Idaho
Furbearer Management Plan
2022-2027

by **IDAHO DEPARTMENT OF FISH AND GAME**

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Executive Summary

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Few species have played a greater role in shaping the American West than animals harvested for their fur. The wild fur trade pushed westward exploration of North America and established some of the first European outposts across the West. This history and heritage of furbearers, and their place in shaping our physical and social environment, remains with us today in Idaho.

Idaho is home to 19 species, representing 7 taxonomic families, which are or were harvested for their fur. Importance of these species is well documented and encompasses a diverse array of social and biological values. Many of these species are abundant in Idaho and valued as a furbearing resource by hunters and trappers. Furbearer harvest provides a varied and unique suite of outdoor opportunities. North American beavers (*Castor canadensis*) and common muskrats (*Ondatra zibethicus*) shape aquatic and riparian ecosystems through their landscape manipulation and herbivory. Red fox (*Vulpes vulpes*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), American badger (*Taxidea taxus*), and other mesocarnivores prey on small mammals, helping keep those populations in balance. North American river otters (*Lontra canadensis*) serve as apex carnivores in aquatic systems. Many furbearing species are considered charismatic by the public and observations of them in the wild by Idahoans are cherished.

Idaho Fish and Game's (IDFG) mission is to preserve, protect, perpetuate, and manage all of Idaho's wildlife and provide for continued supplies of wildlife for hunting, fishing, and trapping. Species management plans, like this Furbearer Management Plan (Plan), help IDFG identify and set priorities for fulfilling its mission related to these species. In the >30 years since the last plan was adopted, much has changed in regard to furbearer management, making this an opportune time to re-establish priorities for the furbearer program.

Through development of this Plan, we identified management needs for individual species and the furbearer program. From this expansive list, we selected a subset of management actions as top priorities for the Plan period. We grouped these top priorities into 4 categories: Harvest Management and Population Monitoring, Habitat Management, Data Management, and Outreach and Communication.

Management directions for Harvest Management and Population Monitoring focus on maintaining furbearer populations across the state, providing hunting and trapping opportunity, and creating flexibility to address wildlife-human conflict. Species-specific priorities include developing tools to better guide harvest of bobcat and river otter. Further priorities include addressing information needs for status and distribution of species for which little data exists, such as ermine (*Mustela erminea*), long-tailed weasel (*Mustela frenata*), and western spotted skunk (*Spilogale gracilis*). We identified several strategies to address these management actions:

- Continue to monitor populations of furbearers and predatory wildlife through catch-per-unit-effort data to inform harvest management and population status.
- Maintain current season structure for furbearers and predatory wildlife.
- Use existing bobcat harvest data to develop a Statistical Population Reconstruction (SPR) model to more accurately estimate how potential changes in harvest regulations would affect bobcat populations.
- Upon development of an initial SPR model, identify additional data or research components (if any) needed to develop an approach to better manage bobcat harvest and begin addressing those data needs.
- Using information gained from SPR modeling and other efforts, work with stakeholders to explore options for modifying bobcat harvest opportunity.
- Update existing calculations of available habitat and potential density estimates for river otters and identify additional data or research components (if any) needed to refine these estimates.
- Develop a monitoring framework to track broad changes in river otter population status at regional scales.
- Work with stakeholders to explore options for modifying river otter harvest opportunity.
- Refine the furtaker harvest report to allow trappers to differentiate between the 2 weasel species and provide harvest location.
- Identify collaborative opportunities to collect information about current distribution of American ermine, long-tailed weasel, and western spotted skunk.
- Explore the value of ermine and long-tailed weasel occurrences collected in other forest-carnivore sampling efforts to inform status and distribution.

Habitat Management priorities are species-specific and rely on partnerships and data to drive successful outcomes. Opportunity exists to incorporate muskrat habitat needs into relevant Wildlife Management Area (WMA) planning activities with potential to create more trapping opportunity and improve wetland habitat for waterfowl. Working with land management agencies to incorporate marten (*Martes americana, M. caurina*) habitat needs is also prioritized, as these species rely on connectivity of mature, mixed-conifer forest. Lastly, use of North American beaver translocation as a habitat restoration tool is increasing across the West, and opportunity exists in Idaho for practical application across a variety of land ownerships (e.g., IDFG, other state agencies, federal agencies, and private). We identified several strategies to address these management actions:

- Develop a muskrat habitat needs document, particularly in relation to water-level manipulation, to incorporate into relevant WMA planning and activities, and provide advice to private landowners, where applicable.
- Communicate habitat needs of marten to promote connectivity of suitable habitat in relation to forest management activities and planning efforts.
- Identify strategies that maximize success of beaver translocations.
- Explore tools and techniques to address flooding caused by beavers through non-lethal means.

Data Management priorities will ensure efficient and effective security and accessibility of furbearer program data. Although current approaches to furbearer harvest data storage have served IDFG to this point, opportunity exists to improve and modernize this component of the furbearer program. Development of an online platform for trappers to submit mandatory furtaker reports will streamline this process and provide a user-friendly interface. Updating data storage and management to a more efficient platform will enhance security of long-term storage and allow for streamlined data analyses. When operational, an online platform could directly incorporate data entered by trappers, thereby significantly reducing valuable staff time and resources currently expended for manual entry and analyses. We identified 2 strategies to address these management actions:

- Develop an online platform for trappers to enter harvest data. This system will provide better service to trappers, expedite data processing, and provide more timely access to harvest data.
- Develop a new data management system for furbearer harvest data that addresses storage concerns, allows for transfer of existing data, and streamlines incorporation of data provided by trappers via an electronic furtaker harvest report.

Finally, Outreach and Communication development is a crucial component of furbearer program priorities, ensuring support and understanding for trapping as a constitutionally protected activity in Idaho. Although regulated trapping provides a valued outdoor opportunity and serves many important purposes in wildlife management, public support for trapping is generally low. Stigmas regarding trapping are primarily rooted in misinformation, and providing the most basic facts about the roles of trapping in modern-day furbearer management can improve support. With changing demographics and a growing population in Idaho, addressing this communication need is of utmost importance to maintain support for trapping. We identified several strategies to address these management actions:

- Host Association of Fish and Wildlife Agencies (AFWA) Trapping Matters Workshops in multiple locations across the state to allow participation by IDFG and sister agency employees.
- Promote inclusion of trapping and wolf trapping education into new employee work plans, including front desk and administrative staff.
- Develop and implement a trapping-related class for IDFG In Service Training School.

- Develop consistent talking points for IDFG staff to address commonly asked questions from the public to ensure consistent messaging and effective communication.
- Create and distribute seasonally appropriate social media and press releases. Address topics including awareness of trapping seasons and regulations, benefits of trapping, reintroduction efforts that utilize trapping, and methods for releasing domestic animals from traps.
- Include language related to roles of the public when encountering a trap or trapped animal, and positive roles of trapping, in all hunting regulation booklets.
- Provide hands-on demonstrations of methods for releasing pets from traps at rattlesnake-avoidance and other appropriate hunting and outdoor dog training events across the state.
- Attend trapping conventions to discuss key messages developed by AFWA and trapping Best Management Practices (BMP).
- Present information regarding the importance and dissemination of key messaging and promotion of trapping BMPs to directors and member of various trapper associations.
- Incorporate key messages regarding importance of trapping and trapping BMP information into IDFG trapper education curriculum.

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Introduction

Furbearers represent a diverse group of wildlife. Comprising 7 different taxonomic families, these species are found in every ecotype of the state, providing outdoor opportunity through hunting, trapping, and wildlife viewing while performing a variety of ecosystem services along the way. Across history, a uniting theme of this suite of species is pursuit for their fur, which is used in a wide array of garments for both fashion and function, hence the name "furbearers." Fur harvested in Idaho may be utilized around the world through fur trade distribution; whether for a hat in Texas, trim on a parka in the Canadian Arctic, or a garment of high fashion in Hong Kong.

Idaho is home to 19 mammal species that are or were harvested for their fur. Idaho Fish and Game (IDFG) manages this group, in part, by their classification in Idaho Code. Idaho Code further defines these species as Furbearing Animals, Predatory Wildlife, Big Game, or Protected Nongame.

Species classified as Furbearing Animals with established harvest seasons include

- American badger (*Taxidea taxus*, badger),
- American beaver (*Castor canadensis*, beaver),
- Bobcat (*Lynx rufus*),
- American marten (*Martes americana*, marten),
- Pacific marten (*Martes caurina*, marten),
- American mink (*Neovison vison*, mink),
- Common muskrat (*Ondatra zibethicus*, muskrat),
- North American river otter (*Lontra canadensis*, river otter), and
- Red fox (*Vulpes vulpes*).
- Species classified as Furbearing Animals with closed seasons include
- Canada lynx (*Lynx canadensis*); listed as threatened under the Endangered Species Act (ESA), and
- Fisher (*Pekania pennanti*); a Species of Greatest Conservation Need (SGCN) in the Idaho State Wildlife Action Plan (SWAP, IDFG 2023).
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Several animals harvested for their fur are classified as Predatory Wildlife:

- Coyote (*Canis latrans*),
- Ermine or short-tailed weasel (*Mustela erminea*, ermine),
- Long-tailed weasel (*Mustela frenata*),
- Northern raccoon (*Procyon* lotor, raccoon),
- Striped skunk (*Mephitis mephitis*), and
- Western spotted skunk (*Spilogale gracilis*).

The last 2 species are gray wolf (*Canis lupus*), classified as Big Game; and wolverine (*Gulo gulo*), classified as Protected Nongame and a SGCN.

The Furbearer Management Plan (Plan) focuses on the 15 species classified as furbearers or predatory wildlife with established harvest seasons .

A variety of recreational opportunities are provided by these furbearers and predatory wildlife. Trapping is a popular method of take for all species discussed and the only legal method of take for beaver, marten, mink, muskrat, and river otter. Hunting with hounds is a popular method of take for bobcats where reliable snow cover exists, and to a lesser degree for other furbearers and predatory wildlife. Predator calling is conducted for a variety of furbearers and predatory wildlife and is particularly popular for coyotes and red fox. Hikers and other outdoor enthusiasts appreciate viewing many of these species in the wild, often as an unexpected highlight while enjoying other outdoor activities.

Management of these species is primarily conducted through trapping and hunting. Regulated harvest seasons provide a valued opportunity to pursue these species, enabling people to interact with a suite of wildlife that are infrequently encountered in other ways. Many of these species are relatively abundant, may contribute to livestock depredation or damage to transportation and irrigation infrastructure, and can serve as sources of zoonotic diseases. Harvest can aid in mitigating these negative interactions.

From a biological perspective, data collected from harvest of these species through trapping enables IDFG to monitor status of populations. Anyone who purchases a trapping license is required to submit a furtaker harvest report before they are allowed to purchase a trapping license for the next year. Analyses of harvest data provided by trappers allow IDFG to estimate total harvest, location of harvest, trapper numbers and effort, and population trends through catch-per-unit-effort (CPUE, usually expressed

BOBCAT PHOTO: CC-BY SHUTTERSTOCK #1233596-1920 as captures/100 trap nights). For the majority of these species, trapper reports serve as the primary data source for determining population status and trend.

License holders who pursue these species, whether by trapping or hunting, tend to be few in number, but are dedicated to these activities. Trappers in the western U.S. spent an average of 45 days/season afield (AFWA 2015), notably more days than expended by people who participated in hunting or angling. Interest in trapping has increased in Idaho. License sales increased from approximately 1,000 in the early 2000s to >2,000 in 2021 (Table A-1). Nonresident participation in trapping is low, averaging 1–2% of total license sales (Table A-1). The increase in trapping license sales did not correlate with increased fur prices and was more likely attributable to a resurgence in overall interest in the outdoors coupled with an interest in trapping as a method of predator management.

Compared to other outdoor activities, trapping tends to draw the least public support (Duda et al. 1998). Lack of support is generally rooted in perceptions that trapping is cruel, inhumane, and results in large numbers of non-target captures (B. White, Association of Fish and Wildlife Agencies, personal communication). Across the country, these perceptions are used to promote anti-trapping legislation through ballot initiatives and bill submissions. Successful efforts to eliminate trapping as a management tool served to undermine legitimacy of state wildlife agencies and were used as stepping-stones to challenge other methods of take and wildlife management in general. As human demographics change across the country and in Idaho, addressing these false perceptions will be a critical component of maintaining trapping as a management tool.

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[1] Management of Canada lynx, fisher, gray wolf, and wolverine are addressed in separate plans.

1990 Furbearer Management Plan Goals And Accomplishments

The most recent furbearer plan developed by IDFG was adopted in 1990 (Will 1990). That plan identified 19 priorities for furbearer management, many of which are still relevant today. These 19 priorities can be grouped into 5 broad categories: Education and Outreach, Harvest Management and Population Monitoring, Habitat Management, Restoring Species to Historical Range, and Regulatory Conflicts. Since development of the 1990 plan, IDFG has made much progress towards addressing those priorities.

Education and Outreach

Priorities: Develop a mandatory trapper education program; promote values and opportunities provided by furbearers and the role of trapping to the public; and address negative perceptions of trapping among some members of the public.

- IDFG developed a trapper education curriculum and offers classes statewide. Beginning in 2018, completion of a trapper education class was required for anyone who purchased their first trapping license after 1 July 2011. Classes promote an understanding of regulations and ethics associated with trapping.
- Promoting the values of furbearers and addressing negative perceptions associated with trapping is an ongoing issue. IDFG employed outreach as specific needs arose and has identified Outreach and Communication as a continued priority in this Plan.

Harvest Management and Population Monitoring

Priorities: Develop reliable and cost-effective management criteria for guiding harvest of furbearers; improve and streamline mandatory furtaker harvest report; and dedicate funding to implement a statewide furbearer management program.

- In 2001, IDFG modified furtaker report forms to collect species-specific CPUE data, which serves as the primary metric for monitoring trends in furbearer populations.
- In 2018, IDFG created and filled a Furbearer Staff Biologist position with an associated budget to oversee furbearer management in the state.

Habitat Management

Priorities: Analyze impacts to furbearers, as well as roles of some species in habitat alteration, when assessing habitat modification projects, land management plans, or loss of wildlife habitat.

- Furbearers, particularly those identified as SGCN, are incorporated in all relevant habitat planning and review.
- Use of beaver as a habitat management tool is growing in IDFG, with 5 regions currently using this approach.

Restoring Species to Historical Range

Priorities: Ensure occupation of suitable habitat by fisher, beaver, and river otter through translocations; and expand partnerships with wildlife agencies in other jurisdictions by providing surplus fisher, marten, and river otter for restoration efforts.

- River otter are considered well-distributed across the state in available habitat.
- River otter were provided to other states to aid in restoration efforts.
- Marten were re-established in the Bear River Mountains of southeastern Idaho.
- Beaver were translocated within the state to address habitat goals.

Regulatory Conflicts

Priorities: Clarify regulations for use of bait and expand regulatory oversight of baiting; modify trap-labeling requirements; and change how IDFG addresses capture of non-target species.

- Regulations associated with baiting were modified and expanded to clearly define lawful opportunities and conditions for use of bait.
- Trap labeling regulations were updated to allow a unique trapper ID number in lieu of a personal name and address.

Trapper Opinion Survey

A fundamental component of successful wildlife management is understanding needs and preferences of relevant constituents. Development of the Plan gave IDFG an opportunity to survey Idaho trapping license holders regarding their views of management and trapping opportunity. Use of standard survey methodology to gather opinions from trappers allowed IDFG to collect data from a representative sample of its constituency that is otherwise not possible via traditional regulatory processes. In September 2021, IDFG mailed a paper questionnaire to all trapping license holders from the previous 5 years (n = 4,305) and received 1,600 completed surveys (37% response rate). Overall margin of sampling error for the survey was ±2.5% (at a 99% confidence level).

Respondents were predominantly white males and average age was 51 (Table 1a). Length of residency varied, but most respondents have been a resident of Idaho for >20 years (Table 1b). Most trapping occurred in Southwest (24.5%) and Panhandle (23.2%) Regions; participation in other regions accounted for 7–15% of effort (Table 2).

Table 1a. Trapper ages.

Age (yrs)	Respondents	%
18–24	55	4.6
25–34	144	12.0
35–44	232	19.3
45–54	215	17.8
55–64	279	23.2
65–74	212	17.6
≥75	68	5.6

Table 1b. Trapper residency.

Residency (yrs)	Respondents	%
1–5	173	15.1
6–10	74	6.5
11–20	86	7.5
21–30	160	14.0
31–40	181	15.8
41–50	192	16.8
>50	278	24.3

Table 2. Self-reported primary trapping region in Idaho, USA among respondents.

Region	Respondents	%
Panhandle	279	23.2
Clearwater	183	15.2
Southwest	295	24.5
Magic Valley	159	13.2
Southeast	159	13.2
Upper Snake	173	14.4
Salmon	90	7.5

Almost one-half (48.4%) of respondents trapped during the previous 1–5 years, whereas 36.6% reported trapping for >10 years. This bimodal distribution suggests the trapping community consists of people who are either relatively new to the activity or long-term, dedicated participants. These data are representative of an attrition rate common among hunting, trapping, and fishing participants.

The primary goal of the trapper opinion survey was to identify species that are commonly targeted, trappers "top-3" species of importance, and motivations for pursuing those species. Of the 15 furbearer species available for trapping in Idaho, trappers identified coyote, bobcat, and beaver as both the most targeted and most important species (Table 3). Respondents reported recreation or pleasure and challenge of trapping as their primary motivations followed by motivations related to their desire to help manage wildlife and control predators (Table 4).

After ranking their top-3 species, respondents were asked to rate satisfaction with their trapping experience, perceptions of target species population status, and preferences for season length. Here, we report results for the 3 species most important to trappers: coyote, bobcat, and beaver.

For respondents who ranked coyote in their top-3, satisfaction averaged 2.9 on a 4-point scale, indicating general satisfaction with their trapping experience. Population status averaged 3.0 on a 5-point scale, indicating no perceived change to coyote populations. Approximately 93% of respondents indicated current coyote season length (i.e., year-round) is "just right."

Satisfaction among bobcat trappers averaged 2.6 on a 4-point scale, indicating general satisfaction with their trapping experience. Population status averaged 3.0 on a 5-point scale, indicating a perception between less game and no perceived change to bobcat populations. Approximately 65% of respondents indicated current bobcat season length is "just right," however, approximately one-third of respondents wished for a longer season with an earlier opening date.

For respondents who ranked beaver in their top-3, satisfaction averaged 3.0 on a 4-point rating scale, indicating general satisfaction with their trapping experience. Population status averaged 3.0 on a 5-point rating scale, indicating no perceived change to beaver populations. Approximately 85% of respondents indicated current beaver season length is "just right."

Table 3. Ranking of furbearer species importance by trappers, 2021, Idaho.

Species	n	%
Coyote	758	23.6
Bobcat	585	18.2
Beaver	443	13.8
Gray wolf	324	10.1
Muskrat	255	7.9
Red fox	237	7.4
Marten	172	5.3
Raccoon	164	5.1
Mink	89	2.8
River otter	70	2.2
Badger	54	1.7
Striped skunk	45	1.4
Long-tailed weasel	9	0.3
Ermine	8	0.2

Table 4. Motivations for trapping in Idaho.

Frequency (%)

	Not At All	Slightly	Somewhat	Largely	Very Much
For recreation/pleasure	3.7	3.8	14.8	34.8	43
For the challenge	6.5	4.3	22	32.1	35.2
To control predators	10	6.3	18.4	23.3	42
To help manage wildlife	5.2	8.1	26.4	29.6	30.6
It is part of my lifestyle	7.4	8.6	22.6	27.9	33.5
To control nuisance wildlife	9.6	12.4	21.9	20.6	35.6
To protect property	20.6	14.4	25.9	19.7	19.3
For disease control	37.2	19.1	23.1	10.3	10.2
To make clothing/fur	43.9	21.6	20.9	9.1	4.5
To make income	42.8	25.7	21.2	7.2	3.1
To take a trophy	53.6	15.1	16.5	7.7	7
To provide food	77.2	13	6.8	2.3	0.7

For Idaho trappers, access to public lands and all 3 commonly used trap types (foothold, body-gripping, and snares) were important in providing opportunity. For the top-3 species, most respondents indicated they primarily used public land to trap (coyote = 70%; bobcat = 81%; beaver = 73%), but private land was also used at high rates (coyote = 56%; bobcat = 50%; beaver = 60%). Foothold traps, and to a lesser extent, snares were used for coyote and bobcat, whereas body-gripping traps were the primary tool used for beaver.

We asked respondents to indicate their support for 2 commonly used management tools (translocation and temporary closures) under certain scenarios. Respondents were supportive or very supportive (61–69%) of translocation to restore a species to historical range, provide additional harvest opportunity, or prevent a species from disappearing in Idaho. Similar levels of support were expressed for closing areas to harvest when goals were to increase populations or reintroduce a species to historical range.

Lastly, we asked participants about their knowledge and support of trapping Best Management Practices (BMPs). In the early 1990s, the European Union proposed to ban import of any wild fur from a country that allowed use of “conventional leg hold traps.” If passed, this ban would have had strong negative consequences for fur harvest in the U.S. Subsequently, the U.S. agreed to identify traps that met agreed-upon humane standards and improve compliance with trap use. The Association of Wildlife and

Fisheries Agencies (AFWA), U.S. Department of Agriculture-Wildlife Services (USDA WS), National Trappers Association, Furtakers of America, and various state agencies led this effort. After 20 years of research, trapping BMPs are available for 22 species of furbearers in North America.

When asked about their knowledge of trapping BMPs and use of BMP traps, 83% of respondents stated they were familiar with trapping BMPs and 92% said most of their traps met BMP guidelines. Of respondents not familiar with BMPs, 49% indicated access to BMP information would facilitate their use of BMP guidelines and traps.

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Department Direction For Furbearer Management 2022-2027

This plan discusses management and conservation needs of 15 species that differ vastly in their ecology and management status. Through the process of plan development, IDFG staff, using input from various user groups, sister agencies, and the public, developed an extensive list of potential needs. To effectively utilize limited resources of IDFG, the various needs identified for each of these species and the furbearer program as a whole must be prioritized. Some priorities are species-specific, whereas others address the furbearer program as a whole. These priorities are grouped into 4 broad categories: Harvest Management and Population Monitoring, Habitat Management, Data Management, and Outreach and Communication. The following sections provide background information and specific priorities identified within each category.

Harvest Management and Population Monitoring

A guiding charge for IDFG is to preserve, protect, perpetuate, and manage all of Idaho's wildlife and provide for continued supplies for hunting, fishing, and trapping. With respect to furbearers and predatory wildlife, level of IDFG action needed for management varies by species. Several species are habitat generalists and exhibit high fecundity rates. These factors, combined with low statewide harvest, suggest additional IDFG effort for population monitoring is not needed to inform harvest management.

To monitor status of furbearers and predatory wildlife, IDFG relies heavily on CPUE data derived from furtaker harvest reports. Currently, licensed trappers are required to submit a furtaker harvest report (by mail on a form provided by IDFG) after seasons close. Trappers report species pursued via trapping and hunting, number harvested, number of traps used, and days of effort by species and county. Further, trappers are asked to report captures of non-target species (animals caught outside of open trapping season for that species). These data are used to calculate number of trap nights required to capture a single animal of a given species. Under the assumption that more trap nights are required to capture an animal when populations are low and fewer trap nights when populations are high, this metric is used to monitor population trends over time.

This type of effort-based data is used throughout wildlife management (Allen et al. 2020). However, there are limitations in this approach. For CPUE to perform at full potential, factors that affect capture rates (other than population density) must remain constant. However, a number of external variables can influence trapping effort and success: weather, regulation changes, fuel prices, and fur prices. Efforts to control for these variables using a statistical approach provide only limited success. Although CPUE remains a useful metric for many species, through this planning process we identified several species for which additional information is needed for management: bobcat, river otter, ermine, long-tailed weasel, and western spotted skunk.

