BIOLOGICAL ASSESSMENT

for

Wildlife Damage Management Activities in Idaho

ANALYSIS OF POTENTIAL IMPACTS
ON THREATENED and ENDANGERED SPECIES

Endangered Species Act, Section 7 Formal and Informal Consultation

United States Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Services
Boise, Idaho

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INTRODUCTION

Section 7 of the Endangered Species Act (ESA) of 1973, as amended, (16 USC 1531-1543) requires each Federal agency to ensure that its actions will not jeopardize the continued existence of listed species or destroy or modify such species' designated Critical Habitat. If one or more listed species are found within the area of a proposed action, then the agency must determine whether and how the action will affect such species. A "may affect" conclusion is appropriate when a proposed action may pose adverse or beneficial impacts on a listed species, or designated Critical Habitat or Essential Fish Habitat (EFH). When a "may affect, likely to adversely affect" conclusion is made, the federal agency must initiate formal consultation with the U.S. Fish and Wildlife Service (USFWS) and/or the National Oceanic and Atmospheric Administration - Fisheries (NOAA Fisheries) as appropriate. If a "may affect, not likely to adversely affect" conclusion is made, federal agencies conduct an informal consultation to obtain concurrence regarding the determination from the USFWS and/or NOAA Fisheries. When a "no effect" conclusion is made, there is no requirement to consult with the USFWS or NOAA Fisheries. This Biological Assessment (BA) contains an evaluation of the potential risks to federally listed species from wildlife damage management activities conducted by the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Idaho Wildlife Services (ID WS) program.

Wildlife damage management, a specialized field within the wildlife management profession, is the science of reducing damage or other problems caused by wildlife, and is recognized as an integral part of wildlife management (Berryman 1991, The Wildlife Society 1992). The Wildlife Services (WS) program is the Federal agency authorized by Congress to conduct wildlife damage management to protect American agricultural, industrial and natural resources, property and human health and safety from damage associated with wildlife (Act of March 2, 1931 as amended 46 Stat. 1486; 7 USC 426-426c). Wildlife Services is a cooperatively funded, service-oriented program that provides assistance to requesting public and private entities and government agencies. Wildlife Services responses to requests for assistance can be in the form of technical assistance or operational damage management depending on the complexity of the wildlife problem and the funding that is available. Before WS conducts any wildlife damage management, a request must be received and an *Agreement for Control* must be signed by the landowner/administrator for private lands or other comparable documents for public or tribal lands must be in place. Wildlife Services activities are conducted in accordance with applicable Federal, State, Tribal and local laws, Cooperative Agreements, "Agreements for Control", Memoranda of Understanding (MOUs), and other applicable documents (WS 2004*a*). These documents establish the need for the requested work, legal authorities and regulations allowing the requested work, and the responsibilities of WS and its cooperators.

This BA is comprised of 4 major sections: (1) Methods (Page 8, listed in Appendix A); (2) Conservation Measures (Page 41); Evaluation of Methods (Page 47); and Biological Assessments (Page 99). The literature cited is located in Appendix B.

The USFWS's July 28, 1992 programmatic Biological Opinion (BO) (USDI 1992), and March 28, 2002 Letter of Concurrence and BO on Canada lynx (*Lynx Canadensis)* (USFWS 2002*a*) are pertinent to this review, because ID WS is currently adhering to all applicable reasonable and prudent alternatives, and terms and conditions stipulated to preclude jeopardy and minimize the likelihood of any incidental take of a listed species.

DURATION OF THIS BIOLOGICAL ASSESSMENT

This BA will remain in effect indefinitely starting from the date of the letters of concurrence, unless (1) the amount or extent of incidental take is exceeded, (2) new information indicates ID WS' proposed action may affect listed species, critical habitat or EFH in a manner or to an extent not considered in this BA, (3) ID WS proposed action is subsequently modified in a manner that causes an effect to the listed species, critical habitat or EFH that was not considered in this BA, or (4) a new species is listed or critical habitat or EFH is designated that may be affected by the proposed action. This BA will be reviewed annually as part of ID WS' monitoring of state wildlife damage management environmental assessments (EAs).

ACTION AREA

The action area for this BA will consist of the entire State of Idaho for all ID WS activities.

METHODS

I. DESCRIPTION OF THE PROPOSED ACTION

The ID WS program, proposes to continue its statewide wildlife damage management (WDM) actions/projects[1]. The current program uses an Integrated Wildlife Damage Management (IWDM) approach, to apply practical and effective WDM methods sequentially or in combination for the prevention and reduction of damage and conflicts caused by wildlife, based on local problem analyses and the informed decisions of trained ID WS personnel. Site specific management plans are developed using the WS Decision Model (Figure 1) which considers a variety of biological and sociological factors including the potential for risks to federally-listed species (Slate et al. 1992). IWDM and the Decision Model allow ID WS personnel greater flexibility and more opportunity to tailor an effective damage management strategy for each problem that is encountered.

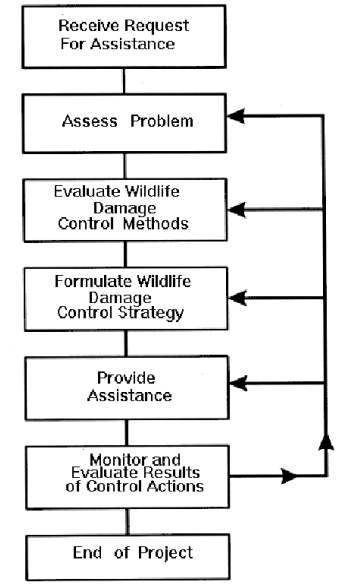

Figure 1. Wildlife Services Decision Model

Methods which may be used include: aerial operations (shooting, telemetry/surveillance and hazing), traps (foothold, quick-kill, corral, culvert, live/cage, bal-chatri, Swedish goshawk, perch pole), snares, registered pesticides (DRC-1339, zinc phosphide, Avitrol®, rodent/denning cartridges, aluminum phosphide, M-44 sodium cyanide and compound 1080 LP collar),

[1] For this analysis, a "project" is considered the use or implementation of wildlife damage management tools and/or techniques at a property until the damage is effectively alleviated or for a duration lasting no longer than one month.

immobilizing and euthanizing agents (Telazol®, potassium chloride and alpha-chloralose), firearms, calling (mouth, electronic and call box), hazing (propane cannons, pyrotechnics, remote controlled boat, laser, Radio Activated Guard call box (more commonly known as the "RAG" box), electronic guard), exclusion (electric fencing, fladry, barriers, netting, wire grids, fencing, sheathing and tree protectors), nets (cannon and rocket nets, hand nets, net guns, mist nets, bow nets), beaver dam removal methods (binary explosives, hand tools), water-level control devices, repellents (abrasives) and trained dogs. The analysis also considers potential risks associated with site use and access in areas with Federally-listed Threatened, Endangered, Proposed, and Candidate species.

The ID WS Program provides services (technical assistance or operational) to protect livestock, property, human health and safety, and natural resources from damage caused by a wide range of animal species. All ID WS management actions are conducted in accordance with applicable federal and state regulations (e.g., ESA, Migratory Bird Treaty Act). The ID WS program has addressed damage and conflicts caused by the following species:

A. Mammals

Carnivores: mountain lion (*Felis concolor*), bobcat (*Felis rufus*), black bear (*Ursus americanus*), grizzly bear (*Ursus arctos horribilis*), gray wolf (*Canis lupus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), badger (*Taxidea taxus*), striped skunk (*Mephitis mephitis*), mink (*Mustela vison*), weasel (*Mustela ermine* and *M. frenata*), river otter (*Lutra canadensis*);

Ungulates: elk (*Cervus elaphus*), white-tailed deer (*Odocoileus virginianus*), mule deer (*Odocoileus hemionus*);

Rodents: porcupine (*Erethizon dorsatum*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), fox squirrel (*Sciurus niger*), yellow-bellied marmot (*Marmota flaviventris*), woodchuck (*Marmota monax*), pocket gopher (*Thomomys spp.*), ground squirrel (*Ammospermophis leucurus, Spermophilus mollis idahoensis, S. m. mollis, S. m. artemisiae, S. armatus, S. columbianus, S. elegans* and *S. beldingi, S. lateralis, S. Canus*), vole (*Microtus, Clethrionomys, Phenacomys and Lemmiscus* spp), bushy-tailed woodrat (*Neotoma cinerea*), deer mouse (*Peromyscus maniculatus*);

Other Native Mammals: white-tailed jackrabbit (*Lepus townsendii*), black-tailed jackrabbit (*Lepus californicus*), little brown bat (*Myotis lucifugus*),

Non-native/Invasive Species: nutria (*Myocastor coypus*), feral cat (*Felis catus*), feral dog (*Canis canis*), feral swine (*Sus scrofa*), Norway rat (*Rattus norvegicus*), house mouse (*Mus musculus*), fox squirrel (*Sciurus niger*),

B. Birds[2]

Waterfowl: gadwall (*Anas strepera*), Northern pintail (*Anas acuta*), Northern shoveler (*Anas clypeata*), redhead (*Aythya americana*), ruddy duck (*Oxyura jamaicensis*), cinnamon teal (*Anas*

[2] Any take of migratory birds would be conducted in compliance with applicable USFWS permits.

cyanoptera), mallard (*Anas platyrhynchos*), green-winged teal (*Anas crecca*), blue-winged teal (*Anas discors*), wood duck (*Aix sponsa*), American widgeon (*Anas americana*), American coot (*Fulica americana*)), Canada goose (*Branta canadensis*), greater white-fronted goose (*Anser albifrons*), snow goose (*Chen caerulescens*),

Gallinaceous Birds: captive chukar (*Alectoris chukar*), captive bobwhite quail (*Colinus virginianus*), captive ring-necked pheasant (*Phasianus colchicus*), wild turkey (*Meleagris gallopavo*),

Pelicaniformes: American white pelican (*Pelecanus erythrorhynchos*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), black-crowned night heron (*Nycticorax nycticorax*), snowy egret (*Egretta thula*), green heron (*Butorides virescens*);

Raptors: red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsoni*), American kestrel (*Falco sparverius*), bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), great horned owl (*Bubo virginianus*), burrowing owl (*Athene cunicularia*), turkey vulture (*Cathartes aura*);

Gulls: California gull (*Larus californicus*), herring gull (*Larus argentatus*), ring-billed gull (*Larus delawarensis*);

Passerines: Brewer's blackbird (*Euphagus cyanocephalus*), red-winged blackbird (*Agelaius phoeniceus*), yellow-headed blackbird (*Xanthocephalus xanthocephalus*), common grackle (*Quisalus quiscula*), brown-headed cowbird (*Molothrus ater*), American crow (*Corvus brachyrhynchos*), common raven (*Corvus corax*), black-billed magpie (*Pica pica*), cliff swallow (*Hirundo pyrrhonota*), barn swallow (*Hirundo rustica*), American robin (*Turdus migratorius*),

Other Native Birds: double-crested cormorant (*Phalacrocorax auritus*), belted kingfisher (*Megaceryle alcyon*), sandhill crane (*Grus canadensis*), northern flicker (*Colaptes auratus*), pileated woodpecker (*Dryocopus pileatus*);

Non-native/Invasive Species: house sparrow (*Passer domesticus*), European starling (*Sturnus vulgaris*). rock dove (*Columba livia*), Eurasian collared dove (*Streptoplia decaocto*);

C. Reptiles

Garter snake (*Thamhophis* spp.), western (north pacific) rattlesnake (*Crotalus viridis oreganus*), and bullsnake (*Pituophis melanoleucus sayi*).

WDM activities may be conducted on additional species as requested but any WDM activities will only utilize the methods described in this document. If new or additional methods not covered in this Section 7 are to be utilized, a separate ESA review will occur at that time.

II. MECHANICAL CAPTURE and MANAGEMENT METHODS/DEVICES

Idaho WS is exempted from Idaho Department of Fish and Game (IDFG) trap check requirements referenced in IDFG (2011). Idaho WS adheres to a mandatory weekly trap check unless indicated otherwise (WS 1994 and WS 2004*b*).

A. Cage-Live Capture Style Traps

1. Small Cage Trap

Small cage traps are widely used by ID WS (up to 200 projects annually) for capturing small mammals such as skunks, feral cats, raccoons, yellow-bellied marmots, fox squirrels and ground squirrels. Cage traps vary in size and shape depending on the species being targeted with the largest for small mammals measuring 12"x12"x36". Typically they are made of welded wire or plastic, utilize a treadle type trigger system and close with a spring or gravity door. Cage traps are selected for each damaging species by size, which can help limit non-target catches by physically excluding them from the trap. Traps are set near signs of damage or near known travel areas. Cage traps are almost always baited and when appropriate, baits are usually species-specific. At times, cage traps are placed over known entrances or exits of structures receiving damage. In these situations, baiting is unnecessary as the only movement path available for the offending animal is enclosed by the trap. Cage traps are easily transported and they may be utilized in all weather conditions. Small cage traps set by ID WS are checked daily by WS personnel, the landowner/manager or their designated agent.

Cage traps are primarily utilized near homes and outbuildings in urban/suburban areas but may also be used in rural locations. Non-target animals are generally released with little or no injury and target animals are euthanized, released on site (e.g., disease surveillance or population monitoring), or relocated as appropriate.

2. Large Cage Trap

Large cage traps are occasionally used by ID WS (up to 20 projects annually) for the capture of coyotes, red foxes, feral dogs, feral swine and mountain lions. We define large cage traps as any cage trap larger than 12" x 12" x 36", but not culvert traps. Large cage traps vary in size and shape depending on the species being targeted. Coyote-size cage traps are made of welded wire, uses a treadle type trigger system and close with a spring or gravity door. Large cage traps for the more powerful animals are typically made of commercial livestock panels made of 3/16" galvanized welded rods. The top, sides, front and bottom panels are welded together and panel openings are approximately 2" x 4". These cage traps may have a treadle type trigger and a single-catch or multi-catch gravity door and can easily be transported by vehicle. Idaho WS implements a daily trap check for all large cage traps with multiple trap checks per day occurring in most situations.

Large cage traps are primarily used in urban/suburban settings where other traps and control methods (*i.e.*, foothold traps, foot and neck snares, shooting, M-44s, etc.) are restricted, impractical or unsafe to use. Non-target animals are generally released with little or no injury and target animals are euthanized, released on site (e.g., disease surveillance or population monitoring), or relocated as appropriate.

3. Culvert Trap

Culvert traps are a type of large cage trap with differing trigger systems, gravity doors, constructed of solid material as compared to welded wire or livestock panels used in large cage traps, and are on a wheeled platform or trailer for transport. Idaho WS rarely use this type of trap (zero to 5 projects annually) when dealing with nuisance black bear problems or livestock depredation. Due to the size and weight of most culvert traps, they

are primarily restricted for use near roadways, although models exist that may be disassembled and reconstructed in remote areas. Depending on the nature of the damage problem, culvert traps may be baited with the carcass of livestock that was killed by the target bear. Baits similar to those attracting nuisance/human health and safety bears may also be used. Idaho WS implements a daily trap check for all large cage traps including culvert traps, including any culvert traps set for black bears in areas occupied by grizzly bears.

Culvert traps are primarily used in rural and remote areas of private and public lands, including agricultural lands and forested areas. Culvert traps may also be used in campgrounds and resort areas. , campgrounds and resort areas. Non-target animals are generally released with little or no injury and target animals are usually euthanized or relocated as appropriate.

4. Avian Cage Trap

These types of traps are commonly used by ID WS (up to 100 projects annually) to capture waterfowl and nuisance birds. Walk-in cage traps are typically made of welded wire and have multiple gravity doors and are baited with grain. These traps vary in size, but are typically 12" x 24" x 48". Walk-in traps are primarily used to capture rock doves (pigeon) and house sparrows in urban environments. Swedish goshawk traps are used to capture raptors and are baited with live rodents or live birds as an attractant to raptors. Drop-in traps are large (36" x 36" x 48" up to 4' x 6' x 8') traps made form welded wire or "chicken wire" which utilize grain baits or other preferred baits to draw birds to the trap. Starlings, black-billed magpies and crows enter open slots on the top of the trap to gain access to the bait, but they are unable to exit the trap due to needed flight requirements (birds in flight are larger than openings). We are also including swim-in traps in the avian cage trap category. Swim-in traps consist of 48" tall welded wire (typically with 1" x 1" openings) in a circular or X shaped design with a funnel opening. The top consists of soft netting stretched to all the sides to which it is attached, forming the enclosure. Swim-in traps are commonly baited with grain. Bird cage traps set by WS are checked daily by WS personnel, the landowner/manager or their designated agent. Animals maintained in avian cage traps as "decoys" are provided adequate food and water (WS 2004*b*).

Non-target animals are usually released with little or no injury, however, in nationwide applications of this method some non-target bird mortality has occurred, usually because of trap stress or because a predator has entered the trap. Target animals will be euthanized, released on site (e.g., disease surveillance or population monitoring), or relocated as appropriate. These traps are primarily used in urban settings around residential homes, business buildings, at airports, both urban and rural waterways (*i.e.*, ponds, rivers, creeks, lakes, etc.), and near vegetable and fruit crops.

5. Corral Trap

Corral traps are occasionally used by ID WS (up to 20 projects annually) to capture feral swine and Canada geese. Corral traps used for feral swine are constructed from 48" commercial livestock panels made of 3/16" galvanized welded rods. The panels are placed in a circular fashion and supported by T-stakes and the entrance is baited for the targeted species (typically soured or whole kernel corn). These traps may have a single catch, multi-catch or gravity door. These may be multiple catch traps, allowing

additional animals to enter the trap even after the trap has been triggered. Non-target animals are able to easily escape feral swine corral traps as they do not have an enclosed top and smaller animals can usually pass through the openings in the panels.

Corral traps used for Canada geese are made of various materials but the basic premise is to create a large funnel with a holding pen in the back of the trap. The wings (sides) of the trap are used to guide molting Canada geese to the catch pen, which is closed by hand. Idaho WS personnel physically guide the targeted Canada geese into the trap; therefore they are 100 % selective. These traps may also be used for flight-capable birds in limited situations.

When these traps are used to target feral swine they are placed in rural areas on private or public lands where damage is occurring or in remote areas where swine routinely travel or feed. When used for waterfowl, they are primarily placed in both urban and rural areas near waterways (i.e., ponds, rivers, creeks, lakes, etc.) where damage is occurring or where the birds congregate, loaf, feed or visit. Target animals may be released on site (e.g., disease surveillance or research projects), relocated or euthanized.

B. Quick-Kill/Body Gripping Traps

Quick-kill traps are frequently used by ID WS (more than 200 projects annually, but not daily) to capture woodpeckers and various mammals. Quick-Kill traps come in a variety of styles, including body-gripping, snap, gopher and mole traps. The body-gripping trap is lightweight, easily set and consists of a pair of rectangular wire frames that close when triggered, killing the captured animal with a quick body blow. The most commonly used trap is the Conibear® which is set in waterways to lethally take beaver. When applied for this use, the traps are set underwater in the entrances of beaver lodges, in underwater travel corridors, or near areas where a beaver dam has been purposely breached. Body-gripping traps set to capture muskrat are used mostly in shallow water den entrances or underwater travel corridors. Smaller body-gripping traps (jaw spread less than 8 inches) can be used on land in trees and buildings for a variety of animals (*i.e.* yellow-bellied marmots, skunks and fox squirrels). WS policy prohibits the use of body-gripping traps with a jaw spread exceeding 8 inches for land sets (WS 2004*b*). Smaller-sized traps may also be set in the entrance of a wooden box or other structure having food or bait placed inside so the animal will trigger the trap when attempting to access the bait.

Quick-kill traps set for beaver, muskrat and woodpeckers may be used in both urban and rural areas and set types generally preclude non-target animals from capture. Quick-kill traps set for other mammals are primarily used in rural areas, limiting non-target animal trap exposure. Quick-kill traps are lethal to both target and non-target animals.

C. Basket-Type Traps

Hancock traps and basket or purse type traps are designed to live-capture beaver which are relocated and released, or euthanized. However, these traps are rarely used by ID WS (zero to 5 projects annually) for damage management activities. The traps are constructed of a metal frame hinged with springs and covered with chain-link fence. When set, the trap is opened to allow an animal to enter and, when tripped, the metal frame closes like a suitcase around the animal. One advantage of using the basket-type trap is the ease in releasing the beaver or non-target animals. The disadvantages of this type of trap are: 1) expense (*i.e.*, approximately $400 per trap);

2) weight (*i.e*., weigh approximately 25 pounds); 3) difficulty in setting; and 4) danger to the individual (such that the person setting could be injured as described by Miller and Yarrow (1994)).

This type of trap would not be a threat to fish species because (1) the trigger mechanism requires a substantial amount of "downward" pressure or "pull" to be applied, much more than a fish could exert, in order to spring the trap, (2) traps are set in very shallow water where medium and large fish would most likely not be present, and (3) small fish or fry that potentially might be inside a trap when it closes can easily escape through the chain-link fence covering.

These styles of traps are set in the shallows of waterways (*i.e*., ponds, rivers, creeks, lakes, etc.) near or on the shoreline or bank so that a captured beaver would always have access to air. They are not set underwater where a triggered trap would be totally submersed in water. Basket-type traps are live capture traps and, when set by ID WS, they are checked daily by ID WS personnel, the landowner or their designated agent.

These traps are primarily used in rural areas, but can be set in urban areas as long as they do not present a hazard to pets or children. Beaver captured in Hancock traps may be relocated or euthanized.

D. Foothold Traps

Foothold traps are versatile and used extensively by ID WS (daily) for capturing numerous species, and are an indispensable tool for resolving many predator damage management (PDM) situations. Traps placed in the travel lanes of target animals, using location to determine trap placement rather than attractants, are known as "blind sets." More frequently, traps are placed as "baited" or "scented" sets. These trap sets use an olfactory attractant, such as fetid meat, urine, or musk/gland oils to attract the animal. Two advantages of the foothold trap are: (l) they can be set under a wide variety of situations, and (2) non-target captures can generally be released unharmed or relocated. Disadvantages of using foothold traps include the difficulty of keeping them in operation during rain, snow, or freezing weather.

Foothold traps set for coyotes, red foxes, bobcats (i.e., Victor SoftCatch #3 or equivalent) and similar sized animals are either staked to the ground securely, attached to a solid structure (*i.e.,* tree trunk, heavy fence post), or used with a drag that becomes entangled in brush, trees or rocks to prevent trapped animals from escaping. Foothold traps set for wolves or mountain lions (i.e., Livestock Protection Company #7, MB-750 Wolf or equivalent) are either equipped with drags or attached to a very heavy object (*i.e.,* log) to prevent the animal from escaping. All of these anchoring systems should provide enough resistance that an unintentionally captured grizzly bear should be able to either pull its foot free from the trap or hold the animal to prevent it from escaping with the trap on its foot.

The type of set and attractant used significantly influences both capture efficiency and risks of catching non-target animals. Effective trap placement and the use of appropriate lures by trained personnel contribute to the foothold trap's selectivity. WS program policy prohibits placement of traps or snares within 30 feet of a draw station to prevent the capture of non-target scavenging birds. The only exceptions to this policy are when setting foothold traps or snares to capture bears or mountain lions returning to a kill (the weight of the target animal allows trap pan-tension adjustments which precludes the capture of lighter scavenging animals), and when modified foothold traps are set next to carcasses to capture raptors under USFWS permits.

Foothold traps are typically set on dry land in rural areas of private and public lands to capture coyotes, foxes, bobcats, wolves and mountain lions. They are placed in or near travel ways of target species or near where depredations have occurred. These traps can also be used in rural areas in waterways (*i.e.*, streams, creeks, ponds, etc.) for capturing beavers or other aquatic mammals. Non-target animals with no or minor injuries are released, but if the animal is deemed unlikely to survive on its own, it is usually euthanized. In the event of a non-target capture of a grizzly bear and lynx, WS will coordinate with the USFWS as early as is practicable regarding the final disposition of the animal (e.g., radio-collar and release).

Trap check frequency: WS employees using foothold traps will check traps weekly or sooner. In habitats inhabited by grizzly bears or lynx, foothold traps will be checked at least daily.

E. Padded-Jaw Pole Traps

Padded-jaw pole traps are rarely used by ID WS (zero to 5 projects annually). Padded-jaw pole traps are modified No. 0 or 1 coil spring foothold traps with weakened springs used to capture raptors. The traps are placed on top of poles or roosting spots frequented by targeted birds and the traps are attached to a slide wire so any captured animals can reach and rest on the ground after captured. Pole traps are utilized to protect human health and safety on and near airports and for the protection of backyard poultry flocks. Pole traps are monitored in accordance with the most current USFWS Depredation Permit issued to ID WS.

These traps are primarily used at airports, but are also sometimes used in rural settings on private property to address depredation on poultry or other small animals. Pole traps are live-capture traps. Captured raptors are relocated or euthanized. Non-target animals captured are released.

F. Foot/Leg Snares

The foot or leg snare is a non-lethal device activated when an animal places its foot on the "throwing-arm" trigger. Foot or leg snares are used occasionally (up to 20 projects annually) for PDM activities. When triggered, the spring-activated snare tightens around the leg and holds the animal. Foot snares are used most effectively to capture grizzly bears, black bears, mountain lions and wolves. This method is primarily used to take larger predators and the amount of weight required to trigger the throwing arm can be increased by use of a pan-tension device. By increasing the pressure, this type of foot snare can effectively exclude smaller animals from being captured while allowing the capture of the target species. Idaho WS requires a daily trap check of any foot snares set for black bears or lions in areas occupied by grizzly bears (USFWS 2002*a*).

Foot/leg snares are typically set on land in rural areas of private and public lands to capture grizzly bears, black bears and mountain lions. If the ID WS program uses foot snares for wolves, they would be set in similar locations. They are placed in or near travel ways of target species or near where depredations have occurred. Target animals will be euthanized, released on site (e.g., disease surveillance or population monitoring), or relocated as appropriate. Non-target animals with no or minor injuries are released, but if the animal is deemed unlikely to survive on its own, it is usually euthanized. In the event of a non-target capture of a grizzly bear and lynx, WS will coordinate with the USFWS as early as is practicable regarding the final disposition of the animal (e.g., radio-collar and release).

Foot/leg snare check frequency: WS employees using foot/leg snares will check the snares weekly or sooner. In habitats inhabited by grizzly bears or lynx, snares will be checked at least daily.

G. Neck/Body Snares

Neck/body snares are used extensively by ID WS (daily) to capture a variety of species (*i.e.,* coyotes, red foxes, beavers, feral swine and wolves). Snares offer several advantages over foothold traps by: l) being lighter to transport or carry, 2) not being as affected by inclement weather, and 3) often being easier to set. Snares can be used effectively wherever a target animal moves through a restricted lane of travel (*i.e.,* "crawls" under fences, trails through vegetation, or "pen" entrances). When an animal moves forward through the snare loop, the noose tightens, and the animal is held. The use of breakaway locks or stops is encouraged when livestock, deer, or other large animals may be exposed to snare sets (WS 2004*b*). The Collarum® is another snare device used to capture canines. When triggered, the Collarum® throws a snare around the head of the animal and acts as an animal restraint device. A stop on the device limits loop closure. The device trigger is specifically designed in which only canines, with a pulling motion, can set off the device.

Idaho WS currently does not set neck snares or Collarms® for gray wolves, coyotes, black bears, or mountain lions in areas occupied by grizzly bears from March15 to December 1. Neck snares may be used from December 1 to March 15 in occupied grizzly bear habitat with special restrictions which applies for *Rangifer tarandus caribou* (Selkirk Mountains woodland caribou (SMWC)) and Canada lynx.

Neck/body snares are typically set on land in rural areas of private and public lands to capture coyotes, foxes, bobcats, wolves and mountain lions. They are placed in or near travel ways of target species or near where depredations have occurred. These snares can also be used in rural areas in waterways (*i.e.,* streams, creeks, ponds, etc.) for capturing beavers or other aquatic mammals. Snares may be used as lethal or live-capture devices depending on how and where they are set. Snares set to capture an animal by the neck are usually lethal unless a stop is used to limit the closure on the snare. Neck snares set for bear in "bear pens" where confirmed bear kills are placed can be a lethal device. Collarums® may be set for coyotes in both urban and rural areas. When trapped target animals are to be lethally removed, they are euthanized. Non-target animals with no or minor injuries are released, but if the animal is deemed unlikely to survive on its own, it is usually euthanized. In the event of a non-target capture of a grizzly bear and lynx, WS will coordinate with the USFWS as early as is practicable regarding the final disposition of the animal (e.g., radio-collar and release).

Neck/body snare check frequency: WS employees using neck/body snares will check the snares weekly or sooner. In habitats occupied by grizzly bears or lynx within Idaho, snares will be checked at least daily and restricted to between December 1 and March 15 and, within the Southern Mountain Caribou Recovery Zone, to areas below 4,500 feet in elevation.

H. Raptor Traps

Raptor traps are rarely used by ID WS (zero to 5 projects annually). Raptor Traps come in a variety of styles such as the bal-chatri and purse traps. These traps have been used by WS at airports to remove raptors from the airfield and from areas around nesting Threatened or Endangered (T/E) shorebirds. They have also been used to reduce predation on poultry or other small animals and in situations where aggressive nesting birds are a safety concern.

These traps are primarily used at airports where the presence of raptors or other large birds threaten the safety of aircraft, but may also be used in rural settings near buildings to address predation problems or safety concerns. Raptor traps are live-capture traps. Captured raptors are

relocated or euthanized. Any non-target animals captured are released. All raptor trapping activities are conducted in in accordance with the most current USFWS Depredation Permit issued to ID WS.

I. Aerial Operations

Aerial operations occur on both private and public lands. All aerial operations conform to WS Aviation Rules (WS 2009*a).*

1. Shooting

Aerial shooting from aircraft (both fixed-wing and helicopter) is an extensively (daily) used wolf, coyote, red fox and feral swine damage management method. Aerial shooting consists of visually sighting target animals in the problem area and shooting them with a firearm from an aircraft. Aerial shooting is species-specific and can be used for immediate damage relief, providing weather, topography and ground cover conditions are favorable. However, there is an inherent risk to the crewmembers. Aerial shooting can be effective in removing offending animals which have become "trap-shy" and/or are not susceptible to calling and shooting or other methods. This method may also be used to reduce local coyote or red fox predations in lambing and calving areas with a history of predation. Wagner (1997) found that aerial shooting may pose fewer risks to non-target animals than use of traps or snares and minimize contact between damage management operations and recreationists.

