Forest Carnivores

OBJECTIVE: Monitor distribution and relative abundance of several forest carnivore species, including Canada lynx, wolverine, fisher and American marten (formerly called pine marten).

DATA SOURCE: Inventory data from BNF and Defenders of Wildlife bait stations, Montana Department of Fish, Wildlife and Parks furbearer harvest data and the Montana Natural History Program's Tracker observations database.

FREQUENCY: Annually.

REPORTING PERIOD: 2014 - 2015.

VARIABILITY: Changes in trends that indicate recovery or further declines.

INTRODUCTION:

Canada lynx are currently listed as Threatened by USFWS. Wolverines are currently proposed for listing by USFWS. Fisher are listed as a Forest Service sensitive species, and have been petitioned for federal listing. USFWS is currently conducting a status review to determine whether proposing to list the species is warranted. Marten are a Forest Plan Management Indicator Species. Evaluations of these species follow.

CANADA LYNX (Threatened)

Lynx are uncommon and occur in low densities even in the best habitat. Lynx habitat in the Bitterroot National Forest has been identified through an interdisciplinary process with FWS to be generally areas exceeding 6,200' elevation that support vegetation types dominated by subalpine fir or spruce. Lynx do not use open or semi-open areas (Maj 1992). They use mature and over mature spruce and subalpine fir forests with deadfalls for denning. Foraging habitat typically is dense 20- to 30-year-old sapling and pole-sized stands of lodgepole pine and other conifer species (Quinn and Parker 1987; Koehler and Brittell 1990; and Thompson et al. 1989). Lynx are dependent on snowshoe hare (*Lepus americanus*) as their primary prey. Lynx abundance and density varies with the cyclic snowshoe hare population fluctuations and trapping pressure. In this area, snowshoe hares frequent dense stands of trees in early successional stages (Koehler and Brittell 1990). The shrubs and saplings provide food for the hares as well as cover from predators. Providing good hare habitat will benefit lynx (Quinn and Parker 1987).

Canada lynx were proposed for listing under the Endangered Species Act in 1999. FWS listed lynx as threatened in 2000, and included them on the list of threatened and endangered wildlife species that may occur on the Forest until 2006. In an amendment to the 2005 Canada Lynx Conservation Agreement the Bitterroot National Forest was classified as unoccupied lynx habitat by the USFWS and the Forest Service. At that time, lynx were removed from the FWS list of threatened and endangered species that may occur on the Forest. In 2013, FWS added lynx to the Forest's list as a species that may be present on the Forest as transient individuals in secondary lynx habitat. However, the Forest continues to be classified as unoccupied lynx habitat.

The Record of Decision (ROD) (USDA Forest Service 2007a) for the Northern Rockies Lynx Management Direction (NRLMD) FEIS (USDA Forest Service 2007b) became effective July 16, 2007. The ROD amended the management direction in the selected alternative into all Forest Plans in the planning area, including the BNF Forest Plan. The NRLMD FEIS management direction incorporates the Terms and Conditions the US Fish and Wildlife Service (FWS) issued in their Biological Opinion and Incidental Take Statement (USDI Fish and Wildlife Service 2007). Direction in the NRLMD FEIS ROD applies to mapped lynx habitat on National Forest System lands presently occupied by lynx, as defined by the Amended Lynx Conservation Agreement between the Forest Service and USFWS.

In 2014 and 2015, the Bitterroot NF analyzed project effects to lynx using the objectives, standards, and guidelines contained in the NRLMD ROD (USDA Forest Service 2007a) and FEIS (USDA Forest Service 2007b) for projects in mapped lynx habitat. Technically, the objectives, standards, and guidelines only apply on Forests classified as occupied lynx habitat, and then only when projects are in mapped lynx habitat. Although the NRLMD

ROD (USDA Forest Service 2007a) encourages compliance with the objectives, standards, and guidelines even on Forests classified as unoccupied lynx habitat, it specifically states that there is no requirement to do so. Current Regional policy, however, includes direction that Forests classified as unoccupied lynx habitat comply with the NRLMD objectives, standards and guidelines in mapped lynx habitat.

MONITORING and EVALUATION:

The Forest was part of a pilot program to test the effectiveness of lynx monitoring using hair snare methodology in 1999, 2001, 2002-3 and again in 2010. The Forest established a grid of stations scented with a lynx attractant near the Continental Divide east of Lost Trail Pass in a potential lynx linkage zone identified in the NRLMD ROD (USDA Forest Service 2007a). We checked hair snares at these stations on a regular basis, and collected any hair samples found.