Bobcats are a popular furbearer pursued by trappers and hunters, and the most valuable furbearer on a per pelt basis. Although they are found throughout much of Idaho, bobcats tend to exist at lower densities than other similar-sized carnivores. Among some bobcat hunters and trappers, there exists interest in additional harvest opportunity and more overlap between bobcat seasons and seasons for other furbearers. However, the current monitoring program limits our ability to make informed decisions on impacts of these desired changes.

River otters are currently managed under a framework that involves both individual and regional harvest quotas; the only furbearer species with this level of harvest management. The original season framework was based on estimated potential river otter populations derived from modeled available habitat and density estimates developed in the 1980s. From this potential population size, IDFG established conservative harvest quotas at the regional level and limits for individual trappers. Although this approach provided a solid foundation to guide initial river otter harvest, our understanding of the species and its habitat needs advanced since the initial season >20 years ago. Trappers are interested in expanding opportunity for otter harvest. However, value of CPUE data for monitoring population trend, and therefore predicting impacts of changes in harvest regulations, is limited by small overall harvest (~160 animals annually).

An additional consideration for increasing monitoring efforts for both bobcat and river otter is the federal nexus regulating trade of their pelts. Both species fall under the Convention on International Trade of Endangered Species (CITES) Appendix II. River otter and bobcat are similar in appearance to imperiled species in other parts of the world. To ensure these imperiled species are not laundered into legal fur trade on the international market, the U.S. Fish and Wildlife Service (USFWS) regulates exportation of bobcat and river otter pelts through a tagging program. Pelts of harvested bobcats and river otters must be marked with individual locking tags by state wildlife agencies. The CITES export program has been challenged multiple times by anti-trapping and other groups in an effort to end export of bobcat and otter pelts, which would largely eliminate the trade in both species. Improving monitoring and harvest management of both species, particularly in light of any changes to harvest, would strengthen IDFG ability to justify and defend this sustainable use of wildlife.

For ermine, long-tailed weasel, and western spotted skunk, harvest and interest among trappers are low. These species are usually harvested as secondary targets while pursuing other furbearers. Recent range-wide assessments suggested populations of both weasel species, and particularly long-tailed weasel, exhibited recent declines (Jachowski et al. 2021). Across its range in the U.S., long-tailed weasel is listed as vulnerable or some higher level of concern in 13 states (Nature Serve 2021). Western spotted skunk has been identified as a SGCN in multiple states, and in 2012, the USFWS found a petition to list an eastern counterpart, the plains spotted skunk (*Spilogale putorius interrupta*), as endangered or threatened under the ESA may be warranted (USFWS 2012). These small carnivores are increasingly recognized as species in need of conservation attention. Because little information exists as to status and distribution of these 3 species in Idaho, increasing our knowledge and understanding via enhanced information gathering and monitoring will be valuable for addressing concerns associated with their status.

Harvest Management and Population Monitoring Direction

Management Direction – IDFG will continue to provide a diverse suite of harvest opportunities and ample flexibility to address wildlife-human conflict.

Strategy: Continue to monitor populations of furbearers and predatory wildlife through CPUE data.

Strategy: Maintain current season structures for furbearers and predatory wildlife.

Management Direction – IDFG will develop tools to better guide bobcat harvest management; allowing ample harvest opportunity and increased season flexibility while ensuring harvest levels are sustainable.

Strategy: Use existing bobcat harvest data to develop a Statistical Population Reconstruction (SPR) model, which can be used to more accurately predict effects of potential changes in harvest on bobcat populations.

Strategy: Upon development of an initial SPR model, identify additional data or research components (if any) needed to enhance bobcat harvest management and begin addressing those needs.

Strategy: Based on outcomes from modeling efforts, work with stakeholders to explore options for modifying bobcat harvest opportunity.

Management Direction – IDFG will develop tools to strengthen harvest management of river otters.

Strategy: Update original calculations of available habitat and potential density estimates for river otters using the best available data.

Strategy: Develop a monitoring framework to track broad changes in river otter population status at the regional scale.

Strategy: Based on revised estimates and population indices, engage stakeholders to explore options for expanding river otter harvest opportunity.

Management Direction – IDFG will gather information to increase our knowledge about status and distribution of ermine, long-tailed weasel, and western spotted skunk.

Strategy: Modify the furtaker report to allow trappers to differentiate between weasel species and provide harvest locations.

Strategy: Identify collaborative opportunities to collect information about current distribution of ermine, long-tailed weasel, and western spotted skunk.

Strategy: Explore the value of ermine and long-tailed weasel occurrence data collected during monitoring projects for other forest carnivores for increasing knowledge of status and distribution.

Habitat Management

IDFG directly manages habitat on its Wildlife Management Areas (WMAs) and provides technical and financial assistance to land management agencies and private landowners to incorporate wildlife needs into their management activities. Through the technical assistance program, IDFG also provides important reviews of proposed land management activities to identify potential impacts to wildlife resources. Although many species of furbearers are considered habitat generalists, some exhibit narrower habitat requirements or are more directly impacted by land management actions than others.

In terms of trapper participation, muskrats are the third-most popular furbearer in Idaho (Table A-3). Muskrats can shape wetland ecosystems through herbivory, and maintaining muskrat populations in wetlands can benefit waterfowl and waterbirds (Bishop et al. 1979, de Szalay and Cassidy 2001). Because of their popularity among trappers and landscape-level effects on wetlands, maintaining healthy muskrat populations can provide multiple social and ecological benefits.

Both marten species in Idaho are associated with mature conifer forest, where canopy cover exceeds 50% and complex horizontal forest structure provides habitat for prey (Andruskiw et al. 2008). Because of this habitat requirement, marten are often susceptible to habitat loss and fragmentation at the landscape scale (Soutiere 1979, Thompson 1994, USFWS 2015). Maintaining forest connectivity in areas impacted by habitat loss (e.g., timber harvest or wildfire) is important to ensure marten populations remain well-represented across the state.

The ability of beaver to manipulate habitat is impressive. Beaver dams improve instream and riparian habitat quality, increase forage for a variety of wildlife species, and temper fluctuations in stream flow caused by annual changes in precipitation (Bouwes et al. 2016). Within IDFG, beaver-mediated habitat restoration is identified as a key strategy in the SWAP, is a programmatic priority in the Wildlife Diversity Program, and is an important tool in the Habitat Program. However, IDFG staff need to develop additional expertise in planning and executing projects involving beaver translocation as a habitat improvement tool. Specific information needs include scientifically tested methods for improving likelihood of beaver survival and success of translocations, and appropriate non-lethal tools to address beaver damage and manage their presence on the landscape.

Habitat Management Direction

Management Direction – IDFG will promote incorporation of habitat management practices that maintain healthy muskrat populations.

Strategy: Develop a guide to muskrat habitat needs, particularly with respect to water level manipulation. Incorporate practices for improving muskrat habitat in relevant WMA plans and management actions, and in technical assistance recommendations for landowners and managers, where applicable.

Management Direction – IDFG will work with land management agencies to incorporate marten habitat needs in land management plans.

Strategy: Communicate habitat needs of marten to promote connectivity of suitable habitat in relation to forest management activities and planning efforts.

Management Direction – IDFG will address information needs and serve as a potential funding source for beaver-mediated habitat restoration.

Strategy: Identify strategies that maximize beaver survival and success of translocations.

Strategy: Explore tools and techniques to address flooding caused by beavers through non-lethal means.

Data Management

A cornerstone of furbearer management in Idaho is data collected through furtaker harvest reports. The current system relies on exchange of paper forms through the mail and manual data entry by IDFG staff. Historically, trappers could enter harvest information online, however this option was suspended. Information is currently stored in a database but should be transferred to and managed from a more secure platform.

Data Management Direction

Management Direction – IDFG will update, streamline, and strengthen collection and storage of furbearer harvest data.

Strategy: Develop an online platform for license holders to enter furtaker harvest data. Online entry will improve service to trappers, expedite data processing, and provide more timely access to harvest data.

Strategy: Develop a new data management system for furbearer harvest data that addresses storage concerns, allows for transfer of existing data, and streamlines incorporation of data provided by trappers via an electronic furtaker harvest report.

Outreach and Communication

Regulated trapping serves many important roles in wildlife management. Trapping provides a unique outdoor opportunity for a dedicated user group and is the only lawful method of take for several species. Skill sets developed by trappers are utilized to capture wildlife for research and translocations. Data collected from trappers are used to monitor trends in populations, and serves as the only source of data for multiple species. Trappers also often address wildlife nuisance problems in their communities. In a national survey of trappers, 54% of Idaho trappers reported having been contacted to remove nuisance wildlife (AFWA 2015). In some instances, often in rural communities, trapping continues to provide an important form of seasonal income.

Despite the many important roles trapping plays in modern life, trapping is poorly understood by the public and tends to garner the least public support compared to other outdoor activities (Duda et al. 1998). Nationwide, negative perceptions fueled several citizen-based initiatives to eliminate or severely limit trapping. Currently, statutes in 10 states (5 in the West) severely restrict or prohibit trapping. Additionally, several other states recently faced petitions or ballot initiatives to severely restrict trapping (including Montana, Oregon, Arizona, and Colorado). Many wildlife professionals believe efforts to eliminate trapping will continue (B. White, personal communication, May 2021).

Negative opinions of trapping are often attributable to limited understanding of roles trapping plays in modern wildlife management and sustainable use of wildlife (AFWA 2001). At a national level, 59% of respondents to a survey disapproved of trapping when no context was provided. However, approval rose to 67% among the same respondents when trapping was conducted for reasons such as population management, addressing wildlife conflict, or biological research (AFWA 2001). Thus, a small amount of information providing context for the role of trapping strongly influenced opinions of survey participants, suggesting negative perceptions were not strongly held.

Negative perceptions are not unique to the general public, but also exist among conservation professionals. In a survey of members of 4 major professional conservation organizations, Muth et al. (2006) found 46% of respondents favored elimination of foothold traps. Reasons included unnecessary pain or stress for captured animals, danger to non-target animals, and lack of value as a management tool. Negative views among some resource professionals may derive from the same limited understanding found in the general public. Although findings of Muth et al. (2006) do not specifically reflect opinions of IDFG employees, the overall results suggest some wildlife professionals are unfamiliar with tools used in trapping and roles of trapping in wildlife management.

Trapping, along with hunting and fishing, is protected in the Idaho constitution, demonstrating the value placed on these outdoor activities by residents. However, this legal designation does not eliminate the need to promote better understanding of trapping and the important roles it plays in wildlife management among IDFG employees and the public. To address this common need among state agencies, AFWA's Furbearer Conservation Technical Working Group collaborated with social scientists and communication specialists to develop a "Communication Strategy for Trapping and Furbearer Management" (AFWA 2019). Using this document as a guide, we identified several opportunities to promote awareness of trapping and improve our messaging and communication.

Outreach and Communication Direction

Management Direction – IDFG will strengthen internal awareness of 1) mechanics of trapping, 2) roles of trapping in wildlife management, and 3) communication strategies to improve public understanding of trapping and trapping-related issues.

Strategy: Host AFWA's Trapping Matters Workshops in multiple locations across the state to allow participation by IDFG and sister agency employees.

Strategy: Promote inclusion of trapping and wolf trapping education into new employee work plans, including front desk and administrative staff.

Strategy: Develop and implement a trapping related class for the IDFG's In Service Training School.

Strategy: Develop consistent talking points for IDFG staff to address commonly asked questions from the public to ensure consistent messaging and effective communication.

Management Direction – To increase awareness and reduce user conflict, IDFG will develop and provide outreach on trapping and roles of trapping in wildlife management to hunters, anglers, and other outdoor recreation groups.

Strategy: Create and distribute seasonally appropriate social media and press releases. Address topics including awareness of trapping seasons and regulations, benefits of trapping, reintroduction efforts that utilize trapping, and methods for releasing domestic animals from traps.

Strategy: Include language related to roles of the public when encountering a trap or trapped animal, and positive roles of trapping, in all hunting regulation booklets.

Strategy: Provide hands-on demonstrations of methods for releasing pets from traps at rattlesnake-avoidance and other appropriate hunting and outdoor dog training events across the state.

Management Direction – Work with state trapper associations to improve communication on the role and value of trapping with other user groups. As a primary user group of furbearers, trappers are important ambassadors of this activity and are strong stakeholders in furbearer management. Opportunity exists to improve how trapping organizations communicate with larger audiences.

Strategy: Attend trapping conventions to discuss key messages developed by AFWA and trapping BMPs.

Strategy: Present information regarding the importance and dissemination of key messaging and promotion of trapping BMPs to directors and member of various trapper associations.

Strategy: Incorporate key messages regarding importance of trapping and trapping BMP information into IDFG's trapper education curriculum.

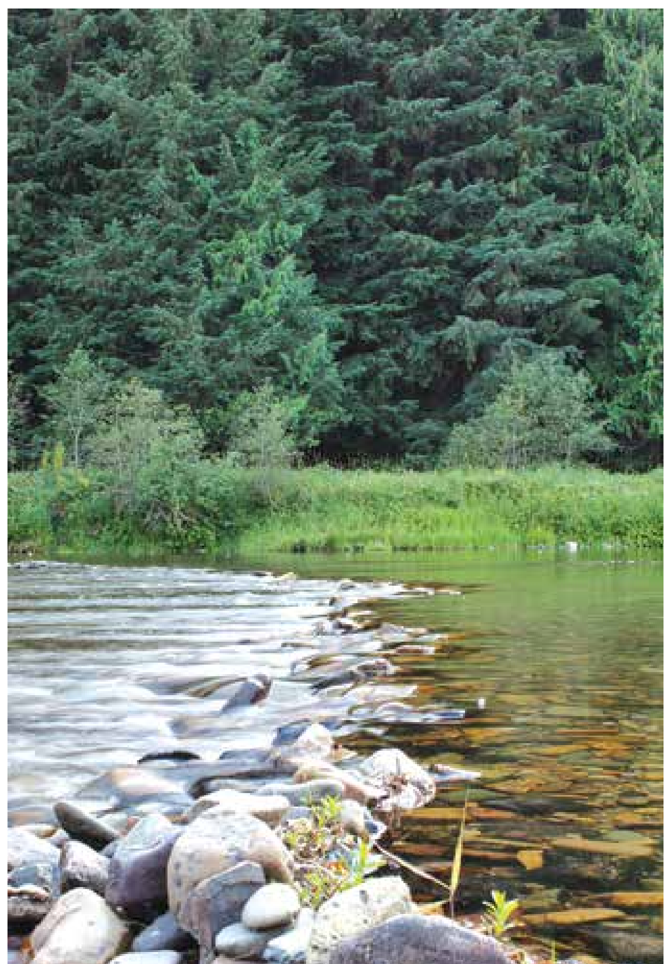

PHOTO: CC-BY CLAYTON-XVEZ3794308 AT UNSPLASH.COM

American Badger

PHOTO: CC-BY SHUTTERSTOCK #549456361

The badger is a semi-fossorial mustelid occupying open grasslands, prairies, cropland, parklands, and mountain meadows from below sea level to 3,600 m. The common habitat feature across this wide range is soils conducive to digging burrows. Although badgers occur throughout Idaho, they are more common in southern Idaho and relatively rare in the north (Figure 1).

Home range size varies widely based on habitats and prey abundance. In British Columbia, Hoodicoff et al. (2009) estimated mean home range size was 78.6 km2. Home ranges in southwestern Idaho were smaller, ranging 0.9–34.3 km2 (Messick and Hornocker 1981). We lack density estimates for Idaho, but densities of 6 individuals/km2 were observed in other parts of the western U.S., and male home ranges tended to overlap multiple female home ranges during breeding season (Messick and Hornocker 1981, Goodrich and Buskirk 1998).

Badgers are opportunistic carnivores that prefer small mammals, such as mice, voles (*Cricetidae*) and ground squirrels (*Sciuridae*). Nevertheless, badgers consume a wide array of food items, including small birds, waterfowl, eggs, upland birds, arthropods, and mammals as large as marmots (*Marmota spp.)*. Badgers will also scavenge on carrion.

Badgers breed from late June through August. Males do not reach sexual maturity until their second year, whereas females can breed at 1 year. Badgers exhibit delayed implantation, which occurs December to early February; average litter size is 1.7 and kits are born in late March to early May (Messick and Hornocker 1981). Average lifespan is 8–10 years, with some individuals surviving 14 years (Messick and Hornocker 1981). Young generally disperse at 4–5 months.

Mortality and Harvest

Human activities (e.g., vehicle collisions, trapping, and shooting) are a leading cause of mortality for badgers. Adult badgers have very few natural predators. In southwest Idaho, only 10% of badger mortalities were attributed to natural causes (predation or starvation); all other mortality was human-caused (Messick and Hornocker 1981). Quinn et al. (2016) identified a number of internal parasites of badgers, including roundworms, tapeworms, and flukes, but parasites are rarely associated with mortality.

In Idaho, badgers are classified as a furbearer and can be hunted and trapped year-round without limit. Capture rates range from 5.5 to 17.2/100 trap nights (Figure 2). On average, 62 trappers pursue badgers each year; with a high of 81 in 2014 (Table A-3). Badgers are typically harvested as a secondary target while pursuing other species and total harvest is relatively low, averaging 250/year (Table A-2).

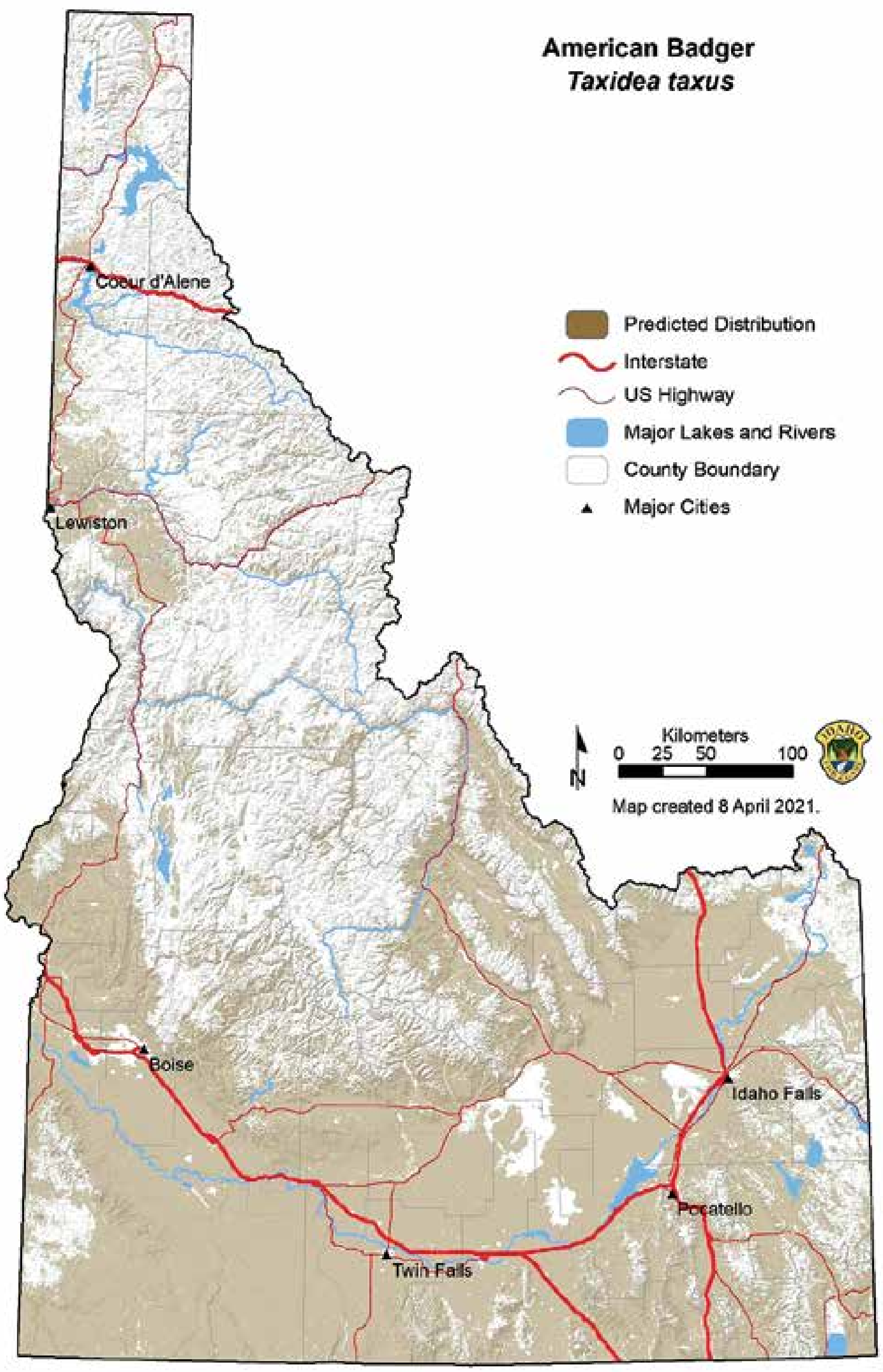

Figure 1. Predicted distribution of American badgers, Idaho, USA.

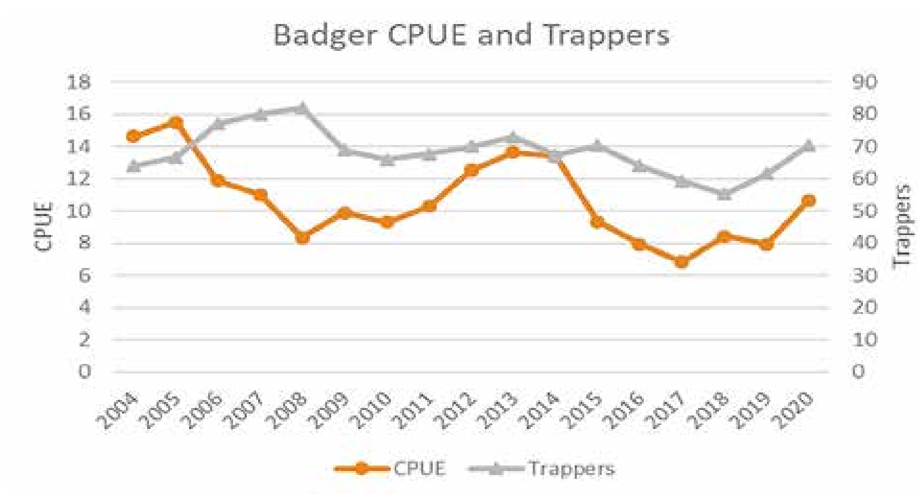

Figure 2. Three-year rolling average of annual badger captures/100 trap nights, and number of badger trappers, 2004–2020, Idaho, USA.

Wildlife-Human Conflict

The primary human conflict with badgers is their tendency to burrow along edges of crop fields and meadows where burrows may cause damage to farm equipment or create potential hazards for livestock. Additionally, badgers may carry a number of zoonotic diseases that can affect humans, notably rabies, leptospirosis, and roundworms.

Management Goals and Direction

Although badger-specific CPUE appears to be declining (Figure 2), this trend is likely tied to the pronounced increase in coyote trapping effort and harvest since 2013. Statewide harvest for badger is low, particularly relative to abundant suitable habitat. Moreover, badger harvest ranks 11th of the 15 species or species groups (Table A-2), suggesting low trapper interest. Based on low harvest and abundant suitable habitat, the badger population is regarded as stable under current management.

Management Actions

- No badger-specific proposed management actions.

North American Beaver

PHOTO: CC-BY SHUTTERSTOCK #768513

Few species influence their environment more than beaver. In small creeks and streams, beavers build a complex of dams to create the deep-water habitat required to avoid predators, expand safe foraging opportunities, and control water levels (Pollock et al. 2017). Ponds created by beavers provide significant benefits for wildlife communities that rely on healthy riparian systems. In lakes, ponds, and large rivers, beavers build lodges and bank burrows for shelter. Beavers occur throughout Idaho; however, distribution in small streams (as evident from dam building) is patchy (Figure 3).