Aerial shooting is used on all lands where authorized by the landowner/manager and deemed appropriate by ID WS. Aerial shooting is virtually 100 % selective for target species due to visual identification and it is a lethal control activity.

2. Telemetry/Surveillance

Aerial telemetry/surveillance flights with both fixed-wing and helicopters are used commonly by ID WS (up to 100 projects annually). These flights may be used by ID WS to locate animals wearing radio transmitter collars or similar devices; search for coyote dens, feral swine, the location of remote camp sites or livestock. In Idaho, telemetry/surveillance flights are primarily utilized to locate radio-collared animals that may be implicated in a reported depredation event. These flights are also used to monitor wildlife populations.

Idaho WS' aircraft also assist other agencies with the capture and collaring of wolves by acting as a spotter plane. This simply entails spotting and tracking wolves in a known work area and then directing the capture and collaring aircraft to the animals for capture.

3. Hazing

Idaho WS' fixed winged aircraft are occasionally used (up to 20 projects annually) to haze elk damaging private hay fields or other property. Aircraft with sirens conduct multiple low-level flights in a manner that moves the elk in a desired direction away from the hay fields/property.

J. Ground Shooting

Ground shooting with pellet, center and rim fire rifles, and shotguns is extensively (daily) used by ID WS. Ground shooting is virtually 100 % selective for target species and is a useful and effective WDM method. Ground shooting is frequently used in conjunction with the use of spotlights, night-vision imaging devices, decoy dogs, predator calling and stalking. Ground shooting may occur over carcasses or bait piles for predator damage management, disease management or population management activities. Shooting is sometimes the only WDM option available, if other factors preclude the use of capture equipment or other methods.

Ground shooting is an integral facet of predator calling. Trap-wise coyotes or red fox, while difficult to trap, are often vulnerable to calling. Shooting can be selective for offending individuals and has the advantage that it can be directed at specific damage situations.

Shooting is only applied in situations where it can be exercised safely and where permitted. The majority of shooting occurs in rural areas of both private and public lands and directed towards coyotes, but occasionally used in urban areas to remove individual birds (*i.e.*, northern flickers, European starlings, feral pigeons, etc.), big game species and at airports for the protection of human health and safety. Shooting is virtually 100 % selective for target species because the identity of the animal is confirmed before the shot is taken.

K. Calling

Calling is used in conjunction with shooting and trapping and is frequently used by ID WS (more than 200 projects annually, but not daily) for WDM. Calling consists of using voice, mouth, handheld or electronic calls to draw predators into an area. Calling is often used to draw predators into firearm range, while call boxes, electronic devices meant for extended stationary use, are utilized to attract predators to trap site locations. Call boxes are simply an additional means of increasing exposure of targeted predators to other trapping devices. Calling may also be utilized to locate predators for the application of other WDM activities (ie. gas cartridges, placement of M-44's).

Calling occurs on both private and public lands. Calling and shooting is normally animal-specific, with take only occurring after the target animal has been visually sighted and identified by ID WS personnel. This virtually eliminates any take of non-target animals. Risks to and fate of target and non-target animals from the use of call boxes with capture devices is as described above for each of the capture devices.

L. Trained Dogs

Hunting/trailing dogs are frequently used by ID WS (more than 200 projects annually, but not daily) for coyote, mountain lions, feral swine and bear damage management activities. Trained dogs are used to find coyote dens, decoy coyotes and to pursue problem animals. Dogs are essential to the successful tracking and capture of problem mountain lions, feral swine and bear to alleviate livestock depredation, property damage, threats to wildlife resources or public health and safety threats. Tracking dogs are trained to follow the scent of target species. If the track of the target species is not too old, the dogs can follow the trail and "tree" the animal which will usually seek refuge up a tree, in a thicket on the ground, or in a hole. The dogs stay with the animal until the ID WS employee arrives and dispatches, tranquilizes, or releases the "treed" species, depending on the situation. A possibility exists that dogs will switch to a fresher trail of a non-target species while pursuing the target species. If trained dogs are being used to decoy or pursue

target animals and it was determined from foot prints or other evidence from of the animal that they were following the scent of a non-target animal, the dogs are removed from the track as soon as possible. Trained dogs are especially effective in alerting their owners to sites where equipment may be effective by indicating where coyotes or other predators have traveled, urinated or defecated. Trained dogs are also valuable in luring adult coyotes within shooting distance, as well as locating coyote dens for the application of other wildlife damage management techniques.

Use of trained dogs occurs on both private and public lands, typically in rural settings.

M. Glue Boards and Glue Trays

Glue boards or trays are rarely used by ID WS (zero to 5 projects annually) to target commensal rodents. Glue boards, however, have been successfully used to capture rattlesnakes in human dwellings (Knight 1983). Glue boards are constructed with a thin layer of glue, varying from 1 to 2 mm in thickness, mechanically applied to a cardboard or plastic platform, while glue trays are normally constructed of plastic and filled with glue to a thickness of 4 to 6 mm (Corrigan 1998). Glue boards and trays come in various sizes from 3" x 6" (*i.e*., mouse size intended for household use for single catches) to 12" x 24" (*i.e*., industrial size intended for multiple catches).

Glue boards are typically used inside structures) to capture rodents damaging property or creating a human health and safety risks. However, the Rural Development, Agriculture, and Related Agencies Appropriations Act prohibits the WS program from conducting urban rodent control. Consequently, WS use of this method would be limited to barns, sheds or other structures in rural areas and disease surveillance in urban and rural areas. Captured commensal rodents are normally euthanized while still attached to the glue, and the board or tray and rodent(s) are disposed of. Non-target animals can be released from the glue boards by applying an oil-based liquid (*i.e*., vegetable oil) to the fur or skin that is attached to the glue.

Glue boards/trays are typically used in rural areas in barns, sheds or other structures.

N. Cannon and Rocket Nets

Idaho WS rarely uses cannon and rocket nets (zero to 5 projects annually) to capture waterfowl, feral pigeons or other birds. Cannons use mortar projectiles or compressed air to propel a net up and over animals that have been baited to a particular site. The devices can capture non-target animals (e.g., a non-target bird in a mixed flock of birds). However, the devices are triggered by an individual who is observing the site and they are not triggered if federally-listed species are at risk of capture in the device.

Cannon and rocket nets may be used in both urban and rural areas of both private and public lands near where waterfowl or other target birds congregate, loaf, visit or feed; or near areas where damage is occurring (*i.e.*, grain crops). Target animals may be euthanized, released on site (e.g., disease surveillance) or relocated, and non-target animals are released on site. Although rare, target/non-target animals may be injured or killed with the use of cannon/rocket nets. Non-target animals with minor injuries are released, but if the animal is deemed unlikely to survive on its own, it is usually euthanized.

O. Net Gun

Net guns are rarely used by ID WS (zero to 5 projects annually) to capture predators, ungulates, waterfowl, and other birds from aircraft and on the ground. The net, with weighted projectiles attached to each corner, is shot from a gun or device with multiple divergent barrels, allowing the net to spread out and envelop the animal up to approximately 20 yards away.

Net guns can be used in rural and urban situations and discharged from the ground or from a helicopter or other moving vehicle. Net guns are an animal-specific, live-capture technique, with target animals typically released unharmed.

P. Mist Net

Mist nets are rarely used by ID WS (zero to five projects annually) for bird or bat capture efforts. Mist nets are very fine mesh netting used to capture small to medium sized birds. Net mesh size determines which birds can be caught. The net is nearly invisible when in place. Birds which fly into the net are entangled in overlapping pockets in the net (Day et al. 1980). These nets can be used for capturing small birds, such as house sparrows and finches (*Carpodacus* spp.), entrapped in warehouses and other structures, to capture nuisance birds entering or exiting structures, and to live-capture birds and bats for disease surveillance. Mist nets can also be used to capture larger birds such as blackbirds and European starlings when they are going to a roost or feeding area.

Mist nets can be used in rural or urban situations on both private and public property. The use of mist nets is highly species-specific. This is accomplished by conducting site evaluations to determine species present and flight patterns of target birds. Mist nets used outdoors are monitored hourly or continually from a discreet location and any non-target species are released quickly and unharmed.

Q. Bow Nets

Bow nets are rarely used by ID WS (zero to 5 projects annually). They are small circular net traps used for capturing birds and small mammals. The nets are hinged and spring loaded so that when the trap is set it resembles a half moon. The net is set over a food source and is triggered by an observer using a pull cord or a remote controlled trigger, minimizing non-target captures. These nets are an animal-specific, live-capture technique.

These capture devices are primarily used at airports where the presence of raptors or other large birds threaten aviation safety. They are also sometimes used in other urban settings near residential or business property to assist in capturing individual or small numbers of waterfowl or birds, or applied to rural settings on private property where raptors are depredating on poultry or other small animals. Target animals may be euthanized, released on site (e.g., disease surveillance or population monitoring), or relocated, and non-target species are released on site.

R. Hand Net

Hand nets are used to catch birds and small mammals in confined areas such as homes and businesses. Idaho WS occasionally uses (up to 20 projects annually) hand nets for various wildlife damage management activities. These nets resemble fishing dip nets but are larger in diameter and have longer handles. A variant on the hand net is a round net with weights at the edges of the net. It is thrown and is similar to those used for fishing. Hand nets are an animal-specific, live-capture technique.

Hand nets are normally used in urban situations to assist with capturing individual birds or small mammals inside of a building or residence or outdoors. Target animals may be euthanized, released on site (e.g., disease surveillance or population monitoring), or relocated, and non-target animals are released on site.

S. Egg, Nest and Hatchling Removal and Destruction

Egg, nest and hatchling removal and euthanasia is occasionally used by ID WS (up to 20 projects annually) for bird damage management activities. Egg addling (vigorous shaking of an egg numerous times causing detachment of the embryo from the egg sac), puncturing (inserting a small probe or large pin into the egg and interior membrane), or oiling with corn or vegetable oil or similar substance (restriction of oxygen to an egg prohibiting embryo development through the use of food grade oil) is the practice of killing the embryo prior to hatching. Eggs are oiled and addled to prevent birds from re-nesting for an extended period of time (*i.e.*, Canada geese will set on eggs an average of 14.2 days beyond the expected hatch date for addled eggs). This method is practical only during a relatively short time interval and requires skill to properly identify the eggs and nests of target species. All egg, nest and hatchling removal and euthanasia can be a means of managing breeding populations of a damaging avian species (e.g., resident Canada geese) or eliminating damage and conflicts associated with a specific nesting pair or colony of breeding birds. This technique may also be used to encourage an aggressive nesting pair of birds to vacate a specific location where they cause a safety hazard.

Destruction of eggs and nests and removal of hatchlings typically occurs in urban settings in situations where an individual nesting Canada goose exhibits aggressive behavior towards people or in rural situations where population control is being directed to a nesting colony of gulls or other birds.

III. CHEMICAL DAMAGE MANAGEMENT METHODS (PESTICIDES)

WS Directive 2.401 (Pesticide Use) states: "Wildlife Services (WS) activities will be in compliance with applicable Federal, State, Tribal, and local laws and regulations pertaining to pesticides, including application, certification, storage, transportation, shipment, disposal, and supervision, or when recommending the use of restricted-use pesticides. Restricted use pesticides used or recommended by WS personnel must be registered by the U.S. Environmental Protection Agency (EPA) and the appropriate State regulatory agency…. Pesticide use, storage, and disposal will conform to label instructions and other applicable regulations and laws." Idaho WS will comply with this Directive, label restrictions and all other applicable regulations and laws pertaining to the use of pesticides.

A. DRC-1339

DRC-1339, 3-chloro-4-methylbenenamine hydrochloride, is commonly used by ID WS (up to 100 applications annually) for management of various avian species. DRC-1339 is an avian toxicant registered with the Environmental Protection Agency (EPA) and by the Idaho State Department of Agriculture (ISDA). For more than 30 years, DRC-1339 has proven to be an effective method of starling, blackbird, gull, crow, raven, magpie, and pigeon damage management (West et al. 1967, Besser et al. 1967, and Decino et al. 1966). It is a slow acting avicide that is rapidly metabolized and excreted after ingestion. Because of its rapid metabolism, DRC-1339 poses a discountable risk of secondary poisoning to non-target animals, including

avian scavengers (Cunningham et al. 1979, Schafer 1984, Knittle et al. 1990). This compound is also unique because of its relatively high toxicity to most pest birds but low-to-moderate toxicity to most raptors and almost no toxicity to mammals (DeCino et al. 1966, Schafer 1991). For example, starlings, a highly sensitive species, require a dose of only 0.3 mg/ bird to cause death (Royall et al. 1967); many other bird species such as raptors, sparrows, and eagles are classified as non-sensitive (USDA 1997 Pages P194-P210). Numerous studies show that DRC-1339 poses minimal risk of primary poisoning to non-target and T/E species (USDA 1997 Pages P194-P210). Secondary poisoning has not been observed with DRC-1339 treated baits. During research studies, carcasses of birds which died from DRC-1339 were fed to raptors and scavenger mammals for 30 to 200 days with no symptoms of secondary poisoning observed (Cunningham et al. 1979). This can be attributed to relatively low toxicity to species that might scavenge on birds killed by DRC-1339 and its tendency to be almost completely metabolized in the target birds which leaves little residue to be ingested by scavengers.

DRC-1339 is unstable in the environment and degrades rapidly when exposed to sunlight, heat, ultra violet radiation or water and is highly soluble in water but does not hydrolyze. DRC-1339 tightly binds to soil and has low mobility. The half-life is approximately 25 hours, which means it is nearly 100 % broken down within a week. Identified metabolites (*i.e.*, degradation chemicals) have low toxicity. Aquatic and invertebrate toxicity is low (USDA 1997 Pages P194-P210). The EPA label prohibits using DRC-1339 baits directly in water or areas where runoff is likely.

Prior to the application of DRC-1339, prebaiting is required to monitor for non-target species that may potentially consume treated baits, reducing potential exposure to non-target species. If non-target species are observed feeding on prebait, ID WS would postpone use of DRC-1339, terminate the proposed project until non-targets discontinue feeding at the site, change bait types to reduce its attractiveness to non-targets or select an alternative site. EPA labels for DRC-1339 prohibit use of the product in areas where potential consumption of treated baits by T/E species could occur. Baits may be in various forms, but the most common uses by ID WS are grains and cull French fries in feedlot/dairy applications and meat bait and boiled eggs for livestock depredation situations. DRC-1339 is typically used on both public and private lands in urban and rural areas for lethal control of starlings, blackbirds, pigeons, magpies, ravens and crows.

DRC-1339 is commonly used on private property, cattle feedlots or dairies during the winter months when European starlings and blackbirds form large flocks and feed at these locations. Although it may be applied in these situations throughout the year, WS usually applies it during the winter months because damage at feedlots and dairies is greatest during the winter months when these birds congregate at these facilities when other food sources are scarce and it greatly reduces potential nontarget take of other migratory birds because they have moved south for the winter. If it is applied at other times during the year, product labeling establishes protocols to minimize potential nontarget take. It is mixed with a bait and hand placed in the alleyways and/or empty lots of dairies and feedlots. Usually treated bait is totally consumed by the target species the same day in which it is placed. Any left-over treated bait is collected and disposed of according to the pesticide label. DRC-1339 is also used to reduce depredation on newborn livestock and eggs and young of wildlife designated to be in need of special protection from common ravens, American crows and magpies on both private and public lands. In this application, chicken eggs or meat baits are treated with DRC-1339 and placed near where livestock depredations occur, where depredations are expected to occur, or in artificial nests or elevated wooden platforms near the area where the wildlife needing protection nests or may raise their young. Unconsumed and leftover meat or egg baits are collected and disposed of by burning or burial.

B. Zinc Phosphide

Zinc phosphide is a metallic pesticide commonly used by ID WS (up to 100 applications annually) to reduce rodent damage. Zinc phosphide, if ingested in sufficient quantity, is toxic to most forms of life (EPA 2004). Zinc phosphide comes in prepared baits on wheat and oats, or comes as a concentrate that can be applied to apples, carrots or other baits attractive to the target animal. Use of zinc phosphide on various types of fruit, vegetable or cereal baits has proven to be effective at suppressing local populations of target animals. Specific bait applications are designed to minimize non-target hazards. Prebaiting with the same bait carrier is used prior to bait application to make the treatment more effective. When zinc phosphide is ingested and comes into contact with dilute acids, phosphine gas is released and causes death. Animals that ingest lethal amounts of bait usually succumb overnight with terminal symptoms of convulsions, paralysis, coma and death from asphyxia. If death is prolonged for several days, intoxication occurs with severe damage to the liver. Animals that are alive after 3 days generally completely recover.

Risks to non-target species from zinc phosphide are primarily from primary toxicity (EPA 2004). Secondary risks appear to be minimal to predators and scavengers that scavenge carcasses of animals killed with zinc phosphide (Hill and Carpenter 1983, Tietjen 1976, Hegdal and Gatz 1977, Hegdal et al. 1980, and Johnson and Fagerstone 1994, EPA 2004). In a 2004 EPA evaluation of risks to non-target species from 9 rodenticides, zinc phosphide had the second highest summary risk rating (4.63; EPA 2004). However, risks were primarily associated with primary toxicity. Risks of secondary toxicity were rated as 0 for birds and 0.69 for mammals. Zinc phosphide is 2 to 15 times more toxic to rodents than to carnivores (Hill and Carpenter 1982). Zinc phosphide also poses reduced risks of secondary toxicity because: 1) 90 % of the zinc phosphide ingested by rodents is detoxified in the digestive tract (Matschke unpubl. as cited in Hegdal et al. 1980), although bait can remain toxic in the gut of primary consumers, 2) 99 % of the zinc phosphide residues occur in the digestive tracts, with none occurring in the muscle, 3) the amount of zinc phosphide required to kill target rodents is not enough to kill most other predatory animals (Johnson and Fagerstone 1994). In addition, zinc phosphide has a strong emetic action (i.e., causes vomiting) and most non-target animals in research tests regurgitated bait or tissues contaminated with zinc phosphide without succumbing to the toxicant (Hegdal and Gatz 1977, Hegdal et al. 1980, Johnson and Fagerstone 1994). Furthermore, some predators such as raptors tend to eviscerate rodents before eating them or otherwise avoid the digestive tract and generally do not eat the stomach and intestines (Hegdal et al. 1980, Johnson and Fagerstone 1994).

Although zinc phosphide baits have a strong, pungent, phosphorous-like odor (garlic like), this characteristic seems to attract rodents, particularly rats, and apparently makes the bait unattractive to some other animals. Many birds appear capable of distinguishing treated from untreated baits and they prefer untreated grain when given a choice (Siegfried 1968, Johnson and Fagerstone 1994). Birds appear particularly susceptible to the emetic effects of zinc phosphide, which would tend to offer an extra degree of protection against bird species dying from zinc phosphide grain bait consumption or, for scavenging bird species, from eating poisoned rodents (USDA 1997 P262-P267). Use of rolled oats instead of whole grain also appears to reduce bird acceptance of bait. Uresk et al. (1988) reported on the effects of zinc phosphide on six non-target rodent populations. They determined that no differences were observed from pretreatment until after treatment in populations of eastern cottontail rabbits (*Sylvilagus floridanus*) and white-tailed jackrabbits. However, primary consumption of bait by non-target wildlife can occur and potentially cause mortality. Uresk et al. (1988) reported a 79 % reduction in deer mouse populations in areas treated with zinc phosphide, however the effect was not statistically

significant because of high variability in densities and the reduction was not long-term (Deisch et al. 1990).

Ramey et al. (2000) reported that 5 weeks after treatment, no ring-necked pheasants had been killed as a result of zinc phosphide baiting. In addition, Hegdal and Gatz (1977) determined that zinc phosphide did not affect non-target populations and more radio-tracked animals were killed by predators than died from zinc phosphide intoxication (Hegdal and Gatz 1977, Ramey et al. 2000). Tietjen (1976) observed horned larks (*Eremophila alpestris*) and mourning doves (*Zenaida macroura*) on zinc phosphide-treated prairie dog colonies, but observations after treatment did not locate any sick or dead birds, a finding similar to Apa et al. (1991). Uresk et al. (1988) reported that ground feeding birds showed no difference in numbers between control and treated sites. Apa et al. (1991) further states that zinc phosphide was not consumed by horned larks because: 1) poison grain remaining for their consumption was low (*i.e.*, bait was accepted by prairie dogs before larks could consume it), 2) birds have an aversion to black-colored foods, and 3) birds have a negative sensory response to zinc phosphide. Reduced impacts on birds have also been reported by Tietjen and Matschke (1982). Deisch et al.(1989) reported on the effect zinc phosphide has on invertebrates. They determined that zinc phosphide bait reduced ant densities, however, spider mites, crickets, wolf spiders, ground beetles, darkling beetles and dung beetles were not affected. Wolf spiders and ground beetles showed increases after one year on zinc phosphide treated areas (Deisch 1986). Generally, direct long-term impacts from rodenticide treatments were minimal for the insect populations sampled (Deisch et al. 1989). Long-term effects were not directly related to rodenticides, but more to habitat changes (Deisch 1986) as vegetative cover and prey diversity increased without prairie dogs grazing and clipping the vegetation (Deisch et al. 1989).

Once in the soil, zinc phosphide rapidly creates phosphine when it comes into contact with soil moisture, which is either released into the atmosphere or converted into phosphates and zinc complexes. Translocation of phosphine has been demonstrated, but it is rapidly converted to harmless phosphates through decomposition of the target animal.

Although there are numerous labels which permit several uses and target rodent species, ID WS' use of zinc phosphide is primarily limited to the "concentrate label" and used in controlling damage caused from yellow-bellied marmots on private property in urban and rural settings. Zinc phosphide concentrate is applied to carrots in accordance to mixing directions on the pesticide label and then individually hand placed at the burrow entrances of marmots which take the treated carrot inside their burrow and consume it. Marmots typically die within a few hours and most always underground. Any left-over or unconsumed bait or observed animal carcasses are collected and disposed of according to label instructions. A typical application will comprise of about 10 pounds of carrot baits enough to remove 20-50 marmots. This product will not be used in areas inhabited by grizzly bears.

C. Avitrol®

Avitrol® is rarely used by ID WS (zero to 5 applications annually) as a management tool for house sparrows, blackbirds (red-winged, yellow-headed, and Brewer's blackbirds, grackles, cowbirds, European starlings), rock pigeons and crows. Avitrol® is a restricted-use pesticide that can only be sold to certified applicators, and is available in several bait formulations. Treated bait is mixed with untreated material to form a final bait formulation where only a small portion of the individual grains carry the chemical. For most species, dilution rates lower than a 1 to 9 ratio are not recommended or needed. For example, the one of the formulations for use in pigeons notes that dilution rates of 1 to 29 can be effective in most situations (EPA Reg. No. 11649-7). For

house sparrows, lower dilution rates such as 1 to 5 may be needed for particularly difficult problems (EPA Reg. No. 11649-6). The active ingredient (4-aminopyridine) acts on the central nervous systems and motor nervous systems. Birds display abnormal flying behavior after ingesting treated baits, become disoriented and emit distress vocalization (Roswell et al.1979, EPA 2007). There is variation among species in response to the product (e.g., pigeons generally do not vocalize) and in response to treated birds. Some species such as blackbirds appear to be highly responsive but others such as house sparrow and rock pigeons are less responsive (EPA 2007). In a study by Roswell et al. (1979), treated birds displayed depressive and dissociative anaesthetic electro-encphalographic changes during course of action. These changes would appear to indicate that although the treated birds are behaving abnormally, they are not in pain. Behavior by treated birds usually deters the remaining birds from the site (EPA 2007). Birds that consume treated baits normally die.

An EPA Ecological Risks Assessment for avitrol (EPA 2007) identified the following potential ecological risks from avitrol use: risk of environmental contamination and local impacts on plants from avitrol which may be washed of bait during rain events; risks to animals which may drink water which has accumulated in avitrol bait stations during rainfall events; risks of direct consumption of avitrol by non-target species; and secondary hazards to predators which may consume animals which have eaten avitrol. The EPA evaluation was conducted using application as directed by the label and does not take into account additional precautions used by ID WS to reduce potential risks from the use of this product. Risks associated with use of avitrol broadcast on the ground and avitrol exposure to rainfall are eliminated because WS uses bait stations to administer avitrol. Wildlife Services personnel remain on site during avitrol application and will not apply bait when it could be rained on unless the bait station is placed in a location where the bait will not be exposed to rainfall. Any bait left after a treatment will be disposed of in accordance with label directions. Current label requirements stipulate that the product must not be applied were non-target birds are feeding and that careful observations of the birds' feeding habits must be made to establish proper feeding locations and to determine that no non-target birds are feeding on pre-bait. In addition to pre-baiting, WS' use of bait stations (e.g., large wooden trays within which the baits are placed) and harassment of non-target species which may approach during bait application prevents risks of non-target species directly consuming treated bait. The product label prohibits application directly to water, to areas where surface water is present, to inter-tidal areas below the mean high water mark, or within 25 feet of a body of water. WS will abide by these label restrictions. Consequently potential risks of primary toxicity, water contamination and plant exposure to avitrol from WS' use of this product are negligible.

There are three likely routes by which a predator or scavenger could be exposed to avitrol treated birds; through consumption of birds behaving erratically because they have consumed a toxic dose of avitrol, consumption of carcasses of birds killed with avitrol, and consumption of birds which had consumed a sublethal dose of avitrol. The EPA report discusses potential secondary hazards to predatory animals and references Ecological Incident Information System (EIIS) records of four predatory bird deaths, including one Peregrine Falcon (*Falco peregrinus*), that were determined to be due to ingestion of poisoned birds (EPA 2007). In other states, WS has also received comments regarding a hypothesis that exposure to sublethal doses of avitrol may cause disorientation and contribute to building collision deaths of raptors in urban areas. In a study by Schafer et al. 1974, no effects were observed in predatory and scavenging species fed avitrol-treated blackbirds, but no information was available on the amount of avitrol in the blackbirds. The dose required to kill a blackbird is lower than for more resistant bird species such as pigeons. The EPA report noted that it would be possible for birds in the wild to consume more

avitrol than the birds were fed in the laboratory studies. Laboratory studies with predator and scavenger species have shown minimal potential for secondary poisoning. However, in a field study, magpies and crows may have been affected secondarily (Schafer 1991). A laboratory study showed, though, that magpies which fed on birds killed with two to 3.2 times the lethal dose of active ingredient for 20 days were not affected (Schafer et al. 1974). As noted above, the EPA report considered risks from avitrol in light of label requirements not ID WS procedures to reduce risks. Risk of raptors catching and consuming birds behaving erratically because of avitrol poisoning is minimized by the presence of WS personnel at the treatment site who can harass any non-target birds, including raptors, which may approach the treatment area. WS patrols the area around the treatment site and collects and properly disposes of carcasses of birds killed with avitrol. Data from Schafer (1991) indicate that avitrol is non-accumulative in tissues and rapidly metabolized by many species. Chronic toxicity has not been demonstrated (Schafer 1991). It is difficult to know the circumstances surrounding the mortality of the raptor species noted in the EIIS. However it should be noted that most avitrol use is by private contractors who, while they may comply with label directions, may not employ the extra protective measures used by WS. Although mortality of individual non-target birds has occurred and is regrettable, to date, there has been no evidence of major non-target kills or adverse impacts on non-target species populations.

Avitrol® is water soluble and EPA expects the product to be both mobile and persistent in the open environment (EPA 2007). However, use of bait stations, the fact that WS will not use the produce when it is raining, and adherence to label requirements for collections and proper disposal of unconsumed bait should prevent environmental contamination. Laboratory studies demonstrated that Avitrol® is strongly absorbed onto soil colloids and has moderately low mobility (USDA 1997 P184-185). Avitrol is expected to be stable under anerobic conditions. Aerobic biodegradation is expected to be slow in soil and water, with a half-life ranging from 3 to 32 months (EPA 2007).

This EPA registered repellent is typically used in urban and rural settings where birds (feral pigeons, gulls, etc.) are causing a nuisance or damage to grain crops or in other situations. Avitrol® treated grain is hand placed in bait stations where target birds feed or are causing the nuisance.

D. Livestock Protection Collar (Compound 1080)

Sodium fluoroacetate or Compound 1080, is the active ingredient in the Livestock Protection Collar (LPC). It is currently registered by the EPA and ISDA for use in Idaho only by ID WS to reduce coyote damage to domestic sheep and domestic goats and is restricted for use in fenced pastures. The LPC is rarely used by ID WS (zero to 5 projects annually) because it can only be used in very limited situations, as specified on the registration label. In Idaho, the LPC is only registered for use by ID WS employees, but can be used in other States by livestock producers who have been specially trained and certified by EPA or applicable State pesticide regulatory agency.

The LPC consists of two rubber reservoirs, each of which contains about one-half ounce of a 1 % solution of sodium fluoroacetate and is attached to the neck of a goat or sheep. The toxicant is dispensed when punctured by the bite of an attacking predator and is selective not only for the target species, but also for target individuals. It specifically targets coyotes because they characteristically attack sheep and goats by grabbing the throat, whereas other predators and dogs generally attack the animal elsewhere on the body (*e.g.*, dogs attack the flanks and mountain lions

the skull). As a result, fewer predators and non-target animals are taken to resolve depredations on pastured sheep and goats.

The advantage of the LPC is its selectivity in eliminating only those individual predators that are responsible for attacking sheep and goats. Disadvantages include the limited applicability of this technique, death of collared livestock that are attacked, the logistics of having to collar and monitor the collared livestock, and the management efforts required to protect livestock other than the target flock (Connolly et al. 1978, Burns et al. 1988). From an efficacy standpoint, use of the LPC is best justified in areas with a high frequency of predation (*i.e.*, at least one kill per week) or flocks that are of high value, such as registered livestock.

Symptoms of sodium fluororacetate intoxication can take up to 30 minutes, during which time the target animal often feeds and disperses from the site. Secondary exposure of target animals (*i.e.*, coyotes) to scavengers and predators is possible if the carcass of the targeted animal is not recovered although risks of secondary poisoning are low (Burns et al. 1991). The label for this product specifically notes that contaminated parts of animals killed while wearing this product must be disposed of via deep burial or incineration. This includes any contaminated soil or vegetation near the kill site.