The Forest implemented a new forest carnivore survey methodology at a limited number of sites in the winter of 2012-2013. Parts of road-killed deer were hung in trees to attract forest carnivores. Motion-activated cameras aimed at the bait tree captured photos of animals that climbed the tree, and gun cleaning brushes situated around the bole of the bait tree collected hair samples. We deployed these bait stations at over 30 sites in the southern half of the BNF including the upper Selway drainage starting in the winter of 2013-14. Starting in the winter of 2014-2015, we entered into a cooperative agreement with the Missoula office of Defenders of Wildlife (DOW). DOW installed about 20 additional bait stations in the northern half of the BNF and collected results using a network of volunteers. DNA analysis of the samples from both surveying efforts by the National Wildlife Genomics Lab in Missoula identified hair from a number of different mammal species, but so far none of the samples have contained lynx hair. We have photographed and collected hair samples from bobcats at a number of these stations, indicating that the methodology would probably be effective at detecting lynx as well.

The Montana Natural Heritage Program maintains a database of species observations (Montana Natural Heritage Tracker). A query of the database located 41 records of lynx observations totaling 51 lynx in Ravalli County from 1910 through 2009. These observations are categorized as either verified or anecdotal. Verified observations or records are those that scientifically document a lynx by identifying physical remains, live-captured animals, or DNA samples (USDA Forest Service 2007b). Anecdotal observations are generally tracks and reported sightings where physical evidence is lacking. Table 1 summarizes the lynx observations from the Montana Natural Heritage Tracker database by year and category. In total, there are 27 verified (physical remains from trapping) lynx observations from Ravalli County from 1910 to 1995. The location recorded in the Tracker database indicates that 21 of these observations were located on BNF lands, while 6 observations were located on State or private land within 10 miles of the Forest. The most recent verified records occurred in 1995 and 1987 (2). There are a total of 24 anecdotal records (no physical evidence) from Ravalli County from 1964 to 2009. The location recorded in the Tracker database indicates that 15 of these observations were located on BNF lands, while nine observations were located on State or private land within 10 miles of the Forest. Anecdotal sightings may include repeat sightings of the same individual.

Table 1 - Summary of Lynx Observations in Ravalli County from the Natural Heritage Tracker Database, by Year and Category

Mountain Range	Verified Observations	Anecdotal Observations
Bitterroot Mountains	1987, 1982, 1980 (3) 1910 (3)	2004, 2000, 1989, 1982, 1980, 1971
Sapphire Mountains	1987, 1986, 1985 (2), 1983 (2), 1982, 1978 (2)	1984, 1982
“Triangle” Area	1983 (2), 1982 (2)	1991 (5), 1982, 1981
Off Forest	1995, 1985, 1979 (2), 1978 (2)	2009* (2), 1986, 1985, 1984 (2), 1983, 1980, 1964
Total	N = 27	N = 24

*Records shown as “Fur harvest” in the Natural Heritage Tracker database, but do not appear in official trapping records from Montana Department of Fish, Wildlife and Parks, and are therefore considered anecdotal.

The Montana Department of Fish, Wildlife and Parks (FWP) regulates trapping in Montana and requires trappers to present all pelts of bobcats, otter, marten, fisher, wolverine and swift fox to FWP personnel for pelt tagging. Lynx can no longer be legally harvested, but any lynx taken incidentally must be turned in to FWP personnel within 5 days of capture. FWP records dates, locations and numbers of these harvested animals and keeps official records of these harvested species. FWP trapping records for Ravalli County show that 30 lynx were harvested by trappers between 1975 and 2010. The last lynx trapping records in Ravalli County in the official FWP database are one animal harvested during the 1994-1995 trapping season, and two animals harvested during the 1986-1987 trapping season. Montana Natural Heritage Tracker data for this same time period shows 26 lynx harvested from Ravalli County.

Included in the Montana Natural Heritage Tracker data is one record showing two lynx taken during trapping year 2008-2009 that are absent from FWP's official trapping records. The location shown in the Tracker database for both of these lynx is on private land off of the BNF along Hwy. 93 just north of Stevensville. This location is miles from the nearest lynx habitat. Any lynx caught in a trap since the lynx season closed in 2000 is defined as incidental take. An email from FWP's Statewide Furbearer Coordinator Brian Giddings dated 4/21/2011 confirms that no incidental lynx captures have been reported in Ravalli County since legal lynx harvest ended in 2000 Since there is a discrepancy between the FWP official trapping records and the Montana Natural Heritage Tracker records concerning these particular observations, the observations are not considered reliable, and thus do not represent verified observations of lynx. While evaluating the validity of lynx records for their publication, McKelvey et al. (2000) stated that "If there was a discrepancy between published tabulations of harvest data and records obtained directly from state or provincial agencies, we assumed the latter to be more reliable and used those data in our analyses."

In addition to the information from the Montana Natural Heritage Tracker and FWP trapping records, several collared lynx captured in Canada and transplanted to Colorado were later radio-located in Montana (Devineaux et al. 2010). Eight of Colorado's 218 reintroduced lynx made 10 forays into Montana, lasting from 1 to 217 days (J. Ivan e-mail to A. Rohrbacher dated July 26, 2011).Two of these individuals traveled through portions of the BNF. In 2005, one individual spent 91 days in Montana, including traveling through the Pryor, Absaroka, Gallatin, Madison and Tobacco Root ranges, past Anaconda and presumably over the Sapphires before being found dead along Hwy. 93 near Stevensville. In 2007, one individual spent 98 days in Montana, travelling west out of Yellowstone into the Gravelly Range, then northwest through the Tobacco Root, Flint Creek and northern Sapphire ranges before passing Lolo and heading into Idaho. These individuals are considered transients.