Beavers live in colonies consisting of multiple generations of the same family. Colonies usually consist of 2 adults, 2 kits, and 2 yearlings; but can range 1–10 animals depending on habitat quality and survival (Novak 1987). Young tend to disperse from the natal colony at 2 years (Novak 1987). Habitat quality strongly regulates home range size. In eastern deciduous forests, average home range on streams ranges from 0.64 km to 0.97 km (Novak 1987). Beaver home range size and habitat use in the arid West are poorly understood.

Beavers are herbivores and consume a wide array of herbaceous plants, as well as inner bark of woody species such as willow (*Salix spp.*), alder (*Alnus spp.*), and aspen and cottonwood (*Populus spp.*) (Jenkins and Busher 1979). Spring and summer diets consist largely of herbaceous plants, whereas fall and winter diets are dominated by woody species after herbaceous plants enter dormancy (Chabreck 1958, Jenkins 1975). In systems where ponds freeze over, beavers cache limbs and branches underwater near their lodges to eat during winter.

Beavers reach sexual maturity at 1.5–3 years (Baker and Hill 2003) and are relatively long-lived (10–12 yrs). Breeding adults form monogamous pair bonds and produce 1 litter/year. Breeding occurs in autumn or early winter and kits (typically 2–4, but up to 9) are born between May and July (Wigley et al. 1983).

Dam building by beavers dramatically alters riparian systems. Flooding and slower water movement increase and diversify instream and riparian habitat, and stream flows in systems occupied by beavers are more resilient to annual changes in precipitation. These outcomes produce far-reaching benefits for a variety of wildlife and can provide important benefits for livestock producers and other water users. Because beaver-mediated habitat restoration can be used to accomplish a variety of fish and wildlife habitat goals, the technique is identified as a key strategy in the SWAP (IDFG 2023), is a programmatic priority for the Wildlife Diversity Program, and is an important tool within the Habitat Program. Interest in strategic use of beavers to improve habitat is growing, and several IDFG regions host beaver-oriented working groups consisting of state, federal, non-profit, and private representation.

Mortality and Harvest

Beaver, like many other game species, are a wildlife management success story. Historically abundant throughout most of North America, beaver were extirpated across much of the continent due to unregulated trapping in the 19th and early 20th centuries. Formation of state wildlife agencies and subsequent harvest management and conservation efforts resulted in strong population resurgence. Today beaver occupy all historical range, albeit at lower densities.

PHOTO: CC-BY BRIAN AT FLICKR.COM

Human activities such as trapping and removal of nuisance animals can be an important source of mortality. Natural causes of beaver mortality include severe winter weather and extreme fluctuations in water levels due to flooding or drought. Beavers have many natural predators in Idaho, including mountain lions (*Puma concolor*), wolves, bobcats, lynx, bears (*Ursus americanus, U. arctos*), coyotes, river otters, red fox, fisher, wolverines, and even raptors. At high population densities or other situations producing population-level stress, tularemia can cause widespread die-offs (Stenlund 1953, Lawrence et al. 1956).

Although beavers exhibit a relatively high reproductive rate, they are considered easy to trap and can be overharvested, especially at a local level. Although assessed in areas ecologically different from Idaho, estimates of sustainable annual harvest rates range from 15% where habitat productivity is low to 30% in higher-quality habitat (Novak 1987). In eastern North America, these rates translate to harvesting 1–2.5 beaver/live lodge. We do not know whether these harvest rates are applicable in Idaho.

Since 1995, annual beaver harvest in Idaho (not including removal of nuisance beavers) has ranged from 1,583 to 4,041 animals (Table A-2). Beaver were identified as the third-most important furbearer by Idaho's trappers (Table 3), and rank second with respect to number of participants (Table A-3). Over the past 19 years, 300–350 trappers pursued beaver statewide, with the exception of a short-lived increase during 2013–2015 (Figure 4).

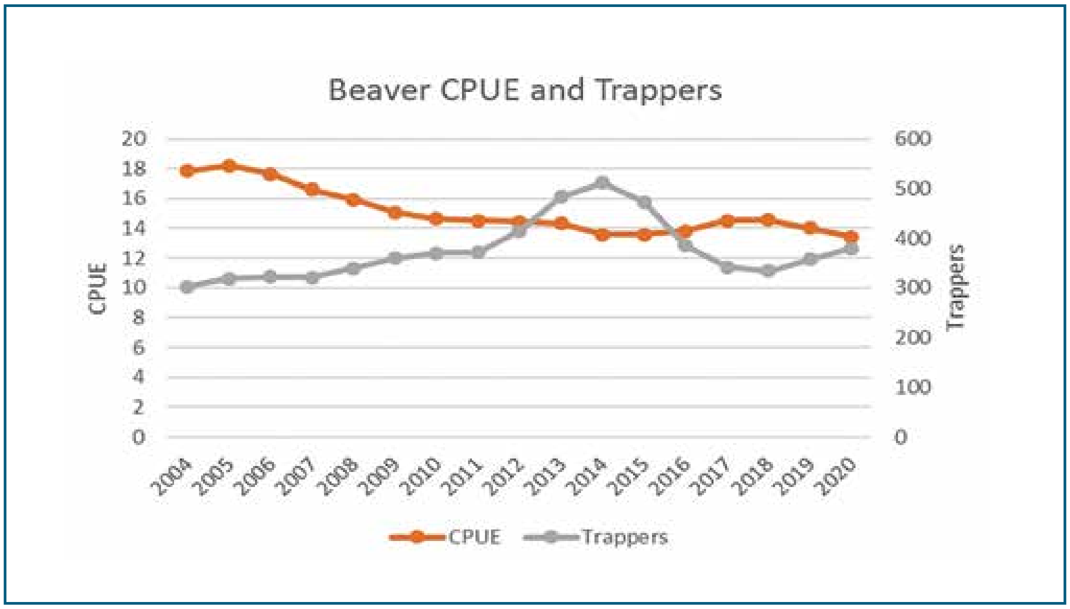

Figure 4. Three-year rolling average of annual beaver captures/100 trap nights, and number of beaver trappers, 2004–2020, Idaho, USA.

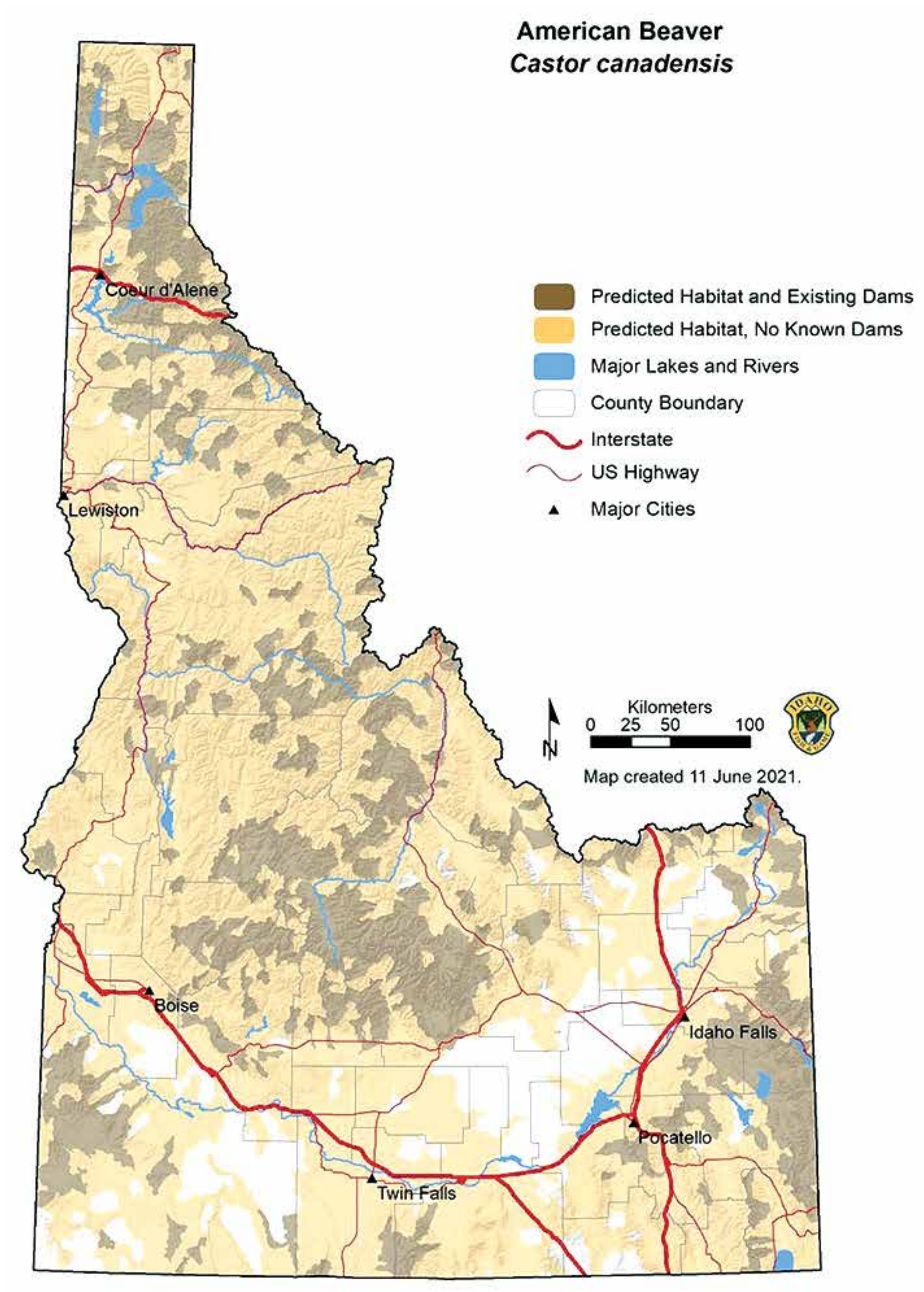

Figure 3. Predicted beaver habitat and presence of beaver dams, Idaho, USA.

Wildlife-Human Conflict

In some locales, or in the absence of mitigation efforts, beaver can cause extensive damage. Dam building and foraging activities can flood roads, clog irrigation infrastructure and culverts, remove desirable trees, flood agricultural crops, and submerge established stream crossings. IDFG utilizes a variety of approaches to balance values and challenges of beaver activity. Outside of harvest seasons, IDFG issues kill permits to address specific damage complaints, allowing permittees to remove beaver themselves or by contracting with a trapper. Under some circumstances, IDFG staff live-trap and relocate nuisance beavers.

During harvest seasons, IDFG encourages removal of problem animals by a licensed trapper, allowing the animal to be utilized. In areas where a landowner or management agency is interested in maintaining beaver presence, IDFG will, on a case-by-case basis, provide guidance on, or assistance with, installing Beaver Deceivers®, pond levelers, tree wrapping, and other beaver damage mitigation techniques.

Management Goals and Direction

The only lawful method of take for beavers is trapping and IDFG offers long (5–6 month) seasons with no personal quotas, thus providing ample opportunity. Moreover, long seasons provide extended opportunity for trappers to address nuisance animals. Stable catch rates (Figure 3) and relatively low statewide harvest indicate beaver populations are stable at a statewide scale.

Beavers are found in all major river systems in the state. However, habitat modeling indicates ample habitat exists in smaller stream systems where beaver are absent or occur at low densities (Figure 3). Therefore, we believe opportunities exist to expand beaver distribution in several areas to meet a variety of habitat and harvest opportunity goals.

Use of beaver as a restoration tool is not a panacea and includes implications for overall beaver management objectives. In some cases, enthusiastic, but potentially poorly informed, proposals for translocation projects in other states included release sites of questionable suitability from a biological or social perspective. Citizen-based attempts to eliminate trapping as a management tool in other western states included poorly informed claims that regulated trapping was responsible for absence of beavers in some areas. To better inform conversations about roles of trapping and translocation in beaver management in Idaho, we need to increase our understanding of habitat use, demographics, and distribution.

Management Actions

- Improve our understanding of beaver habitat use and sources of mortality in systems where beaver-mediated habitat restoration is being considered.
- Where opportunity exists, explore options to address beaver damage via non-lethal methods, such as pond leveling devices and Beaver Deceivers.
- Work with regional staff and stakeholders to identify priority areas where restoration of beaver populations will address wildlife habitat goals and landowner or land manager needs.
- Develop a guidance document for beaver restoration projects that identifies protocols to maximize beaver survival and dam building success while minimizing conflict with humans and disease transmission concerns.

PHOTO: CC-BY MAHAR 15 AT FLICKR.COM

Bobcat

PHOTO: CC-BY SHUTTERSTOCK #2845593

Bobcat is the most widely distributed wild felid in North America. Distribution ranges from central Mexico to southern Canada and throughout most of the contiguous U.S. (Newberry and Hodges 2018). Bobcats are considered common across much of Idaho and are absent only in high-elevation forests, where lack of primary prey species and snowfall inhibit effective hunting, and areas of extensive row-crop agriculture (Figure 5).

Habitat preferences are strongly driven by prey densities (Litvaitis et al. 1986, Koehler and Hornocker 1989). Male and female bobcats may prefer different habitats seasonally; males prefer larger areas overlapping multiple female home ranges, whereas females select smaller areas with the highest prey densities (Chamberlain et al. 2003). During summer, bobcats prefer higher elevations and are not as selective in their use of habitats (Koehler and Hornocker 1989). In winter, habitat selection is heavily influenced by snow conditions, and bobcats prefer lower elevations, south-southwest slopes, rocky terrain, and open areas (McCord 1974, Koehler and Hornocker 1989).

Male home ranges varied from 40 km2 to 100 km2 (Bailey 1974, Chamberlain et al. 2003, Broman et al. 2014), and were typically ≥1.65 times larger than those of females (Ferguson et al. 2009). In Idaho, male home ranges averaged 53.0 km2 (Bailey 1974) and 28.5 km2 (Knick 1990). Idaho-specific density estimates in suitable habitat ranged from 1/11.1 km2 (Knick 1990) to 1/23.3 km2 (Koehler and Hornocker 1989).

Bobcats are strictly predatory. Rabbits (*Sylvilagus spp.*) and hares (*Lepus spp.*) are the most important prey items throughout most of their range, sometimes exceeding 90% of diets (Bailey 1981, Knick 1990). Secondary prey species range widely, from big game to rodents. Tree and ground squirrels, and cricetid rodents played an important role in winter diets of bobcats in Montana and Idaho (~83% and ~90%, respectively; Koehler and Hornocker 1989, Newberry and Hodges 2018).

Breeding is possible throughout the year, but most occurs from December to June (Crowe 1975). Female bobcats typically are not reproductively successful until their second year. Bobcats give birth between April and July (Bailey 1974) and litter sizes range from 1 to 6 kittens, with an average of 2.7 in Idaho. Bobcat young can disperse from their mother at approximately 9 months, but often stay close as long as the following autumn.

Mortality and Harvest

Human activities (e.g., hunting, trapping, vehicle collisions, and removals associated with depredations) are the leading cause of bobcat mortality. In an unexploited population in Idaho, adult survival was 78%; likely near the maximum survival rate for bobcats (Knick 1990). Excluding heavily exploited populations, or during periods of dramatic prey declines, adult bobcat survival rates range from 56% to 67% (Knick 1990).

As with many furbearers, mortality rates vary by age and sex; males generally exhibit higher mortality rates than females (Allen et al. 2020). Kitten survival rates are strongly influenced by prey abundance available to the mother, whereas survival rates of immature bobcats are influenced by their hunting proficiency and ability to establish home ranges. Bobcat populations are resilient to moderate harvest levels, although temporary or localized population declines can occur when adult female harvest exceeds sustainable thresholds (~52% in central Idaho, Knick 1990).

Bobcats are a highly sought-after furbearer and, because of coloration, animals found in the American West consistently rank as the most valuable furbearer (on a per pelt basis) in North America. Originally considered a predator or varmint with little economic value, interest in bobcats surged after adoption of the ESA (1973) and CITES (1975). These 2 legal documents prohibit trade in most species of spotted cats across the world due to population status concerns. With demand for this style of pelt still strong, fashion companies looked for a substitute, and found the spotted pelt of the bobcat.

In Idaho, trapping and hunting (including with hounds) from 14 December through 16 February are approved methods of take for bobcats. Trappers and hunters must present bobcats for tagging with CITES export tags by IDFG personnel within 10 days of season closure. Mandatory reporting has been in effect since the 1981–1982 season.

Capture rates for bobcat consistently range 1.5–2 animals/100 trap nights (Figure 6). Annual trapping participation fluctuated between 250 and 300 bobcat trappers over the past 19 years, with the exception of 2012–2015 seasons, which corresponded with a pronounced increase in fur value and trapping participation (Figure 6). Statewide annual harvest averaged 1,282 bobcats (range = 791–2,404; Table A-2). The Panhandle, Clearwater, and Southwest Regions consistently rank as the top regions for harvest.

Although hunting is allowed for several species of furbearers, bobcats are the only furbearer in Idaho for which hunting is an important contributor to overall harvest. Statewide, hunting (i.e., predator calling, use of hounds, and incidental harvest) accounts for approximately 34% of total bobcat harvest. Hunting with hounds accounts for the majority of hunting take. In regions where persistent snow cover in bobcat habitat provides appropriate conditions for hunting with hounds (e.g., Panhandle and Clearwater Regions), hunting can account for up to 50% of overall bobcat harvest.

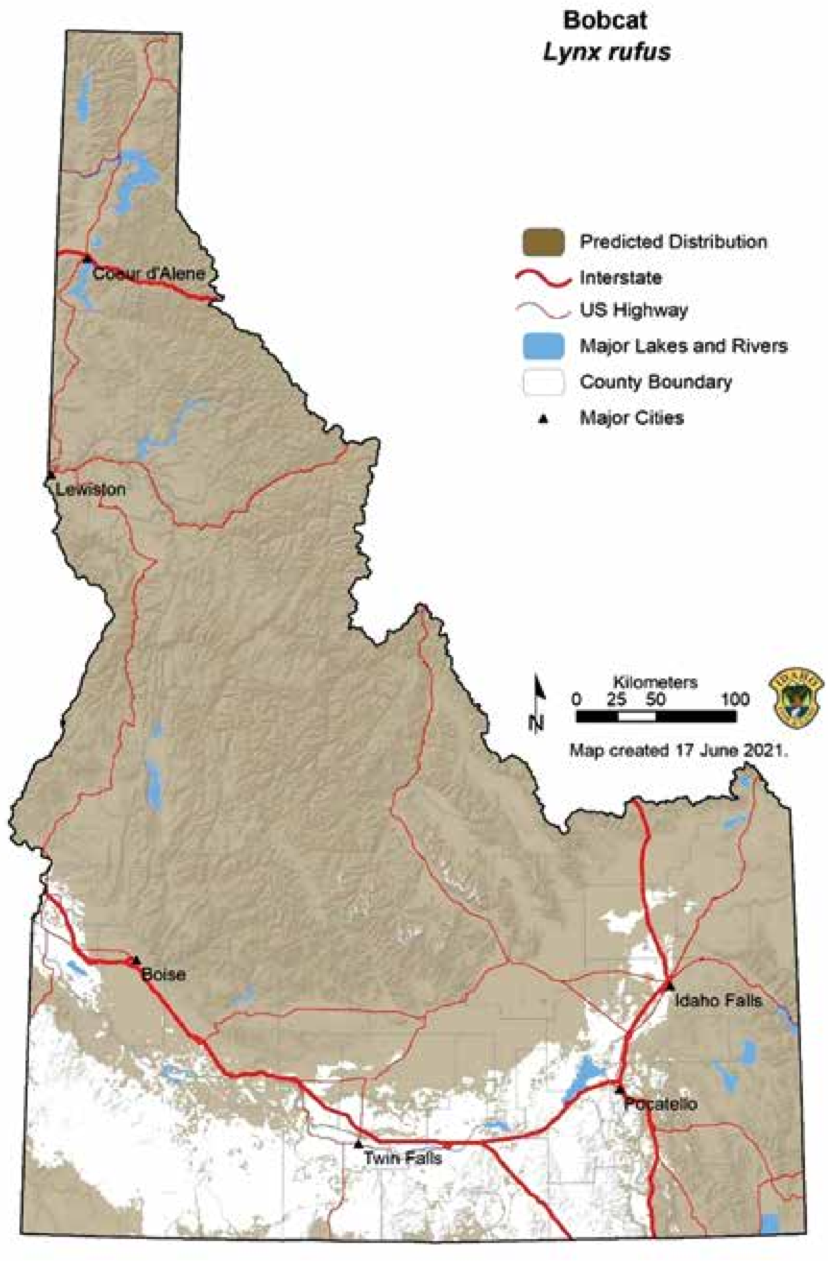

Figure 5. Predicted distribution of bobcats, Idaho, USA.

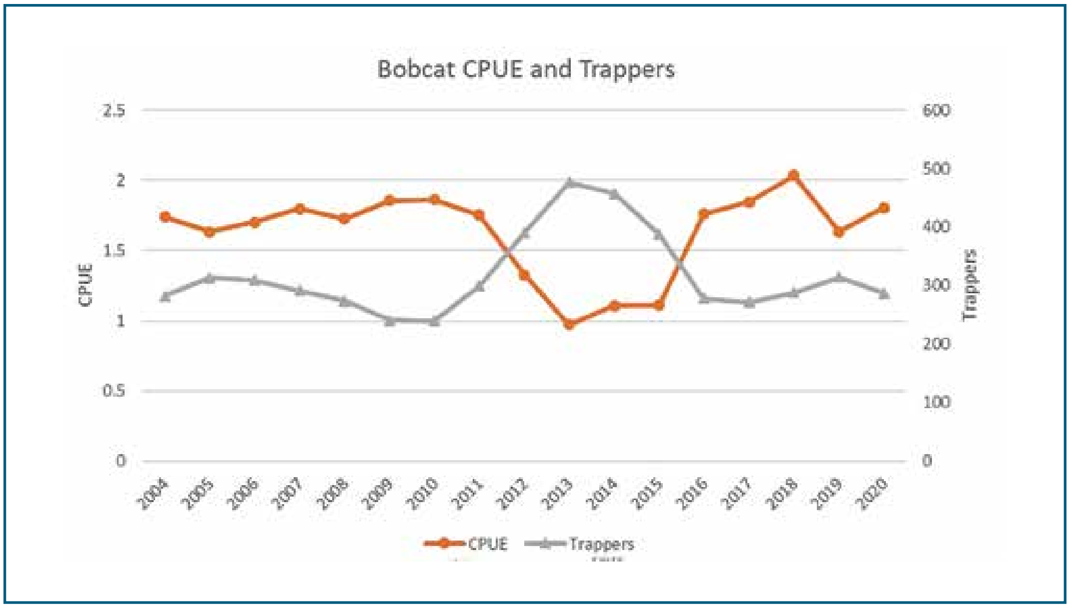

Figure 6. Three-year rolling average of annual bobcat captures/100 trap nights, and number of bobcat trappers, 2004–2020, Idaho, USA.

Wildlife-Human Conflict

Bobcats occasionally prey on domestic animals (APHIS Database 1996–2018). To address depredations outside of open seasons, IDFG issues kill permits to individuals on a case-by-case basis. During open seasons, IDFG encourages resolution through hunting and trapping.

Management Goals and Direction

Opportunities for bobcat harvest are currently provided through a 60-day season where both hunting and trapping are permitted with no personal quotas. Season timing coincides with prime pelt condition and avoids peak breeding season, when bobcats are most susceptible to harvest. The combination of consistent catch rates and ample suitable habitat across the state suggests bobcat populations are likely stable at a statewide scale.