In response to petition from an environmental advocacy organization, the EPA completed a review of complaints concerning risks to non-target species (including T/E species), environmental contamination and human health and safety risks regarding use of 1080 collars (EPA 2009). Based on the review, the EPA determined that use of the products in accordance with label requirements and revised WS pesticide accounting and storage practices does not pose unreasonable risks to the environment. EPA LPC registration labeling requires ID WS to contact the local USFWS office to obtain written approval before using the collar in any areas where grizzly bears may be adversely affected.

LPCs are placed on sheep or goats in fenced pastures in rural settings and normally on private property.

E. Gas Cartridges (Rodent and Denning)

Gas cartridges are 2-ingredient fumigants commonly used by ID WS (up to 100 applications annually) to kill burrowing wildlife and reduce damage associated with them. In the WS program, fumigants are only used in rodent burrows and predator dens (commonly known as denning). The cartridges are placed in the active burrows of target animals, the fuse is lit, and the entrance is then tightly sealed with soil. The burning cartridge causes death by oxygen depletion and carbon monoxide poisoning.

Denning is the practice of locating coyote or red fox dens and eliminating the young, adults, or both to stop an ongoing predation problem or prevent future depredation on livestock. Denning is cost-effective and has a high degree of efficacy in resolving predation problems due to coyotes killing lambs in the spring (Till and Knowlton 1983). Coyote and red fox depredations on livestock often increase in the spring and early summer due to the increased food requirements associated with feeding and rearing litters of pups. Removal of pups will often stop depredations, even if the adults are not taken (Till 1982). Pups are typically euthanized in the den using an EPA registered gas fumigant cartridge. When the adults are killed and the den site is known, the pups are killed to prevent their starvation. Denning is highly selective for the target species responsible for damage. Den hunting for adult coyotes and red fox and their young is often combined with other damage management activities (*e.g.*, aerial shooting, calling and shooting).

Use of gas cartridges may pose a risk to non-target animals which may also be found in burrows of target species. Given the omnivorous nature of target predator diets, non-target rodents, reptiles or amphibians are highly unlikely to occur in a coyote or fox den, so the risk of unintentionally killing a non-target species when using gas cartridges in coyote or fox dens is extremely low. However, some non-target species may occasionally use active rodent burrows (USDA 1997, Pages 247-253). The Idaho WS program reduces risks to non-target species in rodent burrows by conducting pretreatment site surveys for non-target species (tracks, droppings, etc.) and by only treating active burrows. Use of gas cartridges does not result in toxicant residue in animal tissues (USDA 1997, Pages 247-253), so there is no risk of secondary toxicity.

Gas cartridges registered for coyote, striped skunk and red fox dens are normally applied in rural settings on both private and public lands. When dens are selected for fumigation, the fuse of the gas cartridge is ignited and hand-placed in the active den at least 3 to 4 feet inside. Soil is then placed in the den entrance to form a seal to prevent the carbon monoxide from escaping. Rodent gas cartridges are used similarly, with the addition of urban locations (golf courses, etc.). Carcasses of animals taken with these devices are not excavated or retrieved.

F. Aluminum Phosphide

Aluminum phosphide is occasionally used by ID WS (up to 20 applications annually) as a below-ground fumigant for burrowing rodents (*i.e*., ground squirrel, voles, yellow-bellied marmots, etc.). It is sold under several trade names such as Phostoxin® and Fumitoxin® and is prepared in a pellet and tablet form. The pellets/tablets are dropped into the burrow of the target species and the entrance is sealed with a shovel-full of soil. When aluminum phosphide pellets or tablets are placed in burrows, the active ingredient reacts with soil moisture and the animal's respiration, and lethal amounts of Phosphine (PH_3) gas are released, killing the animal underground. Death normally occurs within several minutes after treatment. PH_3 gas that remains in the burrow after the rodents have died dilutes and then decomposes quickly, reducing the possibility that a predator would receive a lethal dose in the event a fumigated burrow is excavated. There are no secondary poisoning hazards associated with aluminum phosphide, however, non-target animals may be killed by primary toxicity if they are inside the treated burrow (USDA 1997 Pages 242-245). The Idaho WS program reduces risks to non-target species in rodent burrows by conducting pretreatment site surveys for non-target species (tracks, droppings, etc.) and only treating active burrows. Federally protected species would be adversely affected by aluminum phosphide if applied directly into burrows occupied by these species, however, there is no risk to large carnivores because they do not occupy small burrows inhabited by the target species (USDA 1997 Pages 242-245). Aluminum phosphide breaks down rapidly in the presence of water to form a gaseous product which is rapidly dissipated. Consequently the product is non-persistent and not mobile in soils and will not pose a risk of groundwater contamination (Etoxonet 1996).

Aluminum phosphide is primarily used on private property to control ground squirrels damaging turf or rangelands, but occasionally ID WS is requested by public land agencies to assist with ground squirrel control on campgrounds or on office lawns.

G. M-44 (Sodium Cyanide)

Sodium cyanide, the active ingredient in the M-44, is frequently used by ID WS (more than 200 applications annually, but not daily) to target and kill coyotes and red fox in reducing livestock depredations. The M-44 device contains four parts and is set with a special tool. The M-44

device consists of: (1) a capsule holder wrapped with fur, cloth, wool, or other material subject to state/local restrictions; (2) a capsule containing 0.8 grams of powdered sodium cyanide; (3) an ejector mechanism; and (4) a 5-7 inch hollow stake. The hollow stake is driven into the ground, the ejector unit is cocked and placed in the stake, and the capsule holder containing the cyanide capsule is screwed onto the ejector unit. A fetid meat or other suitable bait is applied to the capsule holder. An animal attracted by the bait will try to pick up or pull the baited capsule holder. When the M-44 device is pulled, a spring-activated plunger propels sodium cyanide into the animal's mouth. Generally, death is immediate and results from respiratory arrest. The M-44 is generally selective for canids because of the attractants used and their feeding behavior. When properly used, the M-44 presents little risk to humans and the environment and provides an additional tool to reduce predator damage.

Sodium cyanide is highly toxic to all species including humans. M-44 users carry an antidote kit, which consists of six amyl nitrite pearls, on their person while setting or checking the devices which counteracts the effect of an accidental exposure. ID WS personnel that use the M-44 must be certified by the ISDA. The EPA label for the M-44 includes 26 use restrictions (Appendix C), including a restriction which prohibits use of the device in areas where federally-listed experimental, threatened or endangered species might be adversely affected. Devices may not be placed within 30 feet of carcasses used as draw stations. The device may also not be placed within 200 feet of any lake, stream or other body of water (exclusive of natural depressions which catch and hold rainfall for only short periods of time).

In response to petition from an environmental advocacy organization, the EPA completed a review of complaints concerning risks to non-target species (including T/E species), environmental contamination and human health and safety risks regarding use of sodium cyanide (EPA 2009). Based on the review, the EPA revised two of the use restrictions (Restrictions 8 and 9) pertaining to protections for T/E species and the public and pets (Appendix C). Given the updated restrictions, the EPA determined that use of the products in accordance with label requirements and revised WS pesticide accounting and storage practices does not pose unreasonable risks to the environment. EPA noted that in formal Section 7 consultations with the USFWS, the USFWS determined that while incidental take could occur, if reasonable and prudent measures and were properly implemented, incidental take would not adversely impact populations of grizzly bears or gray wolves.

During the past ten years, ID WS use of M-44's has unintentionally killed two non-target wolves in Idaho at one site where the devices were set to reduce coyote predation on livestock. Four ravens were also unintentionally killed with M-44's.

The use of M-44 for WDM activities occur in rural settings on both private and public properties.

H. Anticoagulant Rodenticides

Anticoagulant rodenticides are rarely used by ID WS (up to 5 projects annually) for rodent damage management. Anticoagulants come in a variety of formulations and many are available from commercial vendors. Anticoagulants come in single dose and multiple dose formulations. The active ingredients in anticoagulants which may be used by ID WS include: bromadiolone, brodifacoum, chloraphacinone, difethialone and diphacinone. These baits reduce the clotting ability of blood and damage capillaries. Over time, the rate of blood clotting slowly decreases and blood loss from the damaged capillaries leads to death. Bromadialone, Chlorophacinone, and Diphaceinone are classified as second generation anticoagulants and tend to be more acutely toxic than the first generation anticoagulants chlorophacinone and diphacinone. Second

generation anticoagulants generally provide a lethal dose after one feeding although death is usually delayed 5-10 days. First generation anticoagulants are more rapidly metabolized and may kill some animals in a single feeding, but in most instances, multiple doses must be consumed over a period of several days to provide a lethal dose (Timm 1994).

Anticoagulants are toxic to other species, especially mammals, at low concentrations, so primary toxicity hazards must be guarded against by placing baits in containers or areas inaccessible to pets, children, livestock, and non-target species (EPA 2004). In a 2004 EPA evaluation of non-target species risks from 9 anticoagulants, Brodifacoum was identified as posing the highest overall risk to non-target species (Summary risk rating of 5.55; EPA 2004). Brodifacoum and Difethialone were rated as poising high primary toxicity risks to mammals and birds. Bromadiolone, chlorophacinone and diphacenone were rated as posing high primary toxicity risks to mammals and low to moderate or low primary toxicity risks to birds. All five anticoagulants, especially brodifacoum, difethialone, and bromadiolone, have a high potential for secondary poisoning in mammals and brodifacoum and difethialone also pose high secondary toxicity risks to birds. Risks of secondary tocixity to birds were rated as moderate for bromadiolone and diphacinone, and low for chlorophacinone (EPA 2004). Numerous mortality incidents have been associated with these pesticides, even when EPA label use restrictions are followed (EPA 2004). As required by law, ID WS will follow the EPA label use restrictions (WS 2004*b*).

Anticoagulant rodenticides are typically used to control commensal rodents in barns, poultry houses, sheds and farm/ranch buildings. Anticoagulants will not be used in areas occupied by grizzly bears or Canada lynx.

I. Strychnine

Strychnine is rarely used by ID WS (zero to 5 applications annually) for WDM activities. Strychnine is used mostly to protect alfalfa in Idaho, but has been used to protect other agricultural resources and forests. Strychnine is a white, bitter-tasting pesticide that is highly toxic to most species of mammals and birds, with the exception of gallinaceous birds. In Idaho, is only available for below-ground use to reduce pocket gopher damage. Strychnine is available on milo or oats for use with mechanical burrow builders or hand placement. Burrow builders create underground burrows and drop in baits. Gophers intersect these burrows, consume the baits, and die underground. Baits can also be placed in active burrow systems by hand, through use of a metal probe. The probe creates an opening from the soil surface which connects with the burrow. Strychnine baits are then placed in the opening and grain falls in the burrow. The opening is then plugged by stomping the heel of the applicator's boot over the hole. Gophers that consume these baits mostly die underground. Non-target species that potentially use gopher burrow systems such as field mice and other small rodents can be killed if bait is consumed. Strychnine kills animals relatively quickly and unassimilated baits can be found in the animals gut contents. Primary non-targets, and target gophers may potentially die above ground and pose a potential risk of secondary hazards to scavengers; this hazard has been shown to be quite low (Hegdal and Gatz 1976, Fagerstone et al. 1980, Evans et al. 1990). Since strychnine poses a potential for secondary poisoning, it is conceivable that a smaller predatory or scavenger species could be affected by consuming targeted gophers.

Idaho S primarily uses hand application of strychnine grain baits in rangelands and hay crops such as alfalfa. The use of strychnine grain baits typically occurs on private property in rural areas.

IV. CHEMICAL DAMAGE MANAGEMENT MEHODS (ANIMAL HANDLING)

Handling of live-captured wildlife could be conducted by using several immobilizing agents approved and authorized for this purpose. Selected ID WS personnel have received training in the safe use of authorized immobilization/euthanasia chemicals. This training involves hands-on application of state-of-the-art techniques and chemicals. Idaho WS will comply with all state and federal regulations regarding marking animals that have received immobilization drugs prior to and during hunting seasons. Immobilization agents approved for use by ID WS include:

A. Alpha-Choralose

Alpha-chloralose is rarely used by ID WS (zero to 5 applications annually). Alpha-chloralose is an immobilizing agent used to capture and remove problem/nuisance birds (primarily waterfowl) and is currently approved for use by ID WS as a Food and Drug Administration (FDA) Investigational New Animal Drug. Alpha-chloralose may only be used by ID WS personnel who have been trained and certified in its use. The use or application of alpha-chloralose is monitored at the capture site and baits are fed directly to target species and uneaten baits are retrieved and properly disposed, avoiding consumption of treated baits by non-target species. The alpha-chloralose treated baits (*e.g.*, generally bread cubes, peas or corn) are typically delivered as a well contained bait in small quantities with minimal hazards to pets and humans. Pursuant to FDA restrictions, pigeons, waterfowl or other game birds captured during the hunting season with alpha-chloralose must be euthanized, buried, incinerated or held in captivity for at least 30 days, at which time the birds may be killed and processed for human consumption or released.

Alpha-chloralose is used by ID WS in urban settings where waterfowl (Canada geese, domestic ducks, etc.) are causing a nuisance, damaging turf and/or lawns or for disease surveillance monitoring activities.

B. Injectable Immobilizing Drugs

Ketamine, Xylazine and Telazol® are immobilizing agents occasionally used by ID WS (up to 20 applications annually) to aid in the humane handling of predators such as, wolves, coyotes, red fox, raccoons and skunks.

If ID WS administer immobilizing drugs to non-target game animals (black bears, mountain lions, deer, elk, etc.) to be released, an ear tag is attached to that animal as an identifier to contact IDFG upon harvest. Dependent upon the time the immobilizing drug was administered, IDFG then determines if the animal is safe for consumption.

1. Ketamine Hydrochloride (HCL)

Ketamine HCL is a cyclohexamine (dissociative) type drug that produces immobilization and analgesia by selective depression of the central nervous system. Ketamine produces a state of unconsciousness that interrupts association pathways to the brain and allows for the maintenance of the protective reflexes, such as coughing, breathing, swallowing and eye blinking. Ketamine is detoxified by the liver and excreted by the kidney. Following administration of recommended doses, animals become immobilized in about 5 minutes with anesthesia lasting from 30 to 45 minutes. Depending on dosage, recovery may be as quick as 4 to 5 hours or may take as long as 24 hours. Recovery is generally smooth and

uneventful. Ketamine is rarely used in a pure state due to possible negative side effects. For wolf immobilizations Ketamine would be used in combination with Xylazine, a sedative, to make it more effective as an immobilizing agent and to minimize side effects.

2. Xylazine HCL

Xylazine HCL is a sedative which produces central nervous system depression and moderate analgesia and muscle relaxant properties. Xylazine HCL is most often used in combination with drugs such as Ketamine. Ketamine/Xylazine combinations can be used to effectively and safely immobilize a variety of mammals. At high dose rates the margin of safety decreases greatly. However, recommended dosages are administered by ID WS through intramuscular injection, immobilizing the animal in about 5 minutes and lasting from 30 to 45 minutes.

3. Telazol®

Telazol® is a combination of equal parts of tiletamine HCL and zolazepam HCL and is a much more powerful anesthetic usually used for larger animals such as gray wolves, bears and mountain lions. Following a deep intramuscular injection of Telazol®, onset of anesthetic effect usually occurs within 5 to 12 minutes. Muscle relaxation is optimum for about the first 20 to 25 minutes after administration, and then diminishes. Recovery varies with the age and physical condition of the animal and the dose of Telazol® administered, but usually requires several hours.

Immobilizing agents are delivered to the target animal with a dart gun, blow gun, or syringe pole depending on the circumstances and the species being immobilized. If the agents are delivered via a dart, the dart is retrieved if possible.

Idaho WS' primary use of immobilizing drugs is on wolves if an animal is being fitted with a radio-telemetry collar. Occasionally ID WS field personnel will utilize immobilization drugs on black bears or mountain lions accidently captured in foothold traps to assist with the releasing process. Immobilizing drugs may also be used for disease monitoring/surveillance purposes.

C. Tranquilizer Trap Devices

Tranquilizer Trap Devices (TTDs) are rarely used by ID WS (zero to 5 applications annually). TTDs are small rubber containers filled with the tranquilizer propiopromazine HCL that can be used in conjunction with foothold traps to sedate an animal upon its capture. The drug is administered via a rubber nipple (trap tab) fastened to the trap jaw. When captured, predators instinctively bite the trap tab and ingest the immobilizing drug, whereby sedating them, reducing possible damage to their foot caused by struggling while being held by the trap. Used properly it does not render the animal unconscious.

Idaho WS' use of TTDs are limited to use on foothold traps set to capture wolves for the placement of tracking collars. Traps with TTDs are placed in or near travel ways of wolves or with some type of olfactory attractant (see Foothold Traps section for more information).

D. Euthanasia (Chemical and Physical)

Euthanasia methods include the use of registered drugs such as Beuthanasia-D® and Fatal Plus®, cervical dislocation, decapitation, gunshot to the brain or asphyxiation with carbon monoxide [CO] or carbon dioxide [CO_2]. These methods are species-specific. Animals are rarely (zero to 5 applications annually) euthanized by ID WS with registered drugs. The carcasses of animals chemically euthanized with registered drugs are buried or incinerated.

V. BEAVER DAM BREACHING and WATER-LEVEL CONTROL DEVICE

A. Binary Explosives

Beaver dam breaching/removal is generally conducted to maintain existing stream channels and drainage patterns, drainage structures such as culverts and irrigation canals, and reduce flood waters behind the dams that have affected established silviculture, agriculture (*i.e*., ranching and farming activities), roads, bridges, and residential and commercial property. Idaho WS occasionally uses explosives (up to 20 applications annually) for beaver dam breaching/removal projects. The WS program uses a binary (i.e., 2-part) explosive composed of ammonium nitrate and nitro-methane. Mixed together, these chemicals become a Division 1.1 explosive (U.S. Bureau of Alcohol, Tobacco and Firearms classification). Binary explosives are an efficient, cost-effective means to reduce flooding and property damage caused by beaver.

Binary explosives are placed within the beaver dam to create a vortex of energy within the dam itself to cause the dam material to go up and out (the path of least resistance). When the charges explode, the dam's material is lifted in the air 50 to 100 feet. Shock waves associated with the explosion are directed away from the water to maximize the impact. The intent of removal/breaching by explosives is to loosen the dam material and allow the force of impounded water to wash away the debris. When a dam is removed/breached, debris that is discharged into the water is considered "incidental fall back" or discharge fill.

Debris or material in an average beaver dam consists of about 50 % soil/mud and 50 % sticks (S. Stopak, WS Certified Blaster, ID WS, pers. comm. 2012), but can vary from one extreme to the other. About 75 % of the displaced material is deposited on land adjacent to the explosion and the remainder falls back into the water (S. Stopak, WS Certified Blaster, ID WS, pers. comm. 2012). A typical size beaver dam that ID WS breaches will measure about 4 feet high, 2 feet wide and 12 feet long, which represents about 3.55 cubic yards of debris/material. If all of the debris/material is removed from the blast, about 2.66 cubic yards (75 %) of material is deposited on land and about 0.445 cubic yards of soil/mud and the same volume of sticks can be expected to re-enter the water. Charges detonate at 2,000^{o} F totally consuming the binary components, resulting in no release of known toxic residues into the water (B. LeBlanc, Kinepak Explosives Corporation, Dallas, Texas, pers. comm. 2004, K. Sullivan, Chair, WS Explosive Committee, pers. comm. 2012). Although carbon monoxide is a common by-product of fuel combustion, it is highly unlikely that gas will enter the water, due to its volatile nature, except in minute quantities, resulting in very little concern of reduced water quality.

Beaver dams breached by ID WS are typically the result of very recent or current beaver activity. Typically, ID WS receives most requests soon after affected resource owners discover damage or becomes aware of this service. Beaver-related flooding complaints addressed by ID WS involve obstruction of irrigation ditches and structures, culverts or bridges, where dams have not been in

place long enough for wetland habitats to have developed in association with the dam. Other projects may involve damage to man-made structures (*i.e.* houses, utilities and landscaping), again, not affecting wetland wildlife habitat. Only the portion of the dam blocking the drainage is breached and the natural course of the stream is undisturbed.

Idaho WS personnel must receive explosives training and be certified by the national WS program before using explosives on any official projects (WS 2009*b*). All WS explosive specialists are required to attend 30 hours of extensive explosive safety training and spend time with a certified explosive specialist in the field prior to obtaining certification. Re-certification is required every 2-years and specialists must pass competency evaluations/exams given by WS' Explosives Training Officers. All blasting activities are conducted by well trained, certified blasters. Explosive handling and use procedures follow the rules and guidelines set forth by the Institute of Makers of Explosives, the safety arm of the commercial explosive industry in the United States and Canada. Idaho WS also adheres to transportation and storage regulations from State and Federal agencies such as Occupational Safety and Health Administration (OSHA), U.S. Bureau of Alcohol, Tobacco, Firearms and Explosives, and the Departments of Transportation.

Beaver dam breaching with binary explosives is primarily conducted on private property and in rural settings.

B. Hand Tools

Unwanted beaver dams can be breached by hand with a rake, shovel, power tools or heavy machinery. Hand breaching is more often used on smaller dams, but larger dams may also be breached by hand, but requires substantially more labor. As with explosives, hand removal/breaching utilizes the impounded water to wash away the dam debris. When a dam is breached, excess debris is discharged into the water and is considered "incidental fall back" or discharge fill. ID WS occasionally (up to 20 applications annually) removes/breaches beaver dams by hand.

Beaver dam breaching with hand tools is primarily conducted on private property and in rural settings.

C. Water-Level Control Devices

Water control devices (aka pond levelers) are systems used to allow the passage of water through a beaver dam. The devices are used in situations where the presence of a beaver pond is desired but it is necessary to manage the level of water in the pond. Various types of water control devices have been described (Perry 2007, Clemson University 2006, Spock 2006, Simon 2006, Close 2003, Lisle 2003, 1999, 1996, Brown et al. 2001, Brown and Brown 1999, Organ et al. 1996, Wood et al. 1994). The devices generally involve the use of one or more pipes installed through the dam to increase the flow of water through the dam. To reduce likelihood of beaver blocking the devices, the inlet of the pipe is placed away from the dam to make the source of the water flow more difficult to detect. The end of the pipe may be capped and water allowed to flow into the pipe through series of holes or notches cut through the pipe, and holes and notches may be placed on the underside of the pipe to further reduce signs of water movement. Ninety-degree elbow joints placed facing downward on the upstream end of the pipes may also prevent the noise of running water from escaping and attracting beaver. A protective cage is placed around the upstream end of the inlet pipe to prevent beaver from blocking the pipe and reduce problems with debris blocking the pipe. Water control devices may be used in combination with beaver

exclusion systems discussed below. Some systems used to preclude beaver blockage of the leveler may be a barrier to fish passage (e.g. perforated pipes with end caps).

Water-level control devices can be implemented on either private property or public lands and in urban or rural settings.

VI. HAZING and EXCLUSIONARY METHODS/DEVICES

A. Propane Exploders

Propane gas exploders are occasionally (up to 20 projects annually) used by ID WS to haze waterfowl and blackbirds from depredating field crops or harass predators from depredating on livestock. Propane exploders operate on propane gas and are designed to produce loud explosions at controllable intervals. They are strategically located (*i.e.*, elevated above the vegetation) in areas of high wildlife use to frighten animals from the problem site. Because animals are known to habituate to sounds, exploders must be frequently moved and used in conjunction with other scare devices. Exploders can be left in an area after dispersal is complete to discourage returning animals.

Due to noise restrictions in urban environments, propane exploders are rarely used in these areas with the exception of airports and landfills. The vast majority of propane exploder use is in rural areas around alfalfa, grain crops and fruit tree orchards to discourage bird damage, and lambing and calving pastures to help minimize predation from coyotes, wolves and other predators.

B. Pyrotechnics

Pyrotechnics, including shell-crackers and scare cartridges, are commonly used by ID WS (up to 100 projects annually) to repel Canada geese, California gulls, ring-billed gulls, black-crowned night herons, European starlings, predators and elk. Shell-crackers are a 12-gauge shotgun shell containing a firecracker that is projected up to 75 yards in the air before exploding. They can be used to frighten mammals but are most often used for scaring birds to prevent crop depredations or discourage birds from undesirable roosting or loafing sites such as structures and airport runways. The shells should be fired in front of or underneath flocks of birds attempting to enter crop fields, roosts, or the air operating area at an airport. The purpose is to produce an explosion between the birds and their objective. Birds already feeding in a crop field can be frightened from the field but it is more difficult to disperse birds that have already settled in a roost.

Noise bombs, whistle bombs, racket bombs and rocket bombs are fired from a 15 millimeter flare pistol and their use is similar to shell-crackers. Noise bombs (also called bangers) are firecrackers that travel about 75 feet before exploding and producing a loud boom. The whistle bomb (also called screamers) travels similarly to a noise bomb but produce a visible trail of smoke and fire, as well as a whistling sound throughout the time of travel. Racket bombs make a screaming noise in flight but do not explode and rocket bombs are similar to noise bombs but may travel up to 150 yards before exploding.

A variety of other pyrotechnic devices, including firecrackers, rockets and Roman candles are used for dispersing wildlife but receive very little use by ID WS. Firecrackers can be inserted in slow-burning fuse ropes to control the timing of each explosion. The interval between explosions is determined by the rate at which the rope burns and the spacing between firecrackers.

Idaho WS personnel are trained in the safe and effective use of pyrotechnics (WS 2009*c*) and must comply with WS Directive 2.625 directing the safe use, storage and transportation of pyrotechnics (WS 2006).

Due to noise restrictions in urban environments and potential fire hazard, pyrotechnics are rarely used in these areas with the exception of airports and landfills. Occasionally, urban crow/raven or blackbird roosts may be moved with pyrotechnics. The vast majority of pyrotechnic use is in rural areas around alfalfa, grain crops and fruit tree orchards to discourage bird damage. Use in some areas may be precluded because of noise impacts on neighboring landowners or recreationists.

C. Lasers

Idaho WS rarely utilizes lasers (zero to 5 projects annually) but they can be used to haze waterfowl, blackbirds, crows and gulls. Lasers **(**Light Amplification by Simulated Emission of Radiation) are a relatively new technique used to frighten and disperse birds from their roosts or loafing areas. Although the use of a laser to alter bird behavior was first introduced nearly 30 years ago (Lustick 1973), it received very little attention until recently when it was tested by the National Wildlife Research Center (NWRC). Results have shown that several bird species, such as double-crested cormorants, Canada geese, other waterfowl, gulls, turkey vultures (*Cathartes aura*), black vultures (*Coragyps atratus*) and American crows have exhibited avoidance of laser beams during field trails (APHIS 2001, Glahn et al. 2001, Blackwell et al. 2002). Best results are achieved under low-light conditions (*i.e.*, sunset through dawn; APHIS 2001). Because of the risk of eye damage, safety guidelines and specifications have been developed and are strictly followed by the user (OSHA 1991, Glahn and Blackwell 2000).

Lasers are primarily used in urban settings to help disperse roosting birds which may be creating nuisances or human/livestock health problems associated with accumulation of fecal material.

D. Physical Harassment by Radio-Controlled Vehicles

Physical harassment by radio-controlled vehicles is rarely utilized by ID WS (zero to 5 projects annually). The use of remote control devices for the purpose of disturbing the activity or behavior of birds is a relatively new concept and can be effective for dispersing damage-causing waterfowl. This tool is effective in removing waterfowl from areas that are not easily accessible or when other means of harassment are not permissible or allowed (pyrotechnics in urban areas). Radio-controlled vehicles allow for close and personal harassment of birds, while combining visual (*e.g.*, eyespots on boat) and auditory (*e.g.*, engine noise) scare tactics. Radio-controlled vehicles are available in numerous forms such as: speed boats, helicopters, airplanes, sail boats and race cars.

Radio-controlled vehicles are primarily used in urban settings to help disperse waterfowl from small bodies of water where they may be creating nuisances or human health issues associated with accumulation of fecal material.

E. Other Scaring Methods/Devices

Other scaring devices are rarely used by ID WS (zero to 10 combined projects annually).

1. Electronic Guard

The Electronic Guard (siren strobe-light device) is a battery-powered, portable unit that houses a strobe light and siren, and was developed by the USDA-APHIS-WS National Wildlife Research Center (Linhart 1983, Linhart et al. 1992). The device is a short-term tool used to deter predation until livestock can be moved to another pasture, brought to market, or other PDM methods are implemented. The device automatically activates at nightfall and is programmed to discharge periodically throughout the night. Efficacy of strobe/sirens is highly variable, but in certain situations, has been used successfully to reduce coyote and bear depredation on sheep. The technique has proven most successful when used at "bedding grounds" where sheep gather to sleep for the night. Electronic guards may be used in rural and urban settings. Use in some areas may be precluded because of noise impacts on neighboring landowners or recreationists.

2. Scarecrows and Scarecrow like Devices

The use of scarecrows has been met with mixed results. These techniques are generally only practical for small areas. Scaring devices such as distress calls, helium-filled eye spot balloons, raptor effigies and silhouettes, mirrors, and moving disks can be effective but usually for only a short time before birds become accustomed to, and learn to, ignore them (Schmidt and Johnson 1984, Bomford 1990, Rossbach 1975, Mott 1985, Shirota et al. 1983, Conover 1982, Arhart 1972, Bomford and O'Brien 1990). Mylar tape has produced mixed results for effectively frightening birds (Dolbeer et al. 1986, Tobin et al. 1988). In general, scarecrows are most effective when they are moved frequently, alternated with other methods, and are well maintained. They may be used on public or private land, but are primarily used in urban areas by airport personnel, business owners and homeowners, and by farmers in rural areas.

3. Surface Coverings

Plastic balls approximately 5 inches in diameter can be used to cover the surface of a pond. A "ball blanket" renders a pond unusable for boating, swimming, fishing, and other recreational activities. This method is very expensive and seldom used. Floating plastic balls called Euro-Matic Bird Balls™ have successfully been used at airports and settling ponds to keep birds from landing on them. The most likely location where surface coverings are practical for use is at "small-area" water-treatment sites and lagoons in both urban and rural settings.

4. Dogs

Dogs can be an effective tool for harassing birds and keeping them off turf and beaches (Conover and Chasko 1985, Woodruff and Green 1995). Around water, this technique appears most effective when the body of water to be patrolled is ≤ 2 acres in size (Swift 1998). Although dogs can be effective in keeping birds off individual properties, they do not contribute to a solution for the larger problem of overabundant/anthropogenically accustomed bird populations (Castelli and Sleggs 1998). Swift (1998) reported that when harassment with dogs ceases, the number of birds usually eventually returns to pre-treatment numbers. Idaho WS has recommended and encouraged the use of dogs where appropriate.