WOLVERINE (Proposed)

On February 4, 2013 the USFWS issued a proposed rule to list the wolverine in the contiguous United States as a threatened species under the Endangered Species Act (USDI Fish and Wildlife Service 2013). At the same time, USFWS published a proposed special rule under Section 4(d) of the ESA outlining the prohibitions necessary and advisable for the conservation of the wolverine (*Ibid*). This proposed Section 4(d) rule would prohibit take of wolverine from trapping, hunting, shooting, etc., while allowing incidental take associated with activities such as dispersed recreation, timber harvest, firefighting, mining, etc., if those activities are conducted in accordance with applicable laws and regulations (*Ibid*). However, USFWS subsequently withdrew the proposed rule on August 13, 2014 based on their conclusion that the factors affecting the DPS as identified in the proposed rule are not as significant as believed at the time of the proposed rule's publication. With this withdrawal, the wolverine was once again classified as a sensitive species in Region 1. However, the District Court in Montana vacated USFWS's decision to withdraw the listing proposal on April 4, 2016, and remanded the issue to USFWS for further consideration. With this court ruling, the wolverine returned to proposed status.

Wolverines are solitary animals that range extensively over a wide variety of habitats. Isolation from human presence and association with subalpine habitats characterize the general understanding of wolverine-habitat associations in the southern extent of the species' North American range (Copeland et al. 2007). Wolverine home ranges are very large, averaging approximately 150 square miles for females and 163 square miles for males in a study in northwest Montana (Hornocker and Hash 1981), and 142 square miles for females and 611 square miles for males in a study in central Idaho (Copeland 1996). Wolverines feed primarily on rodents and carrion, although they are opportunists and will also consume berries, insects, fish, birds, and eggs when available. Ungulate carrion seems to be particularly important in the winter.

Recent research indicates that wolverine distribution in the mountains of the western United States is closely tied to high-elevation areas containing alpine vegetation, alpine climatic conditions, or relatively high probabilities of spring snow cover (Aubry et al. 2007). Copeland et al. (2007) found that wolverines in central Idaho favored high elevations throughout the year, and that the downward shift in elevation during the winter described by earlier

investigators was relatively minor in their study area, and was restricted largely to males. They noted that carrion resulting from hunter wounding losses was an important forage resource for wolverines in the winter, but that wolverines utilized carrion found in mid-elevation forests and largely avoided big game winter ranges.

With few exceptions, known wolverine reproductive dens have been located in alpine, subalpine, taiga, or tundra habitats (Magoun and Copeland 1998 including extensive internal citations). In Idaho, wolverine dens occurred in snow-covered boulder talus in subalpine cirque basins located at high elevations, and consisted of long, complex snow tunnels leading under inaccessible boulder scree that provided a high degree of security (*Ibid*). A critical feature of wolverine denning habitat appears to be dependability of deep snow throughout the denning period (February through April). Almost all verified reproductive dens were under 1-5 meters of snow (*Ibid*).

Suitable wolverine denning habitat exists in the higher elevations in all the mountain ranges on the Forest. The Bitterroot Mountains, in particular, provide a large area of high elevation, subalpine to alpine habitats that maintain snow cover well into the spring. Many of the basins within the Selway-Bitterroot Wilderness are very remote and receive very little human use, especially during the winter. The combination of these characteristics provides ideal denning and year-round habitat for wolverines. In addition to providing a large core area of suitable habitat, the Bitterroot Range has been proposed as the central artery for wolverine gene flow in the Rocky Mountains, connecting wolverines at the southern extent of their current range to more robust populations in northwest Montana and Canada (Schwartz et al. 2007).

Researchers have reported that female wolverines may be sensitive to human disturbance in the vicinity of natal and maternal dens, and may abandon dens and move their kits a considerable distance if they detect human presence in the area (Copeland 1996, Magoun and Copeland 1998). This could reduce kit survival rates by increasing the potential for predation or reducing the amount of time the female can spend procuring food. However, other reports indicate that wolverines may be able to tolerate at least some close approach by humans without abandoning their dens (Heinemeyer et al. 2010; Inman et al. 2007; Persson et al. 2006). At least one ongoing study in central Idaho is designed to address whether winter recreational use is compatible with denning wolverines (Heinemeyer et al. 2010). Outside of the denning season, wolverines do not appear to avoid people or roads and trails, and are sometimes found near trails and active campgrounds during summer (Copeland et al. 2007). They will also use unmaintained winter roads for travel (Ibid).