Although CPUE is used to monitor bobcat population status, we need to strengthen our understanding of bobcat harvest management. Bobcat densities are much lower than those of similar-sized carnivores and they exhibit relatively low reproductive potential. Moreover, bobcat populations are less able to compensate for higher rates of adult mortality in arid environments and areas with harsh winter weather (Rolley et al. 1987), which characterizes most of Idaho. Bobcats are consistently the most valuable furbearer in the state on a per pelt basis and are the second-most important species to trappers (Table 3). Although trappers and hunters (with hounds) desire expanded opportunity or adjustments to season structure, our current monitoring strategy is inadequate for predicting effects of changes in harvest regulations on bobcat populations. Development of tools to more accurately monitor changes in bobcat population status would allow greater flexibility in harvest management, and during periods of stable or growing populations, allow more opportunity for hunters and trappers.

Attempts to eliminate use of trapping as a wildlife harvest and management tool are increasing across the country. Because bobcats are commercially valuable, charismatic, and included in the federal CITES export program, management programs for bobcats garner much attention from anti-trapping organizations. These organizations call into question quality of data used to manage bobcats at both state and federal levels. In the past 5 years, bobcats have been a focal species for anti-trapping movements in several western states. Strengthening our understanding of population status in relation to harvest would make Idaho more resilient to challenges to existing bobcat harvest management practices.

Management Actions

- Collaborate with wildlife agencies in bordering states to better understand genetics, disease, and population fluctuations.
- Conduct research to identify how ecology of bobcats varies among ecotypes in Idaho.
- Explore options for gathering information about bobcats through existing monitoring programs for other species (e.g., camera-based surveys for big game).

Coyote

PHOTO: CC-BY SHUTTERSTOCK #684073795

The coyote is a habitat generalist residing in every major habitat in North America and occupying every jurisdiction north of Panama. The coyote's adaptable nature, in both habitat use and prey selection, no doubt contributes to its success, even within America's megacities. Idaho is no exception, and the species inhabits all habitats within the state (Figure 7).

Home range size varies by sex, reproductive status, group size, season, habitat, and prey density. Limited information on home range size is available for Idaho, however densities are likely higher in productive rangelands and agricultural areas compared to more mountainous or heavily timbered habitats. Because coyote population levels are dependent on a variety of factors, generalizing information gathered across disparate areas is inappropriate. Efforts to estimate coyote numbers across targeted geographic locations included techniques such as track counts, scat counts, aerial surveys, CPUE, and howling surveys; however, these methods have not been validated (Knowlton 1972), and IDFG does not attempt to estimate the statewide coyote population.

Coyotes are opportunistic omnivores, taking advantage of a wide range of natural and human-provided food sources. In Idaho, small mammals, particularly lagomorphs and rodents, provided the mainstay in coyote diets (MacCracken and Hansen 1987). Drivers of coyote prey selection include season and availability of alternate prey. Although coyotes sometimes target neonate ungulates, selection of this prey item is often driven by a lack of smaller quarry. However, large-scale coyote removal was positively associated with increased (although not statistically significant) productivity of pronghorn antelope (*Antilocapra americana*) in Wyoming and Utah (Brown and Conover 2011). Similarly, some evidence indicates coyote predation can affect white-tailed deer (*Odocoileus virginianus*) productivity in the southeastern U.S. (Gulsby et al. 2015).

Social structure among coyotes is flexible; ranging from single animals and pairs, to packs of several animals. Adults weigh 9–18 kg. Mated pairs are monogamous and pair bonds can last for several years. Litters of 3–7 pups are typically born between March and May after a gestation of 60–63 days (Voight and Berg 1987). Both parents participate in pup rearing. Reproductive output of female coyotes may be density dependent (Sterling et al. 1983), with fewer pups born when a local population is high, and larger litters produced at low population levels. This characteristic, combined with relatively early sexual maturity (one year), allows coyote populations to rebound quickly following high-mortality events.

Scientific evidence demonstrates removal of coyotes at a local scale has little to no effect on overall population numbers. Regardless of exploitation, coyote numbers tend to remain static; any population fluctuations are usually attributable to weather or changes in rodent populations. Connelly and Longhurst (1975) found removal rates exceeding 75% of a local coyote population were needed to induce measurable population-level effects. Although human attempts to reduce coyote populations are unlikely to succeed at a landscape scale, success can be demonstrated in targeted removal of coyotes to address specific depredations and chronic depredation areas.

Mortality and Harvest

Human activities (e.g., hunting, trapping, removal related to depredation, and vehicle collisions) are a leading cause of mortality for coyotes. Coyote populations can also be regulated by disease and parasites, including, but not limited to, distemper, canine hepatitis, sarcoptic mange, parvovirus, plague, rabies, hydatid disease, tularemia, Lyme disease, and leptospirosis. Predation on coyotes is limited to a few larger carnivores (mountain lions and gray wolves), and occasional take of young pups by golden eagles (*Aquila chrysaetos*) .

In Idaho, coyotes are classified as predatory wildlife and can be taken year-round by individuals with a hunting or trapping license. From a harvest perspective, coyotes were the most popular species among trappers for the past decade (Table A-2). Coyote capture rates appear to be stable to declining over time (Figure 8). The observed decline corresponds with an increase in trappers, particularly since 2011. Declining capture rates may reflect changes in trapper participation rather than overall coyote population status.

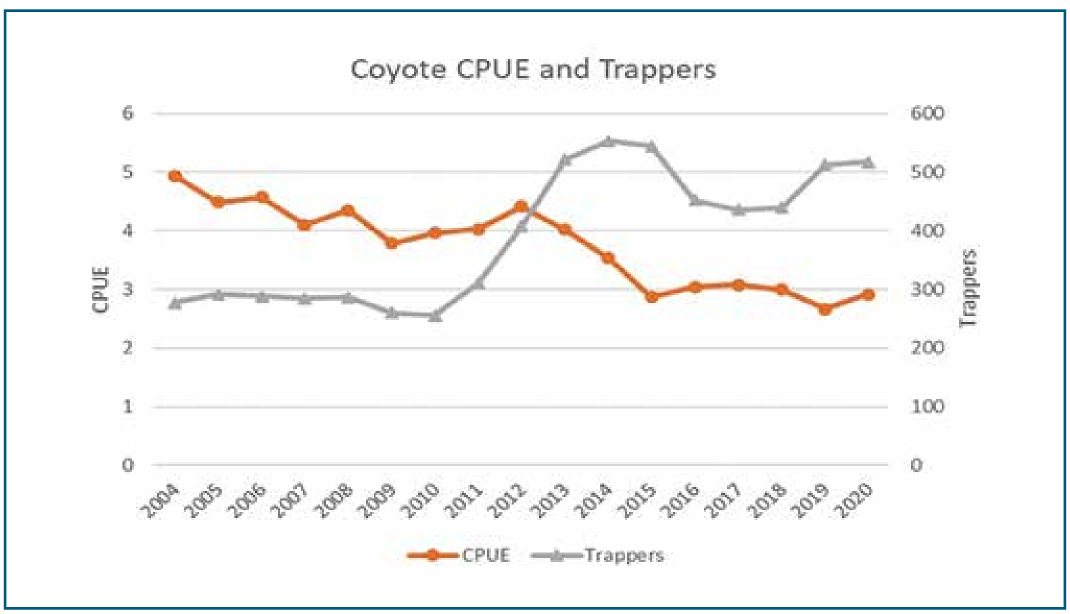

Figure 8. Three-year rolling average of annual coyote captures/100 trap nights, and number of coyote trappers, 2004–2020, Idaho, USA.

Wildlife-Human Conflict

Coyote depredation occurs on a wide array of poultry and livestock and coyotes are the most common predator of domestic sheep in the West. Wildlife Services handles most coyote depredations across the U.S., including Idaho, by targeting areas experiencing chronic problems. Debates over efficacy of reducing depredations through coyote removal are common. Connelly and Longhurst (1975) found ranches where coyotes were removed actually harbored higher densities of coyotes due to enhanced reproductive output and increased immigration into vacated territories. In areas where no removal occurred, coyote densities were lower because coyotes defended territories and produced smaller litters. Whether higher densities always equate to increased depredation likely depends on alternate prey sources, coyote social structure, seasonal environmental conditions, and livestock husbandry practices.

Management Goals and Direction

Coyotes are an ecologically and economically important species in Idaho. Classification as a predatory animal limits IDFG's ability to implement management strategies for coyotes. A decline in CPUE since 2012 corresponded with a pronounced increase in coyote trapping participation driven by an increase in pelt prices. Thus, changes in CPUE may be more closely tied to increased participation by new, less experienced trappers, or increased effort by experienced trappers, rather than an actual decline in coyote populations. The ability of coyote populations to withstand high annual mortality rates, combined with their adaptive reproductive capability, varied diet, and ability to inhabit all habitats in the state suggest coyote populations are stable at a statewide scale.

Management Actions

- No coyote-specific proposed management actions.

PHOTO: CC-BY THOMAS COYOTE IN YELLOWSTONE

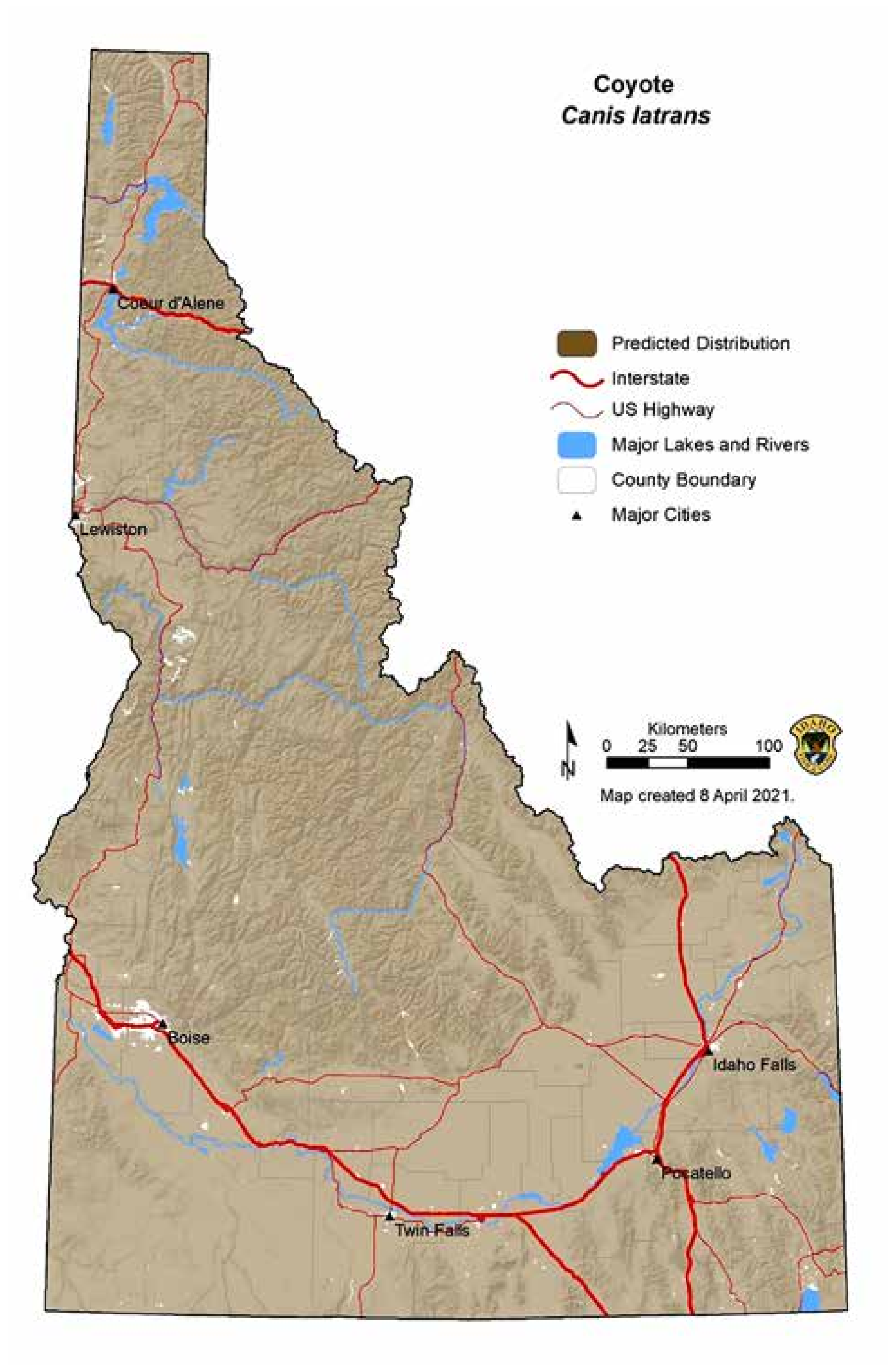

Figure 7. Predicted distribution of coyotes, Idaho, USA.

Marten (American and Pacific)

PHOTO: CC-BY SHUTTERSTOCK #1111995728

In 2012, American marten was split into 2 different species, American and Pacific, based on genetic and morphological differences (Dawson and Cook 2012), and both occur in Idaho. Geographic distribution of the 2 species in Idaho is relatively well-separated by the Clark Fork Valley in northern Idaho (Figure 9, Lucid et al. 2020). American marten occur north of the Clark Fork Valley and Pacific marten occur to the south. Based on genetic sampling, little mixing occurs between the species in Idaho (Lucid et al. 2020). Both species are found in high-elevation, mixed-conifer forests. Due to their ecological similarities, marten are managed as a single entity in Idaho.

Marten prefer forested and semi-forested areas, particularly those displaying complex vertical and horizontal structure, including high tree density and a wide variety of dead and downed wood (Andruskiw et al. 2008). In Idaho, marten are found in forested regions, preferring higher elevations and abundant tree cover. Historically, marten have been associated with mature and old-growth forests, rather than regenerating stands; however, habitat use varies across the U.S. (Thompson et al. 2012).

Marten home ranges are extensive and can be 3–4 times larger than those of similar-sized carnivores (Buskirk and McDonald 2012). In general, individuals in higher-quality habitat occupy smaller home ranges than those in areas of poor habitat; the largest home ranges (>10 km^2) were located in heavily logged landscapes (Bull and Heater 2001*b*, Self and Kerns 2001). Home ranges during winter typically average 3–4 km^2 (Wright 1999, Dumyahn et al. 2007).

Marten exhibit a generalist diet, often consisting primarily of small mammals including voles and mice, as well as birds, insects, and various berries (Martin 1994). In some areas, marten also rely on larger prey; Cumberland et al. (2001) attributed up to 95% of caloric intake to snowshoe hare, grouse (*Phasianidae*), and squirrels.

Marten exhibit a polygamous breeding system (Woodford et al. 2013) and breed from mid-June through August (Markley and Basset 1942). Implantation of fertilized eggs does not occur until 7–8 months post-breeding. Young are born in March and April the following year, meaning females give birth to their first litter at 2 years. Females typically produce 1 litter of 2–3 kits (range = 1–5) each year and provide all care of young (Strickland et al. 1982, Mead 1994, Woodford et al. 2013). Kits stay with their mother 1.5–2 months before becoming independent.

Mortality and Harvest

Marten rarely live beyond 5–7 years; predation is the main source of mortality. Predators include bobcats, coyotes, and raptors, particularly great horned owls (*Bubo virginianus*) (Lindstrom et al. 1995, Bull and Heater 2001a, Erb et al. 2015). Trapping, starvation, exposure, and disease are also common causes of mortality (Fredrickson 1990, Bull and Heater 2001*a*).

In areas where they are pursued as furbearers, trapping can be an important source of mortality. Trapping mortality is consistently male-biased (Strickland and Douglas 1987, Thompson and Colgan 1987, Hodgman et al. 1994, Erb et al. 2015) because higher energy requirements and larger home ranges of males lead to increased exposure to trapping (Buskirk and Lindstedt 1989). Conversely, mortality via natural causes is more

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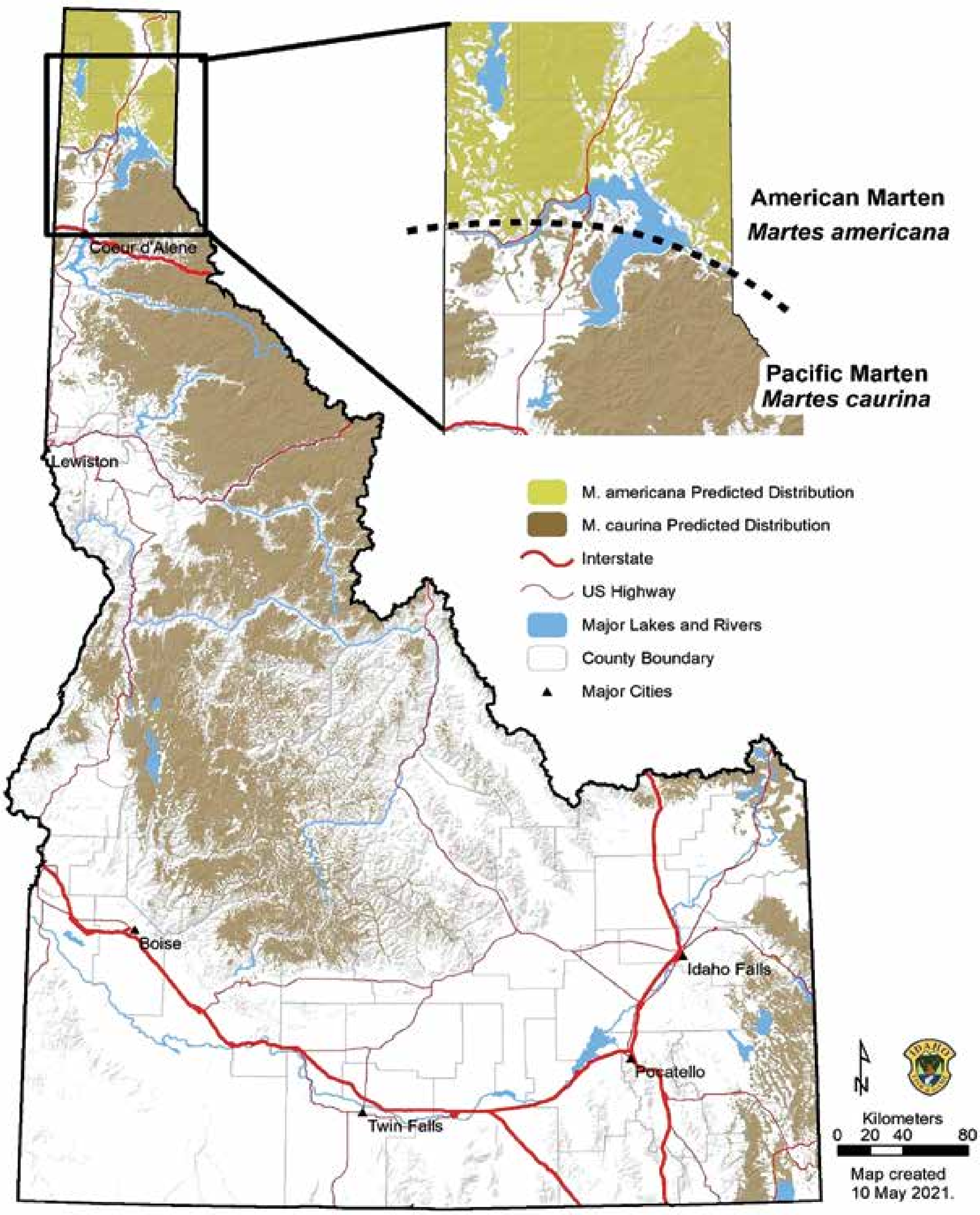

Figure 9. Predicted distribution of American and Pacific marten, Idaho, USA.

female-biased (Strickland et al. 1982, Strickland and Douglas 1987, Hodgman et al. 1997, Erb et al. 2015). Younger marten are generally more susceptible to trapping than older individuals (Strickland and Douglas 1987).

Marten are sensitive to habitat loss and fragmentation at a landscape scale. These habitat changes have been linked to population declines driven by increased predation and reduced survival rates (Soutiere 1979, Thompson 1994, USFWS 2015). Key drivers of habitat loss and fragmentation include timber harvest, climate change, and increased frequency, intensity, and size of wildfires (USFWS 2015). Landscapes with highly fragmented habitat or large open areas cannot support high densities of marten because fewer home ranges can be supported and reduced connectivity impedes dispersal (Thompson 1994, Johnson et al. 2009, USFWS 2015). This suite of effects negatively impact maintenance and expansion of marten distribution at a population or meta-population level (Thompson 1994, Johnson et al. 2009, USFWS 2015).

Marten populations are inherently unstable and exhibit large fluctuations in age structure and vital rates (Powell 1994). Various modeling efforts suggest variation in adult and juvenile survival influences population growth more than variation in fecundity (Buskirk et al. 2012, Slauson et al. 2019). This aspect of marten ecology is important for conservation and management considerations because stable habitat conditions over longer temporal scales are more likely to result in population growth or recovery through increased adult and juvenile survival, as opposed to rapid population growth due to increased fecundity in temporarily favorable conditions (Buskirk et al. 2012).

In Idaho, both marten species are classified as furbearers and are managed as a single entity. Trapping is the only legal method of take for marten. Harvest is managed through season length and there are no personal quotas. Average annual marten harvest was 982 over the last 24 years, but varied substantially among years (range = 515–2,680; Table A-2). A sharp peak in marten harvest occurred between 2010 and 2014, which coincided with an increase in fur prices and concomitant trapper participation (Figure 10). Marten CPUE declined from 9/100 trap nights in 2004 to slightly <5 in 2010. Since then, CPUE has remained stable at 4–5 marten/100 trap nights (Figure 10).

Management Goals and Direction

Marten are less popular among trappers than many of the state's furbearers, with an average of 100 trappers pursuing marten over the last 20 years. After the initial decline of CPUE from 2004 to 2010, statewide CPUE has remained stable for the past 10 years (Figure 9). Although our knowledge of marten densities is limited, large expanses of suitable habitat exist throughout the state (Figure 9), much of which is inaccessible to trappers due to difficult and remote access. These factors, combined with small home ranges and comparatively small harvest (<1,000/yr), suggest harvest pressure on marten at a statewide scale is sustainable.

PHOTO: CC-BY BRIAN AT FLICKR.COM

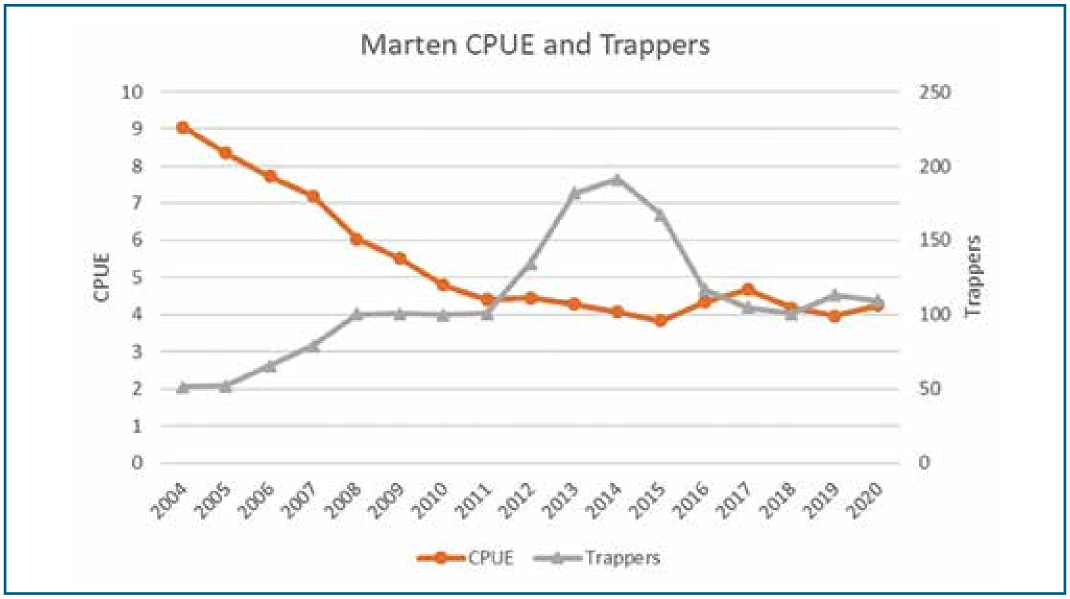

Figure 10. Three-year rolling average of annual marten (American and Pacific combined) captures/100 trap nights, and number of marten trappers, 2004–2020, Idaho, USA.