The use of dogs would be most practical in public or private land in urban settings to help disperse waterfowl from small bodies of water or turf (e.g., parks, golf courses).

5. Tactile Repellents

Tactile repellents are rarely used by ID WS (zero to 5 projects annually). These repellents (*i.e.*, sticky or tacky bird repellents such as Tanglefoot®, 4-The-Birds®, and Roost-No-More®) are smeared or placed in wavy bands with a caulking gun. The sticky surface will often discourage the birds from perching on or in structures, or in orchard, ornamental and shade trees. The birds are not entrapped by the sticky substances, but rather dislike the tacky footing. Some of these repellents will discolor painted, stained, or natural wood siding. Others may run in warm weather, leaving unsightly streaks. It is best to try out the material on a small out-of-sight area first before applying it extensively. The tacky repellents can also be applied to a thin piece of pressed board, ridged clear plastic sheets, or other suitable material, which is then fastened to the area where damage is occurring. The effectiveness of tactile repellents is sometimes short-lived because accumulations of dust and dirt will render them useless. Consequently, tactile repellents are best used indoors or at least placed in areas where dust, wind and moisture are minimized. These devices may be used on public or private land.

F. Fences and Other Barriers

1. Temporary Fencing

Temporary fences are rarely utilized by ID WS (zero to 5 projects annually). The most common uses of such fencing include placing temporary electric polytape fence or fladry fencing around bedding areas to deter predation while the livestock producer moves the livestock to another pasture or takes them to market. They can also be used as night bedding pens for sheep as they are being grazed on open range. The temporary fence may need to be moved daily for various husbandry or livestock management reasons. These systems may also be used around small pastures but the period of efficacy may be limited as predators habituate to or learn to avoid systems which are installed for extended periods of time. Fladry involves installing waving flags hanging about every 20 inches from thin rope or cable stretched about 30 inches above the ground, and is used to reduce wolf predation on livestock (Davidson-Nelson and Gehring 2010). An electrified version of the device may also be used (Lance et al. 2010).

2. Beaver Exclusion Systems

A variety of systems have been used to prevent beaver from blocking water intake structures including the Beaver Deceiver™, Beaver Bafflers™ and pre-dams (Lisle 2003, 1999, 1996, Partington 2002, Brown et al. 2001, Brown and Brown 1999). Beaver are deterred from blocking culverts by the installation of a fence around the upstream end of the culvert. Installation of a fence increases the length of the area which must be dammed, and may also increase the distance between the beaver and the source of the cues which stimulate damming behavior (e.g., water moving through culvert; Callahan 2005, Lisle 2003, 1999, 1996). Usually, fencing is installed directly on the up and downstream ends of the culverts to prevent beaver from entering the deceiver from the downstream side of the culvert to prevent any beaver which might make it past the outer fence from plugging the interior of the culvert. Efforts are made to reduce the sound of water flowing through the culvert by raising the water level on the down-stream side of

the culvert with dam boards or beaver-made dams; by constructing flumes to replace waterfalls, or, in extreme cases, by resetting the culvert (Lisle 1996). Fence mesh size should be selected to minimize risks to beaver and non-target species. Brown et al. (2001) noted that beaver occasionally became stuck in 6 inch mesh and that the risk of beaver entrapment was lower with 5 inch mesh. Lisle (1999) noted that the size of the mesh on the fence of the Beaver Deceivers™ (6 inch mesh) was such that it allowed most species to pass through the fence except beaver and big turtles. In remote areas where there is little traffic it may be acceptable for animals which cannot pass through the deceiver to travel across the road. However, for culverts under busy roads, it is necessary to design special "doors" which can allow the passage of beaver and large turtles through the device.

3. Barriers, Netting, Wire Grids and other Exclusion Methods

Barriers, netting, wire grids and other exclusion methods are occasionally used by ID WS (up to 20 projects annually). Barriers are mostly used to prevent access to areas such as gardens, fish ponds, nest sites[3], dwellings and livestock and poultry pens. Selection of a barrier system depends on the wildlife species being excluded, expected duration of damage, size of the area or facility to be excluded, compatibility of the barrier with other operations (*e.g*., feeding, cleaning, harvesting, recreational activity, etc.), possible damage from severe weather, and effect on site aesthetics. The barrier system also depends on the resource being protected and its value. Systems can range from relatively simple systems such as metal flashing, hardware cloth to highly complex mesh and grid systems. Barrier systems can initially be very costly to erect and expensive to maintain, but can provide a long-term highly effective solution to some damage problems.

Netting consists of plastic or wire mesh placed around or over resources in a small area, likely to be damaged or of high value. Netting is typically used to protect areas such as livestock pens, fish ponds and raceways, high value crops and structures. Complete enclosure of ponds and raceways to exclude all fish-eating birds requires 1.5- to 2-inch mesh netting secured to frames or supported by overhead wires. Gates and other openings must also be covered. Some hatchery operators use mesh panels placed directly on raceways to effectively exclude predatory birds (small mesh netting, less than 1-inch openings, secured to wood or pipe frames, prevent feeding through the panels). Because the panels may interfere with feeding, cleaning or harvesting, they are most appropriate for seasonal or temporary protection. It is also used to prevent wildlife access to settling ponds that contain poisons or oil that could kill them. Small mesh can also be used in ponds to prevent fish from entering shallow water where they would be easy prey for wading birds. Complete enclosure of areas with netting can be very effective at reducing damage by excluding all problem species, but can be costly.

Some birds may be excluded from ponds or other areas using overhead line in a grid-like pattern (Fairaizl 1992, Lowney 1993). Partial enclosures, such as overhead lines, wires, or braided or monofilament lines suspended horizontally in one direction or in a crossing pattern, cost less, but may not exclude all bird or mammal species. These lines should be

[3] For example, using a barrier consisting of a physical exclosure to protect a ground nesting species of bird from predators.

made visible to the birds by hanging streamers or other objects at intervals along the wires. The objective is to discourage bird feeding activities and not cause bird injury or death. Overhead line networks generally require little maintenance other than ensuring proper line tension and replacing broken segments. Ponds, raceways, buildings and other areas can be protected with overhead lines. Spacing between wires or lines should be based on the species and behavior of the birds causing damage. Where the wire grids need to be suspended up high to allow for maintenance the perimeter fencing or wire around ponds and raceways provides some protection from wading birds and is most effective for herons. Overhead wires have been demonstrated to be most effective on sites $\leq$ 2 acres in size, but may be considered unsightly or aesthetically unappealing to some people. In addition, overhead lines can render a pond unusable for boating, swimming, fishing, and other recreational activities. Installation costs are about $1,000 per surface acre depending on the type and quality of materials used. The expense of maintaining wire grids may be burdensome for some people.

For ponds, fencing at least 3 feet high should be erected in water 2 to 3 feet deep to keep the birds from feeding on the pond side of the fence. Raceway fences should be high enough to prevent feeding from the wall.

Occasionally, blackbirds will cling to fencing or screening near the water and feed on small fish. A slippery surface can be created by draping plastic over the fence or screen to eliminate this problem. Electric fences or wires have also been used with limited success. These exclusionary methods are often not practical for large areas and may make routine work around ponds and hatcheries difficult or impossible.

These methods can be used in both urban and rural settings on public and private land.

4. Sheathing and Tree Protectors

Sheathing is rarely used by ID WS (zero to 5 projects annually). Sheathing consists of using hardware cloth, solid metal flashing or other materials to protect trees from wildlife or prevent wildlife from climbing trees to gain access to areas where they are unwanted (*e.g.*, a building). Tree protectors are most often used to prevent damage to trees by beaver, rodents, deer, tree squirrels and porcupines. Sheathing may be impractical where there are numerous plants to protect and because of this, they are mostly used in urban settings where only a few trees or objects need protection.

5. Abrasives

Abrasives are rarely used by ID WS (zero to 5 projects annually). Materials that are abrasive can discourage, reduce or prevent gnawing behavior of rodents. Abrasives produce an unpalatable surface which irritates the teeth and mouth of rodents when they attempt to gnaw or chew on the surface. Flexible materials, such as sandpaper, grinder pads and fine-mesh stainless steel screening can be placed on or over objects (*e.g.*, electrical wiring, plastic piping, fruit trees, etc.) that are susceptible to gnawing rodents. Fine sand can be added and mixed with paint, glue or other suitable liquid adherents to formulate a paste or heavy mixture that can be brushed-on or applied to a surface to discourage rodent gnawing. This method has had limited success when applied or painted on tree trunks to discourage beaver from cutting down trees.

Abrasives can be used in both urban and rural settings, but most practical where only a few trees or areas need protection

VII. METHODS RECOMMENDED BUT NOT IMPLEMENTED BY THE WS PROGRAM

A wide range of nonlethal management tools are recommended by the WS program for wildlife damage management, but are implemented by the landowner/manager. Compliance with applicable federal, state and local laws and regulations is the responsibility of the landowner/ manager implementing the method. Consequently, these methods are not included in this consultation because they are not implemented by the ID WS program. We have provided a list of these types of methods for informational purposes.

Cultural Methods: Crop selection, livestock guarding animals, timing of harvest and grazing patterns to avoid periods/locations of greatest risk, carcass removal, herders, shed lambing.

Habitat Management: permanent fencing systems, minimizing cover where damaging animals might hide, thinning trees to discourage roosting birds, removal of trees from around buildings to reduce access by squirrels and raccoons, planting lure crops on fringes of protected crops, removal or sealing of garbage in tight trash receptacles, proper storage of grain and other feed, and elimination of all pet foods from outside areas.

Human Behavior Management: feeding bans, temporary closure of areas to avoid conflicts with protective breeding birds.

VIII. SITE ACCESS

Before WS conducts any wildlife damage management, a request must be received and an *Agreement for Control* must be signed by the landowner/administrator for private lands or other comparable documents for public or tribal lands must be in place. Idaho WS uses 4-wheel drive vehicles, all-terrain vehicles (ATVs), motorcycles snow machines, aircraft or riding horseback when conducting WDM activities. All ID WS site access activities would be in compliance with Federal, State and local laws, as well as in compliance with the terms and conditions set forth in ID WS Memorandum of Understanding (MOU) with land management agencies.

CONSERVATION MEASURES

I. GENERAL CONSIDERATIONS FOR ID WS ACTIVITIES IN AREAS OCCUPIED BY T/E SPECIES

Based on review of potential risks from WDM methods, ID WS has determined that program actions may adversely affect Grizzly Bear and Canada Lynx and is requesting formal consultation for these species (Biological Assessments Page 99). Idaho WS program activities may affect but are unlikely to adversely affect Selkirk Mountain woodland caribou, Bull Trout (*Salvelinus confluentus),* Northern Idaho Ground Squirrel (*Spermophilus brunneus brunneus*), yellow-billed cuckoo *(Coccyzus americanus)* and is requesting informal consultation regarding for these species (Evaluation of Methods – Page 47; Appendix D – Page 158. We have determined that the proposed action will have no effect on Banbury Spring limpet (*Lanx sp.*), Bliss Rapids snail (*Talorconcha serpenticola*), Snake River physa snail (*Haitia (Physa) natricinia*), Bruneau Hot Springsnail (*Pyrgolopsis bruneaunsis*), Snake River Sockeye Salmon (*Oncorhynchus nerka*), Snake River Spring/Summer and Fall Chinook (*O. tshawytscha*), Snake River Basin Steelhead (*O. mykiss gairdneri*), Kootenai River white sturgeon (*Acipenser transmontanus*), Macfarlane's four-o'clock (*Mirabilis macfarlanei*), slickspot peppergrass (*Lepidium papilliferum*), Spalding's catchfly (*Silene spaldingii*), Ute Ladies-tresses (*Spiranthese diluvialis*) and Water howellia (*Howellia aquatalis*), and Whitebark Pine *(Pinus albicaulis).*

The determinations above regarding "no effect" and "may affect, not likely to adversely affect" are based on the material in the reviews of each method (Section II below) and WS implementation of the general and species-specific conservation measures listed in this section.

WS Standard Operating Procedures to Reduce or Avoid Risks to Federally-listed Species

The ID WS program implements several standard operating procedures to reduce and/or avoid potential adverse impacts on federally-listed species. These procedures include:

1) Only conduct WDM activities when and where a need exists;

2) Train personnel on the identification and sign of federally-listed candidate, proposed, threatened, endangered and experimental/nonessential species found in Idaho.

3) Maintain contact with U. S. Forest Service (USFS), Bureau of Land Management (BLM), IDFG and USFWS personnel, as appropriate, to keep updated on new and existing information on the distribution of T/E species;

4) Provide USFWS maps to each employee indicating areas where T/E species are found in Idaho;

5) Adhere to road restrictions/closures;

6) Adhere to WS Directives on the safe, legal and effective use of damage management methods;

7) Adhere to Terms and Conditions, Reasonable and Prudent Measures, and Conservation Measures outlined in consultations with the USFWS

8) In the unlikely event that a T/E animal is unintentionally captured unharmed, ID WS would take all practical efforts to coordinate with the USFWS, IDFG, USFS or BLM, as appropriate, to facilitate marking or radio-collaring the animal prior to release if applicable. If ID WS determined that it would be impractical to arrange for radio-collaring the animal, and if the animal was judged likely to survive on its own, it would be immediately released. Should the animal be judged unlikely to survive on its own, ID WS would propose that it be humanely euthanized and transferred to the USFWS. If ID WS were to take a T/E species, we would immediately contact USFWS, Ecological Services to determine whether additional measures might be in order to reduce the likelihood of any further unintentional take.

9) Records of conducting extensive and intensive surveys and results will be documented on ID WS' Management Information System (MIS) computer database Work Tasks.

   For the purpose of this document:

   Extensive surveys will cover the area within a 3 mile radius (28.27 mi^2) of a proposed location where a WDM method will be used and will consist of driving dirt roads; inspecting accessible snow machine trails and walking trails, as necessary; using telemetry equipment when applicable; and visiting with landowners and natural resource personnel, as appropriate, to search for any sign of the species of interest.

   Intensive surveys will consist of thoroughly searching the immediate area (0.25 mi2) surrounding the proposed location where a WDM method will be used, to search for sign or other evidence of the species of interest.

II. CONSERVATION MEASURES INTEGRAL TO DETERMINATIONS OF "MAY AFFECT NOT LIKELY TO ADVERSELY AFFECT"

A. Selkirk Mountains Woodland Caribou

SMWC may occur in Bonner and Boundary counties in Idaho. Critical Habitat for SMWC, all in Boundary County, was listed November 28, 2012 (77 FR 71041-71802), with critical habitat designated at or above 5,000 feet.

Neck/body snares may be used to capture wolves, mountain lions, coyotes and beavers in areas occupied by SMWC. Therefore, within the Southern Mountain Caribou Recovery Zone, snares will be restricted to between December 1 and March 15 and to areas below 4,500 feet in elevation, and checked at least daily.

For WDM activities, ID WS would implement the following mitigation measures to reduce any potential for adverse affects to SMWC to an insignificant/discountable level:

1. If wolf or mountain lion damage management is necessary, ID WS will give preference to shooting, because risks to SMWC are eliminated by visual identification of the target species prior to shooting.

2. Protective measures established for grizzly bear, limit use of neck/body snares in SMWC occupied habitat to the period of December 1 to March 15. Idaho WS will also implement the following use restrictions:

Prior to using neck/body snares outside the date and elevation restriction identified above, ID WS will coordinate with the Panhandle IDFG Regional Wildlife Manager and the USFWS to inquire if the area is occupied by SMWC. For the purpose of this condition "occupied" is defined as:

- The presence of caribou from recently obtained telemetry locations.
- Credible reports of caribou activity or observations received by IDFG or USFWS.
- Credible reports of caribou received by ID WS on and near areas proposed for setting neck/body snares.

If the area is occupied by SMWC, ID WS will not use neck/body snares. If the area is determined not to be occupied, ID WS will conduct site-specific extensive and intensive surveys on the proposed property prior to setting neck/body snares.

B. Northern Idaho Ground Squirrel

ID WS rarely receives requests for ground squirrel damage management in or near Northern Idaho Ground Squirrel (NIDGS) occupied range. For ground squirrel damage management activities, ID WS would implement the following mitigation to reduce any potential for adverse effects on NIDGS to an insignificant/discountable level:

1. Idaho WS personnel will not conduct ground squirrel damage management activities within the NIDGS primary and secondary metapopulation boundaries as identified in the probable historic distribution map (Appendix E; USFWS 2003), without first conferring with the USFWS and/or the IDFG to determine if NIDGS populations are in the vicinity of the proposed treatment area.

2. Prior to conducting Columbian, Merriam's or Piute ground squirrel damage management in Adams, Gem, Payette, western Valley and Washington Counties, ID WS personnel will receive identification training on NIDGS, Columbian, Merriam's, Piute and golden-mantled ground squirrels; white-tailed antelope squirrel; and other small, burrowing mammals of similar size and appearance. Training materials on NIDGS general ecology also will be provided.

3. Conduct a field survey of the area prior to treatment to ensure that NIDGS populations are not present and would not be adversely affected by the action. If NIDGS populations are identified on non-private property in or adjacent to the treatment area, ID WS will contact USFWS and/or IDFG biologists to notify them of this discovery. Idaho WS will not initiate a damage management action until USFWS and IDFG biologists concurred that the action could be implemented without having an adverse affect on the NIDGS

populations, or if the action should be implemented under the dual supervision of either USFWS or IDFG biologists and ID WS personnel.

C. Snake River Sockeye Salmon (*Oncorhynchus Nerka*), Snake River Spring/Summer Chinook (*O. Tshawytscha*), Snake River Fall Chinook (*O. T.*), and Snake River Basin Steelhead (*O. Mykiss Gairdneri*)

Essential Fish Habitat Assessment - This BA evaluates and assesses potential effects of ID WS WDM activities on EFH. Pursuant to section 305(b) of the Magnuson-Stevens Act and its implementing regulations (50 CFR Part 600.920), Federal agencies must consult with NOAA Fisheries regarding any of their actions authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken that may adversely affect EFH. The Magnuson-Stevens Act, section 3, defines EFH as "those waters and substrate necessary for fish for spawning, breeding, feeding, or growth to maturity." Federal agencies may incorporate an EFH Assessment into an ESA BA.

Idaho WS will not remove beavers using quick-kill/body gripping traps (unless the proposed site is above a fish screen or other barrier which prevents access by anadromous fish) or breach beaver dams in Snake River sockeye, Snake River spring/summer Chinook, Snake River fall Chinook or Snake River basin steelhead critical habitat. However, if ID WS does receive a request for beaver removal using quick-kill/body gripping traps or beaver dam removal in salmon and steelhead occupied habitat or EFH, ID WS personnel would be instructed not to proceed until first consulting with NOAA Fisheries to determine if there may be potential adverse impacts. If adverse impacts are anticipated, ID WS will initiate formal consultation or terminate the proposed action.

D. Yellow-billed Cuckoo

Idaho WS aerial operations (shooting, telemetry/surveillance and hazing), ground shooting, beaver dam removal (explosives and by hand), beaver dam water-level control devices and propane exploders/pyrotechnic devices could potentially disturb yellow-billed cuckoo. To reduce potential disturbances, ID WS will minimize activities in known occupied yellow-billed cuckoo breeding habitat. If yellow-billed cuckoo are observed in areas outside breeding habitat during the breeding season, the use of propane cannons or pyrotechnics will also be discontinued.

EVALUATION OF METHODS

This Section evaluates potential adverse impacts and/or beneficial effects from implementing the proposed action (proposed action is to implement a Statewide Federal WDM program potentially utilizing 50 individual damage management methods) on 18 Federally listed T/E species, 1 species proposed for listing and 8 species designated as a candidate for listing (n=27). Impacts on Candidate species have been included in this consultation to aid in conservation of the species and to facilitate future consultation if these species are eventually listed as threatened or endangered. Because there are 1,350 possible combinations of species and methods (27 species x 50 methods = 1,350), the resulting evaluation can be very complex and confusing when using a written format. In an effort to condense and simplify the conclusions of impact, a matrix was prepared which lists all T/E, proposed and candidate species and WDM methods (Appendix D). The matrix provides the standard conclusions for each species:

1) No Effect (NE)
2) May Affect, Not Likely to Adversely Affect (NLAA),
3) May Affect, Likely to Adversely Affect (LAA), and
4) Beneficial Effect (BE).

If a NE conclusion is made, then no further action is required by ID WS. However, if a NLAA, LAA or BE conclusion is made then an explanation, with rationale, is provided.

I. Cage Traps – Small

A. Northern Idaho Ground Squirrel

ID WS has conducted PDM activities to reduce the threat of predation from coyotes, badgers and red fox on NIDGS in occupied ground squirrel habitat. The requests were initiated by the USFWS and IDFG. In selecting the most appropriate control tools, small and large cage traps were considered but discounted due to the availability of more effective capture techniques. In the rare occurrence that cage traps would be used in areas occupied by either ground squirrel species, ID WS would utilize baits that are target-specific and not an attractant to ground squirrels, further limiting their exposure to cage traps.

NIDGS have not been captured in cage traps by ID WS. Given that ID WS does not use cage traps in areas occupied by either ground squirrel; trap baits are normally target-specific; and small cage traps are live-capture devices, there is a discountable likelihood that NIDGS will be adversely affected by the use of cage traps. ID WS concludes that the use of cage traps results in a "**may affect, not likely to adversely affect**" finding for NIDGS.

Conceivably, the use of cage traps in known ground squirrel areas may result in a "may beneficially affect" finding for NIDGS populations by removing predators and/or other animals directly competing for food or other resources from the localized area.

II. CULVERT AND LARGE CAGE TRAPS

A. Grizzly bear

Culvert traps may be used to capture black bears and large cage traps are sometime used to target coyotes, feral/wild dogs, red foxes and mountain lions. These traps may be placed in areas occupied by grizzly bears. Additionally, ID WS may utilize culvert traps to capture grizzly bears confirmed of depredating on livestock under a sub-permit issued by the USFWS Grizzly Bear Recovery Coordinator. The carcasses of livestock that were killed by the target predator are commonly used as bait. When implementing grizzly bear damage management activities, ID WS, in accordance with USDI (1992), requires a daily trap check to ensure the health and well-being of any captured bear.

Culvert and large cage traps are live-capture devices and if a grizzly bear or other non-target animal is accidently captured it can be released on site with little or no injury. Target animals captured in culvert or large cage traps can be released on site (placement of telemetry equipment, disease surveillance, etc.), relocated, but normally they are euthanized.

In accordance with USDI (1992), ID WS continues to implement two reasonable and prudent measures as necessary and appropriate to minimize potential for incidental take (see Conservation Measures). These reasonable and prudent measures include a daily trap check of culvert traps targeting black bears in areas occupied by grizzly bears. If grizzly bears are not the target species and there is any sign of grizzly bears in the area, culvert traps are not set for black bears. Idaho WS rarely uses culvert traps (only 1 project during the past 7 years) to target black bears in grizzly bear habitat. There has been no incidental take of any grizzly bear by ID WS from the use of culvert traps. Idaho WS will continue to comply with the above monitoring requirements.

Idaho WS' use of large cage traps for coyotes, feral/wild dogs, red foxes and mountain lions has occurred, but in each instance they were not used in occupied grizzly bear habitat. Large cage traps set for these animals are typically placed in or near populated areas, further reducing the likelihood of an incidental grizzly bear capture due to their habitat use preferences. Idaho WS does not anticipate using large cage traps in grizzly bear recovery areas, however, if this method is deemed absolutely necessary, ID WS will contact the IDFG or USFWS local office to discuss how cage traps can be set to reduce the potential take of grizzly bears, and implement a daily trap check. There has been no incidental take of any grizzly bear by ID WS from the use of large cage traps.

All ID WS grizzly bear capture efforts are at the request of USFWS. The extent of ID WS' activity is normally restricted to capturing and restraining grizzly bears. To date, all grizzly bears targeted for capture and relocation have been immobilized by USFWS or IDFG personnel for biological sampling and/or the attachment of a tracking device. If ID WS must immobilize a captured grizzly bear for any reason, only those employees trained in the use of chemical immobilization drugs may administer such drugs. Neither long term injury nor lingering effects are expected.

If and when the USFWS issues ID WS a "take order," ID WS is authorized to lethally remove a grizzly bear under the terms and conditions as described in Section (i) (C) and (D) of the grizzly bear 4(d) rule, 50 CFR 17.40(b). Under a "take order," and at the request of the USFWS, ID WS would humanely euthanize any captured grizzly bear.

Idaho WS concludes that culvert and large cage traps results in a "**may affect, likely to adversely affect**" finding for grizzly bears.

B. Canada Lynx

Culvert and large cage traps may be used to capture black bears, grizzly bears, coyotes, feral/wild dogs, red foxes and mountain lion in areas occupied by Canada lynx. When utilizing these traps in known lynx habitat, ID WS, in accordance with Conservation Measures noted above and in the lynx BA below, would not use any olfactory attractants containing fish oil, catnip, anise, or castor as ingredients, to reduce the likelihood of attracting lynx or other feline species. Idaho WS has never captured a Canada lynx in a culvert or large cage trap.

Culvert traps, by design (*i.e.*, use of trigger weights), locations of use, and selected baits would likely preclude Canada lynx from being captured. Culvert traps used for the capture of bears are placed in locations of fresh bear activity (livestock kills) to capture offending animals when they return to feed on their kill, which is often used to bait the trap. The use of culvert traps in this way is virtually animal-specific, helping minimize trap exposure to other animals. Culvert traps would primarily be used near populated places (campgrounds, small municipalities, etc.) when other, more efficient bear removal methods (foot snare, shooting) are deemed inappropriate, further limiting Canada lynx exposure due to their habitat use preferences.

The use of large cage traps for mountain lions may occur in Canada lynx habitat, but other more effective methods (foothold traps, foot snares, shooting) would be given priority. Large cage traps used for the capture of mountain lion are placed in locations of fresh lion activity (livestock kills) to capture offending animals when they return to feed on their kill, which is often used to bait the trap. The use of large cage traps in this way helps to minimize trap exposure to other animals. Large cage traps would primarily be used near populated places (campgrounds, small municipalities, etc.) when other, more efficient mountain lion removal methods (foot snare, shooting) are unavailable. Idaho WS' use of large cage traps, set for the capture of mountain lions, has only occurred twice and in each instance, these traps were not utilized in Canada lynx habitat.

Idaho WS' use of large cage traps for coyotes, feral/wild dogs and red foxes has occurred, but in each instance they were not located in Canada lynx habitat. Large cage traps set for these animals are typically placed in or near populated areas, further reducing the likelihood of an incidental Canada lynx capture due to their habitat use preferences.

Given the information and conservation measures listed in this section and that ID WS has not used large cage traps in areas occupied by Canada lynx; that large cage traps would only be used if other more effective methods were unavailable; and that large cage traps set for coyotes, feral/wild dogs and red foxes normally only occur in or near populated areas (improbable in Canada lynx habitat) when other methods are unavailable due to public sensitivities; there is a discountable likelihood that Canada lynx will be adversely affected by the use of large cage traps. ID WS concludes that the use of large cage traps results in a "**may affect, not likely to adversely affect**" finding for Canada lynx.

III. QUICK-KILL/BODY-GRIPPING TRAPS

A. Bull Trout

The use of quick-kill (*e.g.,* Conibear-type) traps for aquatic mammal damage management activities may occur in bull trout occupied streams. The use of quick-kill traps for beaver would only occur if ID WS receives a request for assistance and confirms the damage is threatening property, natural resources, human health and safety or threatened or endangered species.

Quick-kill traps, when set for aquatic mammals (primarily beaver), are typically placed in shallow-water travel ways (2 feet or less) at or near beaver lodges/burrows/dams. Quick-kill traps set for beaver are 10"x10" and trigger placements (often moved to the side of the trap) are adjusted to maximize trap openings, minimizing non-target exposure, yet effectively capturing target animals. Quick-kill traps, set in shallow water at scent-mound (territorial markers) or beaver dam crossovers, minimize exposure to bull trout. Quick-kill traps would only be used in bull trout occupied streams if other capture devices (foothold traps, neck snares, shooting) are deemed ineffective or impractical for situational use. No fish species have been captured or killed by ID WS with quick-kill traps (MIS 2011).

Beaver removal activities normally only occur at locations where beaver have become active within the previous 12 months. With the removal of all beavers from a localized colony, the possibility exists that over time, the associated beaver dams would degenerate into a state of disrepair. In these circumstances, the waterway would revert to its original form prior to beaver inhabitation. The United States Army Corps of Engineers (USACE 1996) has stated that removal of recently constructed beaver dams (less than 1 year old), does not destroy or degrade waters of the United States because there has not been sufficient time for the dams to accumulate organic matter and soil or develop important and valuable aquatic habitats upstream. Thus, removal of beaver dams less than one year old is unlikely to impact wetland habitats and associated wildlife.

Given that ID WS rarely uses quick-kill traps in bull trout occupied streams; other WDM methods would be given priority over the use of quick-kill traps; ID WS removal of beaver, and consequently the possible removal of beaver dams less than one year old would not destroy or degrade waters of the US; IDFG has established quick-kill traps are available for use in bull trout occupied streams; and ID WS has not captured any fish species with quick-kill traps, there is a discountable likelihood that bull trout will be adversely affected by the use of quick-kill traps. Idaho WS concludes the use of quick-kill traps results in a "**may affect, not likely to adversely affect**" finding for bull trout and critical habitat.

Conversely, the use of quick-kill traps to remove beaver that are disrupting stream flow and impeding and preventing migration and spawning, may provide a beneficial effect. Therefore, ID WS is making a "may beneficially affect" determination for bull trout.

IV. FOOTHOLD TRAPS AND FOOT SNARES

A. Grizzly Bear

Some foothold traps may pose a risk to grizzly bears when used in occupied grizzly bear habitat. Based on a review of 20 years of WS data in the United States, 6 non-target grizzly bears have been captured in foothold traps set for depredating wolves. Five bears were captured in Wyoming (1 in 2006, 1 in 2009, and 3 in 2012 (R. Krischke, Wyoming WS, pers. comm., 2012)).

The sixth bear was captured in Montana in 2007. Five of the trapped bears were safely released unharmed while one bear escaped after breaking the trap before it was checked.

