 2016-2017 are pending and are not included in this report. For the purposes of this report, we have not attempted to standardize data among survey techniques and deployment periods. For example, we report some un-baited remote camera detections in September and October 2015 even though all cameras were not deployed until November 2015. We detected a total of 34 non-domestic mammalian and avian species, including lynx and wolverine. Domestic animals detected included dogs, cattle, horses, and goats.

Lynx - We detected lynx 175 times via un-baited remote camera (*n* = 113 detections), bait station (*n* = 53 detections), and snow track survey (*n* = 8 detections) (Figure 2, Table 1). Lynx were detected in the Selkirk (*n* = 35 detections), Purcell (*n* = 115 detections), and West Cabinet (*n* = 25 detections) mountain ranges. Lynx were not detected in the Saint Joe Mountains. Lynx were detected in each of the 3 target areas where they had been detected during the 2010-2014 MBI survey.

We detected a minimum of 7 individual lynx in the Selkirk (*n* = 1 individual), Purcell (*n* = 4 individuals), and West Cabinet (*n* = 2 individuals) mountain ranges. We did not make a specific effort to use pelage color and animal size to differentiate individuals in photographs. However, we report on animals that are easily identified as unique individuals. In the West Cabinets we definitively identified 1 image collected in the West Cabinets as individual LF1. LF1, a female, was fitted with a tracking collar and a yellow ear tag in January 2014 during the MBI study. The tracking collar has since fallen off (as programmed), but we identified this individual as LF1 based on the yellow ear tag (Figure 4). Additionally, we obtained 2 images from the West Cabinets where the lynx's ears lacked tags, and a yellow ear tag would have been visible if present. These images indicate at least one individual in addition to LF1 detected in the West Cabinets (Figure 4A).

Figure 4. Female lynx LF1.

Figure 4a. Lynx detected in West Cabinet mountains in 2017 presented clear view of the right ear. No ear tags were visible indicating this is a different individual(s) than LF1.

In the Purcells, we detected an adult lynx traveling with 2 juveniles (Figure 5). We later obtained an image from the same camera of an adult with 1 juvenile (Figure 6). At a different camera station, we identified 2 different lynx based on size and markings (Figure 7).

Figure 5. Adult lynx travelling with 2 juveniles in the Purcell Mountains.

Figure 6. Adult and juvenile lynx detected at un-baited remote camera in the Purcell Mountains.

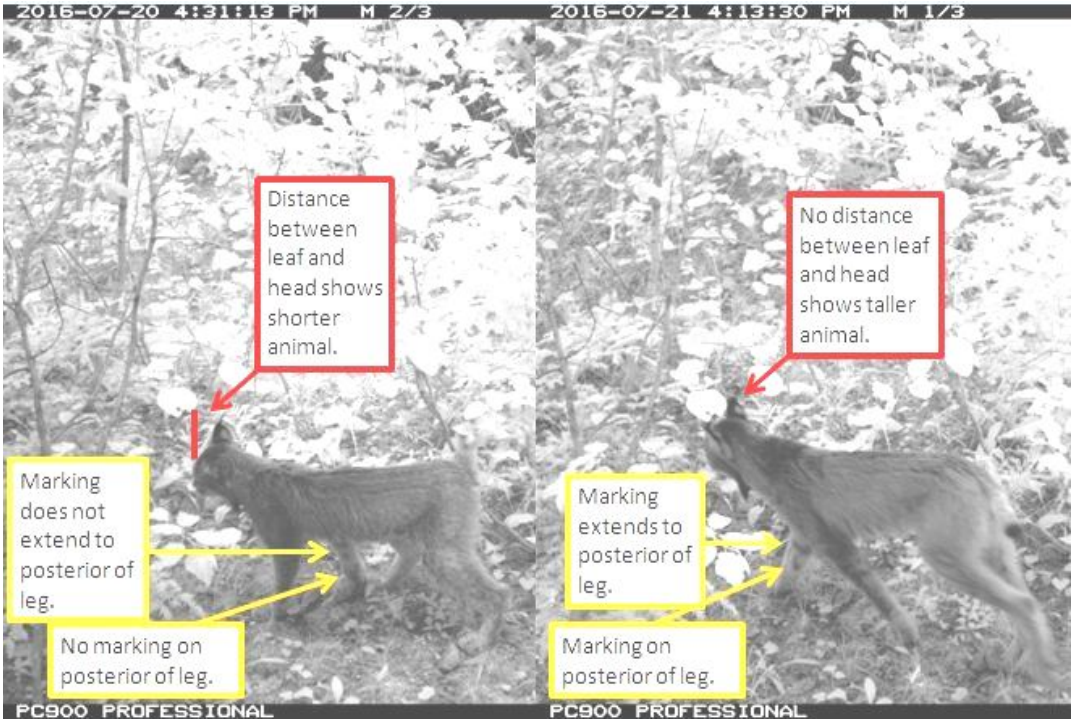


Figure 7. Characters distinguising 2 lynx individuals detected at the same un-baited remote camera in the Purcell Mountains.