Habitat requirements of marten are more specific than those of other furbearers (Strickland 1994, Skalski et al. 2011). Additionally, gene flow through dispersal is an important population maintenance strategy, and habitat fragmentation is a key threat to successful dispersal and survival (Soutiere 1979, Thompson 1994, Johnson 2008, Johnson et al. 2009, USFWS 2015). Lucid et al. (2020) surmised conservation of marten travel corridors, particularly at elevations ≥1,500 m, might be crucial for maintaining robust populations in northern Idaho.

IDFG monitors marten populations through statewide estimates of CPUE. Although this approach allows monitoring of population status on a broad spatial scale, utility diminishes at finer scales. A monitoring program independent of harvest data, and capable of providing more refined estimates of population status, would be valuable for addressing the array of issues associated with marten conservation and management. Although a marten-specific monitoring approach is not currently considered a cost-effective option for the Department, marten are commonly observed during surveys for other species (e.g., fisher, wolverine, wolves) and utility of these observations for monitoring marten should be explored.

Management Actions

- Use existing detection data for marten from all survey efforts to develop a marten habitat or occupancy model.
- Using CPUE data, harvest demographics, camera-survey data, and any other relevant data sources, develop a statistical population reconstruction model (Skalski et al. 2011) to increase our knowledge of marten abundance, natural survival, harvest mortality, and recruitment.
- Develop our understanding of marten population connectivity and health utilizing marten genetic samples collected during monitoring programs for other forest carnivores.
- Emphasize monitoring of American marten to increase our understanding of population dynamics and range extent in Idaho.
- Partner with universities to encourage, facilitate, and advise more research on both Pacific and American marten in Idaho.

American Mink

PHOTO: CC-BY TERRY GRAY AT FLICKR.COM

Mink are strictly carnivores and an important predator in riparian systems. They are generalist predators and feed on diverse prey species, including fish, frogs, crustaceans, and mollusks. Mink are also a primary predator of muskrat (Holmengen et al. 2009). Abundant prey and increased prey diversity are closely associated with increased colonization and occupancy by mink in riparian-stream systems (Wolff et al. 2015, Holland et al. 2018).

The mink is a semi-aquatic mustelid that lives in close association with riparian habitats. Mink occur throughout Idaho and inhabit streams, rivers, and ponds, and adjacent riparian habitat (Figure 11). Mink also inhabit terrestrial environments associated with ephemeral ponds, and arid or semi-desert habitats if there is water close by.

Home range size for mink can range 23–164 ha, with little difference between males and females (Halbrook and Petach 2018). However, females with kits occupy much smaller home ranges (2.12 ha), which is influenced by inability to move longer distances with kits. Haan (2011) estimated mink traveled ≤659 m/day in search of food and resources, but daily movements vary widely. Density of mink varies with prey density, cover, availability of den sites, and concentrations of environmental contaminants. Fuller et al. (2016) developed a conservative density estimate of 1.37 mink/km2 in New York.

Breeding in Idaho typically occurs in March. Gestation ranges from 40 to 75 days. A typical litter of 3–4 kits is born in maternal dens in April or May. By the end of September, males and females reach their adult size (3.1 kg and 1.6 kg), depending on availability of food resources (Do and Miar 2020). By the following spring, kits reach sexual maturity. Average lifespan for mink is 1–3 years in the wild, and up to 8 years in captivity (Basu et al. 2007).

Mortality and Harvest

Several causes of mortality affect mink, including predation, trapping harvest, and environmental contamination. Mink are considered a sentinel species and serve as an indicator species for water quality and environmental contaminants. Because mink are a top carnivore in riparian systems, bioaccumulation of contaminants such as mercury (Hg) and polychlorinated biphenyls (PCBs) can occur (Basu et al. 2007). Health concerns resulting from PCB accumulation in mink consist of decreased reproductive success, reduced growth, and increased kidney and liver weights (Aulerich and Ringer 1977).

In Idaho, mink are classified as a furbearer and trapping is the only lawful method of take. Overall harvest of mink is low, averaging 714/year from 1995 to 2019 (Table A-2) and relatively few trappers pursue mink (134–260/yr, Figure 12). Catch rates for mink vary from 4.5 to 15.7 animals/100 trap nights (Figure 12), but have exhibited a steady decline since 2010.

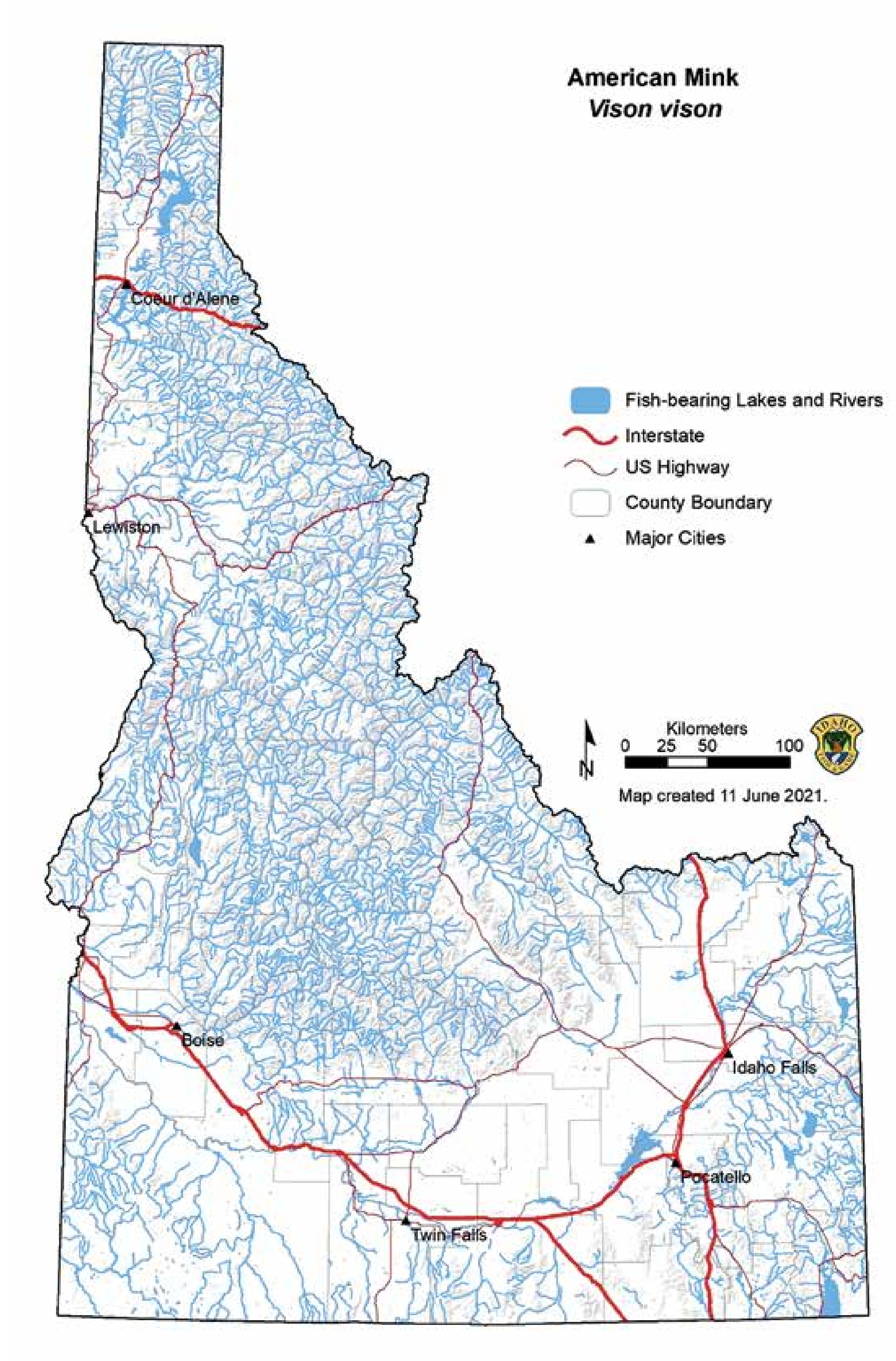

Figure 11. Predicted distribution of mink, Idaho, USA.

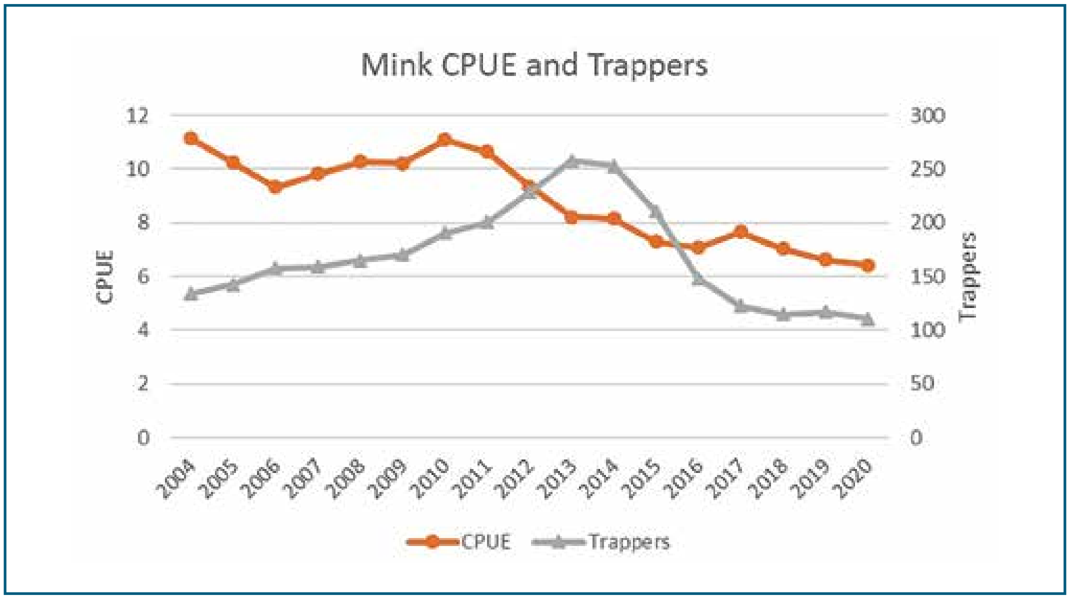

Figure 12. Three-year rolling average of annual mink captures/100 trap nights, and number of mink trappers, 2004–2020, Idaho, USA.

Management Goals and Direction

Compared to some species, CPUE may be less effective for monitoring mink population trend because mink are often caught as a secondary target by trappers pursuing other furbearers, particularly muskrat and raccoon. Thus, the declining trend in capture rates over the last decade may not accurately reflect true population trend. Rather, abundant habitat and low harvest pressure suggest the current harvest strategy is not negatively affecting mink populations.

As a species occupying a high trophic level, mink can bioaccumulate toxic levels of heavy metals, producing negative effects on reproductive fitness and survival. Although there are no emerging concerns in Idaho related to heavy metal bioaccumulation in mink, potential for heavy metal contamination in mink habitat (where and when applicable) should be considered when assessing new or existing projects.

In December 2020, the first known case of COVID-19 in free-ranging wildlife was documented adjacent to a mink farm in Utah. Although COVID-19 negatively affected captive mink farming facilities across the globe, potential impacts on wild mink populations are unknown. Likelihood of coronavirus transmission to humans who interact with wild mink (e.g., trappers and wildlife rehabilitators) is also unknown.

Management Actions

- Where and when applicable, incorporate mink's susceptibility to heavy metal contamination in IDFG technical assistance comments.
- Consider opportunities to collaborate on research involving COVID-19 and wild mink.

Common Muskrat

PHOTO: CC-BY #6307503

Muskrats are the most abundant and widespread semi-aquatic furbearer in North America (McDonald 2010), and consequently, the most trapped furbearer. In Idaho, muskrat is the third-most popular furbearer in terms of trapper participation (Table A-3) and ranked fifth-most important among trappers (Table 2). Muskrats occur in every county in Idaho and are associated with wetlands, ponds, and slow-moving streams (Figure 13). Considered ecosystem engineers, muskrats shape wetlands by altering marsh vegetation through house construction and herbivory, which provide emergent structures and open water beneficial to aquatic invertebrates and waterfowl (Bishop et al. 1979, de Szalay and Cassidy 2001). Muskrats are sensitive to various toxins and chemicals, and are therefore considered indicators of ecosystem health (Everett and Anthony 1976, Erickson and Lindsey 1983).

Muskrats occupy small home ranges centered on their den burrows or houses. In lentic habitats (e.g., marshes, ponds), muskrat home ranges range from 0.05 ha to 0.5 ha depending on habitat and population demographics (Proulx and Gilbert 1983, Keyser 1989). In linear lotic habitats (e.g., creeks, irrigation ditches), muskrat home ranges range 400–900 m of waterway (Ahlers et al. 2010). Drought conditions and seasonal water fluctuations can cause muskrats to leave home ranges to find suitable habitat.

Muskrats are largely herbivorous, consuming a wide variety of plants, but will also consume animal proteins such as freshwater mussels and clams (Neves and Odom 1989). As a dietary generalist, muskrats appear to adapt to non-native food items and persist even in wetlands colonized by invasive plants such as reed canary grass (Phalaris arundinacea) and cattails (Typhus spp.). Under certain conditions, local muskrat populations can increase beyond habitat carrying capacity and consume most of the available aquatic plants (known as an “eat out,” Pelikán et al. 1970, Danell 1978, Willner et al. 1980).

Muskrats usually begin reproducing in the first spring following birth, but earlier breeding has been documented (Willner et al. 1980). Litter size ranges 3–12 and females produce 1–3 litters each year (Willner et al. 1980, Boutin et al. 1988). Reproduction rates vary widely, commensurate with environmental conditions; peaks are associated with water levels that provide abundant emergent vegetation.

Mortality and Harvest

Muskrats rarely live beyond 2 years and predation is the main source of mortality. Predators include mink, bald eagles (*Haliaeetus leucocephalus*), and great horned owls (Errington 1967, Dunstan and Harper 1975). Raccoons can be a predator of muskrat kits, and in some circumstances will prey on adults (Harris 1951).

Muskrats are hosts and reservoirs for a wide range of pathogens, parasites, and contaminants throughout their range; however, effects on health and vitality of individuals and populations can vary (Ganoe 2019). Muskrats are susceptible to a variety of diseases which can cause localized mortality events. Cysticercosis, tularemia, Tyzzer's disease, and biotoxin poisoning from cyanobacteria are primary diseases associated with die-offs (Ganoe et al. 2020).

Muskrat populations can withstand high mortality rates. Harvest rates of 60–74% are sustainable under constant, favorable environmental conditions (Smith et al. 1981, Clark 1987). Because water level is the predominant factor driving muskrat populations (Errington et al. 1963, Virgl and Messier 1996, McDonald 2010), flooding and drought can significantly affect local populations. However, when conditions are suitable, muskrat populations can respond quickly. Muskrat populations generally follow 5–10-year population cycles related to habitat carrying capacity (Willner et al. 1980).

Perceptions of declines in muskrat populations across North America are common among trappers and wildlife managers. Based on analyses of 42 years of muskrat harvest data, compiled across 37 states, Ahlers and Heske

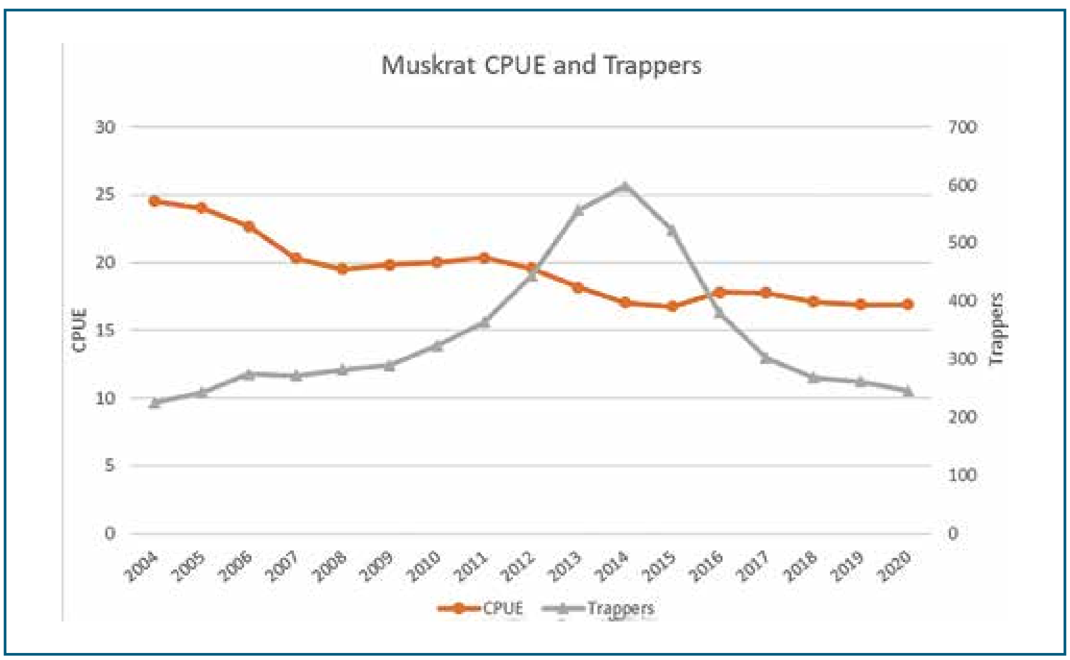

Figure 14. Three-year rolling average of annual muskrat captures/100 trap nights, and number of muskrat trappers, 2004–2020, Idaho, USA.

(2017) found strong evidence for population declines in all 37 states. Causes of declines are unclear, but habitat loss, changes in hydrology, predation, and environmental contamination are all possible contributing factors (Ahlers and Heske 2017, Ganoe et al. 2020). Idaho was included in analyses by Ahlers and Heske (2017), and they identified a 60 to 69% decline in predicted muskrat harvest from 1970–1990 to 1991–2012. Over the past 20 years, statewide CPUE for muskrat declined 31% (Figure 14).

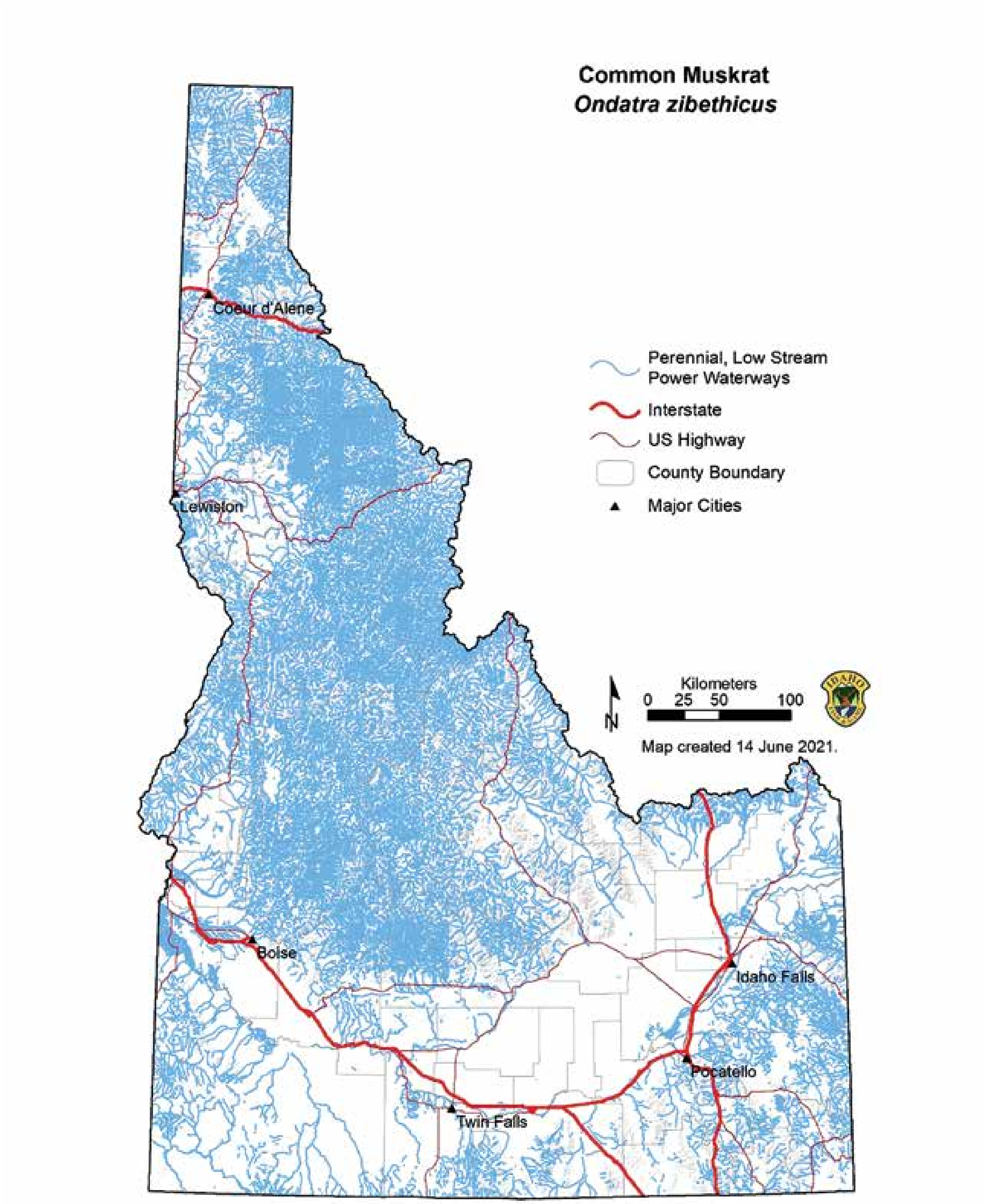

Figure 13. Predicted distribution of muskrats, Idaho, USA.

Wildlife-Human Conflict

Muskrats can cause damage through burrowing activities and depredation on certain agricultural crops. Economic losses can reach $1 million/year in rice-producing states (Miller 2018). In Idaho, most muskrat conflicts result from burrowing into dams and levees, and banks of ponds and irrigation ditches. Idaho statute (Section 36-1107 (c)) allows essentially unrestricted take of muskrats in any water infrastructure system.

Management Goals and Direction

Muskrats are consistently the most harvested furbearer in Idaho (Table A-2) and rank in the top 3 for trapper participation (Table A-3). Although current populations are seemingly meeting trapper demand, there are concerns about long-term declines in muskrat CPUE. Despite these observed declines, overall harvest is low compared to available habitat, potential reproductive rate of the species is high, and muskrats remain widely distributed across the state. IDFG will continue to monitor population trend based on CPUE data and consider adjustments to future harvest management strategies as needed.

Muskrats occupy small home ranges and large populations can exist on relatively small wetlands. With multiple WMAs focusing on wetland habitat, IDFG is well-positioned to promote enhanced management efforts to maintain and expand muskrat populations as well as trapping opportunity. Muskrats are susceptible to abrupt changes in water levels and water depth during winter can be a predictor of muskrat house distribution (Toner et al. 2010). Stable water levels, particularly during winter, are important for muskrat survival and productivity. However, muskrat populations do benefit from periodic drawdowns and re-flooding of wetland habitats (Allen and Hoffman 1984, Toner et al. 2010). These changes in water levels can result in flushes of emergent vegetation that provide habitat and forage for muskrats as well as many other species of wildlife. Enhancing management efforts to maintain and expand muskrat populations in appropriate situations could be beneficial to other species of wildlife, particularly waterfowl.

Management Actions

- Consider opportunities to participate in regional efforts to better understand muskrat population status and perceived declining trends.