Most coyote and wolf damage management is conducted on private lands, however, some trapping may occur on USFS lands where the majority of suitable grizzly bear habitat is assumed to be located. Thus, there is some risk of capturing a grizzly bear by use of foothold traps in occupied grizzly bear habitat. Typically traps set for coyotes will not hold a grizzly bear because their springs lack sufficient strength to apply enough pressure to keep the jaws closed, and the greatest inside distance of the jaw opening (≤ 6 inches) is small enough that if a cub or juvenile grizzly bear stepped directly on the trap, the animal would probably preclude capture because the foot's length (including toe nails) and/or width would be larger than the diameter of the opened trap jaws. The trap would simply close beneath the foot and avoid the entire foot and/or toes. Foothold traps set for coyotes, red foxes, bobcats and similar-sized animals are either staked to the ground securely, attached to a solid structure (*i.e.,* tree trunk, heavy fence post), or used with a drag that becomes entangled in brush, trees or rocks to prevent trapped animals from escaping. WS programs in Idaho, Montana and Wyoming, to the best of their knowledge, have never captured and held, or had a grizzly bear escape (pullout) after being captured in a foothold trap set for coyotes, bobcats or red foxes. However a private fur trapper in Wyoming captured and held a grizzly cub in a trap set intended for a bobcat in the fall trapping season of 2011 (M. Bruscino, Wyoming Game and Fish Department, pers. comm. 2012). The cub was released unharmed by Wyoming Game and Fish Department officials.

Foothold traps used for wolf or mountain lion damage management are larger in size, heavier, have stronger springs and greater jaw diameter (normally <8 inches) than traps used for coyotes. When ID WS sets these traps for wolves or mountain lions they are either equipped with drags or attached to very heavy objects (*i.e.,* log) to prevent the wolf or lion from escaping. With all of these anchoring systems, should a grizzly bear become trapped there should be enough resistance that the animal will either pull its foot free from the trap or hold the animal to prevent it from escaping. Idaho WS wolf and lion trapping activities, taking place in occupied grizzly bear habitat (delineated annually on USFWS provided maps) while bears are not hibernating (*i.e.*, between March 15 to December 1), only occur as part of an active damage management operation in cooperation with the IDFG and foothold traps are only used when other capture methods (*i.e.,* aerial shooting and foot snares) are impractical or ineffective. Idaho WS confers with the USFWS and IDFG grizzly bear specialists regularly to obtain updated information about these animals, their activity and location. The best of our knowledge, ID WS has never captured a grizzly bear in a foothold trap when trapping for wolves or mountain lions in grizzly bear habitat.

Current WS policy dictates if foot snares are used in occupied grizzly bear habitat for the capture of black bears or mountain lions, all snares used will be grizzly bear sized snares with ¼ inch steel cables anchored to fixed positions, and equipped with appropriate swivels. This is to ensure that if a grizzly bear is unintentionally captured, the snare will hold the bear (rather than the possibility of breaking away from the anchor and the grizzly bear escaping with the snare remaining on the leg) until it can safely be immobilized and released. Loose drags are avoided unless there is no fixed location to attach snares (*i.e.,* trunk of a large tree). Where there is no fixed location, heavy drags (in excess of 250 pounds) are used. Foot snares are only used when other capture methods (*i.e.,* aerial shooting, culvert trap) are deemed impractical or ineffective, but are often used in combination with calling and shooting. Foot snares set for black bears, mountain lions, grizzly bears, and wolves between March 15 and December 1 in areas designated by the USFWS as occupied grizzly bear habitat are checked daily so that any unintentionally captured animal can be safely immobilized and released unharmed. Idaho WS has never captured a grizzly bear in a foot snare set for wolves, mountain lions or black bears.

WS records nationwide shows that there has been only one grizzly bear accidently captured in a foot snare during the past 20 years. This happened in Wyoming in 1996. The bear was safely released unharmed.

All ID WS grizzly bear capture efforts are at the request of USFWS and the extent of activities are normally restricted to capturing and restraining the animal as explained in the BA– Grizzly Bear Section. To date, all grizzly bears targeted for capture and relocation have been immobilized by other agency personnel (USFWS or IDFG) for biological sampling and/or the attachment of a tracking device. However, the USFWS could potentially request that ID WS personnel be involved in immobilizing or removing specific bears. If ID WS must immobilize a captured grizzly bear for any reason, only those employees trained in the use of chemical immobilization drugs may administer such drugs. No long term injury or lingering effects from immobilization activities are expected.

The only exception to current grizzly bear management in Idaho is when the USFWS issues ID WS a "take order" authorizing the lethal removal of the bear under the terms and conditions as described in Section (i) (C) and (D) of the grizzly bear 4(d) rule, 50 CFR 17.40(b). Under the "take order," sub-permit issued to ID WS by the USFWS, ID WS would humanely euthanize any captured bear at the direction of the USFWS Grizzly Bear Recovery Coordinator.

With ID WS' WDM activities in occupied grizzly bear habitat, particularly responding to wolf or mountain lion predation, an incidental take of a grizzly bear within the Idaho portions of the grizzly bear distribution area of the Greater Yellowstone PCA, the Selkirk Mountains Recovery Zone boundary and Cabinet-Yaak Recovery Zone cannot be discounted. ID WS concludes that the use of foothold traps and foot snares result in a "**may affect, likely to adversely affect**" finding for grizzly bears.

B. Selkirk Mountains Woodland Caribou

Foothold traps may be used to capture wolves, coyotes and mountain lions, and foot snares may be used to capture black bears, grizzly bears, and mountain lions in areas occupied by SMWC. Idaho WS has never captured or harmed a SMWC in any of its WDM activities.

Only one unintentional capture of caribou has ever occurred by WS, nationwide. The incident occurred in Alaska when a young barren-ground caribou *(Rangifer tarandus granti)* calf was captured in a foothold trap set for arctic fox (*Vulpes lagopus*). The calf died prior to trap check. Alaska barren-ground caribou are not a threatened or endangered species; rather they are listed as a big game animal and are present in extremely large herds. Although arctic fox trapping has occurred in the area for the past six years, this is the only incident that has occurred despite the high trap use and caribou exposure rate. Although ID WS' use of foothold traps throughout Idaho is extensive, with very moderate use of foot snares, ID WS' use of these devices in SMWC recovery area for the capture of wolves or other predators has not occurred.

Foot snares set by ID WS in SMWC habitat could potentially capture and hold the animal. However, foot snares are normally set at kill sites of black bears, grizzly bears and mountain lions and SMWC would most likely avoid these locations because fresh scent of these predators would likely be left at the site and the smell of fresh blood and other prey remains, would likely repel the animals.

Idaho WS has never captured a SMWC while conducting its WDM activities. Suitable habitat and the range of SMWC in Idaho are extremely limited, with the majority of time of this population spent above 4,000 feet in elevation. Idaho WS has not conducted PDM activities in SMWC habitat, and if activities were to occur they would be rare. Foot snares would be set near predator kill sites that are unlikely to be visited or traveled through by caribou. Therefore, given the information above and the Conservation Measures listed on Pages 42 and 43, there is a discountable likelihood that SMWC would be adversely affected by the use of foothold traps, and that the use of foothold traps and foot snares "**may affect, not likely to adversely affect**" SMWC.

In the rare instances when foothold traps and foot snares would be used in SMWC habitat to remove caribou predators, use of these devices could beneficially affect SMWC by removing potential predators.

C. Canada Lynx

Foothold traps may be used to capture wolves, coyotes and mountain lions, and foot snares may be used to capture black bears, grizzly bears, mountain lions and wolves in areas occupied by Canada lynx. Idaho WS has had one unintentional capture of a Canada lynx with a foothold trap in Idaho over the last 40 years, which occurred before lynx were listed. The Canada lynx was captured in atypical habitat in 1991 and was released unharmed.

Although ID WS' use of foothold traps is extensive, use of foothold traps in described lynx habitat is primarily for wolf damage management activities. An occasional need may also arise to use foot snares in lynx habitat for capturing black bears, grizzly bears or mountain lions. In accordance with our March 28, 2002 BO on Canada lynx which covers the southern-most 34 counties in Idaho, ID WS continues to implement the following conditions:

1. Foothold traps placed for coyotes will not be used in conjunction with any visual attractants of the type normally expected to attract bobcats or other feline species (*i.e.*, pieces of fur, feathers, shiny metal or fabric, etc.).

2. Foothold traps placed for coyotes will not be used in conjunction with any olfactory attractants containing fish oil, catnip, anise, or castor as ingredients, to reduce the likelihood of attracting lynx or other feline species.

3. Foothold traps and foot snares set to capture larger predators (such as mountain lions, black bears, or adult wolves) will have pan-tension adjusted such that it would require 8-10 pounds of pressure to trigger the trap. (This would be expected to minimize the likelihood of capturing a lynx or any other animal up to about 30-35 pounds in weight).

Idaho WS has only had one unintentional capture of a Canada lynx which occurred prior to implementation of any restrictive trapping considerations (1991, prior to listing), and no Canada lynx have been captured since lynx conservation measures were put in place. Despite the conservation measures and that the Canada lynx population in Idaho is extremely limited and foothold traps and foot snares are live-capture devices, it cannot be discounted that a Canada lynx may be adversely affected by the use of foothold traps. Consequently, ID WS concludes that the use of foothold traps and foot snares results in a "**may affect, likely to adversely affect**" finding for Canada lynx.

D. Northern Idaho Ground Squirrels

At the request of the USFWS, foothold traps have been used by ID WS for PDM in areas occupied by NIDGS. These predator management activities were implemented to benefit NIDGS by directly reducing predation on localized NIDGS colonies. When utilizing foothold traps, pan-tensions are utilized to minimize non-target captures while still allowing for capture of target species. NIDGS range in weight from 4.2 – 10 ounces, making the capture of NIDGS in foothold traps discountable when pan-tensions are incorporated on traps.

Given that ID WS uses pan-tension devices when using foothold traps and no ground squirrels have been captured with foothold traps, there is a discountable likelihood that NIDGS will be adversely affected by the use of foothold traps. Idaho WS concludes that the use of foothold traps results in a "**may affect, not likely to adversely affect**" finding for NIDGS. The use of foothold traps may also result in a "may beneficially affect" finding regarding NIDGS by the potential and localized reduction of predation on their limited populations.

V. NECK/BODY SNARES

A. Grizzly Bear

Neck/body snares used to capture mountain lions, coyotes, gray wolves and beavers could pose a risk to grizzly bears. Idaho WS does not utilize neck snares set for mountain lions or gray wolves within occupied grizzly bear habitat between March 16 and November 30 unless specifically authorized by the IDFG or USFWS.

A review of records for WS, nationwide, for the past 20 years indicate that only one grizzly bear has been captured in a neck snare. In 2003, Wyoming USFWS and WS captured a young female grizzly bear (about 60 lbs) while attempting to capture a wolf for monitoring purposes. The USFWS requested WS to capture the wolf at a site where wolves were depredating and feeding on livestock. The USFWS provided WS with the snare. The snare was not equipped with a breakaway lock but did have a "stop" device attached to help prevent the snare loop from constricting smaller than approximately ≈6 inches in diameter, which is sufficient to hold a wolf and prevent asphyxiation. Unfortunately the neck diameter of the captured grizzly bear was larger than 6 inches, and the bear succumbed. Wolf neck snares have a much greater holding-strength than coyote neck snares due to the larger diameter cable used (wolf snares are normally made with 1/8 inch diameter cable while coyote, bobcat and red fox snares are normally made with 1/16 to 5/64 inch diameter cable) and larger, more robust locks. In addition, the loop of a wolf snare is larger in diameter (around 16 to 18 inches) than a coyote neck snares (around 10 to 12 inches in diameter) making grizzly bears more susceptible to wolf neck snares than coyote neck snares.

The probability of ID WS accidently snaring a grizzly bear with the use of coyote, bobcat, or red fox neck snares is extremely low because: (1) within the Southern Mountain Caribou Recovery Zone, snares will be restricted to between December 1 and March 15 and to areas below 4,500 feet in elevation; (2) similarly within the Cabinet-Yaak Recovery Zone boundary, snares will be restricted to between December 1 and March 15 and to areas below 4,500 feet in elevation; (3) the number of PDM activities where neck snares would be the control method of choice is about 4 per year in the Selkirk Recovery Zone boundary, about 4 per year in the Cabinet-Yaak Recovery Zone boundary (ID WS is proposing that no neck snares be used in the Cabinet-Yaak Recovery Zone boundary), and about 6 per year in the Greater Yellowstone PCA boundary; (4)

snares are set as a blind set, meaning that no olfactory scents, baits or visual attractants are used in conjunction with the snare to help lure an animal to the set; (5) each PDM control action only lasts a few weeks in duration; (6) the loop of the snare is normally about 10 to 12 inches in diameter, precluding capture of most grizzly bears because the length and diameter of their heads would possibly be longer and/or wider than the snare loop; (7) the extreme top of the loop is set about 20 to 22 inches above the ground (this setting is about 4 inches above the head of a coyote when walking on a trail) and the bottom of the snare about 10 to 12 inches above the ground. Snares set at this height would probably be brushed by grizzly bears and knocked down or knocked to the side of the trail rendering the set snare inoperable; (8) the likelihood that a grizzly bear would lift its front feet or legs up and through the snare loop is remote because they don't tend to lift their feet very far off the ground when walking; and, (9) the use of break-away locks with breaking-strength of 285 lbs. or less will dramatically decrease the risks of holding and killing a young grizzly bear, but not cubs, as compared to neck snares not equipped with these locks.

The reason ID WS does not use break-away locks on all their neck snares set for coyotes is because there have been a few instances where coyotes have sheared the pin of a break-away lock and escaped, which can potentially lead to additional or continuing livestock depredations, and compounding the control effort because those animals would probably develop an avoidance to snares causing ID WS to incorporate other control methods which might not be as effective or possibly be more intrusive to non-target species.

With an increase of ID WS WDM activities in occupied grizzly bear habitat, particularly regarding wolf depredation management, an incidental take of a grizzly bear could occur. Idaho WS concludes that the use of neck or body snares result in a "**may affect, not likely to adversely affect**" finding regarding grizzly bears.

Neck snares set in areas designated by the USFWS or IDFG as occupied by grizzly bears will be used by ID WS with the following proposed restrictions:

1. Use of neck snares for coyotes, bobcats and red foxes would only occur if livestock depredation is verified by WS personnel. The duration of use will only occur until the damage is effectively resolved or for a maximum of four weeks.

2. Neck snares set for coyotes, red foxes, bobcats, wolves, mountain lions or black bears will be restricted to between December 1 and March 15 and to areas below 4,500 feet in elevation within the Idaho portion of the occupied grizzly bear habitat.

3. Neck snares for mountain lions, black bears, feral swine or wolves will be restricted to between December 1 and March 15 and to areas below 4,500 feet in elevation in the Idaho portion of the Selkirk Mountain Recovery Zone boundary and Greater Yellowstone PCA boundary.

4. Neck snares set for coyotes, red foxes or bobcats will be restricted to between December 1 and March 15 and to areas below 4,500 feet in elevation in the Idaho portions of the Selkirk Mountains Recovery Zone boundary and Greater Yellowstone PCA boundary will be equipped with breakaway locks with a breaking-strength rating of 285 lbs. or less. Use of these neck snares will only occur after a confirmed depredation on livestock has occurred. Additionally, prior to any use of neck snares as described above, ID WS will conduct both site-specific extensive and intensive surveys, and contact the IDFG Panhandle or Upper Snake Regional Offices, and USFWS, as appropriate, to inquire if the area is occupied by

grizzly bears. For the purpose of this condition "occupied" is defined as: (1) the presence of grizzly bears from the use of recent telemetry locations, (2) credible reports of grizzly bear activity or observations received by IDFG or USFWS, and (3) credible reports of grizzly bear received by ID WS on and near areas proposed for setting neck/body snares. If the IDFG and USFWS determine the area is occupied, ID WS will not use these snares. If the area is determined not to be occupied, ID WS will have the discretion to use breakaway neck snares.

B. Selkirk Mountains Woodland Caribou

Neck/body snares may be used to capture wolves, mountain lions, coyotes and beavers in areas occupied by SMWC. Although ID WS could use neck/body snares statewide, ID WS' use of these snares in SMWC occupied habitat for PDM activities has not occurred. Idaho WS has never killed or captured a SMWC in any of its WDM activities.

SMWC occupied habitat is fully included in occupied grizzly bear habitat and use of neck snares will be restricted to between December 1 and March 15 and to areas below 4,500 feet in elevation. Although neck snares set for wolves or mountain lions do not have breakaway locks, no wolf or lion damage management activities have occurred in SMWC critical habitat. Idaho WS does not expect this to change in the future, but if wolf or mountain lion damage management is necessary; ID WS would give preference to shooting, as it is 100% selective. Idaho WS will also implement the following use restrictions if snares are used to capture wolves or lions in SMWC critical habitat.

1. Prior to using neck/body snares, ID WS will contact the Panhandle IDFG Regional Wildlife Manager to inquire if the area is occupied by SMWC. For the purpose of this condition "occupied" is defined as: (1) the presence of caribou from recently obtained telemetry locations, (2) credible reports of caribou activity or observations received by IDFG or USFWS and (3) credible reports of caribou received by ID WS on and near areas proposed for setting neck/body snares. If the area is occupied by caribou, ID WS will not use neck/body snares.

2. If the area is determined not to be occupied, ID WS will conduct site-specific extensive and intensive surveys on the proposed property prior to setting neck/body snares.

If ID WS does not verify SMWC sign or activity after conducting these surveys and inquiries, it will be determined that the area is not currently occupied and ID WS will have the discretion to use wolf or mountain lion neck/body snares. Idaho WS will periodically conduct extensive surveys during the time-period neck/body snares are used in these areas, and if evidence of caribou presence is verified the snares will be removed immediately.

Idaho WS also adheres to additional conservation measures when using neck snares for coyotes in SMWC occupied habitat (see Neck/Body Snare – Grizzly Bear section).

Given that ID WS has never captured a SMWC in any of its WDM activities; critical habitat and population range of SMWC in Idaho is extremely limited; ID WS has not used neck/body snares in SMWC critical habitat and if use were to occur, there would be in extremely low number of snares used per incident (less than 5); and that neck snares set for coyotes in SMWC critical habitat would be equipped with breakaway locks; there is a discountable likelihood that SMWC will be adversely affected by the use of neck/body snares. Therefore, ID WS concludes that the use of neck snares "**may affect, not likely to adversely affect**" SMWC.

In the rare instance when WS might use neck snares in SMWC habitat, the action may result in a "may beneficially affect" finding regarding SMWC through the potential and localized reduction of caribou predators.

C. Canada Lynx

Neck snares may be used to capture black bears, wolves, coyotes, bobcats and mountain lions in areas occupied by Canada lynx. During the last 40 years, the national WS program has not captured a Canada lynx with a neck snare. The only non-target lynx incidentally taken in a neck snare in the western region of the lower 48 States in recent years was in Nebraska in 2005 by a private fur trapper (T. Hall, WS Environmental Coordinator, pers. comm., 2012). The lynx was killed in a neck snare set for coyote (Hoffman and Genoways 2005) and was a dispersing animal that was captured in Alaska and released in southwestern Colorado (Shenk 2005) as part of the lynx reintroduction project. In Alaska and Canada where lynx are not a listed species, neck snares are commonly used by fur trappers to target and take lynx.

Although ID WS uses neck snares throughout Idaho, the use of neck snares in described lynx habitat is primarily for wolf damage management activities. Additionally, when conducting PDM in Canada lynx habitat, ID WS continues to follow its self-imposed conservation measures regarding Canada lynx to minimize the possibility of an unintentional capture. In accordance with our March 28, 2002 BO on Canada lynx that covers the southern-most 34 counties in Idaho, ID WS:

1. Only conducts WDM in lynx habitat when and where a need exists;

2. does not use neck snares for coyotes or bobcats in lynx habitat; and,

3. neck snares set for wolves in lynx occupied habitats will have cable stops and placed so the loop will be 18 or more inches above the ground or packed snow level.

Idaho WS has only had one unintentional captured of Canada lynx which occurred in a foothold traps prior to implementation of conservation measures for the protection of a federally-listed species. No Canada lynx have been captured since the lynx conservation measures were put in place. Nonetheless, it cannot be discounted that Canada lynx may be adversely affected by the use of neck snares. Therefore, ID WS concludes that the use of neck snares may result in a **"may affect, likely to adversely affect**" finding for Canada lynx.

VI. ZINC PHOSPHIDE

A. Northern Idaho Ground Squirrels

The use of zinc phosphide could adversely affect the NIDGS. However, ID WS has not used zinc phosphide in areas occupied by NIDGS.

Given that ID WS has not used zinc phosphide in areas occupied by NIDGS and will implement the aforementioned conservation measures, there is a discountable likelihood that NIDGS will be adversely affected by the use of zinc phosphide. Idaho WS concludes the use of zinc phosphide results in a "**may affect, not likely to adversely affect**" finding for NIDGS.

B. Grizzly Bear, Canada Lynx and Selkirk Mountains Woodland Caribou

ID WS has not applied zinc phosphide in grizzly bear, Canada lynx or SMWC habitat and is unlikely to do so in the future. If ID WS did receive requests in the future to conduct WDM activities in habitats of these animals, it would likely be carried out using other methods such as burrow fumigants, snap or cage traps, or shooting which would not pose risks to any of these species. However, if ID WS receives a request from a National Forest to assist with conducting pocket gopher or ground squirrel control using zinc phosphide grain bait, this BA and pre-existing NEPA documents would be reviewed to ensure compliance. Any additional environmental analysis or re-initiation of ESA consultation would be the responsibility of the respective National Forest requesting the assistance and would be completed prior to application of zinc phosphide.

VII. LIVESTOCK PROTECTION COLLAR (COMPOUND 1080)

A. Grizzly Bear

There is very little LPC use by ID WS and no grizzly bears have ever been taken incidentally with this method. No use of LPCs has occurred on USFS lands. Livestock protection collar use is infrequent due to the labor required to put on and monitor collars, restrictions that the devices only be used in fenced pastures, and because it generally requires a regular and predictable pattern of predation by individual coyotes in a localized area in order to be successful.

A possible risk to grizzly bears, other than direct mortality from attacking a collared sheep or lamb, exists if a grizzly bear scavenges on the carcass of a collared sheep or lamb where the collar had been punctured. Research on non-target scavenger hazards has shown that scavengers almost invariably feed on the portion of the carcass that has been "opened-up" and fed upon by the target predator, which, is usually the thoracic cavity or the hindquarters, and not the neck area which is the area contaminated by the LPC contents when a collar is punctured (Connolly 1980). This factor, combined with the fact that very few LPCs are used by ID WS, and the requirement to retrieve and properly dispose of carcasses and other materials contaminated by the toxicant, results a very low to virtually nonexistent risk to grizzly bears. For this reason, and because, in compliance with EPA Use Restriction 9, WS does not use LPCs in occupied grizzly bear habitat as delineated annually on USFWS maps, it is unlikely that LPC's would pose any threat to grizzly bears. However, on a case-by-case basis, ID WS can contact the USFWS's Regional Grizzly Bear Recovery Coordinator or their designee and obtain written permission to use LPCs in Grizzly Bear habitat.

In addition to complying with all LPC use restrictions, ID WS will conduct both intensive and extensive surveys to confirm grizzly bear are not active in the area of the LPC proposed use area. The surveys will consist of the following:

1. Prior to using LPCs, ID WS will contact the appropriate IDFG Regional Office to inquire if the area is occupied by grizzly bears. For the purpose of this condition "occupied" is defined as: (1) the presence of grizzly bears from the use of recent telemetry locations, (2) credible reports of grizzly bear activity or observations received by IDFG Regional Office or USFWS Regional Office, and (3) credible reports of grizzly bear received by ID WS on and near areas proposed for use of LPCs. If the area is occupied, ID WS will not use LPCs.

2. If the area is determined to be unoccupied, ID WS will conduct site-specific extensive and intensive surveys on the proposed property prior to LPC use for coyotes. Idaho WS will periodically conduct extensive surveys during the period of LPC use in these areas, and if evidence of grizzly bear presence is verified, LPCs will be immediately removed. Records of conducting intensive and extensive surveys and their results will be documented on WS' MIS computer database Work Tasks.

Given that ID WS has rarely used LPCs; no grizzly bears have ever been taken unintentionally with LPCs; and ID WS will comply with EPA Use Restriction for use of LPC's in occupied grizzly bear habitat, the effects of LPCs on grizzly bears are discountable. Idaho WS concludes the use of LPCs results in a "**may affect, not likely to adversely affect**" finding for grizzly bears.

VIII. GAS CARTRIDGES (RODENT AND DENNING)

A. Northern Idaho Ground Squirrels

Gas cartridges may be used for the removal of coyotes, red fox and striped skunks in areas occupied by NIDGS. The use of gas cartridges for PDM activities in areas occupied by NIDGS is typically at the request of USFWS for the specific protection of these ground squirrels. No non-target take of NIDGS has occurred by ID WS through the use of gas cartridges.

Gas cartridges, by their use restrictions and design, target only coyotes, red fox and striped skunks at their den/burrow sites. Idaho WS employees are trained in the identification and sign of NIDGS; therefore, no NIDGS burrows would be targeted. NIDGS are also highly unlikely to be using active dens of coyotes and red fox.

Gas cartridges, when used for PDM in occupied NIDGS habitat, are most likely beneficial to the species. By removing predators that prey upon NIDGS, the use of gas cartridges help limit the effects of predation on localized NIDGS populations.

Given that ID WS' use of gas cartridges targets coyotes, red fox and striped skunks, and that ID WS complies with all label restrictions, there is a discountable likelihood that NIDGS will be adversely affected by the use of gas cartridges. Idaho WS concludes the use of gas cartridges results in a "**may affect, not likely to adversely affect**" finding for NIDGS. Idaho WS concludes the use of gas cartridges results in a "may beneficially affect" finding for NIDGS by removing predators that prey upon NIDGS.

IX. ALUMINUM PHOSPHIDE

A. Northern Idaho Ground Squirrels

The use of aluminum phosphide could adversely affect the NIDGS. Idaho WS has never used aluminum phosphide in areas occupied by NIDGS. Should ID WS see the need to apply aluminum phosphide to reduce range or agricultural damage by Columbian ground squirrels, or when those populations are directly competing for limited resources with NIDGS, those proposed uses will be thoroughly discussed with USFWS and IDFG as appropriate prior to conducting the project to mitigate any negative impacts to NIDGS. In either of these cases the effect can be beneficial to NIDGS.

Given that ID WS rarely uses aluminum phosphide in areas occupied by NIDGS and ID WS will implement the aforementioned conservation measures, there is a discountable likelihood that NIDGS will be adversely affected by the use of aluminum phosphide. Idaho WS concludes the use of aluminum phosphide results in a "**may affect, not likely to adversely affect**" finding for NIDGS. Idaho WS also concludes the use of aluminum phosphide may beneficially affect NIDGS in situations where there is direct competition from neighboring Columbian ground squirrels.

X. M-44 DEVICE (SODIUM CYANIDE)

A. Grizzly Bear

M-44s are sometimes used by ID WS as a WDM tool and they are highly selective for coyotes due the selection of fetid baits that are particularly attractive to these species; and by the design of the device. A review of the past 20 years of WS records, nationwide, show no grizzlies have been killed by M-44s. ID WS will not use M-44 devices between March 1 and November 30 in areas occupied by grizzly bears and will continue to rely on information provided annually by the USFWS's Grizzly Bear Recovery Coordinator and the IDFG to determine where grizzly bears may occur[4].

Given that ID WS' use of M-44s in occupied grizzly bear areas occurs only during the bears hibernation period (December 1 to February 28, or February 29 during a leap year); no grizzly bears have been documented as taken unintentionally with M-44s in Idaho; ID WS continues to implement grizzly bear Conservation Measures and all requirements outlined in the USFWS grizzly bear sub-permit issued by the Grizzly Bear Recovery Coordinator; and ID WS will comply with EPA Use Restrictions for use of M-44s in occupied grizzly bear habitat, the effects of M-44s on grizzly bears is discountable. Idaho WS concludes the use of M-44s results in a "**may affect, not likely to adversely affect**" finding for grizzly bears.

B. Northern Idaho Ground Squirrels

M-44s may be used for the removal of coyotes and red fox in areas occupied by NIDGS. However, M-44s, by design, preclude NIDGS from being directly affected by the M-44. No non-target take of NIDGS has occurred with the use of M-44s by ID WS.

M-44s, when used for PDM activities in NIDGS occupied habitat, are likely to be beneficial to the species. By removing predators that prey upon NIDGS, the use of M-44s may help limit the effects of predation on localized NIDGS populations.

Given that ID WS' use of M-44s poses no threat to NIDGS, ID WS has never incurred a non-target take of NIDGS through the use of M-44s; and the use of M-44s removes predators that may prey on NIDGS, there is a discountable likelihood that NIDGS will be adversely affected by the use of M-44s. Idaho WS concludes the use of M-44s results in a "**may affect, not likely to adversely affect**" finding and concludes the use of M-44s "may beneficially affect" NIDGS by removing potential predators.

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[4] The USFWS' Grizzly Bear Recovery Coordinator has previously indicated that the use of M-44s would not likely adversely affect grizzly bears when used between December 1 and February 28 (or February 29 during a leap year), since bears would be expected to be in hibernation during this period.

XI. KETAMINE, XYLAZINE AND TELOZOL®

A. Canada Lynx

The immobilizing drugs ketamine/xylazine and Telazol® may be administered to unintentionally captured Canada lynx for the placement of radio-tracking collars. All ID WS personnel who employ chemical immobilization drugs are trained and certified in accordance with WS Policies (WS 2009*d*). Idaho WS' use of immobilizing drugs on Canada lynx would be for radio-collaring activities conducted in cooperation with the USFWS, at which time the USFWS would most likely administer any immobilizing drugs. Immobilization drugs may also be utilized by ID WS for the safe release of a captured Canada lynx. The use of immobilizing drugs is not expected to have any long-lasting effects.

Idaho WS personnel are trained and certified to properly use chemical immobilization drugs, and any use of immobilizing drugs on Canada lynx would only occur with the coordinated efforts of the USFWS. Given that immobilizing drugs are not expected to have any long-lasting effects; the very low probability that ID WS would use immobilization drugs on lynx prey, and that ID WS has only had one unintentional capture of a Canada lynx within Idaho during the last 40 years, there is a discountable likelihood that Canada lynx will be adversely affected by the use of immobilizing drugs. Idaho WS concludes that the use of immobilization drugs results in a "**may affect, not likely to adversely affect**" finding regarding Canada lynx. Idaho WS also concludes the use of immobilization drugs may result in a "may beneficially affect" finding for Canada lynx by allowing the safe release of any unintentionally captured lynx.