MONITORING RESULTS:

The Forest implemented a new forest carnivore survey methodology at a limited number of sites in the winter of 2012-2013. Parts of road-killed deer were hung in trees to attract forest carnivores. Motion-activated cameras aimed at the bait tree captured photos of animals that climbed the tree, and gun cleaning brushes situated around the bole of the bait tree collected hair samples. We deployed these bait stations at over 30 sites in the southern half of the BNF including the upper Selway drainage starting in the winter of 2013-14. Starting in the winter of 2014-2015, we entered into a cooperative agreement with the Missoula office of Defenders of Wildlife (DOW). DOW installed about 20 additional bait stations in the northern half of the BNF and collected results using a network of volunteers.

In FY 2014 the BNF effort collected DNA evidence of wolverines at nine locations in the Selway River drainage. Other sites had photos of wolverines, but DNA was inconclusive. Subsequent DNA analysis by the National Wildlife Genomics Lab in Missoula identified two unique individual wolverines, one male and one female. DNA tests were unable to confirm wolverine identity to individual for other samples.

In FY 2015, the BNF effort collected DNA evidence of wolverines at four locations in the Selway River drainage, one location on the Montana side of the Bitterroots, and three locations in the southern Sapphires. Other sites had photos of wolverines, but DNA was inconclusive. Subsequent DNA analysis by the Genomics Lab identified three unique individual wolverines. Two of these were the same individual male and female identified in the Selway drainage previously. The one in Montana was a new male. In addition, the DOW effort collected DNA evidence of wolverines at four locations on the Montana side of the Bitterroots. Other sites had photos of wolverines, but DNA was inconclusive. Subsequent DNA analysis by the Genomics Lab identified two unique individual wolverines, one new male and one new female. As a result, through FY 2015 we have identified six unique individual wolverines on the BNF using DNA.

Prior to implementation of this survey methodology, records of wolverine occurrence on the BNF come from incidental observations or trapping records. These sightings and the recent survey results indicate that wolverines are present on the BNF, and that they occur in a variety of locations across the Forest.

The Montana Natural Heritage Program maintains a database of species observations (Montana Natural Heritage Tracker). A query of the database located 50 records of wolverine observations totaling 52 wolverines in Ravalli County from 1948 through 2013. These observations are categorized as either verified or anecdotal. Verified observations or records are those that scientifically document a wolverine by identifying physical remains, live-captured animals, or DNA samples (USDA Forest Service 2007b). Anecdotal observations are generally tracks and reported sightings where physical evidence is lacking. Table 2 summarizes the wolverine observations from the Montana Natural Heritage Tracker database by year and category. In total, there are 20 verified (physical remains from trapping) wolverine observations from Ravalli County from 1976 to 2011. Trapping locations are open to question since they are reported by the trappers, who may have an interest in concealing areas where they have been successful. All wolverine trapping records reported for Ravalli County in the Tracker database included GPS coordinates that were actually in the County. There are a total of 32 anecdotal records (no physical evidence) from Ravalli County from 1948 to 2013. Anecdotal sightings may include repeat sightings of the same individual.

Table 2 - Summary of Wolverine Observations in Ravalli County from the Natural Heritage Tracker Database, by Year and Category

Mountain Range	Verified Observations	Anecdotal Observations
Bitterroot Mountains	2011, 2006 (2), 2005, 2003 (2), 2001, 1998, 1986, 1983, 1980, 1979 (2), 1978, 1976	2013, 2004, 2003, 2001, 1999 (2), 1992 (2), 1983, 1980,1979 (2), 1978 (4), 1977 (2), 1976, 1969, 1952
Sapphire Mountains	1995, 1983, 1982, 1977	2004, 2001, 1999, 1996, 1995, 1992 (2), 1986 (2), 1982, 1948
“Triangle” Area	1982	N/A
Total	N = 20	N = 32

In addition, the BNF has records of several wolverine observations on the Forest that are not in the Tracker database and are not reflected in Table 2. These include a verified observation from the Bitterroot Mountains in 2013 (DNA from hair samples), two from the Sapphires in 2009 (radio-collared animals) and one from the Triangle area in 2009 (radio-collared animal). Additional anecdotal observations from the Bitterroot Mountains occurred in 2011, 2006, 2004, 2001 (2), and 1995, and from the Sapphires in 2011 and 2004.

Montana is the only state that still allows limited trapping of wolverines. However, the wolverine trapping season was closed via a temporary restraining order from a state district court judge in December 2012. Wolverine trapping in Montana will remain closed for the foreseeable future. MDFWP trapping records indicate that between 1996 and 2010, trappers harvested an annual average of about 0.55 wolverines within Ravalli County.

EVALUATION:

The wolverine is one of the rarest and least-known mammals in North America (Aubry et al. 2007). Since the 1800s, dramatic contractions have occurred within the historical range of the wolverine in the contiguous United States. Although the species once occurred in California, Utah, Colorado and the Great Lakes states, its current range in the lower 48 states is limited to north-central Washington, northern and central Idaho, western Montana, and northwestern Wyoming (Ruggiero et al.2007).