PHOTO: CC-BY LANCE BECK AT FLICKR.COM

Northern Raccoon

PHOTO: CC-BY ISTOCK

A habitat generalist, raccoons can exploit a wide array of habitats across North America. In Idaho, raccoons are found across much of the state, absent only in higher elevation forests and desert areas far from water sources (Figure 15). Highest densities are associated with permanent water sources in conjunction with row crop agriculture and some forested cover.

In a summary of raccoon home ranges, Kaufmann (1982) identified areas as small as 5.1 ha in a suburban environment in Ohio, to >2,560 ha in prairies of North Dakota. Adult males maintain exclusive home ranges, but significant overlap exists between females and their young. Due to this overlap, raccoon densities can reach high levels. Densities varied 12.8–31 raccoons/km2 across the U.S. (Yeager 1937, Slate 1980). Based on habitat needs, densities in Idaho are likely at the lower end of reported estimates.

Raccoons are omnivorous and utilize a wide array of food sources, including wild and domestic fruits, nuts and berries, crayfish, mussels, carrion, small mammals, eggs, and amphibians. Where available, raccoons forage on items associated with human activities, such as garbage, a wide variety of row crops, and food intended for human or domestic animal consumption.

Raccoons can breed during their first year, and typically produce 1 litter of 2–5 kits (mean = 2.6) in spring. Young can disperse approximately 9 months after birth, but often stay in natal groups up to 18 months. In the wild, a raccoon's lifespan is heavily influenced by harvest intensity and is typically <5 years, although some live to 16 years (Johnson 1970).

Mortality and Harvest

Human activities (e.g., hunting, trapping, vehicle collisions) are the leading cause of mortality for raccoons. In a relatively unhunted population, starvation and extreme parasitism were leading causes of death of juvenile animals, however adult mortality was extremely low (Mech et al. 1968). Distemper was the only disease reported to impact local populations (Johnson 1970).

Raccoons can sustain population levels under relatively intensive harvest. Population resilience is attributable to flexibility in diet and habitat requirements, ability to exist at high population densities, low natural mortality rates, and relatively high reproductive rates. Sanderson et al. (1987) suggested sustainable harvest rates in Illinois ranged 49–59% of the population depending on fecundity.

Capture rates in Idaho were relatively stable over the last 18 years, fluctuating between 10 and 12 animals/100 trap nights; and on average, 230 trappers pursued raccoons each season (Figure 16). Although we lack specific information on densities, overall harvest is low (1,140/yr, Table A-2).

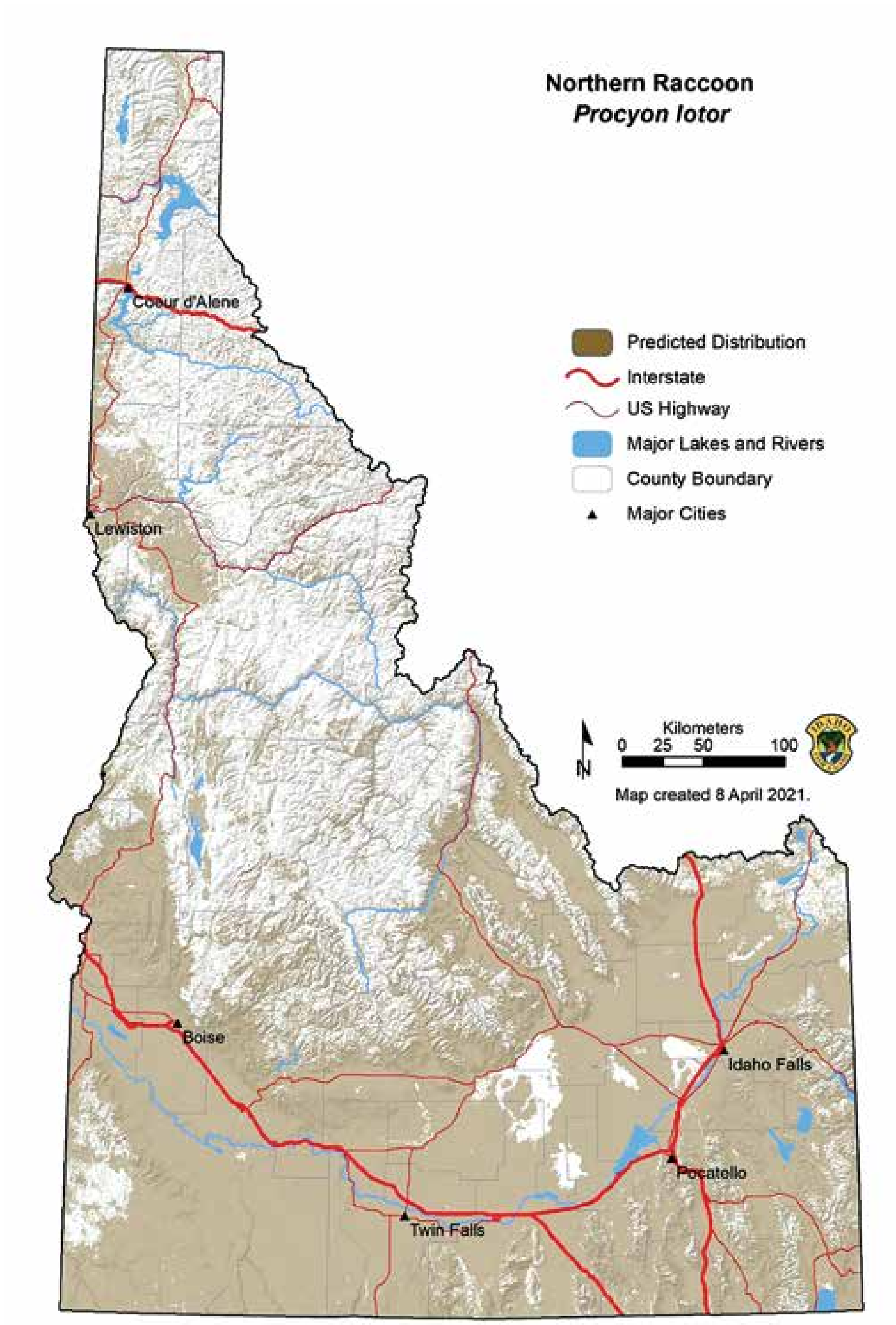

Figure 15. Predicted distribution of northern raccoon, Idaho, USA.

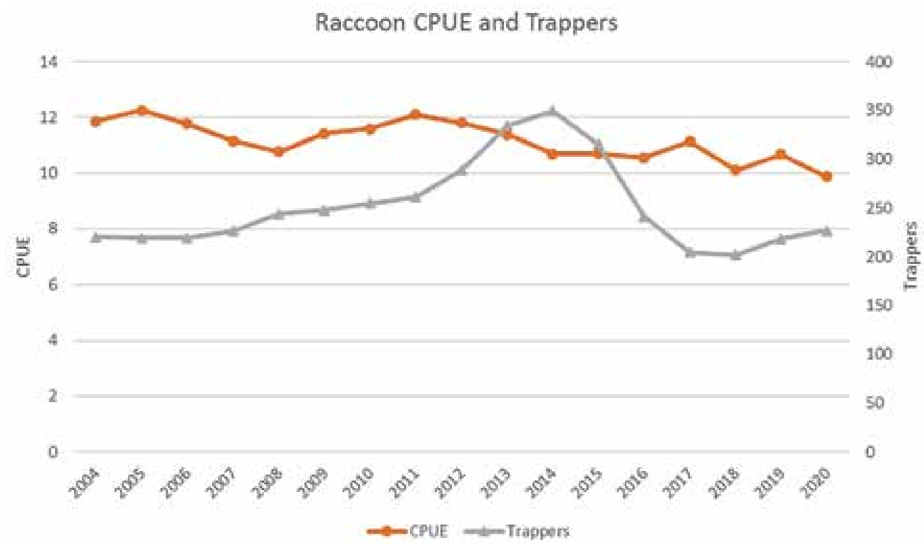

Figure 16. Three-year rolling average of annual raccoon captures/100 trap nights, and number of raccoon trappers, 2004–2020, Idaho, USA.

Wildlife-Human Conflict

Raccoons cause damage at poultry farms, fish ponds and hatcheries, gardens, and food stores for livestock. Localized impacts on agricultural crops, particularly corn, are common. Predation on wild bird nests can be problematic in situations where nests occur at high densities (e.g., waterfowl and colonial waterbirds). Additionally, raccoons carry several zoonotic diseases that can negatively affect humans, including raccoon roundworm, leptospirosis, and rabies.

Management Goals and Direction

Raccoons are a popular species among trappers, ranking in the top 5 most-pursued species over the past 25 years (Table A-3). Because raccoons are classified as predatory animals, IDFG's ability to implement specific management strategies is limited. Consistent CPUE and resilience to high harvest rates suggest raccoon populations are stable in Idaho.

Management Actions

- No raccoon-specific proposed management actions.

Red Fox

FOX IN McCALL IPHOTO: CC-BY MICHAEL ROBINSON AT FLICKR.COM

The red fox is a small canid and the most widely distributed carnivore on the planet (Voigt 1987). Red foxes occupy habitats ranging from tundra to desert, though they are most abundant in agricultural areas across North America (Samuel and Nelson 1982, Voigt 1987, Larivière and Pasitschniak-Arts 1996). In Idaho, red foxes are found in all habitats except those at the highest elevations; however, density varies across habitats (Figure 17).

Red fox family groups are territorial, with distinct, non-overlapping home ranges. In eastern North America, home ranges were 500–2,000 ha in high-quality habitat (Voigt 1987). Densities of 1–3/km2 occurred in high-quality habitats in eastern North America, but were as low as 0.1/km2 in lower-quality boreal forest and tundra habitats (Voigt 1987). No home range or population density estimates are available for Idaho. Local population densities are likely related to abundance of small mammals, presence of alternative food sources, and competition with other predators.

Red foxes diets are varied (Samuel and Nelson 1982), but often dominated by small and medium-sized mammals (Green and Flinders 1981). Being omnivorous, foxes readily consume berries and other vegetation at certain times of year. Ground-nesting birds, bird eggs, and fledgling birds are susceptible to fox predation, particularly during nesting season. Invertebrates and herpetofauna provide food sources in some environments, and carrion can be an important food source, particularly in late winter.

Although red foxes are generally considered seasonally monogamous, evidence suggests some level of polygamy occurs. Most breeding takes place during January–March, and gestation lasts 52 days. Females <1 year old may breed in low-density populations. Litters of 3–6 pups are typical, however up to 14 pups have been documented (Voigt 1987). Fecundity in foxes appears closely tied to mortality rates; higher mortality results in higher fecundity (Voigt 1987, Larivière and Pasitschniak-Arts 1996).

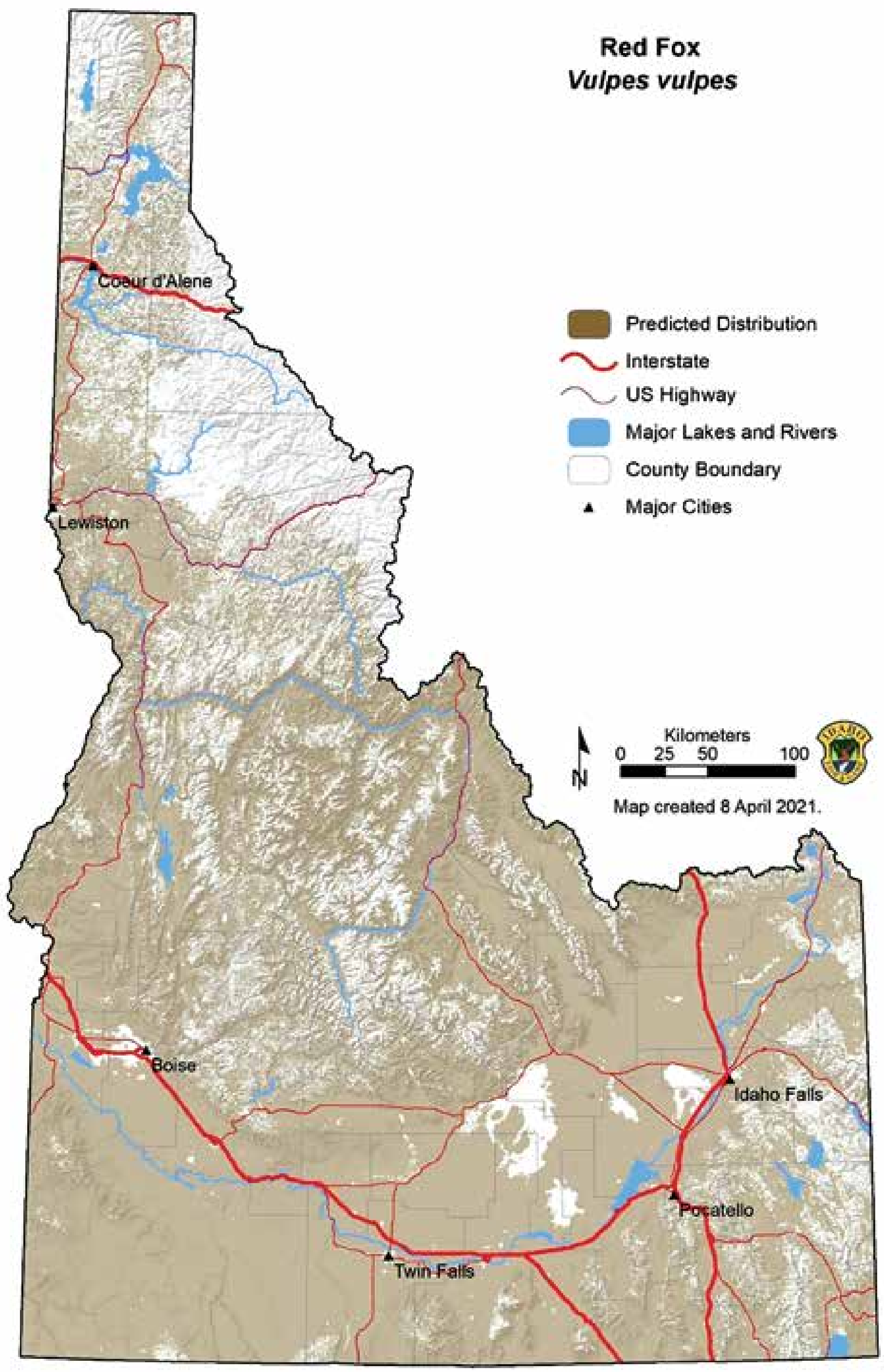

Figure 17. Predicted distribution of red fox in Idaho, USA.

Mortality and Harvest

Red foxes are susceptible to a variety of mortality factors. Hunting, trapping, and other human-caused mortality (e.g., vehicle collisions, removals to protect poultry) can be locally significant. In some states and provinces, human-caused mortality may remove up to 85% of juvenile populations (Voigt 1987). Population size and fur prices can significantly affect harvest levels (Voigt 1987). Foxes are often caught as a secondary targets in coyote and bobcat sets.

Diseases and parasites can locally impact both adult and juvenile foxes (Samuel and Nelson 1982). In Idaho, sarcoptic mange may be an important contributor to mortality. Although not lethal by itself, effects of mange can lead to starvation, hypothermia, and infection. Rabies can be a significant cause of fox mortality, but has not been detected in Idaho. Other diseases, such as parvovirus and distemper, and various internal parasites can kill foxes (Voigt 1987), but are unlikely to pose a serious threat to red fox populations in Idaho.

Evidence suggests red fox populations may be held in check by coyotes due to interspecific competition (Voigt and Earle 1983, Harrison et al. 1989, Sargeant and Allen 1989, Mueller et al. 2018). Consequently, foxes may flourish in areas with low coyote densities. If coyote populations are similarly limited by presence of gray wolves (Dekker 1989), red fox abundance may be higher in areas where wolves are present.

Catch rates for red fox in Idaho have ranged 4–8/100 trap nights since 2002, with a steady decline since 2011 (Figure 18). Because red foxes are often caught as a secondary target while pursuing coyotes, uncoupling CPUE trends between the species is challenging. Reasons for the observed decline in CPUE and absence of red fox from some areas in northern Idaho are unknown. In eastern parts of the country, red foxes are closely associated with agriculture, and changes in agriculture practices may negatively affect populations in these areas. Historical distribution of red foxes in Idaho is unknown and low population levels in Panhandle and Clearwater Regions may well reflect inherent habitat suitability or some unknown limiting factor.

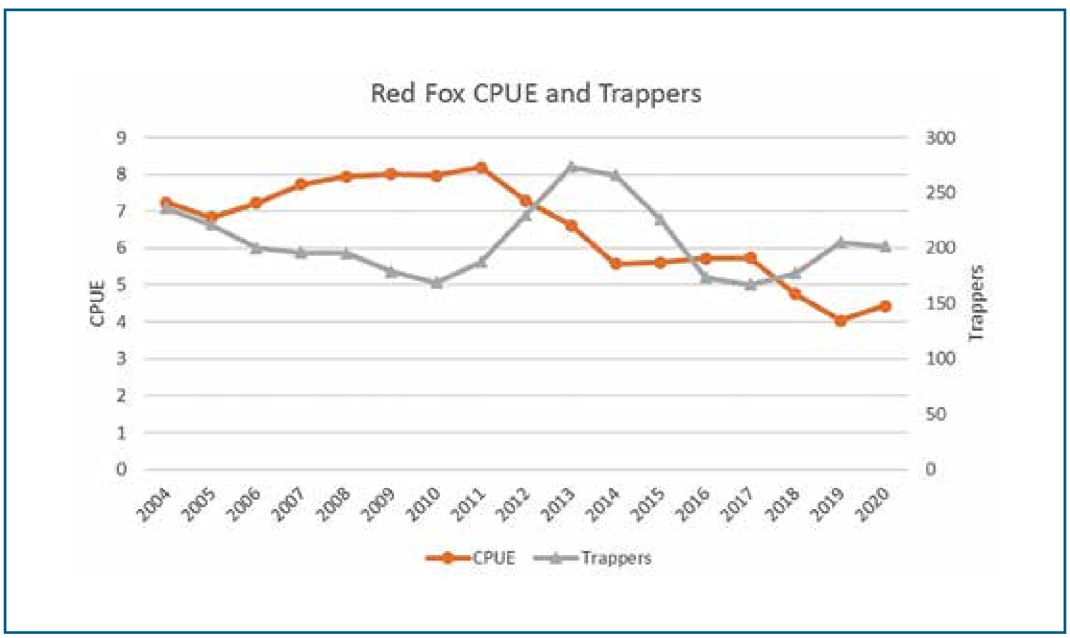

Figure 18. Three-year rolling average of annual red fox captures/100 trap nights, and number of red fox trappers, 2004–2020, Idaho, USA.

Wildlife-Human Conflict

Red foxes rarely come into conflict with humans except in isolated instances. Foxes readily occupy home ranges that include both agricultural and suburban landscapes, which can result in loss of poultry (and eggs) and other conflicts. In Idaho, USDA Wildlife Services removed <10 nuisance red foxes annually from 2014 to 2018 (USDA WS 2020).

Recent genetic research, primarily in West Coast states, identified several subspecies of red fox. As a result of subspecific differentiation, some red fox populations were listed or petitioned for listing under the ESA. Interest in exploring genetic variation and potentially delineating additional subspecies is increasing across the U.S., but genetic relationships among red fox populations in the Intermountain West remain poorly understood.

Management Goals and Direction

Whether declining CPUE for red fox is associated with a population decline or the increase in coyote trapping is unclear. Although we lack detailed understanding of red fox densities, large areas of the state, where access by trappers is limited by steep terrain and low road densities, should provide abundant habitat. Availability of these pseudo-refugia, combined with small home ranges and comparatively small harvest, suggest harvest pressure on red fox at a statewide scale is sustainable.

Management Actions

- Explore utility of red fox data collected through other sampling efforts (i.e., camera and genetic-based surveys) for monitoring status and distribution.
- Consider participating in collaborative projects with other state agencies to explore genetic structure of red fox populations.

RED FOX PHOTO: CC-BY SHUTTERSTOCK 523551145

North American River Otter

PHOTO: CC-BY CHARLES PETERSON AT FLICKR.COM

The river otter is a modern-day conservation success story. Historical range covered most of North America with the exception of the extreme Arctic and portions of the arid Southwest and central Plains. However, by the early 1900s river otters were extirpated or nearly extirpated from 20 of the lower 48 states. Subsequently, focused conservation efforts by state wildlife agencies made great progress in restoring the species. Today, river otters occupy all 48 contiguous states and have likely reached maximum potential geographic distribution in the U.S. (Roberts et al. 2020).

River otters inhabit a wide array of natural and man-made aquatic habitats. In Idaho, river otters inhabit perennial water bodies across the state and are absent only in sparsely vegetated desert waterways (Figure 19). The primary driver of river otter occupancy in any given waterway is likely prey availability.

In Idaho, Melquist and Hornocker (1983) defined seasonal home range as the minimum linear distance traveled along a waterway; which ranged from 8 km for a juvenile female in autumn to 78 km for a yearling male in summer. Using the same metric, Mack et al. (1994) estimated home range lengths in Clearwater Region varied from 15.5 km to 148.3 km. Home ranges overlap among individuals, and multiple individuals use the same foraging areas (Melquist and Hornocker 1983). Otter density varied from 1/2.7 km to 1/5.8 km across central Idaho during the 1970s (Melquist and Hornocker 1983).

River otters are opportunistic feeders and utilize a wide array of aquatic and terrestrial food sources. Although fish are usually the most important diet item, river otters also consume invertebrates, birds, amphibians, and small mammals (Anderson and Woolf 1987, Mack et al. 1994, Day et al. 2015). In particular, crustaceans (primarily crayfish) can comprise a significant portion of the non-fish diet, and were an important prey species in Idaho (Mack et al. 1994). River otters in Idaho likely specialize in pursuing warmwater fish and crayfish in lakes, ponds, and larger river systems, but may also target salmonids when they are the most readily available prey in cold-water systems.

Female river otters first breed at 2 years, and will then produce up to 1 litter annually. In Idaho, river otters breed in late April or May and give birth in March or early April the following spring. Similar to other mustelids, river otters exhibit delayed implantation, which results in fertilized eggs lying dormant for 8–9 months after successful breeding. In addition, river otters exhibit induced ovulation. Males become sexually mature at 2 years, but may not become successful breeders until the bacculum has fully developed at age 3–5 (Hamilton and Eadie 1964, Stenson 1985, Diggs 2013). In central Idaho, average litter size was 2.4 pups. Pups are weaned at 5 months and disperse within the first year, staying with the mother until early March at the latest. In the wild, river otter lifespan is generally ≤10 years.