XII. AERIAL OPERATIONS– SHOOTING

General Considerations: A number of studies have looked at responses of various wildlife species to aircraft overflights. The National Park Service (1995) reviewed studies on the effects of aircraft overflights on wildlife. The report summarized a number of studies have documented responses by certain wildlife species that suggest adverse impacts might occur. Few, if any studies, have proven that aircraft overflights cause significant adverse impacts on populations, although the report stated it is possible to draw the conclusion that impacts to wildlife populations are occurring. It appears that some species will frequently or at least occasionally show adverse responses to even minor overflight occurrences. In general, it appears that the more serious potential impacts occur when overflights are frequent such as hourly and over long periods of time which represents "chronic exposure." Chronic exposure situations generally involve areas near commercial airports and military flight training facilities.

Several examples of wildlife species that have been studied with regard to low-level flights are available in the literature. Grubb et al. (2010) evaluated golden eagle response to civilian and military (Apache AH-64) helicopter flights in northern Utah. Study results indicated that golden eagles were not adversely affected when exposed to flights ranging from 100 to 800 meters along, towards and from behind occupied cliff nests. Eagle courtship, nesting and fledging were not adversely affected, indicating that no special management restrictions were required in the study location.

It was reported that low level overflights of 2-3 minutes in duration by a fixed-wing airplane and a helicopter produced no "drastic" disturbance of tree-nesting colonial waterbirds, and, in 90% of the observations, the individual birds either showed no reaction or merely looked up (Kushlan 1979). Conomy et al. (1998) quantified behavioral responses of wintering American black ducks (*Anas rubripes*), American wigeon, gadwall and American green-winged teal) exposed to low-level flying

military aircraft in North Carolina and found that only a small percentage (2%) of the birds reacted to the disturbance. They concluded that such disturbance was not adversely affecting the time-activity budgets of the species. Krausman et al. (1986) reported that only 3 of 70 observed responses of mule deer to small fixed-wing aircraft overflights at 150 to 500 feet above ground resulted in the deer changing habitats. These authors felt that the deer may have been accustomed to overflights because the study area was near an interstate highway which was followed frequently by aircraft.

Krausman et al. (1983) reported that, in 32 observations of the response of bighorn sheep to low-level flights by small fixed-wing aircraft, 60% resulted in no disturbance, 21% in "slight" disturbance, and 19% in "great" disturbance. However, in this study, researchers made up to 10 passes directly above the surveyed animal which is a much higher level of impact than the limited flights that WS would make focusing on the swine. When Krausman et al. (1986) evaluated the effects of simulated low-altitude jet aircraft noise on desert mule deer (*Odocoileus hemionus crooki*) and mountain sheep (*Ovis canadensis mexicana*), they found that heart rates of the ungulates increased according to the dB levels, with lower noise levels prompting lesser increases. When they were elevated, heart rates rapidly returned to pre-disturbance levels suggesting that the animals did not perceive the noise as a threat. Responses to the simulated noise levels were found to decrease with increased exposure. Fancy (1982) reported that only 2 of 59 bison (*Bison bison*) groups showed any visible reaction to small fixed-wing aircraft flying at 200-500 feet above ground. The study indicated bison are relatively tolerant of aircraft overflights. Andersen et al. (1989) conducted low-level helicopter overflights directly at 35 red-tailed hawk (*Buteo jamaicensis*) nests and concluded their observations supported the hypothesis that red-tailed hawks habituate to low level flights during the nesting period. Their results also showed similar nesting success between hawks subjected to such overflights and those that were not. White and Thurow (1985) did not evaluate the effects of aircraft overflights, but showed that ferruginous hawks (*B. regalis*) are sensitive to certain types of ground-based human disturbance to the point that reproductive success may be adversely affected. However, military jets that flew low over the study area during training exercises did not appear to bother the hawks, and neither were they alarmed when the researchers flew within 100 feet in a small fixed-wing aircraft (White and Thurow 1985). White and Sherrod (1973) suggested that disturbance of raptors by aerial surveys with helicopters may be less than that caused by approaching nests on foot. Ellis (1981) reported that 5 species of hawks, 2 falcons, and golden eagles were "incredibly tolerant" of overflights by military fighter jets, and observed that, although birds frequently exhibited alarm, negative responses were brief and never limiting to productivity. Further reassuring, the considerable analyses of the Air National Guard (1997*a*, 1997*b*) show that, despite considerable research on numerous wildlife species, no scientific evidence exists that indicates any substantive adverse effects on wildlife populations will occur as a result of any of the types of low-level or other overflights that do or may occur.

A. Grizzly Bear

Aerial shooting is used with fixed-wing or rotor craft aircraft and the predominate target species are coyotes and gray wolves. Idaho WS personnel are trained and expected to positively identify target species and to completely avoid accidental shootings. Aerial shooting would have no direct lethal effect on grizzly bears because positive target species identification is made before an animal is shot. Additionally, ID WS does not use shooting from aircraft to remove bears so there is no risks of unintentionally removing a grizzly bear while seeking to shoot something similar in appearance. There are no recorded incidents where ID WS has mistakenly shot a grizzly bear from the air. Thus, ID WS' use of methods that involve shooting have been and are expected to continue to be virtually 100% selective for target species and would not pose a lethal risk to grizzly bears.

It is possible that, gunshot noise and frequent flights overhead (e.g., below 500 feet above ground elevation over a period of two days) may temporarily displace a grizzly bear. This disturbance

would be short in duration and intensity and therefore insignificant. Aerial shooting activities are greatly reduced during the denning months. Given the reduced use of shooting from aircraft and limited duration of noise impact, use of shooting from aircraft is not expected to disturb denning bears. Consequently, ID WS concludes that aerial shooting results in a "**may affect, not likely to adversely affect**" finding for grizzly bears.

B. Canada Lynx

Aerial shooting is used with fixed-wing or rotor craft aircraft and the predominate target species are coyotes and gray wolves. Aerial shooting would have no direct lethal effect on lynx because positive target species identification is made before an animal is shot; and ID WS personnel are trained and expected to positively identify target species and to completely avoid accidental shootings. Additionally, ID WS does not use shooting from aircraft to remove bobcat so there is no risks of unintentionally removing a Canada lynx while seeking to shoot something similar in appearance. There are no recorded incidents where ID WS has mistakenly shot a lynx from the air. Thus, ID WS' use of methods that involve shooting have been and are expected to continue to be virtually 100% selective for target species, and would not pose a lethal risk to lynx. However, gunshot noise and frequent flights overhead may temporarily displace a Canada lynx. This disturbance would be short in duration and intensity and therefore insignificant. Consequently, ID WS concludes that aerial shooting results in a "**may affect, not likely to adversely affect**" finding for Canada lynx.

C. Yellow-billed Cuckoo

Aerial shooting is commonly used for the protection of livestock from wolf and coyote depredation which may on occur on or near yellow-billed cuckoo habitat. Aerial shooting uses shotguns as the primary weapon used to remove target predators. Aerial shooting is 100 % target selective, therefore will pose no threat to yellow-billed cuckoo. Generally, most aerial shooting occurs during the winter and early spring months prior to yellow-billed cuckoo migrations, further limiting their exposure to WS aerial operations.

While conducting aerial shooting operations, aircraft conduct low-level flights for predator identification and removal. The aircraft produce engine noise as a result of their flight operations. An expected result of aerial shooting on yellow-billed cuckoo is the temporary disturbance of the birds by engine noise. It is also likely that aerial shooting operations may invoke an aerial predator response by yellow-billed cuckoo, causing them to seek protective cover. Both of these responses to aerial operations are not expected to have long-lasting effects on localized populations of the yellow-billed cuckoo. Gunshot noise and frequent flights overhead may temporarily displace a yellow-billed cuckoo, but this disturbance would be short in duration and intensity and therefore insignificant.

Given the information above; that ID WS' aerial shooting poses no direct threat to yellow-billed cuckoo; and that any disturbances by aerial shooting will not be of sufficient frequency or duration to constitute chronic exposure and not expected to have long-lasting effects, ID WS concludes the use of aerial shooting results in a "**may affect, not likely to adversely affect**" finding for yellow-billed cuckoo.

XIII. AERIAL OPERATIONS – TELEMETRY/SURVEILLANCE

A. Grizzly Bear

Aerial telemetry/surveillance is generally used by ID WS to locate wildlife, particularly wolves, having radio transmitter collars or devices; and in some cases, used to search for coyote dens, feral swine and the location of remote camp sites or livestock. As aerial telemetry/surveillance activities have no physical interactions with the landscape, they will pose no physical threat to grizzly bears.

While conducting aerial telemetry/surveillance operations, aircraft may conduct low-level flights for species identification or for other purposes. The aircraft produce engine noise as a result of their flight operations, possibly causing a temporary disturbance to nearby grizzly bear that may invoke an "escape response," causing individuals to seek protective cover. Both of these responses to aerial telemetry/surveillance are not expected to have long-lasting effects. When used for surveillance, aircraft overflights are expected to be of even less duration and frequency than when used for aerial shooting above or hazing described below.

Given that ID WS' use of aerial telemetry/surveillance poses no threat to grizzly bears, ID WS has never incurred a non-target grizzly bear take during aerial telemetry/surveillance; and any disturbances by aerial telemetry/surveillance are not expected to have long-lasting effects, the effects of aerial telemetry/surveillance flights would be insignificant. Idaho WS concludes the use of aerial telemetry/surveillance results in a "**may affect, not likely to adversely affect**" finding for grizzly bears.

B. Canada Lynx

Aerial telemetry/surveillance is generally used by ID WS to locate wildlife having radio transmitter collars or devices; and in some cases, used to search for coyote dens, feral swine, and the location of remote camp sites or livestock. As aerial telemetry/surveillance activities have no physical interactions with the landscape, they will pose no physical threat to lynx.

While conducting aerial telemetry/surveillance operations, aircraft may conduct low-level flights for species identification or for other purposes. The aircraft produce engine noise as a result of their flight operations, possibly causing a temporary disturbance to nearby lynx that may invoke an "escape response," causing individuals to seek protective cover. Both of these responses to aerial telemetry/surveillance are not expected to have long-lasting effects. When used for surveillance, aircraft overflights are expected to be of even less duration and frequency than when used for aerial shooting above or hazing described below.

Given that ID WS' use of aerial telemetry/surveillance poses no threat to Canada lynx; ID WS has never incurred a non-target lynx take during aerial telemetry/surveillance; and any disturbances by aerial telemetry/surveillance are not expected to have long-lasting effects, the effects of aerial telemetry/surveillance flights would be insignificant. Idaho WS concludes the use of aerial telemetry/surveillance results in a "**may affect, not likely to adversely affect**" finding for Canada lynx.

C. Yellow-billed Cuckoo

Aerial telemetry/surveillance is generally used by ID WS to locate wildlife having radio transmitter collars or devices; and in some cases, used to search for coyote dens, feral swine and

the location of remote camp sites or livestock. As aerial telemetry/surveillance activities have no physical interactions with the landscape, they will pose no physical threat to yellow-billed cuckoo. When used for surveillance, aircraft overflights are expected to be of even less duration and frequency than when used for aerial shooting above or hazing described below. Generally, most aerial telemetry/surveillance activities occur during the winter and early spring months prior to yellow-billed cuckoo migrations, further limiting their exposure to WS aerial operations.

While conducting aerial telemetry/surveillance operations, aircraft may conduct low-level flights for species identification or for other purposes. The aircraft produce engine noise as a result of their flight operations. An expected result of aerial telemetry/surveillance on yellow-billed cuckoo is the temporary disturbance of the birds by engine noise. It is also likely that these aerial telemetry/surveillance operations may invoke an aerial predator response by yellow-billed cuckoo causing individuals to seek protective cover. Both of these responses to aerial telemetry/surveillance are not expected to have long-lasting affects on localized populations of the yellow-billed cuckoo.

Given that ID WS' use of aerial telemetry/surveillance poses no threat to yellow-billed cuckoo; ID WS has never incurred a non-target take of yellow-billed cuckoo during aerial telemetry/surveillance; and any disturbances by aerial telemetry/surveillance are not expected to have long-lasting effects, the effects of aerial telemetry/surveillance flights would be insignificant. Idaho WS concludes the use of aerial telemetry/surveillance results in a "**may affect, not likely to adversely affect**" finding for yellow-billed cuckoo.

XIV. AERIAL OPERATIONS – HAZING

A. Yellow-billed Cuckoo

Aerial hazing is sometimes used to haze wild ungulates from private property for the protection of livestock forage in yellow-billed cuckoo habitat. Aerial hazing uses low-level flights in conjunction with a small ground crew, typically on ATVs (addressed in Site Access section below), to move elk, mule deer, antelope, etc. from a localized area. As aerial hazing activities have no physical interactions with the landscape, they will pose no physical threat to yellow-billed cuckoo. Generally, most aerial hazing operations occur during the winter and early spring months prior to yellow-billed cuckoo migrations, further limiting their exposure to WS aerial hazing operations.

While conducting aerial hazing operations, aircraft conduct low-level flights to help guide the target animals from a given area. The aircraft produce engine noise as a result of flight operations. ID WS' aerial hazing operations are primarily conducted during the winter months; therefore, aircraft disturbances to yellow-billed cuckoo breeding habitats are not an issue. The only expected result of aerial hazing on yellow-billed cuckoo is the temporary disturbance of the birds due to engine noise. It is also likely that these aerial hazing operations may invoke an aerial predator response by yellow-billed cuckoo causing individuals to seek protective cover. Both of these responses to aerial hazing are not expected to have long-lasting effects on localized populations of the yellow-billed cuckoo.

Given that ID WS' use of aerial hazing poses no threat to yellow-billed cuckoo; ID WS has never incurred a non-target take of yellow-billed cuckoo during aerial hazing; and any disturbances by aerial hazing are not expected to have long-lasting effects, the effects of aerial hazing flights would be insignificant. Idaho WS concludes the use of aerial telemetry/surveillance results in a "**may affect, not likely to adversely affect**" finding for yellow-billed cuckoo.

XV. BEAVER DAM REMOVAL – EXPLOSIVES AND HAND REMOVAL

A. Bull Trout

The removal of beaver dams is an activity that could possibly impact bull trout. Activities may also be conducted to enhance or reclaim wildlife and stream fishery habitats.

Beavers construct dams primarily in small riverine wetlands (intermittent and perennial streams and creeks) which consist of mud, sticks and other vegetative materials. Dams obstruct the normal flow of water and typically change the preexisting wetland hydrology from flowing or circulating waters to slower, deeper, more expansive waters that accumulate bottom sediment. Depth of the bottom sediment depends on the length of time an area is covered by water and the amount of suspended sediment in the water. Damage is caused when the more expansive waters flood new lands such as crops or when there is an obstruction in structures such as irrigation systems causing water flow to be impeded. The more expansive waters do not become wetlands for a few to several years depending on preexisting conditions (if the area was a wetland in the past and soils still had characteristics of being hydric soils, it is likely to become a wetland sooner).

Beaver dam breaching involves the removal of debris deposited by beaver that impedes the flow of water and, in Idaho, is generally conducted to maintain irrigation systems, culverts and bridges where wetland habitats are not involved. Other projects may involve damage to man-made structures (houses, utilities and landscaping), again not affecting wetland wildlife habitat. Idaho WS receives most requests for assistance with beaver damage soon after affected resource owners discover damage or become aware of the WS program, typically within a few weeks or months of dam construction. Consequently, areas that have not had enough time to take on the qualities of a true wetland (*i.e.*, hydric soils, aquatic vegetation, pre-existing function) are not considered wetlands. Instead, WS actions restore the site to conditions prior to beaver colonization. Only the portion of the dam blocking the drainage is breached and the natural course of the stream is undisturbed.

Dams are breached in accordance with exemptions from permit requirements established by regulation or as allowed under a Nationwide Permit granted under Section 404 of the Clean Water Act, and USACE, Branch Guidelines established in 1996 (USACE 1996) specifically for Idaho (Appendix F). The impoundments or ponds created by these dams are not considered true wetland habitats and do not typically possess the same wildlife habitat values as established wetlands. The estimated amount of surface water held by the majority of beaver dams breached by ID WS averages ¼ surface acres or less, with the larger areas rarely exceeding ½ surface acres. No major disturbances to permanent structures or primary substrates, such as stream banks, adjoining soil composition, natural bottom sediment or bedrock are damaged or removed through ID WS' use of binary explosives. The USACE (1996) has stated that removal of recently constructed beaver dams (less than 1 year old), does not destroy or degrade waters of the United States because there is not sufficient time for the dams to accumulate organic matter and soil, or to develop important and valuable aquatic habitats upstream. Thus, significant impacts on downstream, established wetland wildlife habitat are minimized. Therefore, it is concluded that ID WS' beaver dam breaching activities have minimal impact on wetland wildlife habitat.

Beaver dam removal with binary explosives could have impacts on bull trout mainly from the increased flow of water following the removal of the dam and the rapid loss of water from the

pond. The binary explosives are used such that the blast creates an energy vortex in the center of the dam which then causes the dam material to go up and out (the path of least resistance). The rush of water from the pond is the primary concern because bull trout, especially juveniles, could be swept downstream and sediment in the bottom of the pond could be picked up by the stream causing sediment load in the waters to increase; although the newer the dam the less the sediment load. In addition, the rapid loss of water from the pond itself could strand fish in puddles above the dam.

Over the past 5 Fiscal Years (FY) (October 1 to September 30), ID WS breached a total of 104 beaver dams (average of 20.8 dams annually) (Table 1.) Sixty dams (58%) were breached using binary explosives while 44 (42%) were breached using hand tools. The average size beaver pond that ID WS breaches (i.e., with explosives or hand tools) is considered small (≤ 0.25 surface acres of water; 11,000 cu. ft. of water) and when released will not likely adversely affect bull trout downstream because flows would increase minimally. Any fish found could be netted and returned to the stream. The removal of larger dams (>0.5 surface acres of water; >22,000 cu. ft. of water) that hold deep or expansive waters could increase water flows that could potentially impact bull trout. Larger dams will be breached by hand if practical, however, if binary explosives are used, then multiple smaller explosive charges can be used to remove small portions of the dam to minimize the rush of water. Once the site has lost much of its water, the dam could be completely removed with minimal potential impacts to bull trout. This would also minimize the sediment load in the water. The vast majority of dams breached by ID WS (≈95%) are considered small.

In reviewing the locations of dams breached by ID WS using binary explosives or hand tools during the past 5 FYs (Table 1), no beaver dams were breached in waters that are designated as bull trout critical habitat (75 FR 63898-64070). If a dam is proposed for removal anywhere in Idaho by WS, whether with binary explosives or hand tools, WS will consult with the USFWS and/or NOAA Fisheries, as appropriate, to determine if there may be potential adverse impacts. Some areas of the State may be "block cleared" via a consultation for the use of hand tools to breach dams. If adverse impacts are anticipated, ID WS will initiate formal consultation or terminate the proposed action.

Given that no beaver dams have been removed by ID WS in occupied bull trout habitat; ID WS uses explosives and hand tools to breach an extremely low number of beaver dams annually (approximately 20.8 per year); there is a low volume of sediment (about 0.445 cubic yards) discharged from beaver dams removed with explosives and extremely low volume of sediment using hand tools; only beaver dams less than one year old may be removed; ID WS has never breached a beaver dam in occupied bull trout streams; and through the adherence of the protocols established above, ID WS concludes that beaver dam removal in bull trout will have no effect for bull trout. Conversely, in some instances, beaver dam breaching may have a potential positive effect on bull trout because beaver dams could disrupt stream flow, impede or prevent migration, and contribute to increased water temperatures and sedimentation. Because of this potential positive effect, ID WS also believes that beaver dam breaching using manual methods or binary explosives "may beneficially affect" bull trout.

Table 1. Number and location of beaver dams breached by ID WS during the past 5 FYs.

FY	Method of Breaching	Number of Dams	County	Description of Location/Site
11	Explosives	1	Bingham	Irrigation Ditch
	Explosives	4	Blaine	Fish Creek
	Explosives	1	Camas	Phillips Creek
	Hand Tools	4	Bingham	Irrigation Ditch
10	Explosives	4	Camas	Phillips Creek
	Explosives	2	Caribou	Stump Creek
	Hand Tools	2	Caribou	Stump Creek
	Hand Tools	2	Washington	Mann Creek
	Hand Tools	1	Washington	South Crane Creek
09	Explosives	4	Blaine	Fish Creek above Fish Creek Reservoir
	Explosives	1	Camas	Upper Soldier Creek
	Explosives	2	Caribou	Slug Creek
	Hand Tools	1	Bingham	Tributary of Willow Creek
	Hand Tools	10	Washington	Rush Creek
	Hand Tools	7	Washington	Intermittent Tributary of Crane Creek
	Hand Tools	2	Washington	West Pine Creek
	Hand Tools	1	Washington	Near Mann Creek
	Hand Tools	1	Washington	On Pond near Jenkins Creek
08	Explosives	7	Washington	Little Willow Creek
	Hand Tools	3	Washington	Tributary of Crane Creek
	Hand Tools	3	Washington	Marsh off the Weiser River
	Hand Tools	1	Washington	Irrigation Ditch
07	Explosives	33	Blaine	Fish Creek above Fish Creek Reservoir
	Explosives	1	Caribou	Intermittent Stream Adjoining Meadow Creek
	Hand Tools	3	Washington	Irrigation Ditch
	Hand Tools	2	Washington	Tributary of Monroe Creek
	Hand Tools	1	Washington	Tributary of Crane Creek
Sub-total Using Explosives		60 (58 %)		
Sub-total Using Hand Tools		44 (42 %)		
TOTAL		104		

B. Snake River Sockeye Salmon, Snake River Spring/Summer Chinook, Snake River Fall Chinook, and Snake River Basin Steelhead

Idaho WS does not anticipate removing and/or breaching beaver dams in anadromous fish critical habitat or EFH. If ID WS does receive a request for beaver dam removal in salmon and steelhead critical habitat, ID WS personnel would be instructed not to proceed until first consulting with NOAA Fisheries to determine if there may be potential adverse impacts. If adverse impacts are anticipated, ID WS will initiate formal consultation or terminate the proposed action.

C. Yellow-Billed Cuckoo

The removal of beaver dams with explosives or by hand, as well as the use of water control devices for aquatic mammal damage management activities, may occur in yellow-billed cuckoo habitat in Idaho. The use of these water management activities poses no direct physical threat to yellow-billed cuckoos, but the removal of beaver dams in cuckoo habitats may directly benefit yellow-billed cuckoos by maintaining and/or conserving cuckoo habitat.

In most circumstances, a successful beaver damage management plan involves both the removal of beavers, as well as breeching of beaver dams to alleviate flooding. By removing beaver and subsequently removing any dams associated with those beaver, the damage (death) to trees by flooding is alleviated. Cutting down or killing trees by beavers in yellow-billed cuckoo habitat may have negative impacts on the overall quality of the habitat. The trees removed by these activities may not have an immediate impact on the habitat, but over time these trees would have formed the dense, mid-level canopies needed for quality habitat by the yellow-billed cuckoo.

When explosives are used, a loud sound is produced and a moderate amount of debris may be displaced into the air at the beaver dam removal site. The noise and physical disruption of the area by flying debris may temporarily disturb yellow-billed cuckoos in the immediate area. Although the use of explosives for the removal of beaver dams may temporarily disturb yellow-billed cuckoos, ID WS does not expect these activities to have any long-lasting effects or produce abandonment by yellow-billed cuckoos from their nests or habitat.

Given that ID WS' use of explosives for beaver dam removal poses no direct physical threats to yellow-billed cuckoos; the removal of beaver dams or the use of water control structures may be beneficial to yellow-billed cuckoos by preserving their habitat; and ID WS' use of explosives for beaver dam removal is on a limited basis, there is a discountable likelihood that yellow-billed cuckoo will be adversely affected by beaver dam removal with explosives or by hand. Idaho WS concludes the removal of beaver dams with explosives or by hand removal, as well as the use of water control devices, results in a "**may affect, not likely to adversely affect**" finding for yellow-billed cuckoos. ID WS also concludes the removal of beaver dams with explosives or by hand removal, as well as the use of water control devices results in a "may beneficially affect" finding for yellow-billed cuckoos by maintaining or conserving habitat.

XVI. GROUND SHOOTING

A. Grizzly Bear

Ground shooting is used in conjunction with calling, stalking and night vision. Ground shooting would have no direct lethal effect on grizzly bears because positive target species identification is made before an animal is removed. Although grizzly bears have reportedly been mistakenly shot by entities other than ID WS employees (USFWS 2000), ID WS personnel are trained and expected to positively identify target species and to completely avoid any such accidental shootings. There are no recorded incidents where ID WS has mistakenly shot a grizzly bear. Thus, ID WS' use of methods that involve shooting have been and are expected to be virtually 100% selective for target species, and would not pose a lethal risk to grizzly bears. Gunshot noise may disturb grizzly bear, but they are most likely conditioned throughout the year to the sound of gunshot noise from general hunting activities and it is very unlikely the disturbance is life threatening. Therefore, ID WS determines that ground shooting is insignificant and results in a "**may affect, not likely to adversely affect**" finding for grizzly bears. However, ground shooting may remove competing predators, thereby reducing competition in the local area where the removals are conducted resulting in a "may beneficially affect" finding for grizzly bear.

B. Selkirk Mountains Woodland Caribou

Ground shooting is used in conjunction with calling, stalking and night vision. Ground shooting would have no direct lethal effect on SMWC because positive target species identification is made before an animal is removed. Thus, ID WS' use of ground shooting has been and is expected to be virtually 100% selective for target species, posing no significant lethal risk to

SMWC in Idaho. Gunshot noise may disturb the caribou, but they are most likely conditioned throughout the year to the sound of gunshot noise from general hunting activities making it unlikely the disturbance is life threatening. Therefore, ID WS determines that ground shooting is insignificant and results in a "**may affect, not likely to adversely affect**" finding for SMWC. Ground shooting may remove predators, thereby reducing predation on SMWC, resulting in a "may beneficially affect" finding for SMWC.

C. Canada Lynx

Ground shooting is used in conjunction with calling, stalking and night vision. Ground shooting would have no direct lethal effect on lynx because positive target species identification is made before an animal is removed. Thus, ID WS' use of ground shooting has been and is expected to be virtually 100% selective for target species, and would not pose a significant lethal risk to lynx in Idaho. Gunshot noise may disturb lynx, but they are most likely conditioned throughout the year to the sound of gunshot noise from general hunting activities making it unlikely the disturbance would be life threatening. Therefore, ID WS determines that ground shooting is insignificant and results in a "**may affect, not likely to adversely affect**" finding for Canada lynx. However, ground shooting may remove competing predators, thereby reducing competition in the local area where the removals are conducted resulting in a "may beneficially affect" finding for Canada lynx.

D. Northern Idaho Ground Squirrels

Ground shooting is used in conjunction with calling, stalking and night vision. Ground shooting would have no direct lethal effect on ground squirrels because positive target species identification is made before an animal is removed. Thus, ID WS' use of ground shooting has been and is expected to be virtually 100% selective for target species, and would not pose any lethal risk to NIDGS in Idaho. Gunshot noise may disturb NIDGS, but they are most likely conditioned throughout the year to the sound of gunshot noise from general hunting activities and it is unlikely the disturbance would be life threatening. Therefore, ID WS determines that ground shooting is insignificant and results in a "**may affect, not likely to adversely affect**" finding for NIDGS. Ground shooting may remove predators that prey on NIDGS resulting in a "may beneficially affect" finding by reducing potential predation on their limited populations.

E. Yellow-billed cuckoo

Ground shooting is used in conjunction with calling, stalking, and night vision and is used for the removal of wolves, coyotes, red fox and badgers in areas that may be occupied by yellow-billed cuckoo. Shooting would have no direct lethal effect on yellow-billed cuckoo because positive target species identification is made before an animal is removed. Thus, ID WS' use of ground shooting has been and is expected to be virtually 100% selective for target species, and would not pose a significant lethal risk to yellow-billed cuckoo. However, gunshot noise may disturb yellow-billed cuckoo, but they are most likely conditioned throughout the year to the sound of gunshot noise from general hunting activities and it is unlikely the disturbance would be life threatening. Therefore, ID WS determines that ground shooting is insignificant and results in a "**may affect, not likely to adversely affect**" finding for yellow-billed cuckoo. Shooting, when used for WDM activities targeting beaver in occupied yellow-billed cuckoo habitat, is most likely beneficial to the species. By removing beaver that damage yellow-billed cuckoo habitat, shooting helps limit the effects of beaver resulting in a "may beneficially affect" finding for localized yellow-billed cuckoo populations.

XVII. SCARE DEVICES

A. Propane Exploders

1. Grizzly Bear

Propane exploders may be used in areas occupied by grizzly bear for the protection of livestock; typically during the night to help protect domestic sheep flocks. When used for PDM, propane cannons are utilized in extremely localized areas for short durations. Cannons are often used in conjunction with other predator deterrents such as livestock guard animals and animal husbandry practices.

The sound reports of propane cannons may be heard from great distances and passing grizzly bears may be exposed to those sound reports. Within close proximity, propane cannons may be extremely loud, but the intent of propane cannons as a predator deterrent is to keep injurious animals at a safe distance from livestock. Although the sound of propane cannons may be heard by localized populations of grizzly bears, the use of propane cannons is not expected to have any long-lasting effects on grizzly bears. Grizzly bears are likely conditioned to the sound of gunshot noise (very similar to the sound reports of propane cannons) from general hunting activities and it is unlikely the disturbance from propane cannons is life threatening.

Given that ID WS' use of propane cannons poses no direct physical threat to grizzly bears; propane cannons are not expected to have any long-lasting effects on grizzly bears; the use of propane cannons for PDM activities is on a limited basis; grizzly bears are pre-conditioned to similar sounding noises (gunshots during hunting season); and propane cannon use for PDM activities would only affect an extremely small portion of occupied grizzly bear habitat, ID WS concludes the use of propane cannons would be insignificant and results in a "**may affect, not likely to adversely affect**" finding for grizzly bears. Idaho WS also concludes the use of propane cannons results in a "may beneficially affect" finding for grizzly bears by deterring bears from depredating livestock, which in turn may alleviate the need for PDM activities targeting grizzly bears.