Wolverines in the Western United States and the interior Columbia basin occur widely at very low densities, but only in northwestern Montana are wolverine populations considered to be healthy and thriving (Witmer et al. 1998). In Montana, the wolverine was thought nearly extinct by 1920 from over-trapping. Wolverine numbers increased in the western, mountainous region of Montana from 1950 to 1980 (Hornocker and Hash 1981), presumably as a result of reduced trapping seasons on other furbearers and increased dispersals from Canada. Hornocker and Hash (1981) concluded that in Montana, extensive wilderness habitat, coupled with more restrictive furbearer harvest regulations, should provide secure wolverine populations in the foreseeable future. With approximately 73% of the Bitterroot National Forest in inventoried roadless areas or wilderness, it appears abundant wolverine habitat exists and is well distributed across the Forest.

MDFWP classifies the wolverine as a Montana Species of Concern. The Montana Natural Heritage Program and MDFWP rank the wolverine as a G4 S3 species (MDFWP 2016). This means that across its range the species is

considered uncommon but not rare (although it may be rare in parts of its range), and usually widespread. It is apparently not vulnerable across most of its range, but there is possibly cause for long term concern. In Montana, the species is considered potentially at risk because of limited and potentially declining numbers, extent, and /or habitat, even though it may be abundant in some areas.

FISHER (Sensitive)

The home range of fishers varies in size from 4 to 32 square miles, wherein optimum habitat is thought to include mature, moist coniferous forest with a woody debris component, particularly in riparian/forest ecotones in low- to mid-elevation areas that do not accumulate large amounts of snow (Jones 1991, Heinemeyer 1993, Ruggiero et al. 1994). A review of fisher research suggests that the species uses a diversity of tree age and size class distributions at the patch or stand level that provide sufficient (generally greater than 40%) overhead cover (either tree or shrub).

Fishers use lower elevations than pine marten (i.e. are restricted to areas of lower snow accumulation compared with marten) and are better adapted to earlier successional stages of forests than marten (Banci 1989, Jones 1991). However, the studies conducted in this region have concluded that fishers use late successional forest more frequently than the early to mid-successional forests that result from timber harvest (Aubry and Houston 1992; Buck et al. 1994; Rosenberg and Raphael 1986). Similarly, fishers in the Rocky Mountain study preferred late-successional forests with complex physical structure, especially during the summer (Jones and Garton 1994). Fisher seem to avoid non-forest and pole/sapling stands, and spend little time in ponderosa pine stands. They show a strong affinity for forested riparian habitats throughout the year (Jones 1991).

Documented den sites have occurred in cavities of live or dead trees in forested areas with some structural diversity (forb/shrub cover, downed wood, multiple forest canopy layers) that maintain a prey base of snowshoe hare, porcupine, and a variety of small mammals (Ruggiero et al. 1994). Almost all known natal dens for fishers (where parturition occurs) and maternal dens (other dens where kits are raised) have been discovered in Eastern North America (Arthur 1987; Paragi 1990). Of these, the vast majority were located high in cavities in living or dead trees. This strongly suggests that female fishers are highly selective of habitat for natal and maternal den sites. Information is available for only two natal dens (California, Buck et al. 1983; Montana, Roy 1991) and one maternal den (California, Schmidt et al. 1993, unpubl.) in the western United States. The den found in Montana was in a hollow log 11m long with a convoluted cavity averaging 30 cm in diameter. Female fishers will use 1-3 dens per litter. (Paragi 1990). Riparian stringers of late successional stage vegetation provide important connectors. Fishers use forested riparian areas extensively for foraging, resting, and as travel corridors (Claar et al. 1999; Witmer et al. 1998, p. 15).

RESEARCH and MONITORING:

The Forest implemented a new forest carnivore survey methodology at a limited number of sites in the winter of 2012-2013. Parts of road-killed deer were hung in trees to attract forest carnivores. Motion-activated cameras aimed at the bait tree captured photos of animals that climbed the tree, and gun cleaning brushes situated around the bole of the bait tree collected hair samples. We deployed these bait stations at over 30 sites in the southern half of the BNF including the upper Selway drainage starting in the winter of 2013-14. Starting in the winter of 2014-2015, we entered into a cooperative agreement with the Missoula office of Defenders of Wildlife (DOW). DOW installed about 20 additional bait stations in the northern half of the BNF and collected results using a network of volunteers. To date, this bait station methodology has not detected any fishers on the BNF. It has been highly effective in detecting marten, indicating that the methodology would probably be effective at detecting fishers as well.