Figure 8. Lynx detection at bait station in the Selkirk Mountains.

We re-detected 2 of the 5 individuals first identified during the 2010-2014 period (Table 2): LF1 via photograph as described above and W12AV3 vie genotyping a scat sample. Female lynx LF1 was first detected on 29 January, 2014 and most recently detected on 24 May, 2016. Male lynx W12AV3 was first detected on 6 February, 2011 and most recently detected on 15 April, 2016.

Wolverine - We detected wolverines a total of 10 times via un-baited remote camera (n = 2 detections), bait station (n = 6 detections), and opportunistically (n = 3 detections) (Figures 9-10, Table 1). We did not detect wolverines during the snow track surveys. Wolverines were detected in the Purcell (n = 4 detections) and Saint Joe (n = 6 detections) mountains, but were not detected in the Selkirk or West Cabinet Mountains.

From 2010-2017 we detected 5 individual wolverines in our study area. We detected 3 male wolverines from 2010-2014. We did not re-detect these individuals from 2015-2017, but we did detect 2 new males during this period. MBI male LS1 was detected 6 times in the Selkirks from 2010-2014 (Lucid et al. 2016, Table 3). This male was the only known resident wolverine in the Idaho Panhandle from 2010-2014. We did not detect this individual, or any other wolverine in the Selkirks, during the September 2015-September 2017 survey period. Although we did not detect wolverines in the Purcells from 2010-2014, we did detect wolverines at 2 different un-baited remote cameras in September and December, 2016. Males FC1744AV2 and FC1444CV2 were each detected in the Saint Joe during the 2013-14 MBI winter season (Lucid et al. 2016) and were not re-detected in 2015-2017. Individual 16771 was detected in Montana about 5km from the Idaho state line. Individual 16771 was detected incidental to grizzly bear hair snaring research.

We received reports of two potential wolverine dens in the Saint Joe Mountains. On the ground follow up suggests one was a wolverine den and the other was a badger den. DNA samples were collected and sent to the laboratory for analysis. Genetic results will provide more evidence as to which species occupied the dens.

Figure 9. Wolverine detection on un-baited remote camera in the Purcell Mountains.

Figure 10. Wolverine detection at bait station in the Saint Joe Mountains.

Additional Species - Our multi-species approach enabled the detection of 34 species of mammals and birds at bait stations and un-baited cameras (Figure 11, Table 2). Few standardized data are available for most of these common and rare species. Detections during this study indicate potential of this approach for efficiently bridging data gaps for a variety of species.

Figure 11. 34 non-domestic mammals and bird species were detected during the reporting period including mountain lion, badger, grizzly bear, and red squirrel.

Objective 2)

Eight un-baited trail cameras were deployed in the southern half of the IDFG Panhandle region (Map 1). Checking of cameras is outside the scope of the grant, and cameras will be checked in the future using a different funding source.

7. Discuss differences between work anticipated in grant proposal and grant agreement, and that actually carried out with Federal Aid grant funds.

Objective 1:

FY16:
Planned Objective: 30 cameras, 8 bait stations, 1 track survey

Delivered Product: 30 cameras deployed, 10 bait stations run, and 1 track survey completed

Differences: Our deliverables exceeded our objectives during FY16 by 2 bait stations.

FY17:
Planned Objective: 30 cameras, 0 bait stations, 1 track survey

Delivered Product: 28 cameras, 11 bait stations, 1 track survey

Differences: Our camera deliverables were less due to stolen cameras in FY16. We deployed and ran 11 bait stations when we planned 0.

Objective 2:

FY17:
Planned Objective: 6 un-baited cameras in the southern portion of the IDFG Panhandle Region

Delivered Product: We deployed 8 un-baited cameras in the southern portion of the IDFG Panhandle Region.

Differences: We deployed 2 more cameras than anticipated.

We did not target fisher for individual follow up. Un-baited remote cameras have not been an effective technique for detecting this species, and project funding was not adequate to deploy bait stations at each location where fisher were detected from 2010-2014. We detected fisher on 3 occasions via un-baited remote camera in the West Cabinets (Figure 12). We detected fisher at 4 bait stations in the West Cabinet Mountains (Figure 13). We detected one fisher scat during a snow track survey in the Purcell Mountains on 15 May, 2016. Species ID was confirmed genetically but DNA quality was not sufficient to genotype the individual. Fisher was not detected in the Selkirk Mountains during the 2010-2014 survey.

Figure 12. Fisher detected at un-baited remote camera in the West Cabinet Mountains.