2. Canada Lynx

Propane exploders may be used in areas occupied by Canada lynx for the protection of livestock; typically throughout the night to help protect domestic sheep flocks. When used for PDM, propane cannons are utilized in extremely localized areas for short durations. Cannons are often used in conjunction with other predator deterrents such as livestock guard animals and animal husbandry practices.

The sound reports of propane cannons may be heard from great distances and passing Canada lynx may be exposed to those sound reports. Within close proximity, propane cannons may be extremely loud, but the intent of propane cannons as a predator deterrent is to keep injurious animals at a safe distance from livestock. Although the sound of propane cannons may be heard by localized populations of Canada lynx, the use of propane cannons is not expected to have any long-lasting effects on Canada lynx. Canada lynx are likely conditioned to the sound of gunshot noise (very similar to the sound reports of propane cannons) from general hunting activities and it is unlikely the disturbance from propane cannons is life threatening.

Given that ID WS' use of propane cannons poses no direct physical threat to Canada lynx; propane cannons are not expected to have any long-lasting effects on Canada lynxes; the use of propane cannons for PDM activities is on a limited basis; Canada lynx are pre-conditioned to similar sounding noises (gunshots during hunting season); and propane cannon use for PDM activities would only affect an extremely small portion of occupied Canada lynx habitat, ID WS concludes the use of propane cannons would be insignificant and results in a "**may affect, not likely to adversely affect**" finding for Canada lynx.

3. Northern Idaho Ground Squirrels

Propane exploders may be used in areas occupied by NIDGS for the protection of livestock. In most circumstances and as an added deterrent, propane exploders are employed throughout the night to help protect domestic sheep flocks. When used for PDM, propane cannons are utilized in extremely localized areas for short durations. Cannons are often used in conjunction with other predator deterrents such as livestock guard animals and animal husbandry practices.

The sound reports of propane cannons may be heard from great distances and localized populations of NIDGS may be exposed to those sound reports. Within close proximity, propane cannons may be extremely loud, but the intent of propane cannons as a predator deterrent is to keep injurious animals at a safe distance from livestock. Although the sound of propane cannons may be heard by localized populations of NIDGS, the use of propane cannons is not expected to have any long-lasting affects on these ground squirrels.

Given that ID WS' use of propane cannons poses no direct physical threat to NIDGS, propane cannons are not expected to have any long-lasting effects on these ground squirrels; the use of propane cannons for PDM activities is on a limited basis; and propane cannon use for PDM activities would only affect an extremely small portion of NIDGS occupied habitat; ID WS concludes the use of propane cannons would be insignificant and results in a "**may affect, not likely to adversely affect**" finding for NIDGS.

4. Yellow-billed cuckoo

Propane exploders may be used in areas occupied by yellow-billed cuckoo for the protection of livestock. Typically, propane exploders are employed throughout the night to help protect domestic sheep flocks. When used for PDM, propane cannons are utilized in extremely localized areas for short durations. Cannons are often used in conjunction with other predator deterrents such as livestock guard animals and animal husbandry practices. Propane exploders are rarely used by ID WS for PDM activities, further limiting their exposure to yellow-billed cuckoo.

The sound reports of propane cannons may be heard from great distances and localized populations of yellow-billed cuckoo may be exposed to those sound reports. Although the sound of propane cannons may be heard by localized populations of yellow-billed cuckoo, the use of propane cannons is not expected to have any long-lasting effects on these birds.

Given that ID WS' use of propane cannons poses no direct physical threat to yellow-

billed cuckoo; ID WS will discontinue the use of propane cannons if a yellow-billed cuckoo is observed; propane cannons are not expected to have any long-lasting effects on these birds if heard; the use of propane cannons for PDM activities are on a limited basis; and propane cannon use for PDM activities would only affect an extremely small portion of yellow-billed cuckoo occupied habitat; ID WS concludes the use of propane cannons would be insignificant and results in a "**may affect, not likely to adversely affect**" finding for yellow-billed cuckoo.

B. Pyrotechnics

1. Grizzly Bear

Pyrotechnics may be used in areas occupied by grizzly bear for the protection of livestock. In most circumstances, pyrotechnics are used as a predator deterrent near domestic livestock for short durations. Often, pyrotechnics used in this manner target grizzly bears that are actively harassing livestock or are in the process of attempting to depredate livestock. Pyrotechnics are often used in conjunction with other predator deterrents such as livestock guarding animals, predator-resistant fencing and animal husbandry practices.

The sound reports of pyrotechnics may be heard from great distances and local and/or passing grizzly bears may be exposed to those sound reports. Within close proximity, pyrotechnics may be extremely loud, but the intent of pyrotechnics as a predator deterrent is to keep injurious animals at a safe distance from livestock. Although the sound of pyrotechnics may be heard by localized populations of grizzly bears, the use of pyrotechnics is not expected to have any long-lasting effects on grizzly bears.

Given that ID WS' use of pyrotechnics poses no direct physical threat to grizzly bears; pyrotechnics are not expected to have any long-lasting effects on grizzly bears; the use of pyrotechnics for PDM activities is on a limited basis; pyrotechnics used for PDM activities would only affect an extremely small portion of occupied grizzly bear habitat; and ID WS personnel are trained in the safe use of pyrotechnics, ID WS concludes the use of pyrotechnics would be insignificant and results in a "**may affect, not likely to adversely affect**" finding for grizzly bears. ID WS also concludes the use of pyrotechnics results in a "may beneficially affect" finding by deterring bears from depredating on livestock, which in turn may alleviate the need for PDM activities targeting grizzly bears.

2. Canada Lynx

Pyrotechnics may be used in areas occupied by Canada lynx for the protection of livestock. In most circumstances, pyrotechnics are used as a predator deterrent near domestic livestock for short durations. Often, pyrotechnics used in this manner target predators that are actively harassing livestock or are in the process of attempting to depredate livestock. Pyrotechnics are often used in conjunction with other predator deterrents such as livestock guarding animals, predator-resistant fencing and animal husbandry practices.

The sound reports of pyrotechnics may be heard from great distances and local and/or passing Canada lynx may be exposed to those sound reports. Within close proximity, pyrotechnics may be extremely loud, but the intent of pyrotechnics as a predator deterrent

is to keep injurious animals at a safe distance from livestock. Although the sound of pyrotechnics may be heard by localized populations of Canada lynx, the use of pyrotechnics is not expected to have any long-lasting affects.

Given that ID WS' use of pyrotechnics poses no direct physical threat to Canada lynx; pyrotechnics are not expected to have any long-lasting affects on Canada lynx; the use of pyrotechnics for PDM activities is on a limited basis; pyrotechnics used for PDM activities would only affect an extremely small portion of occupied Canada lynx habitat; and ID WS personnel are trained in the safe use of pyrotechnics, ID WS concludes the use of pyrotechnics would be insignificant and results in a "**may affect, not likely to adversely affect**" finding for Canada lynx.

3. Yellow-billed cuckoo

Pyrotechnics may be used in areas occupied by yellow-billed cuckoo for the protection of livestock. In most circumstances and as an added deterrent, pyrotechnics are rarely employed and their use is intermittent throughout the night to help protect domestic sheep flocks. When used for PDM, pyrotechnics are utilized in extremely localized areas for short durations. Pyrotechnics are often used in conjunction with other predator deterrents such as livestock guard animals and animal husbandry practices.

The sound reports of pyrotechnics may be heard from great distances and localized populations of yellow-billed cuckoo may be exposed to those sound reports. Within close proximity, pyrotechnics may be extremely loud, but the intent of pyrotechnics as a predator deterrent is to keep injurious animals at a safe distance from livestock. Although the sound of pyrotechnics may be heard by localized populations of yellow-billed cuckoo, the use of pyrotechnics is not expected to have any long-lasting affects on these birds.

Given that ID WS' use of pyrotechnics poses no direct physical threat to yellow-billed cuckoo; ID WS will discontinue the use of pyrotechnics if a yellow-billed cuckoo is observed; pyrotechnics are not expected to have any long-lasting effects on these birds if heard; the use of pyrotechnics for PDM activities are on a limited basis; and propane cannon use for PDM activities would only affect an extremely small portion of yellow-billed cuckoo occupied habitat; ID WS concludes the use of pyrotechnics would be insignificant and results in a "**may affect, not likely to adversely affect**" finding for yellow-billed cuckoo.

C. Other Scare Devices (Reflecting Tape, Eyespot Balloons, Alarm or Distress Calls, Predator Effigies, Raptor Models, etc.)

1. Grizzly Bear

Scaring devices may be used in areas occupied by grizzly bears for the protection of livestock. Some scare devices can produce both visual and audible effects that may be observed and/or heard from a distance by local and/or passing grizzly bears. In most circumstances, scare devices are used as predator deterrents near domestic livestock. Often, scare devices used in this manner target predators that are in close proximity to livestock or are frequenting areas near livestock. Commonly, scare devices are utilized to protect livestock that are limited to small areas for overnight protection in remote areas.

Scare devices are often used in conjunction with other predator deterrents such as livestock guarding animals, predator-resistant fencing and animal husbandry practices.

Within close proximity, scare devices act as a frightening agent to keep injurious animals at a safe distance from livestock. Although scare devices are used for short-term affect on individual or localized grizzly bear populations, they are not expected to have any long-lasting affects.

Given that ID WS' use of scare devices poses no direct physical threat to grizzly bears; scare devices are not expected to have any long-lasting affects on grizzly bears; the use of scare devices for PDM activities is on a limited basis; and scare devices used for PDM activities would only affect an extremely small portion of occupied grizzly bear habitat, ID WS concludes the use of scare devices would be insignificant and results in a "**may affect, not likely to adversely affect**" finding for grizzly bears. Idaho WS also concludes the use of scare devices results in a "may beneficially affect" finding by deterring bears from depredating livestock, which in turn may alleviate the need for PDM activities targeting grizzly bears.

2. Canada Lynx

Scaring devices may be used in areas occupied by Canada lynx for the protection of livestock. Some scare devices can produce both visual and audible effects that may be observed and/or heard from a distance. In most circumstances, scare devices are used as predator deterrents near domestic livestock. Often, scare devices used in this manner target predators, such as wolves and coyotes that are in close proximity to livestock or are frequenting areas near livestock. Commonly, scare devices are utilized to protect livestock that are limited to small areas for overnight protection in remote areas. Scare devices are often used in conjunction with other predator deterrents such as livestock guarding animals, predator-resistant fencing and animal husbandry practices.

Within close proximity, scare devices act as a frightening agent to keep injurious animals at a safe distance from livestock. Although scare devices are used for short-term livestock protection, they are not expected to have any long-lasting or permanent affects.

Given that ID WS' use of scare devices poses no direct physical threat to Canada lynx; scare devices are not expected to have any long-lasting effects on Canada lynx; the use of scare devices for PDM activities is on a limited basis; and scare devices used for PDM activities would only affect an extremely small portion of occupied Canada lynx habitat, ID WS concludes the use of scare devices would be insignificant and results in a "**may affect, not likely to adversely affect**" finding for Canada lynx.

XVIII. FENCES

A. Electric/Temporary Fences

1. Grizzly Bear

Electric/temporary fencing may be used in areas occupied by grizzly bears for the protection of domestic livestock. In most circumstances, these fencing techniques are used as a non-lethal deterrent of predators in close proximity to livestock. Commonly, fencing is utilized to protect livestock that are limited to a small area for overnight

protection in remote areas. Fencing is often used in conjunction with other predator deterrents such as livestock guarding animals, fladry, pyrotechnics, and good husbandry practices.

With most fencing techniques, the fencing is electrified to provide a mild shock to animals coming into contact with it. The mild shock provides negative reinforcement to offending animals to remain clear of the area, protecting the livestock contained within the fenced enclosure. Electric fencing used in this manor provides no long-lasting affects to animals exposed to the electric fence.

Given that ID WS' use of predator-resistant and temporary fencing acts as a non-lethal deterrent to grizzly bears; these fencing applications are usually temporary and limited to relatively small area; and they are not expected to have any long-lasting affects on grizzly bears. Therefore, ID WS concludes the use of predator-resistant and temporary fencing would be insignificant and results in a "**may affect, not likely to adversely affect**" finding for grizzly bears. Idaho WS also concludes the use of predator-resistant and temporary fencing results in a "may beneficially affect" finding by deterring bears from depredating livestock, which in turn may alleviate the need for PDM activities targeting grizzly bears.

XIX. TRAINED DOGS

A. Grizzly Bear

Trained dogs are often used to track or decoy predators in areas potentially occupied by grizzly bears. Trained dogs, when used as decoys, lure predators into shooting range for removal. Tracking dogs are used to follow the scent trails of target animals and after the animal is bayed, shooting is used to remove the animal. Use of trained dogs is selective as trailing or tracking dogs do not lethally take the target animal. Shooting used in conjunction with trained dogs poses no direct threat to grizzly bears because it is 100% selective through species confirmation, however, dogs may be preyed upon by grizzly bears.

When using trained dogs for PDM activities, there is a possibility that dogs, in pursuit of target predators, may disturb or flush a grizzly bear. Trained dogs used to pursue black bears and mountain lions trail the animal by scent and are most often within hearing distance, but normally out-of-sight, of the handler. If trained dogs are being used to decoy or pursue target predators and it is determined from foot prints or other evidence of the animal that they were following was a grizzly bear, the dogs would be removed from the track as soon as possible. It is sometimes difficult to determine if a dog is pursuing a black bear or a grizzly bear especially when track prints cannot be found, however, grizzly bears have a tendency to "hold their ground" and "bay-up" when pursued by dogs as compared to black bears who are more likely to run longer distances before "treeing" or "baying-up." Use of trained dogs in grizzly bear habitat is extremely rare, further reducing the possibility of tracking dogs following the scent of a non-target grizzly bear. The possible disturbances of grizzly bears with trained dogs would be highly limited in scope and unlikely to have a significant effect on the overall population.

Given that ID WS' use of trained dogs results in removal of predators by shooting, which is 100% selective; ID WS has never incurred a direct take of a grizzly bear with trained dogs; use of trained dogs in grizzly bear habitat is rare; and the limited scope of disturbance by trained dogs,

ID WS concludes the use of trained dogs results in a "**may affect, not likely to adversely affect**" finding for grizzly bears.

B. Canada Lynx

Trained dogs are used to track or decoy predators in areas occupied by lynx. Trained dogs, when used as decoys, lure predators into shooting range for removal. Tracking dogs are used to follow the scent trails of target animals and after the animal is bayed, shooting is used to remove the animal. Use of trained dogs is selective as trailing or tracking dogs do not lethally take the target animal. Shooting used in conjunction with trained dogs poses no direct threat to Canada lynx because it is 100% selective through species confirmation.

When using trained dogs for PDM activities, there is a possibility that dogs, in pursuit of target predators, may disturb or flush a lynx. If trained dogs were being used to pursue or decoy target predators and it was determined that they were following the scent of a lynx, the dogs would be removed from the track as soon as possible. In the unlikely event that tracking dogs are distracted by the track of a lynx, the lynx are expected to find shelter in trees or other elevated sites where they will be safe from the dogs until the dogs are removed by their handler.

Given that ID WS' use of trained dogs results in removal of predators by shooting, which is 100% selective; ID WS has never incurred a direct take of a lynx with trained dogs; and the limited disturbance to lynx by trained dogs, ID WS concludes the use of trained dogs results in a "**may affect, not likely to adversely affect**" finding for lynx.

C. Northern Idaho Ground Squirrels

Trained dogs are often used to track or decoy predators in areas occupied by NIDGS. Trained dogs, when used as decoys, lure predators into shooting range for removal. Tracking dogs are used to follow the scent trails of target animals and after the animal is bayed, shooting is used to remove the animal. Use of trained dogs is selective as trailing or tracking dogs do not lethally take the target animal. Shooting used in conjunction with trained dogs poses no direct threat to NIDGS or grizzly bears because it is 100% selective through species confirmation.

Use of trained dogs in PDM activities within occupied NIDGS habitat, is most likely beneficial to the species. By removing predators that prey upon these ground squirrels, the use of trained dogs helps limit the effects of predation on localized NIDGS populations. If trained dogs were being used to pursue or decoy target predators and it was determined that they were harassing NIDGS, the dogs would be removed from the area as soon as possible.

Given that ID WS' use of trained dogs results in removal of predators by shooting, which is 100% selective; shooting removes predators that could prey on NIDGS; ID WS has never incurred a direct take of these ground squirrels with trained dogs; and the limited disturbances to NIDGS by trained dogs would be insignificant to the overall population, ID WS concludes the use of trained dogs results in a "**may affect, not likely to adversely affect**" finding for NIDGS. Idaho WS also concludes the use of trained dogs may result in a "may beneficially affect" finding for NIDGS by removing predators that may negatively impact local populations.

XX. SITE ACCESS (PICKUP TRUCK, ATV, MOTORCYCLE, SNOWMOBILE, AIRCRAFT AND HORSEBACK RIDERS)

A. Grizzly Bear

Idaho WS may use 4-wheel drive vehicles, ATVs, motorcycles, snow machines, aircraft or riding horseback in occupied grizzly bear habitat. Although the majority of roads ID WS travels on are open to the public, there are times when WS personnel request to travel on USFS roads that are closed or request that a particular road be closed to help prevent the public from accessing a site where WDM equipment is set. These requests are in the interest of public safety. Idaho WS may inadvertently disturb a grizzly bear while conducting WDM activities. Activities would not be directed at grizzly bear, unless ID WS was engaged in a grizzly bear damage management project and these modes of transportation were used to access the site. These disturbances would be of temporary nature, and grizzly bears would most likely not abandon an established territory. All ID WS site access activities would be in compliance with all Federal, State and local laws, as well as in compliance with the terms and conditions set forth in ID WS MOUs with land management agencies.

Given that ID WS' access to occupied grizzly bear habitat for WDM activities is only on an as-needed basis; ID WS adheres to all Federal, State and local law; adheres to rules set forth in cooperative MOUs with land management agencies; ID WS activities are not likely to have long-lasting effects on localized grizzly bear populations; and limited disturbances from site access activities would be insignificant, ID WS concludes that site access for WDM activities results in a "**may affect, not likely to adversely affect**" finding for grizzly bears.

B. Selkirk Mountains Woodland Caribou

Idaho WS may use 4-wheel drive vehicles, ATVs, motorcycles, snow machines, or landing an aircraft in SMWC occupied habitat. While conducting WDM activities ID WS may inadvertently disturb a SMWC. Activities would not be directed at SMWC, would be of temporary nature, and caribou would most likely not abandon an established territory. All ID WS site access activities would be in compliance with all Federal, State and local laws, as well as in compliance with the terms and conditions set forth in ID WS MOU with land management agencies.

Given that ID WS' access to SMWC occupied habitat for WDM activities is only on an as-needed basis; ID WS adheres to all Federal, State and local laws; ID WS adheres to rules set forth in cooperative MOUs with land management agencies; ID WS activities are not likely to have long-lasting effects on localized SMWC populations; and limited disturbances from site access activities would be insignificant, ID WS concludes that site access for WDM activities results in a "**may affect, not likely to adversely affect**" finding for SMWC.

C. Canada Lynx

Idaho WS may use 4-wheel drive vehicles, ATVs, motorcycles, snow machines, aircraft or riding horses in occupied Canada lynx habitat. While conducting WDM activities ID WS may inadvertently disturb a Canada lynx. Activities would not be directed at Canada lynx, would be of temporary nature, and Canada lynx would most likely not abandon an established territory. All ID WS site access activities would be in compliance with all Federal, State and local laws, as well as in compliance with the terms and conditions set forth in ID WS MOU with land management agencies.

Given that ID WS' access to occupied Canada lynx habitat for WDM activities is only on an as-needed basis; ID WS adheres to all Federal, State and local laws; ID WS adheres to rules set forth in cooperative MOUs with land management agencies; ID WS activities are not likely to have long-lasting effects on localized Canada lynx populations; and limited disturbances from site access activities would be insignificant, ID WS concludes that site access for WDM activities results in a "**may affect, not likely to adversely affect**" finding for Canada lynx.

D. Northern Idaho Ground Squirrels

Idaho WS may use 4-wheel drive vehicles, ATVs, motorcycles, snow machines, aircraft or riding horses in NIDGS occupied habitat. While conducting WDM activities ID WS may inadvertently disturb NIDGS. Site access activities would not be directed at these ground squirrels, but ID WS may engage in PDM activities for the protection of these ground squirrels. Vehicles would be used to gain access to the site, would be of temporary nature, and NIDGS would most likely not abandon an established territory/colony. All ID WS site access activities would be in compliance with all Federal, State and local laws, as well as in compliance with the terms and conditions set forth in ID WS MOU with land management agencies.

Given that ID WS' access to occupied NIDGS habitat for WDM activities is only on an as-needed basis; ID WS adheres to all Federal, State and local laws; ID WS adheres to rules set forth in cooperative MOUs with land management agencies; ID WS personnel are trained in the identification of NIDGS; ID WS activities are not likely to have long-lasting effects on localized NIDGS populations; and limited disturbances from site access activities would be insignificant, ID WS concludes that site access for WDM activities results in a "**may affect, not likely to adversely affect**" finding for NIDGS.

E. Yellow-Billed Cuckoo

Idaho WS may use 4-wheel drive vehicles, ATVs, motorcycles, snow machines, aircraft or riding horses in occupied yellow-billed cuckoo habitat. While conducting WDM activities ID WS may inadvertently disturb a yellow-billed cuckoo. Activities would not be directed at yellow-billed cuckoos, would be of temporary nature, and yellow-billed cuckoos would most likely not abandon an established territory. All ID WS site access activities would be in compliance with all Federal, State and local laws, as well as in compliance with the terms and conditions set forth in ID WS MOUs with land management agencies.

Given that ID WS' access to occupied yellow-billed cuckoo habitat for WDM activities is only on an as-needed basis; ID WS adheres to all Federal, State and local laws; ID WS adheres to rules set forth in cooperative MOUs with land management agencies; ID WS activities are not likely to have long-lasting effects on localized yellow-billed cuckoo populations; and limited disturbances from site access activities would be insignificant, ID WS concludes that site access for WDM activities results in a "**may affect, not likely to adversely affect**" finding for yellow-billed cuckoos.

XXI. INDIRECT AFFECTS

Potential Interspecific Effects on Grizzly Bears From Wolves and Wolf Management

Interspecific effects from wolf management on grizzly bears are a concern most applicable to the Greater Yellowstone Area (GYA) as ID WS has not removed any wolves from other grizzly bear recovery areas. The following assessment focuses on the GYA grizzly bear population.

Grizzly bears live in the widest habitat range of any bear species and as adaptable generalists[5] they are low on the list of species threatened by climate change (*i.e*., global warming). Existing threats to grizzly bears include excessive killing and habitat fragmentation/destruction by roads and subdivisions.

Due to the grizzly bears' low reproductive rate (Schwartz et al. 2003) and status as a threatened species[6] (USFWS 1993), the effects of wolves on carrion availability and cub survival was an important consideration for wolf reintroduction and grizzly bear conservation efforts. When grizzly bears in the GYA were listed in 1975, as few as 136 remained. Estimates today place the GYA grizzly population at more than 580 bears, growing at 4-7% since the mid-1990s. Grizzly bears now occupy 48% more of the GYA than when they were first listed. Currently, about 84-90% of females with cubs occupy the PCA and about 10% of females with cubs have expanded beyond the PCA within the DPS. Grizzly bears now occupy 68% of the suitable habitat within the GYA DPS and may soon occupy the remainder of the suitable habitat. The GYA DPS now has a viable grizzly population of sufficient numbers and distribution of reproductive individuals to provide a high likelihood that the species will continue to exist and be well distributed throughout this portion of its range for the foreseeable future. State and Federal agencies' agreement to implement the extensive Conservation Strategy and state management plans ensures that adequate regulatory mechanisms are in place to protect grizzly bears and that the GYA grizzly bear population will not become an endangered species (http://www.igbconline.org/html/yellowstone.html).

The potential effects of wolves on the region's grizzly bear population were evaluated by Servheen and Knight (1993) and 15 North American gray wolf and wolf-prey scientists prior to reintroduction (Lime et al. 1994). There was consensus among the 15 panelists that in other locations, such as the Yukon, Alaska and Glacier National Park, wolves and grizzly bears generally do well together (Lime et al. 1994). It was recognized that in areas where wolves and grizzly bears coexist, interspecific killing by both species occurs (Ballard 1980, 1982; Hayes and Baer 1992) with most agonistic interactions involving defense of young or competition for carcasses (Murie 1981, Ballard 1982, Hornbeck and Horejsi 1986, Hayes and Mossop 1987, Kehoe 1995, MacNulty et al. 2001). Six panelists thought wolves would provide more protein for grizzly bears; four believed the overall impact would be "slightly beneficial." The six who did not believe wolves would provide more protein called the effect "neutral" or "slightly negative." The two remaining panelists described the overall impact as "slightly negative" (Lime et al. 1994). Servheen and Knight (1993) predicted that reintroduced wolves could reduce the frequency of winter-killed and disease-killed ungulates for grizzly bears to scavenge, but that grizzly bears would occasionally usurp

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[5] Grizzly bears can subsist on vegetation and consume meat opportunistically whereas wolves depend entirely on meat and must kill prey (Servheen and Knight 1993).

[6] On March 22, 2007, the USFWS announced that the GYA DPS of grizzly bears is a recovered population no longer meeting the ESA's definition of threatened or endangered. However, on September 21, 2009, the Federal District Court in Missoula issued an order enjoining and vacating the delisting of the GYA grizzly population. In compliance with this order, the GYA grizzly population is once again a threatened population under the ESA (75 FR 14496-14498, March 26, 2010).

wolf-killed ungulate carcasses[7]. Servheen and Knight (1993) and Lime et al. (1994) hypothesized that interspecific killing and competition for carcasses would have little or no population level effect on either species. Lime et al. (1994) further added that "this is not surprising considering the historic coexistence of these animals throughout most of their range."

GYA Grizzly bears obtained ungulate meat primarily by preying on and scavenging rut-weakened and rut-killed elk and bison (*Bison bison*) in late summer and fall (Mattson 1997), by scavenging winter-killed elk and bison carcasses in spring[8] (Green et al. 1997), and by preying on elk calves in late spring and early summer (Gunther and Renkin 1990). Female grizzly bears with reliable high-energy foods have been shown to attain larger body size and litter sizes than their counterparts with less reliable food resources. However grizzly bears, and particularly female bears with cubs, may not be able to take advantage of the carrion during mid-winter due to their hibernation. In addition, Gunther and Smith (2004) documented two incidents where wolf packs probably killed grizzly bear cubs. Although no direct observation occurred for either incident, evidence from the carcasses and kill sites suggest that wolves killed both cubs. Both cubs were killed near the carcasses of ungulates that had attracted grizzly bears and wolves. In addition, the distances between canine puncture wounds in the hides of both cubs suggests that they were attacked by more than one animal, consistent with predation by wolf packs (Mech 1970, Paradiso and Nowak 1982), but not by solitary mountain lions (Dixon 1982) or black bears (Jonkel 1978, Pelton 1982).

Foraging theory provides a context to understand and predict the amount of wolf-provisioned carrion available to scavengers. Elk carrion is an important winter food for many scavengers[9] in Yellowstone National Park (YNP) (Houston 1978). When gray wolves partially consume prey, they subsidize scavengers with a high calorie food. In addition, depending on weather conditions, wolves can change the timing of carrion availability from a more abundant resource at the end of severe winters to a more constant resource throughout the winter (Wilmers and Getz 2005, Wilmers and Post 2006). Carrion abundance before wolf reintroduction was primarily from abiotic factors (severe winters and snow depth) (Gese et al. 1996), but is now primarily from wolves (Mech et al. 2001, Wilmers et al. 2003*b*).

Wilmers et al. (2003*b*) hypothesized that wolves found in the Lamar Valley of YNP would: 1) increase the abundance, 2) alter the timing, 3) decrease year-to-year variation, and 4) change the variance of carrion available to scavengers. During mild winters, Wilmers et al. (2003*b*) model predicts that wolves would increase the amount of carrion available to scavengers from February to March. During severe winters, wolf predation would result in a small increase in carrion overall, with a decrease in mid-winter carrion, when conditions were most severe, and a small increase in carrion at the end of winter, when conditions were milder. Wilmers et al. (2003*b*) also reported that as wolf pack size changes, the amount of carrion available to scavengers also changes. Initially the amount of carrion available to scavengers would increase as wolf numbers increase and kill more but would decline as wolf numbers continue to increase as wolves would consume a higher percentage of their kills. Wolf packs of intermediate size kill

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[7] Female grizzly bears with cubs were successful at usurping carcasses from wolves in only 1 of 5 observed interactions at carcasses (Gunther and Smith 2004). Although Gunther and Smith (2004) documented 1 case of a female grizzly bear with cubs usurping a carcass, interactions between wolves and grizzly bears with dependent young were rare during their study. The energy gained by female grizzly bears with dependent cubs that usurp wolf-killed ungulates is potentially significant, although there are also potentially lethal risks associated with kleptoparasitism, as demonstrated by two cubs that were killed by wolves near ungulate carcasses.

[8] Deep snows lead to increased elk metabolic activity (Parker et al. 1984) and decreases access to forage, thereby causing elk to weaken and die (Houston 1982).

[9] Ravens, bald eagles *(Haliaeelus leucocephahis),* golden eagles *(Aquila chrysaetos*), black-billed magpies, coyotes, grizzly bears, and black bears are frequent visitors at wolf kills (Wilmers et al. 2003*b*) and use carrion for survival and reproductive success (Newton et al. 1982, Swenson et al. 1986, Blanchard 1987, Dhindsa and Boag 1990, Crabtree and Sheldon 1999, Wilmers et al. 2003*a*).

at a relatively high rate but consume only part of the carcass, thereby maximizing the amount of carrion for scavengers in YNP.

Wilmers and Post (2006) reported that climate warming reduced late winter snow pack in YNP, causing reductions in late winter carrion for scavengers in habitats without wolves. However, during severe winters when snow levels increase, a substantial increase in late winter carrion would be available without wolves (Wilmers and Post 2006). Further, climate influences on carrion availability where wolves were present are buffered because wolf-pack size becomes the primary factor driving winter carrion for scavengers (Wilmers et al. 2003*b*).