The Forest participated in a Regional pilot study designed to determine fisher presence within 25 square mile grid cells in 2007, 2008, 2009, 2010 and 2012. The survey methodology is based on baited hair snares that are left in suitable fisher habitat for three weeks. Hairs collected from animals that attempt to reach the bait are then sent to the Genomics Lab for identification. Surveys performed by Forest personnel in 2012 sampled fisher habitat in Deep Creek (Selway River drainage), several tributaries entering Nez Perce Creek from the north, Mine Creek, Willow Creek and Butterfly Creek. One fisher was detected at two different sites in Deep Creek, but none were detected in the other areas. Surveys in 2010 sampled fisher habitat in several tributaries of Nez Perce Creek and in several tributaries entering both sides of the East Fork Bitterroot River near the end of the East Fork Road. No fishers were detected. Surveys in 2009 sampled several tributaries on both sides of the West Fork Bitterroot River. No fishers were detected. However, the Region also contracted with FWP to conduct fisher surveys using this methodology in 2009. Montana Fish, Wildlife & Parks' surveys identified two fishers in the Lost Horse drainage in 2009. In 2008, this survey methodology identified one fisher in Trapper Creek, one fisher in Bear

Creek, and one fisher in a tributary of Nez Perce Creek. No fishers were detected in Lost Horse Creek, Roaring Lion Creek, upper Skalkaho Creek, or Woods Creek. In 2007, one fisher was detected in the Burnt Fork drainage, but no fishers were detected in Willow Creek, Daly Creek, Sleeping Child Creek, Moose Creek, Meadow Creek, Mine Creek, Coal Creek, or Soda Springs Creek.

The Montana Natural Heritage Program maintains a database of species observations (Montana Natural Heritage Tracker). A query of the database (August 2014) located 101 records of fisher observations totaling at least 102 fisher sightings in Ravalli County from 1965 through 2014. These observations can be categorized as either verified or anecdotal. Verified observations or records are those that scientifically document a fisher by identifying physical remains (usually from trapping), live-captured animals, or DNA samples. The verified fisher records resulting from DNA collected by the BNF's monitoring efforts described previously are not included in the Tracker database.

Anecdotal observations are generally tracks and reported sightings where physical evidence is lacking. Table 3 summarizes the fisher observations from the Montana Natural Heritage Tracker database by year and category. In total, there are 62 verified (physical remains from trapping) fisher observations reported from Ravalli County from 1965 to 2014. Trapping locations are open to question since they are reported by the trappers, who may have an interest in concealing areas where they have been successful. The coordinates reported for 11 of the fisher harvest locations listed for Ravalli County in the Tracker database are actually not in Ravalli County, and are therefore shown in Table 1 as "Unknown". There are a total of 40 anecdotal records (no physical evidence) from Ravalli County from 1965 to 2014. The location coordinates recorded in the Tracker database indicates that all of these observations actually occurred in Ravalli County. Anecdotal sightings may include repeat sightings of the same individual.

Table 3 - Summary of Fisher Observations in Ravalli County from the Natural Heritage Tracker Database, by Year and Category

Mountain Range	Verified Observations	Anecdotal Observations
Bitterroot Mountains	2011 (2), 2010, 2009 (2), 2008, 2007 (3), 2006 (3), 2005 (3), 2003, 2001, 2000 (2), 1999, 1995, 1994, 1989 (2), 1988 (2), 1987 (3), 1986 (2), 1985, 1984 (2), 1981, 1978	2014, 2013, 2011, 2004 (2), 1998, 1996, 1995 (2), 1994, 1990 (2), 1989 (2), 1988 (2), 1987, 1986 (2), 1985, 1984 (6), 1978 (5), 1977 (2)
Sapphire Mountains	2006, 1995, 1990, 1988, 1986, 1985 (2), 1984, 1965	1994, 1986, 1985 (2), 1984 (2)
"Triangle" Area	2011, 2010, 2005, 1986 (2), 1985	
Unknown	2007, 2006, 2004 (2), 2002, 2001, 2000 (2), 1997, 1989, 1985	
Total	N = 62	N = 40

The Montana Department of Fish, Wildlife and Parks (FWP) regulates trapping in Montana and requires trappers to present all pelts of bobcats, otter, marten, fisher, wolverine and swift fox to FWP personnel for pelt tagging. FWP records dates, locations and numbers of these harvested animals and keeps official records of these harvested species. FWP trapping records for Ravalli County show that 63 fishers were harvested by trappers between 1975 and 2010, although the listed coordinates place 9 of those records outside of Ravalli County. Based on these figures, trappers harvested an average of about 1.8 fishers per year from Ravalli County between 1975 and 2010, mostly from the Bitterroot Mountains. Montana Natural Heritage Tracker data for this same time period shows 59 fishers harvested from Ravalli County, although the listed coordinates place 11 of those records outside of Ravalli County.

The BNF has records of several other fisher sightings that don't appear in the Tracker database. A BNF wilderness ranger spotted a fisher near Nez Perce Creek in 2009. A wildlife biologist spotted a fisher while hiking in the Larry Creek area in 2006. Dr. Kerry Foresman from the University of Montana detected fishers in the Big Creek and Bear Creek drainages during a study in the winter of 1994-1995. He believes most of the Bitterroot canyons support fisher populations.

EVALUATION:

Based on the above research, monitoring, and the following evaluation of other available information, it appears suitable fisher habitat is well distributed within capable ecotypes across the Bitterroot National Forest and, although uncommon by nature, the species has been using that habitat until recently. The absence of fisher detections despite a considerable amount of survey effort in the last few years may indicate that fisher numbers have declined, but whether any such decline is cyclical or is a long-term trend is unknown. Fisher habitat and fisher sightings have historically been more common in the Bitterroot Mountains than in the Sapphire Mountains.