Figure 13. Fisher visits bait station in West Cabinet Mountains.

8. List any publications or in-house reports resulting from this work.

F15AF00962 Panhandle Forest Carnivores 2016 Interim Report

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Coeur d'Alene Tribe of Indians: Nathan Albrecht and Cameron Heusser
Idaho Department of Fish and Game: Shannon Ehlers, Lacy Robinson, Lucas Swanson, Laura Wolf, Tyler Schober, Steve Sluka, and Jessica Krohner.
Volunteers: Scott Rulander and David Moskowitz

Justin Teisberg and Wayne Kasworm of the US Fish and Wildlife Service provided opportunistically collected wolverine hair.

Mike Brede provided observation data.

Wildlife Genetics International provided exceptional laboratory work and service.

Literature Cited:

Lucid, M.K., L. Robinson, and S.E. Ehlers. 2016. Multi-species Baseline Initiative project report. 2010-2014. Idaho Department of Fish and Game, Coeur d'Alene, Idaho, USA.

Table 1. Lynx and wolverine detections by detection method, month, and mountain range (detections do not differentiate individuals).

				2015				2016												2017								
				Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	
	Total U[a]	**Total B[b]**	**Total O[c]**																									
Lynx																												**Total**
Cabinets	24	0	1	4	1	4	0	0	1	0	1	1	1	2	4	2	0	0	0	1	0	0	0	0	1	2	0	**25**
Purcells	61	46	8	6	4	3	2	1	2	2	1	10	6	9	10	12	7	13	1	3	5	12	0	0	4	2	0	**115**
Selkirks	28	7	0	0	0	0	0	2	1	2	2	0	0	0	0	0	0	1	0	0	0	4	22	1	0	0	0	**35**
Saint Joe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total	**113**	**53**	**2**	**10**	**5**	**7**	**2**	**3**	**4**	**4**	**4**	**4**	**7**	**11**	**14**	**14**	**7**	**14**	**1**	**4**	**5**	**16**	**22**	**1**	**5**	**4**	**0**	**175**
Wolverine																												
Cabinets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Purcells	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	**4**
Selkirks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Saint Joe	0	5	1	NA	NA	0	3	1	1	1	NA	NA	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0	0	0	**6**
Total	**2**	**5**	**3**	**0**	**0**	**0**	**4**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**

[a]U: Total detections at un-baited remote cameras [b]B: Total detections at bait stations, [c]O: Total other detections including snowtrack surveys and incidental/opportunistic detections

Table 2. Individual lynx detections from 2010-14 (top) and 2015-16 (bottom)

Individual	Gender	Mt. Range	Date	ID Method	Latitude	Longitude	Elev. (m)
Shorty2C	M	Selkirks	2/21/2010	Bait Station (DNA + Photo)	48.9605	-116.6796	1751
W12AV3	M	Purcells	2/6/2012	Bait Station (DNA + Photo)	48.99714	-116.03759	1650
W12AV3	M	Purcells	2/6/2011	Scat (DNA)	48.94313	-116.09629	1686
LF2	F	Purcells	12/29/2012	Incidental Trapping (Mortality DNA)	48.81653	-116.27998	1011
OMG20141B	F	Purcells	12/18/2013	Scat (DNA)	48.98565	-116.06906	1321
OMG20141B	F	Purcells	3/21/2014	Scat (DNA)	48.97482	-116.07157	1365
LF1	F	W. Cabinets	1/29/2014	Incidental Trapping (Live Animal)	48.54283	-116.32148	1118
LF1	F	W. Cabinets	8/10/2014	Remote Camera (Photo)	48.59039	-116.2687	1666
LF1	F	W. Cabinets	7/2/2014	Remote Camera (Photo)	48.5904	-116.29497	1313
LF1	F	W. Cabinets	5/24/2016	Remote Camera (Photo)Trail Camera	48.58227	-116.26761	1354
W12AV3	M	Purcells	4/15/2016	Scat (DNA)	48.95063	-116.06745	1411

Table 3. Individual wolverine detections from 2010-14 (top) and 2015-16 (bottom)

Individual	Gender	Mt. Range	Date	ID Method	Latitude	Longitude	Elev. (m)
LS11	M	Selkirks	1/27/2011	Anal Secretion (DNA)	48.93619	-116.66917	1467
LS11	M	Selkirks	2/28/2010	Bait Station (Photo)	48.88303	-116.80922	1447
LS11	M	Selkirks	3/14/2011	Wolverine Trap (Photo)	48.94954	-116.65305	1607
LS11	M	Selkirks	3/20/2011	Wolverine Trap (Photo)	48.94954	-116.65305	1607
LS11	M	Selkirks	12/13/2011	Bait Station (Photo+DNA)	48.94582	-116.74344	1555
LS11	M	Selkirks	3/6/2013	Bait Station (Photo+DNA)	49.09972	-117.02512	1588
FC1744AV2	M	Saint Joe	1/23/2014	Bait Station (Photo+DNA)	47.22868	-115.30809	1764
FC1444CV2	M	Saint Joe	4/8/2014	Bait Station (Photo+DNA)	47.36151	-115.70045	969
16771	M	Purcells (MT)	9/26/2015	Bear Hair Corral (DNA)	48.95319	-115.90594	1489
16771	M	Purcells (MT)	10/14/2015	Bear Hair Corral (DNA)	48.91742	-115.96188	1938
OMG2016_9	M	Saint Joe	3/18/2016	Incidental Trapping Pullout (DNA)[a]	47.10649	-115.39521	unk