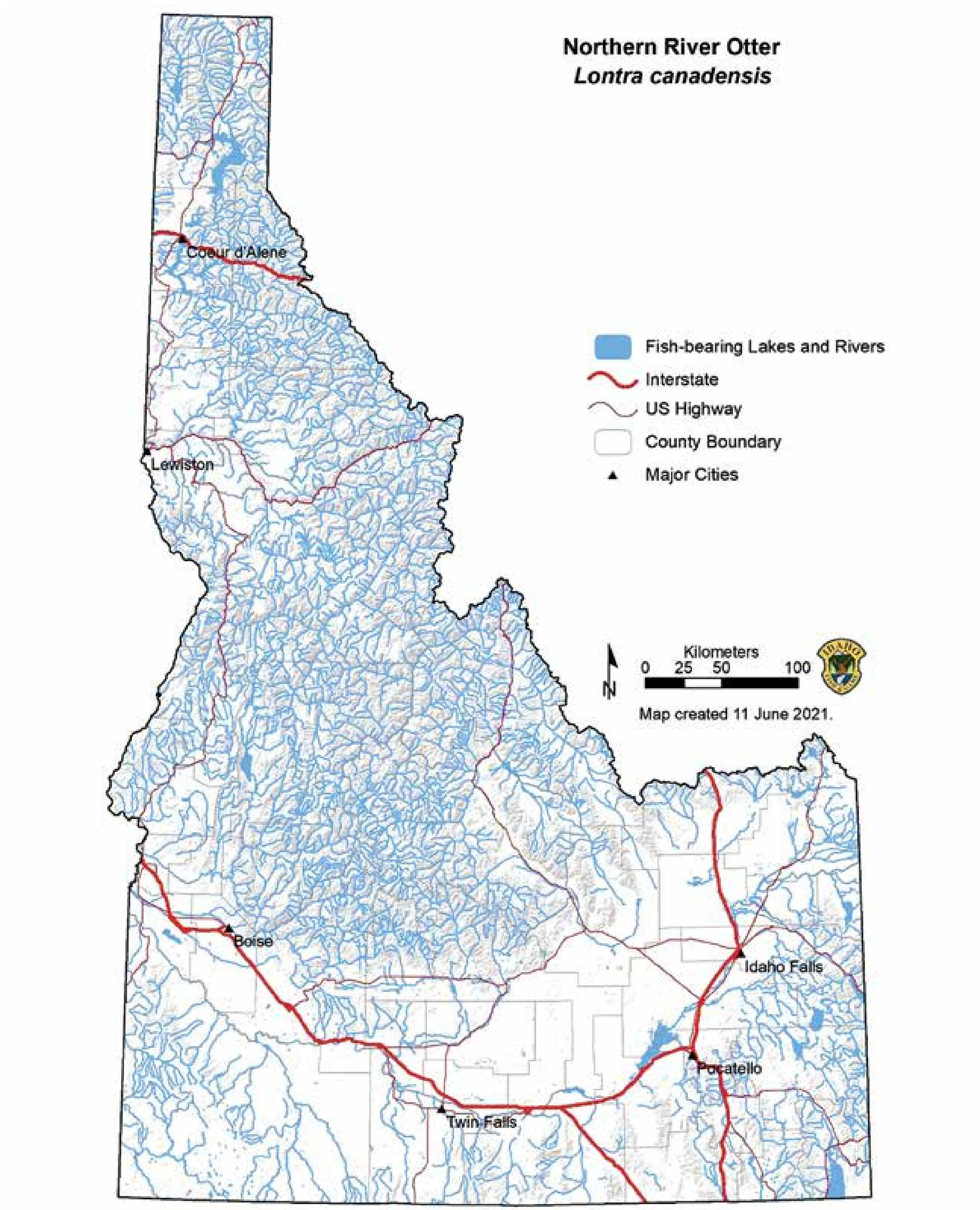

Figure 19. Predicted distribution of river otter, Idaho, USA.

Mortality and Harvest

River otters have very few natural predators and are particularly safe from predation when in water. When travelling on land, otters are vulnerable to predation from domestic dogs and coyotes, and potentially other large carnivores (Hornocker and Melquist 1983). Leading causes of mortality in wild river otter populations are human driven and often associated with trapping and vehicle collisions (Hornocker and Melquist 1983, Rutter 2018). Death due to parasites or disease is difficult to assess (Kimber and Kollias 2000), but was not documented in Idaho (Hornocker and Melquist 1983, Mack et al. 1994).

Overharvest and aquatic habitat alterations and contamination in the early 1900s were likely important factors leading to reduced river otter distribution across much of the contiguous U.S. (Roberts et al. 2020). Otters are particularly susceptible to water pollution as many pollutants directly affect their prey, as well as individual river otters themselves (Kimber and Kollias 2000). In the 1970s, many states and provinces, including Idaho, began implementing management actions to directly address river otter conservation (Melquist and Hornocker 1979, Raesly 2001).

After a 29-year closure in Idaho, a river otter trapping season was reopened in 2000. Initial trapping regulations incorporated regional and personal quotas, modeled available habitat, estimated river otter densities from published research, and extrapolation to estimate potential population size. Regional quotas were set at levels designed to harvest ≤5% of estimated populations. After the initial quota structure was established, regional quotas were slowly increased over time throughout the state. Continued non-target otter captures, along with stable CPUE rates (Fig. 20), suggest a stable population. As of 2020, total allowable harvest in Idaho was 160 animals apportioned among the 7 regions.

Catch rates for river otters over the last 20 years were relatively consistent at 9–12/100 trap nights. During the same time period, average number of trappers was 72, with notable spikes during 2014 and 2015 following a pronounced rise in fur prices. From 2000 to 2019, annual river otter harvest ranged from 82 to 196 animals (mean = 126, Table A-2).

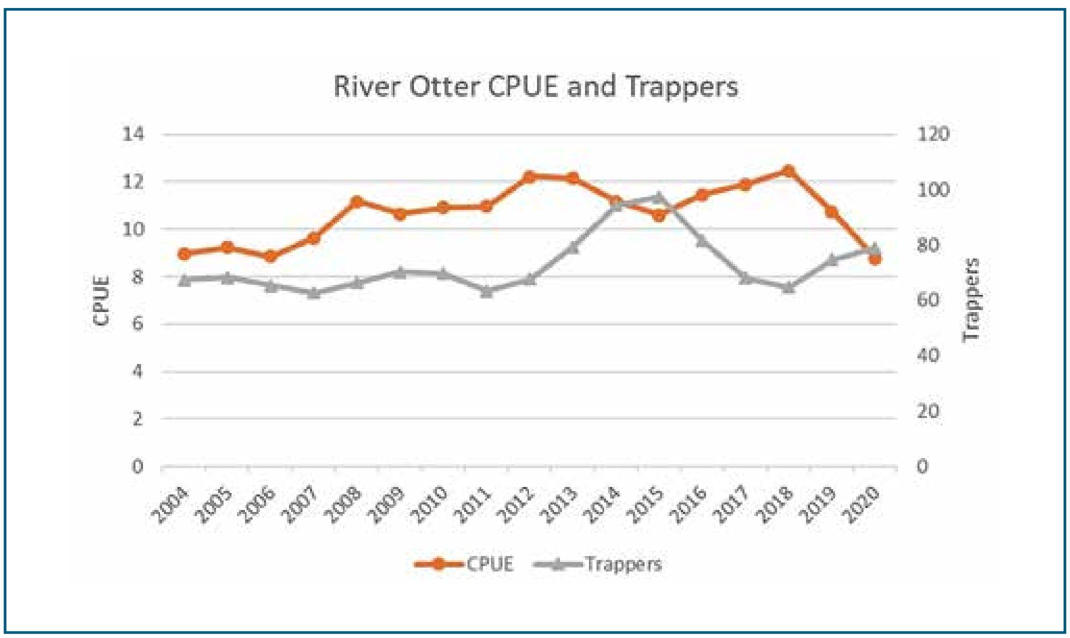

Figure 20. Three-year rolling average of annual river otter captures/100 trap nights, and number of river otter trappers, 2004–2020, Idaho, USA.

Wildlife-Human Conflict

Most conflict with river otters involves eating fish in private ponds, hatcheries, and in some situations, waterbodies popular among anglers. Additionally, otter scat and latrines can be unsightly and destructive on docks and at marinas. River otters can host a variety of endoparasites (e.g., nematodes and trematodes), including some species that may be passed to pets through feces, though these transmissions rarely lead to clinical symptoms (Kimber and Kollias 2000).

Management Goals and Direction

Since reopening river otter trapping in 2000, IDFG has made several changes to harvest regulations, including adjusting regional quotas, increasing personal quotas, and opening or closing waterways to harvest. Statewide, stable river otter CPUE and abundant available habitat suggest a stable population. Furthermore, conservative harvest management through regional and personal quotas provides security from overharvest.

Although current management includes built-in safeguards to ensure sustainable harvest, IDFG lacks tools to accurately predict effects of increased harvest opportunity (and therefore harvest) on river otter populations. Unlike most furbearers, and even some big game species, river otters exhibit a low reproductive rate, occur at low densities, and recover slowly from overharvest. Use of capture rates to monitor population trend is most effective under consistent harvest pressure and large harvests of a primary target species. Thus, CPUE data has limited applicability for monitoring Idaho's river otter population because of low overall harvest, particularly at a regional scale, and frequent capture of otters as a secondary target (by beaver trappers).

For IDFG to assess impacts of increased harvest opportunity, additional monitoring data is needed. Beyond use of harvest data, other methods for monitoring otters can be labor- and time-intensive. Population estimates derived from mark-recapture techniques are expensive and only feasible at small scales. Therefore, most agencies that conduct monitoring beyond harvest data utilize some form of sign-based survey, using density of sign, or presence of sign under an occupancy framework, as proxies for population levels. Due to Idaho's large size and ecological diversity, any proposed monitoring program would require careful consideration of cost, personnel time, and logistical constraints in relation to quality and usefulness of anticipated program products (e.g., population or density estimates, occupancy rates, spatial scale, and applicability for management purposes).

Management Actions

- See Harvest Management and Population Monitoring section.

PHOTO: CC-BY #275962-1020

Western Spotted Skunk

PHOTO: CC-BY HUGH RANSON AT FLICKR.COM

Western spotted skunk is the smallest North American skunk (Rosatte and Larivière 2003). The species is distributed from central Mexico north to British Columbia, and from the California Coast to the central Great Plains (Verts et al. 2001). Spotted skunks occur across much of Idaho, but appear patchily distributed (Figure 21).

Spotted skunks are omnivores and occupy a variety of habitats, including wooded areas, tall-grass prairies, and rocky canyons, but seldom occur in low-lying deserts (Rosatte and Larivière 2003). Availability of burrows, food, and thick vegetative cover is likely essential for maintenance of Spilogale spp. populations (Rosatte and Larivière 2003). In western Washington and Oregon, western spotted skunks were widely distributed throughout upland coniferous forest, contrary to previously reported habitat associations (e.g. Carey and Kershner 1996).

Populations of spotted skunks are disjunct and often localized (Rosatte and Larivière 2003). Density estimates for eastern spotted skunk (S. putorius) ranged from 5/km2 in an agricultural area (woodland pasture and flat, intensively cultivated agricultural land) of Iowa (Crabb 1948) to 40/km2 on a Florida barrier island (Kinlaw et al. 1995).

Western spotted skunks breed in September, undergo delayed implantation, and give birth in April and May (Mead 1968). Gestation lasts 210–230 days and mean litter size was 3.8 (range = 2–5; Mead 1968). Western and eastern spotted skunks are considered reproductively isolated from one another (Rosatte and Larivière 2003).

Mortality and Harvest

Spotted skunks are killed by a variety of predators, including bobcat, great horned owl (Howard and Marsh 1982), and domestic dogs and cats. Most mortality is likely caused by humans via vehicle collisions and killing skunks that are considered pests (Howard and Marsh 1982, Rosatte 1987). Although rabies affects spotted skunks elsewhere, the disease is apparently absent from animals in Idaho. Incidence of rabies in spotted skunks varies temporally and geographically, and impacts of infectious diseases on population regulation are unknown (Rosatte and Larivière 2003). In captivity, spotted skunks may live almost 10 years (Egoscue et al. 1970). In the wild, longevity is lower, most likely <5 years (Van Gelder 1959).

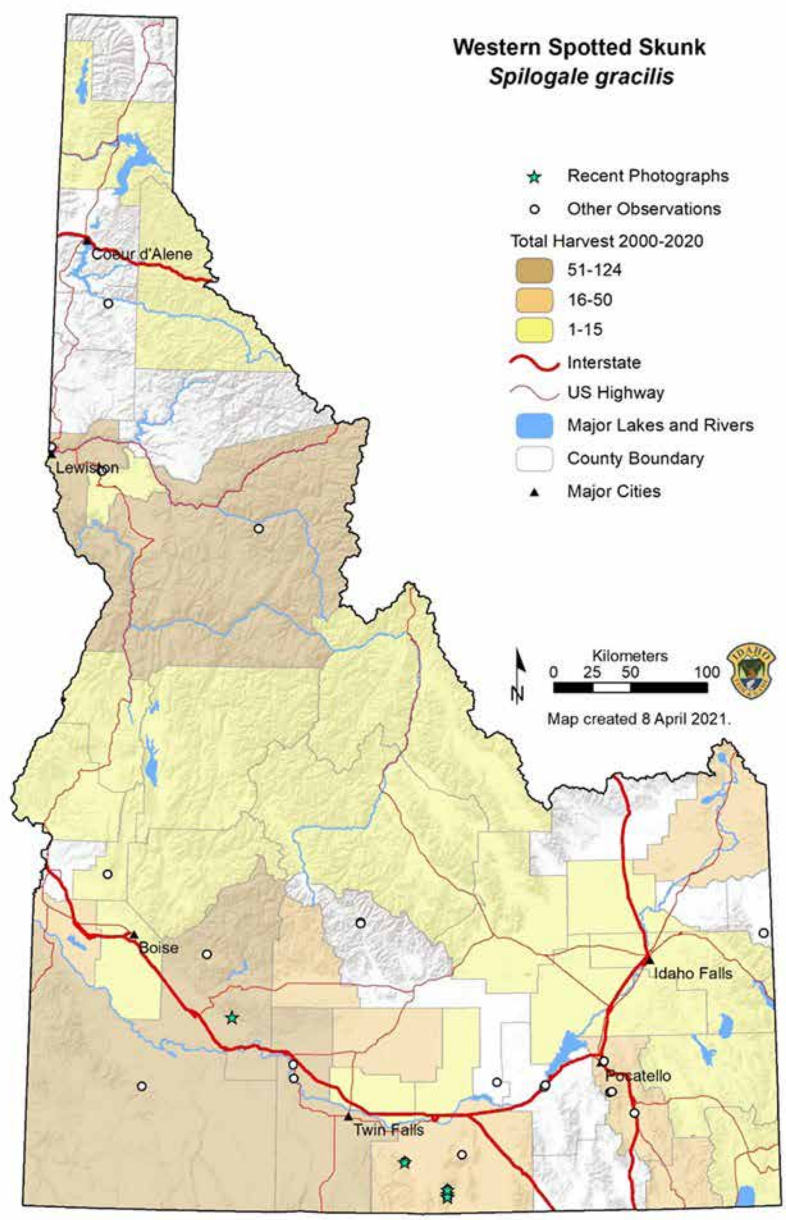

Figure 21. Trapper harvest of western spotted skunk by county, and incidental observations, 2000–2020, Idaho, USA.

Rangewide, spotted skunks are not a popular species among trappers and most are likely caught as secondary targets while pursuing other furbearers. In Idaho, both reported harvest (~36/yr, Table A-2) and participation are low. Although trappers reported harvest from 33 of 44 counties, most harvest occurred in north-central and southwestern Idaho (Figure 21). Because harvest is very low (ranking last among trapped furbearers) and few trappers specifically target spotted skunks, trends of CPUE hold little value.

Wildlife–Human Conflict

Skunks can become a nuisance when their burrowing and feeding habits conflict with human interests. Skunks sometimes damage apiaries by eating bees, and occasionally dig in golf courses, yards, and gardens for grubs and insects (Rosatte 1987, Knight 1994). However, these complaints should be weighed against benefits provided by skunks when they prey on destructive insects and other pests, particularly in agricultural areas (Rue 1981). Skunks may burrow under porches or enter buildings through foundation openings, sometimes creating a nuisance with their odor (Crabb 1948, Knight 1994). Occasionally, skunks feed on corn, kill poultry, and eat eggs (Crabb 1948).

Management Goals and Direction

Status and distribution of spotted skunks are unclear in several states (Rosatte and Larivière 2003). Although status of western spotted skunk is virtually unknown, long-term trends for the congeneric eastern spotted skunk suggest a significant rangewide decline and the species is currently listed by various state agencies as endangered, threatened, or "of concern" across much of its range (Gompper and Hackett 2005). In 2012, the USFWS found a petition to list the plains spotted skunk (S. p. interrupta) as endangered or threatened under the ESA may be warranted (USFWS 2012). The International Union for Conservation of Nature categorizes the western spotted skunk as "Least Concern" with a decreasing population trend, but considers the rate of decline insufficient for categorization as "Near Threatened" (Cuarón et al. 2016).

In Idaho, the spotted skunk is classified as predatory wildlife, yet the species was elevated to SGCN status in several western states (Washington, Arizona, Texas, California, and Wyoming) due to lack of information on current status. Accordingly, the fundamental objective for spotted skunk management in Idaho is to ensure persistence of a viable population. Increasing our understanding of spotted skunk status in Idaho will be essential to future conservation and management efforts, as well as for addressing potential listing petitions.

Management Actions

- See Harvest Management and Population Monitoring section.

PHOTO: CC-BY VLADEB AT FLICKR.COM

Striped Skunk

PHOTO: CC-BY LUVDOGS65 AT FLICKR.COM

Striped skunks are small (1.8–4.5 kg), nocturnal omnivores which occupy a wide variety of habitats in the lower 48 states, Canada, and northern Mexico. They are found throughout Idaho, but are most common at elevations <1,800 m (Figure 22). Although strong diggers, they often take advantage of human structures (basements, porches, outbuildings, and culverts) for use as den sites, or co-opt abandoned dens of other species. At northern latitudes during winter, skunks may enter torpor for ≤100 days. Normally solitary, skunks will den communally during winter to conserve heat and energy.

Skunks breed once per year in spring, and females give birth to 5–8 kits in early summer (Hamilton 1963). Kits stay with the female until late summer to early fall. Densities depend on habitat quality, ranging from 0.5 to 14.3 skunks/km2 (Verts 1967, Bjorge 1977), and tend to be highest in areas of mixed agriculture.

Skunks are primarily nocturnal, foraging along habitual routes for terrestrial and aquatic insects, small reptiles, mice, snails, worms, and eggs of ground-nesting birds. True omnivores, skunks also eat fruit, berries, row crops, compost, and carrion.

Mortality and Harvest

Skunks serve as prey for a variety of animals, including badgers, great horned owls, coyotes, and golden eagles. Human-caused mortality in the form of trapping, hunting, vehicle collisions, and farming operations is common. Skunks are parasitized by a wide array of endo- and ecto-parasites, which can reduce fitness.

Since 2004, statewide harvest of striped skunks and number of skunk trappers have increased. Capture rates fluctuated between 12 and 16/100 trap nights through 2015, but declined afterward (Figure 23). As a metric for population status, CPUE is likely less reliable for skunks than some other species because skunks are often caught as a secondary target while trappers are pursuing bobcat, coyote, and red fox. The recent strong market for coyote pelts and consequent pronounced increase in coyote harvest likely contributed to increased striped skunk harvest and trapper participation.

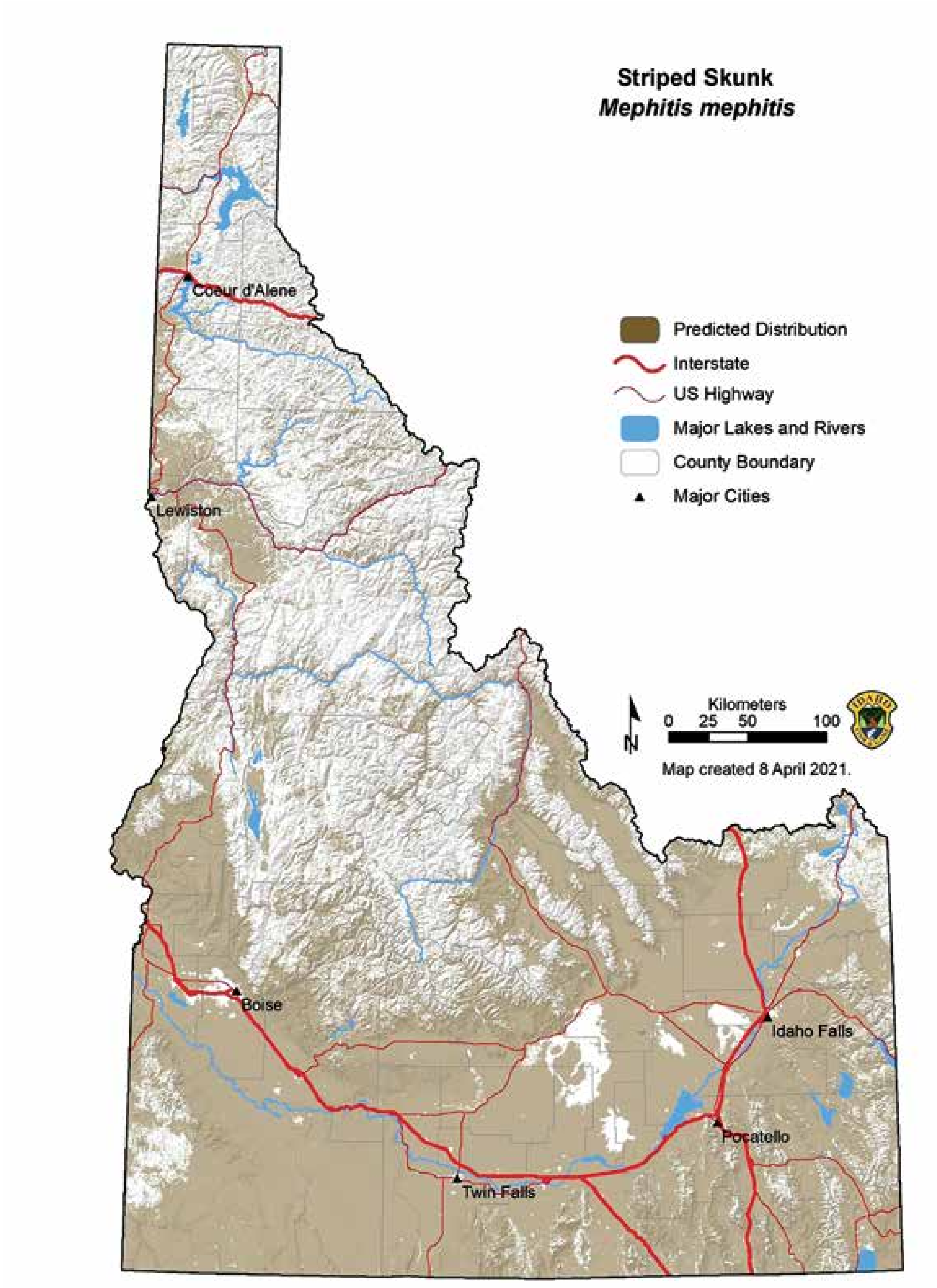

Figure 22. Predicted distribution of striped skunk, Idaho, USA.

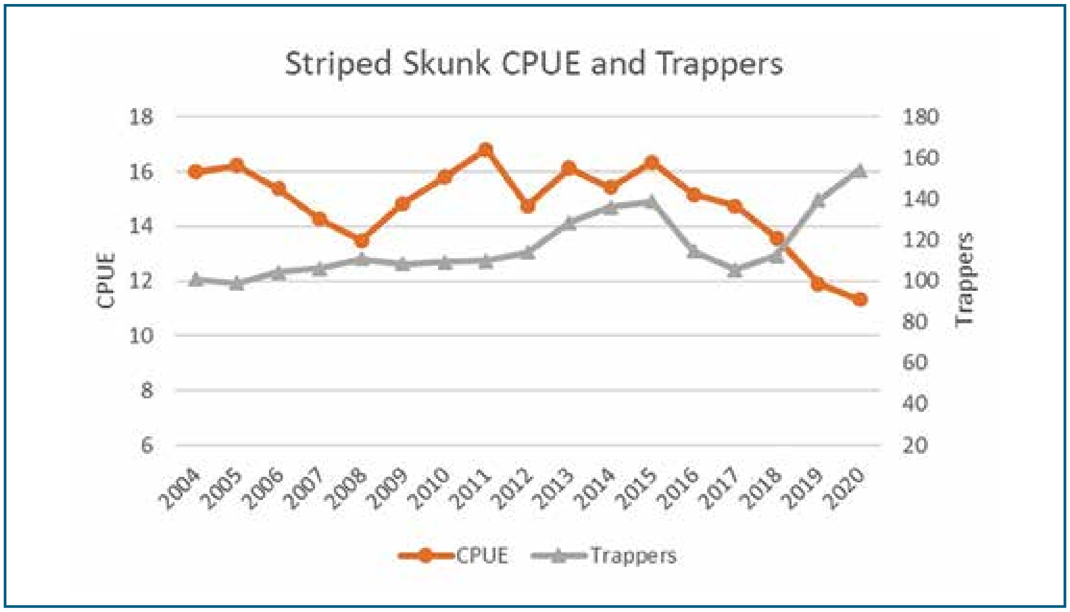

Figure 23. Three-year rolling average of annual striped skunk captures/100 trap nights, and number of striped skunk trappers, 2004–2020, Idaho, USA.