MDFWP classifies the fisher as a Montana Species of Concern. The Montana Natural Heritage Program and MDFWP rank fisher as a G5 S3 species (MDFWP 2016). This means that across its range the species is considered common, widespread, and abundant (although it may be rare in parts of its range). It is not vulnerable in most of its range. In Montana, the species is considered potentially at risk because of limited and potentially declining numbers, extent and /or habitat, even though it may be abundant in some areas.

Witmer et al. (1998, p.14) states that the status of the fisher in the Western United States is poorly known but generally perceived as precarious and declining. Fisher populations in all the other states in the northern Rocky Mountains and Pacific Northwest are considered Imperiled, Critically Imperiled or Possibly Extirpated (MNHP, 2006). Fisher are apparently secure in their core range, which includes the boreal forest zone across Canada.

Fishers were apparently extirpated from Montana by 1930, and there are no records of their occurrence in the state from then until fishers from other areas were released at several sites in the early 1960s (Vinkey, 2003). The Bitterroot Mountains possess the most verified records of fisher in the state both before and after 1989, and appear to be the stronghold of fisher populations in Montana (Vinkey, 2003). This is largely due to a release of 39 fishers from British Columbia in the Idaho side of the Bitterroots in 1962, although genetic investigations indicate that some native fishers may have survived in the Selway-Bitterroot region (Vinkey, 2003). Twelve fishers from British Columbia were released at Moose Lake on the eastern edge of the Sapphire Mountains in 1962, and apparently became established in the Sapphires based on trapping records. However, there have been few verified records of fishers in the Sapphires since 1989, and researchers have been unable to verify the presence of a self-sustaining population in this area (Vinkey, 2003). University of Montana mammalogist Dr. Kerry Foresman considers the Sapphire Mountains to be generally too dry for fishers, and has been unable to locate any on the east side of the Bitterroot Valley (K. Foresman, pers. comm. 2006).

At the Bitterroot National Forest-wide scale, a query of FIA data estimates that we have 95,134 acres of summer habitat and 286,142 acres of winter fisher habitat. This is 95% of the habitat necessary to maintain a minimum viable population of fishers (Samson 2006; Samson 2005). The adjacent Lolo National Forest and Clearwater National Forest have an estimated 149% and 358% of the habitat necessary to maintain a minimum viable population, respectively (Samson, 2005).

Given the large amount of estimated suitable habitat on the Bitterroot National Forest and additional connected habitat on the adjacent Forests (indicated, in part, by the successful expansion and continued presence of re-introduced populations), short term viability of the fisher at this scale does not appear to be concern. For the fisher, managing the landscape within the natural range of composition, structure and frequency and extent of ecological drivers (fire, insects, and wind) may be most effective for long-term fisher persistence (Samson 2006 p. 11).

MDFWP classifies the fisher as a Montana Species of Concern. The Montana Natural Heritage Program and MDFWP rank the wolverine as a G5 S3 species (MDFWP 2016). This means that across its range the species is considered common, widespread, and abundant (although it may be rare in parts of its range). In Montana, the species is considered potentially at risk because of limited and potentially declining numbers, extent, and /or habitat, even though it may be abundant in some areas.

AMERICAN MARTEN (Management Indicator Species)

The marten is one of the most common, mid-sized carnivores in northern North America. Although populations have been reduced by habitat loss and trapping in some areas, marten are still common, particularly in western Montana (Foresman 2001). Marten are active throughout the year and are dietary generalists, foraging primarily on voles and mice. Home range sizes reported from studies in Montana range from 370 acres to 16,800 acres for males and 99 acres to 1,800 acres for females (*Ibid*), depending on habitat quality. Average home range size in Montana is about 716 acres for males, and 173 acres for females (Burnett 1981).

Marten use predominantly cooler, moister forested habitat types. Much of marten preferred habitat resembles mature and old growth habitat. Dead woody debris is an essential component of this habitat (Douglas and

Strickland 1987; Witmer et al.1998, p. 14 and 16). Resting and denning tend to occur in structures associated with late-successional conifer forests, including squirrel middens, large-diameter logs, large and medium diameter snags and high canopy cover (Ruggiero et al. 1998). Most studies have reported that marten prefer forests with continuous overhead cover (Claar et al. 1999, Koehler and Hornocker 1977). Marten in the northern Rocky Mountains are frequently associated with forested riparian habitats, perhaps because the structural components they require are found most consistently in riparian corridors. Riparian stringers of late successional stage vegetation provide important connectors. Marten use forested riparian areas extensively for foraging, resting, and as travel corridors (Claar et al. 1999, Witmer et al. 1998, p. 15).