[a] Hair found on triggered wolf foot hold trap.

Table 4. Individual fisher detections from 2015-16. See Lucid et. al (2016) for complete list of individuals detected from 2010-14.

Individual	Gender	Mt. Range	Date	ID Method	Latitude	Longitude	Elev. (m)
F2016A1	M	W. Cabinets	11/16/2015	Incidental Trapping Mortality (DNA)	48.32305	-116.17284	1071
F2016B1	F	W. Cabinets	11/16/2015	Incidental Trapping Mortality (DNA)	48.33337	-116.17249	1124

Table 5. Number of baited and unbaited survey locations with species detections. This table identifies how many survey stations detected each species. The total number of detections is not quantified.

Common Name	Scientific Name	U (*n* = 26)	BS (n=19)	**Total**
Gray Wolf	*Canis lupus*	23	7	**30**
White-tailed Deer	*Odocoileus virginianus*	25	4	**29**
Moose	*Alces americanus*	25	3	**28**
Red Squirrel	*Tamiasciurus hudsonicus*	11	16	**27**
Black Bear	*Ursus americanus*	22	3	**25**
Snowshoe Hare	*Lepus americanus*	20	3	**23**
Coyote	*Canis latrans*	14	7	**21**
Elk	*Cervus canadensis*	20	1	**21**
Mule Deer	*Odocoileus hemionus*	20	0	**20**
Mountain Lion	*Puma concolor*	17	2	**19**
Grizzly Bear	*Ursus arctos*	15	2	**17**
American Marten	*Martes americana*	4	12	**16**
Canada Lynx	*Lynx canadensis*	9	6	**15**
Bobcat	*Lynx rufus*	12	2	**14**
Grouse species	*Phasianidae spp.*	13	0	**13**
N Flying Squirrel	*Glaucomys sabrinus*	0	12	**12**
Steller's Jay	*Cyanocitta stelleri*	3	8	**11**
Gray Jay	*Perisoreus canadensis*	2	6	**8**
Striped Skunk	*Mephitis mephitis*	7	0	**7**
Weasel species	*Mustela spp.*	2	5	**7**
Common Raven	*Corvus corax*	3	2	**5**
Fisher	*Pekania pennanti*	2	2	**4**
American Badger	*Taxidea taxus*	4	0	**4**
Wolverine	*Gulo gulo*	0	2	**2**
Red Fox	*Vulpes Vulpes*	0	2	**2**
NA Porcupine	*Erethizon dorsatum*	2	0	**2**
Cooper's Hawk	*Accipiter cooperii*	1	0	**1**
BT Woodrat	*Neotoma cinerea*	1	0	**1**
Wild Turkey	*Meleagris gallopavo*	1	0	**1**
Northern Flicker	*Colaptes auratus*	1	0	**1**
Shrew species	*Sorex spp.*	1	0	**1**
Swainson's Thrush	*Catharus ustulatus*	1	0	**1**
American Robin	*Turdus migratorius*	1	0	**1**

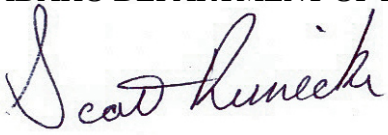
*U: Un-baited remote cameras **BS: Bait Station

Submitted by:

Toby Boudreau
Federal Aid Coordinator

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME



Scott Reinecker, Chief
Bureau of Wildlife

FEDERAL AID IN WILDLIFE RESTORATION

The Federal Aid in Wildlife Restoration Program consists of funds from a 10% to 11% manufacturer's excise tax collected from the sale of handguns, sporting rifles, shotguns, ammunition, and archery equipment. The Federal Aid program then allots the funds back to states through a formula based on each state's geographic area and the number of paid hunting license holders in the state. The Idaho Department of Fish and Game uses the funds to help restore, conserve, manage, and enhance wild birds and mammals for the public benefit. These funds are also used to educate hunters to develop the skills, knowledge, and attitudes necessary to be responsible, ethical hunters. Seventy-five percent of the funds for this project are from Federal Aid. The other 25% comes from license-generated funds.