Wildlife-Human Conflict

Striped skunks are common in rural areas and often use human structures for denning areas. As a result of living in close proximity to humans, conflicts arise when skunks raid poultry coops for eggs, dig in yards and gardens for grubs, or spray domestic dogs during altercations. In other parts of the country, skunks can be primary vectors for rabies. The skunk rabies variant is found in the Midwest, Southwest, and California, but has not been detected in Idaho. Skunks are effective nest predators and can be problematic in areas where upland game bird or waterfowl production are a priority (Vickery et al. 1992, Pasitschniak–Arts and Messier 1995).

Management Goals and Direction

Striped skunks are classified as predatory wildlife in Idaho, which limits opportunity for effective management by IDFG. Based on data collected from trappers over many years, statewide skunk harvest is relatively low and CPUE appears stable over the long term (Figure 23). These harvest metrics, in combination with ample suitable habitat, suggest striped skunk populations are stable.

Management Actions

- No striped skunk-specific proposed management actions.

Ermine and Long-Tailed Weasel

Idaho is home to 2 weasel species: ermine (or short-tailed weasel) and long-tailed weasel. During summer, weasels are dorsally brown and white below, but both molt into all white fur during winter (except the tip of the tail, which remains black). Long-tailed weasels are approximately one-third larger than ermine. Individuals of both species are typically solitary, except during mating season, and territorial.

Both species are found across a wide swath of North America, and overlap across large portions of their ranges, including Idaho (Figures 24 and 25). Where species are sympatric, long-tailed weasels tend to be much less common; reported ratios of long-tailed weasels to ermine in the harvest ranged from 1:1.5 (Gamble 1980) to 1:119 (Hall 1981). Relative abundance in Idaho is unknown.

Like other mustelids, weasels exhibit sexual dimorphism, with males being larger than females. Linnell et al. (2017a) found female ermine occupied much smaller home ranges (8.6 ha) than males (51.3 ha). Long-tailed weasels tend to occupy larger home ranges; up to 51.8 ha for females and 180.3 ha for males (Gehring and Swihart 2004). Home range size of both species depends on habitat, level of habitat fragmentation, and prey availability.

Weasels are strictly carnivores and prey on an array of species. Small mammals such as voles and mice are primary prey items, but weasels frequently prey on snakes, rabbits, and birds. Weasels are considered generalist predators, which may contribute to their ability to occupy a variety of habitats. Females tend to be more sensitive to prey abundance during breeding season and select habitats, such as early-seral forests, where small mammals are plentiful (Linnell 2014).

Both species breed during April-June and give birth the following April or May (King and Powell 2007). Litter size is typically 4–9, and kits begin consuming meat within a few weeks of birth. Female ermine often breed during the first few months of life, giving birth the following spring. In contrast, female long-tailed weasels rarely breed until 1 year old. Young of both species quickly become independent; within 16 weeks for ermine and 10–12 weeks for long-tailed weasels.

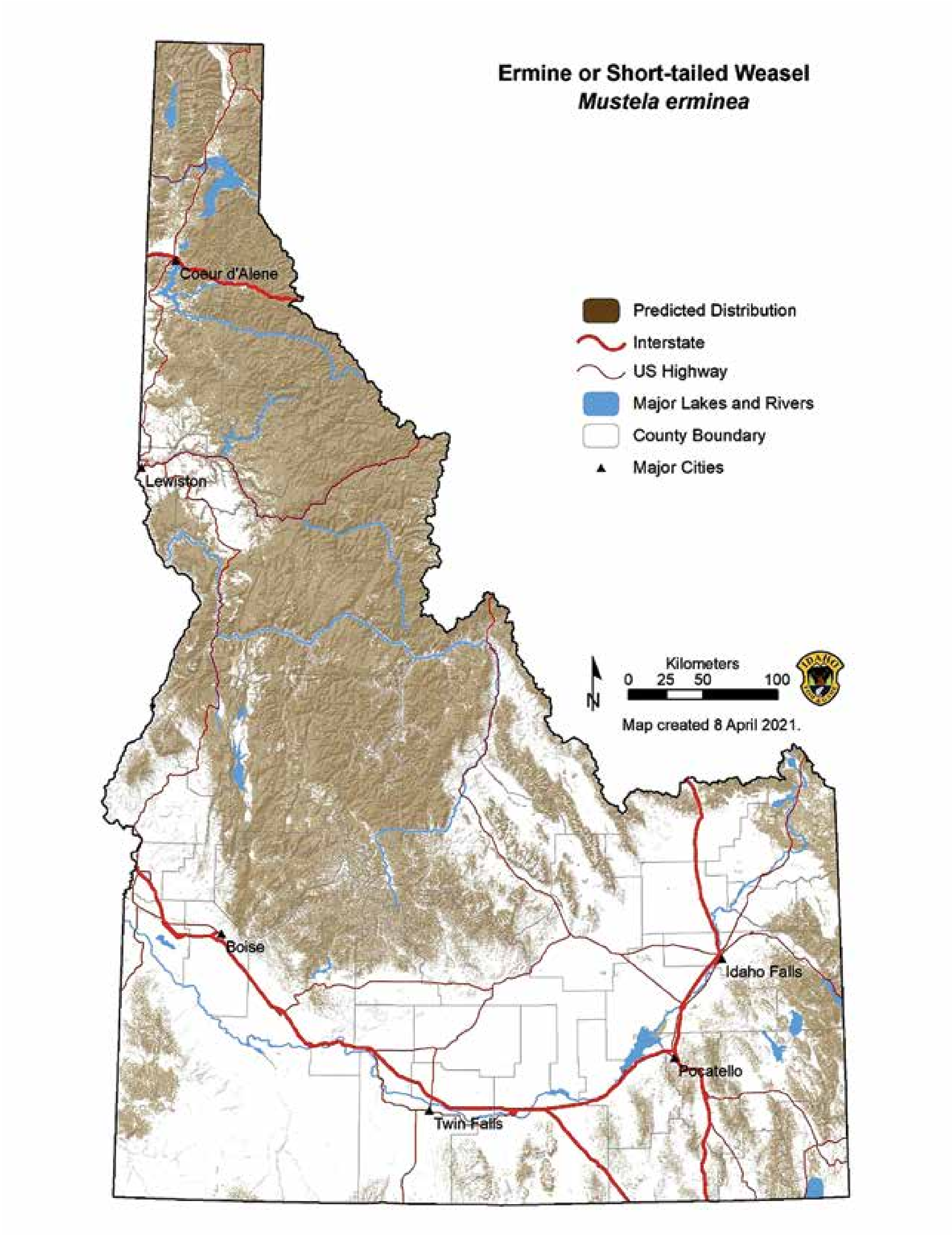

Figure 24. Predicted distribution of ermine (short-tailed weasel), Idaho, USA.

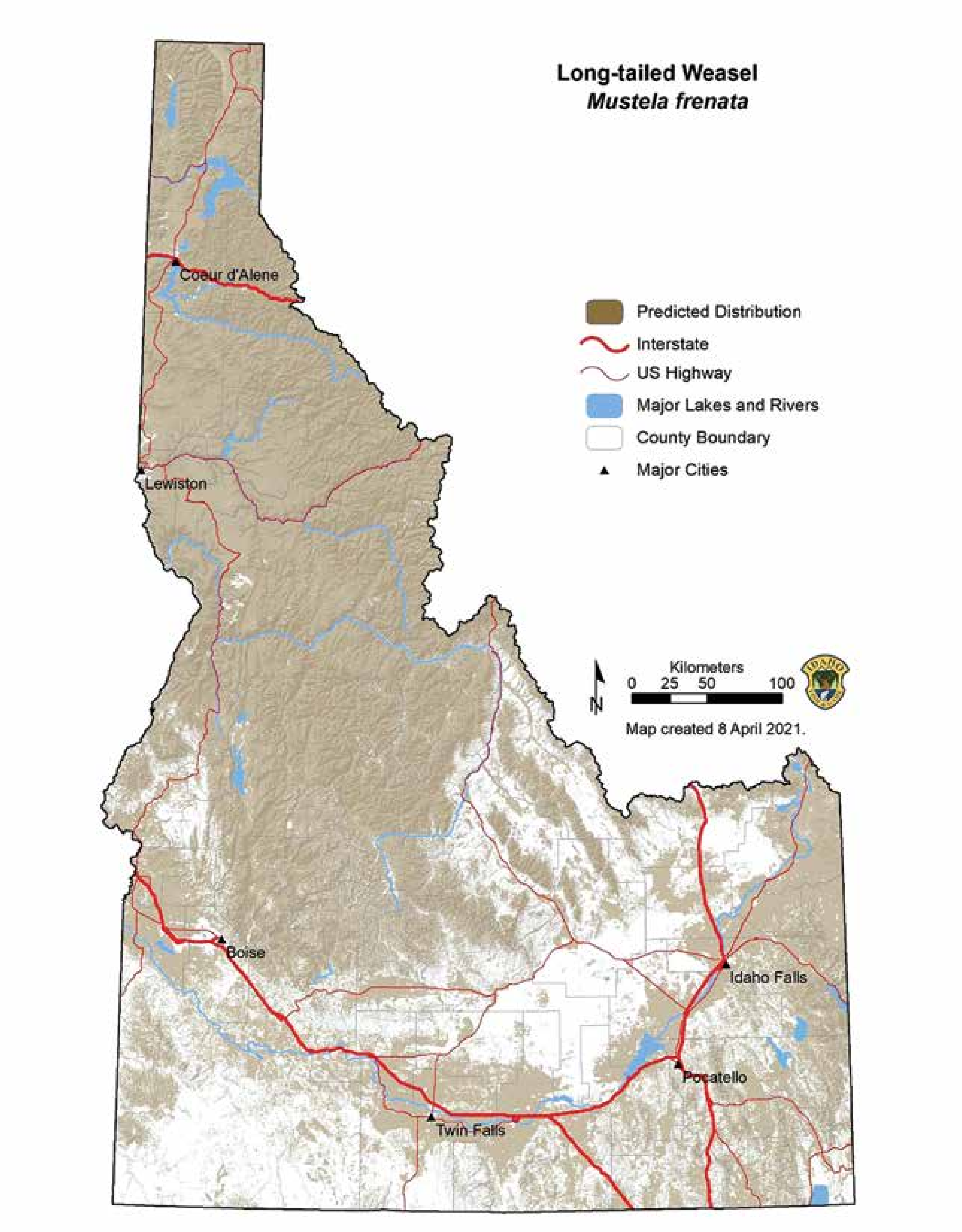

Figure 25. Predicted distribution of long-tailed weasel, Idaho, USA.

Mortality and Harvest

Predation by raptors occurs infrequently during most of the year, but increases in winter (Linnell et al. 2017b). Foxes and coyotes prey on weasels opportunistically.

Compared to larger mustelids, both species display high reproductive rates, breed at a young age, and exhibit high annual rates of mortality (≤50%, Sandell 1984). Ermine populations fluctuate widely, likely in conjunction with prey availability and weather events that impact kit survival. Although research on harvest management for weasels is lacking, ermine are generally considered resilient to harvest, and harvest rates tend to parallel population fluctuations. In contrast, long-tailed weasels are rarer, reproduce at lower rates, and exhibit higher rates of natural mortality.

To date, trappers have not been asked to distinguish between weasel species in harvest reports. Annual weasel harvest (138, Table A-2) and participation by trappers (44, Figure 26) are low. Currently, little commercial value exists for either species and most weasels are likely harvested as a secondary target while pursuing other species, such as marten.

Management Goals and Direction

Classification of both ermine and long-tailed weasel as predatory wildlife limits IDFG's ability to implement management strategies. Considering the amount of suitable habitat and low overall harvest, neither species is likely impacted by harvest.

Although both species are relatively understudied compared to other mammalian carnivores, some noteworthy conservation and information themes have evolved. Indications of rangewide declines of long-tailed weasel are a concern. Harvest records from Canada indicate a population decline since the 1930s, and several states list the species as one of special concern. Long-tailed weasel are currently the focus of research to investigate rangewide status.

Although not yet universally recognized by taxonomic authorities, recent genetic research separated ermine into 3 species (Colella et al. 2021). Advances in genetic research and breadth of application will likely lead to further revision of taxonomic relationships across a wide array of wildlife species.

Although we do not suspect current management is negatively impacting either weasel species in Idaho, concerns raised in other jurisdictions suggest IDFG would benefit from gathering additional information on status and distribution of both species.

Management Actions

- See Harvest Management and Population Monitoring section.

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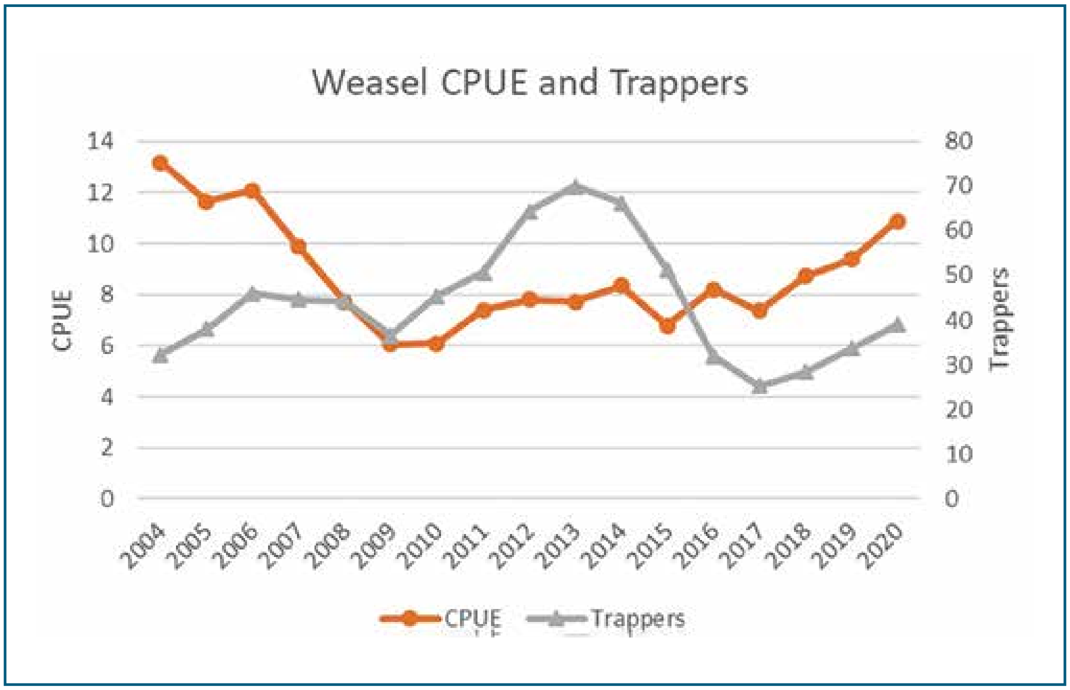

Figure 26. Three-year rolling average of annual weasel (short-tailed and long-tailed combined) captures/100 trap nights, and number of weasel trappers, 2004–2020, Idaho, USA.

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Appendix A:

Annual Trapping License Sales, Total Reported Harvest of Furbearers and Predatory Wildlife, and Trapping Participation by Species

The Department tracks harvest of most furbearers and predatory wildlife through Furtaker Harvest Reports. For anyone who purchases a trapping license, completion of this form is a prerequisite for purchasing a trapping license for the following year. Harvest reports include species taken by county, and after 2001, effort expended (trap-nights) by species. Furtaker reports only include information from licensed trappers. Because the Department does not collect data regarding harvest of species (other than bobcat) by hunters, estimates of harvest for species that can be hunted should be considered minimums. This system allows IDFG to determine how trapping participation for different species varies over time. For each species, the Department can estimate total harvest, spatial distribution of harvest, catch-per-unit-effort, trapper participation, and non-target captures.

Table A-1. Trapping license sales, 1994–2020, Idaho, USA.

	Licenses Sold					
Season	Adult resident	Junior resident	Total resident	Non-resident	Total sales	% Non-resident
1994-1995	na	na	748	10	758	1
1995-1996	na	na	638	7	645	1
1996-1997	na	na	779	7	786	1
1997-1998	740	130	870	12	882	2
1998-1999	612	110	722	14	736	2
1999-2000	451	98	549	9	558	2
2000-2001	504	97	601	6	607	1
2001-2002	546	91	637	10	647	2
2002-2003	690	126	816	8	824	1
2003-2004	835	130	965	8	973	1
2004-2005	871	137	1008	10	1018	1
2005-2006	858	131	989	12	1001	1
2006-2007	1042	132	1174	26	1200	2
2007-2008	1015	112	1127	23	1150	2
2008-2009	1091	112	1203	15	1218	1
2009-2010	992	111	1103	11	1114	1
2010-2011	1082	131	1213	9	1222	1
2011-2012	1568	171	1739	28	1767	2
2012-2013	1799	232	2031	26	2057	1
2013-2014	2117	253	2370	24	2394	1
2014-2015	1999	309	2308	31	2339	1
2015-2016	1771	248	2019	28	2047	1
2016-2017	1583	155	1738	21	1759	1
2017-2018	1627	169	1796	34	1830	2
2018-2019	1635	130	1765	28	1793	2
2019-2020	1861	155	2016	37	2053	2
2020-2021	2034	174	2208	38	2246	2

Table A-2. Annual reported furbearer harvest, 1994–2020, Idaho, USA.

Season[a]	Badger[b]	Beaver	Bobcat[b]	Coyote[b]	Marten	Mink
1994-1995	150	2462	na	1603	515	350
1995-1996	280	3675	407	2304	452	749
1996-1997	145	4041	na	1915	537	758
1997-1998	169	3529	925	1166	316	513
1998-1999	187	2164	711	1529	150	540
1999-2000	229	2290	879	1349	370	603
2000-2001	190	2829	1022	1674	289	582
2001-2002	285	2657	947	2638	775	763
2003-2004	297	2637	1976	4874	688	613
2004-2005	213	3399	1878	3728	1100	735
2005-2006	199	2950	1721	3061	813	971
2006-2007	487	2744	2402	4061	1437	1105
2007-2008	335	2965	1450	3588	1243	586
2008-2009	253	3066	1012	2544	1264	772
2009-2010	189	3069	962	2313	967	964
2010-2011	501	2728	1429	3097	1231	1078
2011-2012	290	2480	1669	4152	1751	925
2012-2013	245	3550	1564	4069	2234	1028
2013-2014	275	3545	1412	4755	2680	1101
2014-2015	160	2653	861	4080	1488	794
2015-2016	247	2172	908	4749	897	484
2016-2017	313	1583	897	3972	697	380
2017-2018	237	1878	1351	5167	974	599
2018-2019	232	1971	1247	5705	780	441
2019-2020	248	2153	974	5752	918	416
2020-2021	227	1977	822	4348	528	326

[a] Data for 2002–2003 season are not available.

[b] Species that are hunted and trapped.

Table A-2 (continued).

Season[a]	Muskrat	Raccoon[b]	Red fox[b]	River Otter	Striped Skunk[b]	Spotted skunk[b]	Weasel[b]
1994-1995	12498	614	2734	na	447	1	50
1995-1996	23954	968	2716	na	682	30	67
1996-1997	21055	849	2856	na	455	11	78
1997-1998	13903	656	1740	na	511	7	51
1998-1999	13741	540	1822	na	545	0	78
1999-2000	8841	709	1943	na	508	31	98
2000-2001	11190	931	1787	99	689	30	89
2001-2002	15522	1270	2785	82	999	26	93
2003-2004	8312	1347	2980	114	1096	36	140
2004-2005	11849	1287	2141	122	1173	39	178
2005-2006	14563	1158	1243	124	856	43	181
2006-2007	15973	1397	1469	119	760	75	201
2007-2008	9564	1326	1216	110	573	0	113
2008-2009	13819	1415	994	123	790	28	111
2009-2010	19026	1335	758	121	660	44	114
2010-2011	20876	1519	1043	120	809	22	267
2011-2012	21767	1432	1227	122	847	59	208
2012-2013	30821	1457	1292	161	742	78	293
2013-2014	34792	2054	1429	196	845	37	362
2014-2015	30397	1643	954	157	869	53	99
2015-2016	12321	889	740	150	795	17	121
2016-2017	9548	815	662	94	563	9	44
2017-2018	10085	882	914	126	1022	74	99
2018-2019	7705	879	909	134	1007	67	158
2019-2020	7722	1136	1236	119	988	71	148
2020-2021	6263	875	697	145	935	32	106

[a] Data for 2002–2003 season are not available.

[b] Species that are hunted and trapped.

Table A-3. Number of trappers by species, 1994–2020, Idaho, USA.

Season[a]	Badger[b]	Beaver	Bobcat[b]	Coyote[b]	Marten	Mink
1994-1995	39	169	68	156	38	82
1995-1996	48	261	99	196	35	133
1996-1997	46	293	120	210	34	144
1997-1998	36	247	101	151	28	112
1998-1999	44	211	107	149	15	92
1999-2000	51	195	111	153	37	95
2000-2001	52	213	109	154	33	111
2001-2002	57	282	201	252	52	147
2003-2004	61	307	346	387	52	137
2004-2005	74	282	298	275	55	140
2005-2006	65	284	253	238	49	144
2006-2007	92	276	282	283	83	158
2007-2008	83	283	263	267	94	134
2008-2009	71	330	217	241	108	163
2009-2010	53	328	198	216	86	170
2010-2011	74	316	254	256	89	196
2011-2012	76	333	362	387	105	189
2012-2013	60	446	446	482	177	244
2013-2014	83	508	499	571	220	279
2014-2015	59	426	331	469	137	187
2015-2016	69	351	254	448	116	131
2016-2017	64	275	196	325	82	103
2017-2018	45	298	297	410	102	110
2018-2019	57	321	296	452	101	110
2019-2020	83	357	272	542	120	114
2020-2021	69	334	235	464	84	102
26-yr average	62	305	239	313	82	143

[a] Data for 2002–2003 season are not available.

[b] Species that are hunted and trapped.

Table A-3 (continued).

Season[a]	Muskrat	Raccoon[b]	Red fox[b]	River otter	Spotted skunk[b]	Striped skunk[b]	Weasel[b]
1994-1995	156	123	168	na	1	64	19
1995-1996	277	183	198	na	8	93	30
1996-1997	277	193	228	na	5	76	31
1997-1998	212	143	143	na	4	92	20
1998-1999	180	135	140	na	0	86	26
1999-2000	156	144	141	41	12	73	26
2000-2001	188	168	152	45	11	94	27
2001-2002	210	228	234	74	135	11	24
2003-2004	233	276	289	68	125	13	40
2004-2005	222	209	209	71	10	99	40
2005-2006	222	192	156	64	12	95	39
2006-2007	267	219	197	53	22	97	57
2007-2008	218	217	197	65	0	99	38
2008-2009	254	236	162	75	10	110	38
2009-2010	291	217	146	61	10	90	33
2010-2011	316	246	168	60	8	105	62
2011-2012	362	258	205	58	15	107	50
2012-2013	509	302	270	75	21	106	71
2013-2014	617	375	287	96	14	151	77
2014-2015	471	297	191	103	17	132	42
2015-2016	327	209	156	85	5	107	30
2016-2017	238	168	146	52	6	78	23
2017-2018	260	193	168	61	12	108	23
2018-2019	230	199	181	75	16	127	37
2019-2020	235	220	231	82	15	160	38
2020-2021	207	223	170	78	12	168	36
26-yr average	274	214	190	69	19	98	38

[a] Data for 2002–2003 season are not available.

[b] Species that are hunted and trapped.

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