RESEARCH and MONITORING:

Marten populations have been monitored by the Bitterroot National Forest through track transects since 1988. Each Ranger District has established permanent marten monitoring routes that were created in 1988. These transects were established in developed area, areas to be developed, and in areas where no development is scheduled. A base line population index was established by counting any marten tracks that crossed the established transects during the 1988-1996 monitoring seasons. During that period, the Bitterroot National Forest surveyed nearly 750 miles of transects, and found an average of one marten track ever 6.7 miles (6.7 miles per track). This information is used for comparison instead of a strict “most recent five-year average” because it contains more robust data.

Due to limited funding and competing priorities, track surveys have not been completed in recent years. Some transects have been surveyed in some years, but none of the transects have been surveyed repeatedly each year since 1996. Marten populations have been monitored though several different methods in order to supplement the incomplete track surveys and although these supplemental methods are not exactly comparable to the data from the earlier track transects, they do provide a platform from which to monitor the Bitterroot’s marten populations. Instead of the established track surveys, marten detections for the 2014 – 2015 monitoring period were collected through non-invasive DNA collection, photographs, and Montana Fish, Wildlife and Parks trapping harvest data.

The Forest implemented a new forest carnivore survey methodology at a limited number of sites in the winter of 2012-2013. Parts of road-killed deer were hung in trees to attract forest carnivores. Motion-activated cameras aimed at the bait tree captured photos of animals that climbed the tree, and gun cleaning brushes situated around the bole of the bait tree collected hair samples. We deployed these bait stations at over 30 sites in the southern half of the BNF including the upper Selway drainage starting in the winter of 2013-14. Starting in the winter of 2014-2015, we entered into a cooperative agreement with the Missoula office of Defenders of Wildlife (DOW). DOW installed about 20 additional bait stations in the northern half of the BNF and collected results using a network of volunteers. To date, this bait station methodology has been highly effective in detecting marten.

In FY 2014 the BNF effort collected DNA evidence of martens at six locations in the Selway River drainage and one location in Montana. Other sites had photos of marten, but DNA was inconclusive. The National Wildlife Genomics Lab does not attempt to identify marten DNA to individual.

In FY 2015, the BNF effort collected DNA evidence of martens at one location in the Selway River drainage and three locations in Montana. The survey crew did not submit DNA samples that appeared to be marten, especially when only martens appeared on the camera. Many, if not most of the 27 BNF sites run in 2015 were visited by martens. In addition, the DOW effort collected DNA evidence of martens at 17 locations on the Montana side of the Bitterroots and three locations in the Sapphires, with only three stations not detecting martens.

Martens are known to be highly vulnerable to trapping, and trapping records are another way of monitoring marten distribution and relative abundance. FWP trapping data indicates that the statewide marten harvest has continued to increase, with an increasing harvest trend during the past several years (including the 2010-2013 monitoring period). Results calculated from FWP’s annual trapper harvest survey reports trapper effort for all species provide Catch per Unit Effort (CPUE = # animals harvested/1,000 trap days). Examining the trend in marten CPUE, it appears harvest effort has remained relatively stable on a statewide base, indicating more marten are being taken with consistent effort. Table 4 shows the number of marten harvested in Trapping District 2 (TD2) (which covers the Bitterroot National Forest) during the monitoring period. From 2004, through 2010, the average number of marten taken by trappers annually was 362 within TD2, and 181 within Ravalli County. The higher harvest numbers in recent years in TD2 indicated that marten continue to be a relatively common species in the Bitterroot drainage and surrounding areas. Annual trapping harvest reports can be located at: http://fwp.mt.gov/hunting/trapping/.

Table 4 - Marten Harvested in Trapping District 2, 2009-2014

Year	Harvest
2009-2010	402
2010-2011	363
2011-2012	420
2012-2013	656
2013-2014	709

EVALUATION:

When compared to the base line data, more recent surveys have shown a dramatic decrease in the miles per marten track. This could reflect an increase in marten numbers, or could be indicative of sampling variables such as snow conditions during surveys. Other observations from additional data sources (DNA sampling, photographs, harvest records) indicate that marten are relatively common, well distributed through the drainages on the Bitterroot National Forest and potentially increasing as a population. If populations are increasing, it is difficult to attribute this to a particular cause like habitat change, as this monitoring item intended. The most recent science and analysis indicate that marten are doing well on the Forest, and we will continue to use monitoring and research results to evaluate this management indicator species.

At a Forest wide scale it is estimated that we have approximately 393,400 more acres of marten habitat than is necessary to maintain a minimum viable population (Samson 2006), which is estimated to be 2,374% of the habitat necessary to maintain a minimum viable population of marten on the Forest.

The Montana Natural Heritage Program and MDFWP rank the marten as a G5 S4 species (MDFWP 2016). This means that across its range the species is considered common, widespread, and abundant (although it may be rare in parts of its range). In Montana, the species is considered apparently secure, though it may be quite rare in parts of its range, and/or suspected to be declining.

No further evaluation is needed at this time, since all indications are that marten appear to be doing well on the Forest. Continued monitoring and research may eventually allow us to draw some clearer conclusions.

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