A further consideration is elk condition through the winter which is partially mediated by summer and fall food supply; hence any effects of climate change on plant nutrition and/or fire regimes may affect the amount of winter carrion (Wilmers and Post 2006). In YNP, the effects of climate warming on the scavenger community are strongest when carrion is regulated by factors such as winter snow fall rather than wolf predation (Wilmers and Post 2006). While an increase in the frequency of warm winters leads to a larger relative decline in carrion for scavengers with strong seasonality in resource use, an increase in the frequency of cold winters yields the opposite pattern (Wilmers and Post 2006).

Wilmers and Getz (2005) report that late-winter carrion in YNP will decline with or without wolves, but wolves extend the timescale over which scavengers can adapt to the changing environment[10]. It is important to note that under current conditions, Wilmers and Getz (2004) expect wolves to decrease the long-term average elk population in YNP. This will lead to a corresponding decrease in average yearly carrion levels due to fewer elk but will be partly offset by a short-term higher turnover in the elk population due to wolf predation of old animals (Wilmers and Getz 2004). However, elk population numbers in YNP are currently constrained by the availability of winter range, where snow levels are restricting elk movements and "cratering" through the snow to access forage (Wilmers and Getz 2005). If snow levels in YNP decline in the future, winter range expansion and thus higher elk densities are likely to occur (Wilmers and Getz 2005).

To further address the potential effects of wolf removals on grizzly bears in the GYA, ID WS reviewed wolf control actions which occurred during fiscal years 1995-2010 in the Idaho portion of the GYA grizzly bear range. During this period, a total of 8 wolf control actions were conducted between July 2008 and August 2010, and 9 wolves were removed from IDFG's Upper Snake Wolf Management Zone during those actions. ID WS' management actions, by calendar year, included: 2 wolves removed in 2008, 6 wolves removed in 2009, and 1 wolf removed in 2010 in the Upper Snake Wolf Management Zone. The minimum estimated wolf population in the Upper Snake Zone at the end of calendar year 2008 was 17 wolves (Nadeau et al. 2009), and at the end of 2009 it was 29 wolves (Mack et al. 2010). The fact that the grizzly bear population has increased in the GYA during a period when ID WS was concurrently removing limited numbers of wolves from the Idaho portion of the GYA suggests that these wolf removals are not directly or indirectly causing adverse effects to the GYA grizzly population.

[10] The grizzly bears' response to the YNP dump closures illustrates the ability bears have to adapt to changes in their environment (S. Miller, National Wildlife Federation @ http://missoulian.com/news/opinion/columnists/article_b18f30de-f6e2-11de-b230-001cc4c002e0.html).

BIOLOGICAL ASSESSMENTS: GRIZZLY BEAR, CANADA LYNX AND BULL TROUT

I. GRIZZLY BEAR

A. Species Description / Critical Habitat

Grizzly bears are one of the largest carnivores ranging in size from about 3 to 9 feet in length and distinguished from black bears by a distinctive hump on the shoulders, a dished profile to the face, and long claws about the length of a human finger. They are 36 to 60 inches tall at the shoulder and can tower at a height of 8 feet when standing upright on their hind legs. They range in weight from about 175 to more than 1,300 lbs. On average, adult males are 8 to 10 % larger than females. Coloration is usually darkish brown but can vary from very light cream to black. The long guard hairs on their back and shoulders often have white tips and give the bears a "grizzled" appearance, hence the name "grizzly." They have an excellent sense of smell (i.e., able to follow the scent of a rotting carcass for more than two miles), human level hearing, but relatively poor eyesight. Grizzly bears are extremely strong and have good endurance.

The USFWS proposed to designate Critical Habitat for grizzly bears in 1976 (41 FR 48757-48759) but the proposal was never finalized. The grizzly bear was listed in the lower 48 States on July 28, 1975 (40 FR 31734-31736). Recognizing the importance of habitat to the species, instead, the Interagency Grizzly Bear Committee (IGBC) issued habitat management guidelines within all occupied grizzly bear habitat (USFS 1986). The grizzly bear listing predated the 1978 amendments replacing the ability to list "populations" with the ability to list "Distinct Population Segments." To interpret and implement the 1978 DPS provision of the ESA and congressional guidance, the FWS and the National Marine Fisheries Service published a policy regarding the recognition of distinct vertebrate population segments under the ESA (61 FR 4722, February 7, 1996). Therefore, grizzly bears are managed by DPS'. In Idaho, grizzly bears may be located within the following counties: Bonner, Bonneville, Boundary, Clearwater, Fremont, Idaho, Lemhi, Shoshone, Teton and Valley.

B. Home range and dispersal

Grizzly bears occupy a variety of habitats, but in the New World they seem to prefer open areas such as tundra, alpine meadows and coastlines. The main habitat requirement for grizzly bears is an area with some dense cover that provides daytime shelter for hiding and security. The lack of security cover and overstory cover are believed to be reason that grizzly bears do not use certain areas (Gillin et al. 1994). The grizzly bear has a home range of 50 to 500 square miles[11] to fulfill their basic biological needs, including food and shelter, and uses a diverse mixture of forests, moist meadows, grasslands, and riparian habitats. Grizzly bears generally prefer large, remote areas of habitat for feeding, denning, and reproduction that are isolated from human development (USFWS 1993).

Home ranges overlap extensively and there is no evidence of territorial defense, although bears are generally solitary. Occasionally, bears may gather in large numbers at major food sources

[11] Home ranges can be as large as 1,000 mi^2, but are on average between 28 and 160 mi^2, with male ranges nearly 7 times larger than female ranges.

and form family foraging groups with more than one age class of young. Under these conditions, dominance hierarchies are usually formed and maintained with aggression. Highest ranking individuals are large adult males, although the most aggressive bears are females with young. Least aggressive and lowest ranking are adolescents. The only social bonds formed are between females and young. During the breeding season, males may fight over females and guard their mates for 1-3 weeks.

C. Diet

The grizzly bear is an opportunistic feeder that uses a wide variety of plant and animal food sources. The grizzly bear diet varies seasonally and yearly depending on the availability of high-quality foods. In spring, grasses, sedges, roots, moss and bulbs are mainly eaten. During summer and early autumn, berries are essential, with bulbs and tubers also eaten, with individuals sometimes traveling hundreds of miles during the autumn to reach areas of favorable food supplies, such as areas of high berry production (USFWS 1993). They also consume insects, fungi and roots and dig mice, ground squirrels and marmots (*Marmota* spp.) out of their burrows year-round. Spawning fish and army cutworm moths (*Euxoa auxiliaries*), are an important food source where they are abundant. Army cutworm moths provide important dietary fat in the fall when grizzly bears are preparing for hibernation and are positively correlated with bear reproductive success (Bjornlie and Haroldson 2001). The adult moths, which spend early summer months in alpine areas, migrate to lower elevations to deposit their eggs between August and October which provide the Army cutworm moths for the grizzlies. In the Rockies, grizzly bears hunt moose (*Alces alces*), elk, mountain sheep (*Ovis canadensis*), mountain goats (*Oreamnos americanus*), and occasionally black bears. Grizzlies also kill and eat domestic livestock.

The grizzly bear also makes use of a variety of vegetative food sources. Whitebark pine seeds are an important fall source of food for grizzly bears in the Greater Yellowstone Ecosystem (GYE) (Mattson et al. 1991) and use of this food is positively associated with fecundity and survivorship of the population (Mattson and Reinhart 1994). Bears consume whitebark pine seeds contained in red squirrel (*Tamiasciurus hudsonicus*) cone caches (Mattson and Jonkel 1990). Studies show that in years when the whitebark pine seed crop is low, there is an exponential increase in human-bear conflicts (Mattson et al. 2001). This is likely due to bears seeking alternative food sources, such as clover (*Trifolium* spp.) and yampa (*Perideridia* spp.), that occur at lower elevations and closer to humans. In addition to supplying a food source high in fat, whitebark pine seed crops also serve grizzly bears by keeping them at high elevations far from intense human use. Other grizzly bear seasonal foliage use includes graminoids, horsetail (*Equisetum* spp.), forbs, and fruits (whortleberry (*Vaccinium* spp.) and huckleberry (*Ericaceae*)) (Mattson and Knight 1991).

D. Den site selection

Denning studies conducted by Judd et al. (1986) indicate that grizzly bears generally construct dens in areas far from human disturbance; most often, they dig their own dens and make a bed out of dry vegetation. North exposures, 30 to 60 degree slopes, and sites with whitebark pine and subalpine fir (*Abies lasiocarpa*) appeared to be preferred denning sites of grizzly bears. Grizzly bears begin their hibernation in October-December, and resume activity in March-May, with the exact period dependent on the location, weather, and condition of the individual. Dens are sometimes used repeatedly year after year. Denning bears can be disturbed by winter sport activities such as snowmobiling, and current studies are focused on minimizing disturbance by controlling access to important denning areas (Podruzny et al. 2002).

E. Reproduction

Mating takes place from May to July, although the fertilized eggs are not implanted in the uterus until October or November. Births occur from January to March (usually while the female is in hibernation) after a total gestation ranging from 180-266 days. Females remain in estrus throughout the breeding season until mating occurs and do not ovulate again for at least 2 (usually 3 or 4) years after giving birth. Two offspring are generally born per litter, and young are born blind and naked. They are weaned at 5 months of age but remain with the mother until at least their second spring of life (usually until the third or fourth). They mature sexually between 4-6 years of age, but continue growing until 10-11 years old. Bears have been known to live and reproduce in Yellowstone National Park at 25 years of age, and potential lifespan in captivity is as great as 50 years.

F. Environmental Baseline

Regulations implementing the ESA (50 CFR 402.02) define the environmental baseline as the past and present impacts of all federal, state, or private activities in the action area or that affect the action area indirectly, the anticipated impacts of all proposed state or federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation process.

The action area is defined at 50 CFR 402 as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." For the purposes of this consultation, the action area includes portions of the Cabinet-Yaak Ecosystem (CYE), Selkirk Ecosystem (SKE) and GYE in Idaho. Grizzly bear habitat outside Idaho is not included in this consultation.

Managers and biologists are working to identify population size, trend, survival, and travel corridors that link other populations with the CYE, SKE and GYE. Advances in genetic technology allow researchers to address these through the identification of species, sex, and individuals from DNA extracted from bear hair without handling a bear. The exact size of the grizzly bear population in the CYE, SKE and GYE is unknown due to the reclusive nature of the species and the rugged terrain. The grizzly bear population is estimated at 42 for the CYE, 80 for the SKE and more than 582 bears for the GYE (USFWS 2011*a*, Table 2).

Table 2. Estimated grizzly bear population size and population growth rate by Recovery Zone-Adapted from Grizzly Bear 5-Year Review: Summary and Evaluation. (USFWS 2011*a*)

Recovery Zone	Estimated Population Size	Trend (% change annually)
Greater Yellowstone Area	582[a]	+4.7 %[b]
Cabinet-Yaak	42[c]	–3.8 %[c]
Selkirk	80[d]	+1.9 %[f]

a Haroldson 2010
b Harris et al. 2006
c Kasworm et al. 2010
d Proctor et al. 2012; Wakkinen, IDFG. pers. comm. 2012
f Wakkinen and Kasworm 2004

1. Population Status and Distribution

Between 1800 and 1975, grizzly bear populations in the lower 48 states decreased from estimates of more than 50,000 to less than 1,000, and were extirpated from many areas. Historically, the grizzly bear ranged from the Great Plains to the Pacific Ocean and from the northern United States border with Canada to the southern border with Mexico. Currently in the contiguous United States, the grizzly population has been reduced to roughly 2% of its former range with a present population of about 1,200-1,400 wild grizzly bears. As such, the USFWS was directed by Congress to conserve grizzly bears and the ecosystems upon which they depend. Grizzly bears presently occur in five ecosystem areas and to maintain these populations and the health of grizzly bear populations, the total effect of mortalities, genetic diversity, habitat and food availability and more are monitored.

Grizzly bears are reoccupying many areas outside the Recovery Zones, as designated in the USFWS 1993 Revised Recovery Plan, where they have been absent for more than 40 years. In addition, under the Conservation Strategy, bear-livestock depredations inside and surrounding the PCA are monitored to make sure that these conflicts are resolved according to the protocol established in the strategy.

Cabinet-Yaak Ecosystem

The CYE in northwestern Montana and SKE in northeastern Idaho has more than 1,900-square miles of forested and mountainous habitat occupied by grizzly bears. A minimum population estimate of 42 bears was made for the Cabinet-Yaak recovery zone during 2005-10 based on captures, genetic information, mortality, and sightings of unique individuals (Kasworm et al. 2010). These populations are connected to populations of grizzly bears to the north of the United States border with Canada, as interchanges of radio-collared bears across the border have been documented (USFWS 1993). The most recent data indicate that population status is below recovery goals in the CYE for the distribution of females with young in the Bear Management Units (BMUs) and exceeds the 6-year average of female mortality in the recovery zone (USFWS 2011*a*).

The CYE grizzly bear populations have never attained the Recovery Plan criteria for females with cubs. Separate population estimates were made for the Cabinet Mountains and the Yaak River drainage because there is not any documented movement of grizzly bears between these two portions of the recovery zone. The Cabinet Mountains lie south of the Yaak River drainage and contain about 60% of the recovery zone. There were a minimum of 16 individuals in the Cabinet Mountains and 26 individuals in the Yaak portion of the recovery zone (Kasworm et al. 2010). Wakkinen and Kasworm (2004) documented a population declining at a rate of 3.6% annually in 2002 (95% CI=0.844-1.063). USFWS determined that populations of grizzly bear in the combined SKE-CYE recovery zone were warranted for endangered status but were precluded in 1999 and suggested that the two populations might be inter-connected (64 FR 26725-26733).

CYE mortalities have 7 known and probable mortalities in 2002 (6 were human-caused), 0 known mortalities in 2003, 1 known mortality on 2004 (human-caused), 5 known mortalities in 2005 (all human-caused), 2 known mortalities in 2006 (all human-caused), 1 known mortality in 2007 (human-caused) 4 known mortalities in 2008 (all human-caused), 3 known mortalities in 2009 (2 were human-caused), and 4 known mortalities in 2010 (3 were human-caused).

Greater Yellowstone Ecosystem

The 9,209-square mile GYE recovery zone includes portions of Wyoming, Montana, and Idaho and portions of six National Forests (Beaverhead, Bridger-Teton, Custer, Gallatin, Shoshone, and Targhee), Yellowstone and Grand Teton National Parks, John D. Rockefeller Memorial Parkway, portions of adjacent private and State lands, and lands managed by the BLM.

The best available information suggests the GYE grizzly bear population is stable and increasing. However, the long term conservation of the population continues to depend largely on managing bear-human conflicts, which often results in human-caused mortality of grizzly bears. Years in which natural grizzly bear food production and availability are high can result in younger age classes of grizzly bears accustomed to fairly good food availability. A year of drought and poor food production can compel grizzly bears to search widely for food. Such wide ranging movements can bring grizzly bears into close contact with humans, increasing bear-human conflicts and resultant control/management actions.

As the habitat area most remote from the other remaining grizzly bear habitat, the GYE has been the primary focus of grizzly recovery efforts to date. This work has been very successful; the grizzly population numbers and distribution here have exceeded target recovery levels for the last several years. The population of adult female grizzly bears, for example, has grown from a low point in 1983 of less than 30 to more than 100 today. Recovery work continues to reduce grizzly bear mortalities and ensure habitat standards for maintaining a recovered population.

On March 22, 2007, USFWS announced that the GYE Distinct Population Segment (DPS) of grizzly bears was a recovered population no longer meeting the ESA's definition of threatened or endangered. The GYE DPS has increased from estimates as low as 136 individuals when listed in 1975 to more than 500 individuals in 2006 with a 4-7 annual percent increase during this time frame. The range of this population also has increased dramatically as evidenced by the 48% increase in occupied habitat since the 1970s. GYE grizzly bears continue to increase their range and distribution annually and grizzly bears in the GYE now occupy habitats they have been absent from for decades. Roughly 84-90% of females with cubs today occupy the Primary Conservation Area (PCA) and about 10% of females with cubs have expanded out beyond the PCA within the DPS boundaries. Grizzly bears now occupy 68% of suitable habitat within the DPS boundaries and continue to expand their range.

On September 21, 2009, the Federal District Court in Missoula issued an order enjoining and vacating the delisting of the GYE grizzly population. In compliance with this order, the GYE grizzly population is once again a threatened population under the ESA.

Intensive monitoring of the population and its habitat are continuing so that managers can continue to base management decisions on the best available scientific information. The GYE DPS represents a viable population which has sufficient numbers and distribution of reproductive individuals so as to provide a high likelihood that the species will continue to exist and be well distributed throughout its range for the foreseeable future. State and Federal agencies are committed to implementing the extensive Conservation Strategy and State management plans. They have formally incorporated the habitat and population

standards described in the Conservation Strategy into the six affected National Forests' Land Management Plans and Yellowstone and Grand Tetons National Park Compendiums. This commitment coupled with State wildlife agencies' approved grizzly bear management plans ensure that adequate regulatory mechanisms are in place and that the GYE grizzly bear population will not become an endangered species within the foreseeable future throughout all or a significant portion of its range. Therefore, based on the best scientific and commercial information available, the USFWS is finalizing the delisting of the GYE grizzly bear DPS.

GYE grizzly mortality, known and probable, was 26 in 2004 (19 known human-caused), 16 in 2005 (11 known human-caused), 15 in 2006 (7 known human-caused), 33 in 2007 (24 known human-caused), 48 in 2008 (37 known human-caused), 31 in 2009 (24 known human-caused), and 50 in 2010 (42 known human-caused). The number of mortalities appears to be trending upwards, likely as a result of an increased population creating more potential for human-bear conflicts.

Selkirk Ecosystem

The SKE of northwestern Idaho, northeastern Washington, and southeastern British Columbia includes about 1,080 square miles in the U.S. portion and about 875-square miles in the Canadian portion of the recovery zone. The SKE recovery zone is the only defined grizzly bear recovery zone that includes part of Canada because the habitat in the United States portion is not of sufficient size to support a minimum population. The habitat is contiguous across the border and radio-collared bears are known to move back and forth. Therefore, the grizzly bears north and south of the border are considered one population (USFWS 1993).

Neither the CYE nor the SKE grizzly bear populations have ever attained the Recovery Plan criteria for females with cubs. It is estimated that the population of grizzly bears in the SKE is slowly increasing at a rate of 1.9% annually (95% CI=0.922-1.098) (Wakkinen and Kasworm 2004). USFWS determined that the combined SKE-CYE grizzly bear recovery zones were warranted endangered but precluded in 1999 and suggested that the two populations might be interconnected (64 FR 26725-26733).

2. Conservation Mechanisms

In an effort to facilitate consistency in the management of grizzly bear habitat within and across ecosystems, the Interagency Grizzly Bear Guidelines were developed by the Interagency Grizzly Bear Committee (IGBC) (IGBC 1986, 51 FR 42863, November 26, 1986) for use by land managers. The IGBC developed specific land management guidelines for use in each of the five grizzly bear ecosystems including the three in Idaho. The current Grizzly Bear Recovery Plan (USFWS 1993) outlines recovery strategies for the various grizzly bear ecosystems. The Plan defines a recovered population as one that can sustain the existing level of known and unknown human-caused mortality that exists in the ecosystem and is well-distributed throughout the recovery zone. Additionally, adequate regulatory mechanisms for population and habitat management through the development of a conservation strategy must be demonstrated before a population can be considered recovered.

Recovery zones also have been established for the grizzly bear and include areas large enough and of sufficient habitat quality to support a recovered bear population.

According to the Grizzly Bear Recovery Plan (USFWS 1993), a recovery zone is defined as that area in each grizzly bear ecosystem within which the population and habitat criteria for achievement of recovery will be measured. Areas outside of recovery zones may provide habitat that grizzly bears will use, but are not considered necessary for the survival and recovery of this species. The area outside the recovery zone but within the 10-mile buffer area is managed to consider and protect grizzlies and their habitat whenever possible, recognizing that population and mortality data within this zone are collected and pertinent to recovery criteria (USFWS 1993). Beyond the 10-mile buffer, grizzly bear mortalities or populations are not considered when determining whether recovery goals have been met; however, protection is still accorded to the grizzly bear under the ESA.

Recovery zones are divided into smaller areas called BMUs (Bear Management Units) for the purpose of habitat evaluation and monitoring. BMUs were designed to:

(1) assess the effects of existing and proposed activities on grizzly bear habitat without having effects diluted by consideration of an area too large;

(2) address unique habitat characteristics and bear activity and use patterns;

(3) identify contiguous complexes of habitat which meet year-long needs of the grizzly bear; and,

(4) establish priorities for areas where land use management needs would require cumulative effects assessments.

Areas within the recovery zone are stratified into Management Situation Zones 1, 2, and 3; each having a specific management direction.

Management Situation 1 (MS1) lands contain population centers of grizzlies, are key to the survival of the species and are where management decisions will favor the needs of the bear even when other land use values compete.

Management Situation 2 (MS2) lands are those areas that lack distinct grizzly bear population centers and the need for this habitat for survival of the grizzly bear is more uncertain. The status of such areas is subject to review. Here, management will at least maintain those habitat conditions that resulted in the area being classified as MS2.

Management Situation 3 (MS3) designation is intended for lands where grizzly bears may occur infrequently. There is high probability that Federal activities here may affect the species survival and recovery. Management focus is on human-bear conflict minimization rather than habitat maintenance and protection. According to the Grizzly Bear Recovery Plan, in order to facilitate recovery of the population, a conservative approach is taken toward allowable mortality, accounting for error in both minimum population estimates and unknown, unreported mortality. Studies by Harris (1984) indicate that a grizzly bear population can sustain an average annual human-caused mortality of 6 % without experiencing a decline.

3. Threats and Reason for Decline

An estimated 50,000 grizzly bears roamed the American west prior to European settlement (USFWS 1993). Due to loss of habitat and excessive and intentional killing by people, only 1,000-1,500 grizzly bears remain in a few isolated populations in

Montana, Idaho, Wyoming, and Washington. This represents approximately 2% of their historic range in the lower 48 states (USFWS 1993).

Primary threats to grizzly bears are associated with motorized and dispersed recreational use[12] and forest management activities, including timber harvest. Recreational uses include hunting, fishing, camping, horseback riding, hiking, biking, off-road vehicle (ORV) use, and snowmobiling. Direct human-caused mortality is the most obvious threat to the grizzly bear. This kind of mortality can occur in several ways: 1) mistaken identification by big game hunters, 2) malicious killing, 3) defense of human life or property, or 4) management removals. Bears are removed to defend human life or property, usually because bears have become dangerously bold as a result of food conditioning and habituation at campsites, lodges, resorts and private residences or they become habituated predators of livestock.

The frequency of grizzly bear-human conflicts is inversely associated with the abundance of natural bear foods (Gunther et al. 2004). That is, most grizzly bear mortalities are directly related to grizzly bear-human conflicts. Gunther et al. (2004) reported known human caused mortalities from 1992-2000 in the GYE. Of 74 human-caused mortalities, 43% were in defense of life and property, 28% were management removals due to human-bear conflicts, 12% were illegal kills, 10% were accidental deaths, and 7% were hunting-related (Gunther et al. 2004). The greatest increase in recent years is self-defense during autumn months by big game hunters. According to USFS (2004), for the years of 1975 to 2002, 59% of grizzly bear deaths (136 out of 230) occurred on Forest System lands. Of these, 67% (91 of the 136) were not directly related to forest management actions. The remaining 33% (45 of the 136), can be at least indirectly attributed to forest management activities, for example mortalities related to backcountry recreation use and the presence of domestic livestock.

Grizzly bears have also experienced displacement from available habitat (i.e., loss of habitat effectiveness due to disturbance associated with increased human uses from road building, ORV use, and recreational use). They have also experienced loss of existing available habitat due to: 1) increased development on private land related primarily to residential housing and 2) potential for increased development on public land related primarily to oil/gas and recreational developments. The grizzly bear also faces a decrease in value of available habitat due to: 1) a loss of biodiversity (especially early succession related vegetative types), and 2) sub-optimal composition, structure, and juxtaposition of vegetation as a result of fire suppression, forest management strategies, and advancing succession. Finally, the bear faces isolation due to fragmentation of available habitat due to: 1) major development of private land, 2) construction of major highways that block or restrict movements, 3) inadequate provision for linkage on minor roads and highways, and 4) large clear cuts.

[12] Long distance travel habits of grizzly bears increase the risks of contact with humans, including highway crossings, and contact with hunters, recreationists, and a variety of human congregations. Pest bears often must be eliminated or removed from developed areas.

4. Recovery Efforts

1. Final Recovery Plan: Plan completed on January 29, 1982, Revised September 10, 1993: Revised Grizzly Bear Recovery Plan

2. Recovery Actions:

a. Minimize sources of human-bear conflict

b. Limit habitat loss or degradation because of human actions such as road building, timber harvest, oil and gas exploration and development, mining, and recreation

c. Improve habitat or security where applicable

d. Understand the relationship between bear density and habitat value to better understand limiting factors

e. Develop techniques to successfully move bears into areas where the populations are in need of augmentation

f. Improve public relations and education to develop better support for and understanding of the species and to minimize adverse human actions

g. Continue grizzly bear habitat research to ensure adequate scientific knowledge is available on which to base management decisions

G. Impacts of the ID WS Program

Grizzly bear may potentially occur in Bonner, Bonneville, Boundary, Clark, Fremont and Teton counties (http://www.fws.gov/idaho/species/IdahoSpeciesList.pdf). Grizzly bear are also listed as an Experimental Population, Non-Essential in Clearwater, Idaho, Lemhi, Shoshone and Valley counties (http://ecos.fws.gov/speciesProfile/profile/countiesByState.action?entityId=1302&state=Idaho).

Under the terms of a 2006 MOU between the IDFG and Idaho State Animal Damage Control Board (IDFG and ISADCB 2006), ID WS has the lead responsibility for the capture and restraint of grizzly bears involved in livestock depredations in Idaho. Idaho WS coordinates activities with the USFWS and IDFG on any grizzly bear capture efforts. All grizzly bear activities are conducted under the authority of Section (i)(C) and (D) of the grizzly bear 4(d) rule, 50 CFR 17.40(b) through a subpermit issued by the USFWS Grizzly Bear Recovery Coordinator.

In a 1992 consultation on the national WS program (USDA 1997), the USFWS acknowledged some potential for incidental take of a grizzly bear during legitimate damage management operations, including actions to manage grizzly bears, and stipulated reasonable and prudent measures and terms and conditions as necessary and appropriate to minimize ID WS' potential for incidental take of grizzly bears. These are:

Reasonable and Prudent Measures

1. ADC [WS] personnel shall take all precautions possible to reduce any possible incidental take, including training on the use of drugs for animal immobilization and restraint.

2. ADC [WS] personnel shall monitor incidental take to ensure compliance with anticipated take levels.

Terms and Conditions

1. All cage (culvert) traps and foot snares set for black bears in areas occupied by grizzly bears shall be checked at least once a day.

2. Neck snares (for coyotes) without break-away locks shall not be used in areas occupied by grizzly bears.

3. Neck snares shall not be used for black bears or mountain lions in areas occupied by grizzly bears.

4. The Service Fish and Wildlife Enhancement Office, in the Regions of the species occurrence, shall be notified within 5 days of the finding of any dead or injured grizzly bears in or adjacent to an ADC [WS] Program work area. Cause of death, injury, or illness, if known, also shall be conveyed to those offices.

The 1992 BO established an incidental take limit of one Grizzly Bear per year for Wyoming and the Northern Continental Divide Area of Montana. There was no incidental take allowance for Idaho. Idaho WS completed state-specific consultations in 1996 and 2002 (File #140.0000 1-4-96-I-72 (USFWS 1996) and File # 140.0000 FWS # 1-4-02-F-0058 (USFWS 2002*a*), respectively), which concluded that ID WS actions may affect but were unlikely to adversely affect Grizzly Bear. The 2002 consultation added additional measures and/or modifications to existing measures for the protection of Grizzly Bears:

1. Only Idaho – WS employees who are trained to use immobilization and restraint drugs will administer such drugs to grizzly bears.

2. Neck snares for gray wolves, coyotes, black bears, or mountain lions will not be used in areas occupied by grizzly bears from March 15th to December 1st.

3. If any dead or injured grizzly bear were to be found anywhere by an Idaho-WS employee, this finding would be reported to the USFWS and to the IDFG, as well as the appropriate land management agency.

For this BA, ID WS is proposing that Measure #2 (immediately above), "Neck snares for gray wolves, coyotes, black bears, or mountain lions will not be used in areas occupied by grizzly bears from March 15th to December 1st ." from the 2002 Letter of Concurrence (USFWS 2002*a*) be modified as noted in the below 2 measures:

1. Neck snares set for coyotes, red foxes, bobcats, wolves, mountain lions or black bears will not be used from March 16 to November 30 in the Idaho portion of the Cabinet-Yaak Recovery Zone boundary.

2. Neck snares set for coyotes, red foxes or bobcats from March 16 to November 30 in the Idaho portions of the Selkirk Mountains Recovery Zone boundary and Greater Yellowstone PCA boundary will be equipped with breakaway locks with a breaking strength rating of 285 lbs. or less. Use of these neck snares will only occur after a confirmed depredation on livestock has occurred. Additionally, prior to any use of neck snares as described above, ID WS will conduct both site-specific extensive and intensive surveys, as well as confirming no recent grizzly bear activity in the area with local Federal and State wildlife officials.

There has been no incidental take of any grizzly bear by ID WS; however, an incident in Wyoming serves as an example of the potential for incidental take to occur. A young female grizzly bear (i.e., about 60 lbs) was captured in Wyoming while attempting to capture a wolf for the USFWS for monitoring purposes. The USFWS provided the equipment and requested Wyoming WS capture the wolf at the site where wolves had killed livestock. The bear was captured in a snare set for wolves (no breakaway lock) and subsequently succumbed. Six non-target grizzly bears have been captured by WS in Wyoming (n=5) and Montana (n=1) from May 2006 to June 2012. Five of the trapped bears were safely released unharmed while one bear escaped after breaking the trap before it was checked. "Self-imposed" measures have been implemented by ID WS to prevent any unintentional captures of grizzly bears in Idaho while attempting to capture wolves. These measures include:

1. Suspension of wolf trapping near carcasses in occupied grizzly bear habitat while bears are not in hibernation, unless it is a confirmed livestock depredation situation.

2. Neck snares without breakaway locks will not be used in occupied grizzly bear habitat during the period bears are not in hibernation; and

3. Traps and foot snares will be anchored with the expectation that a grizzly bear could be potentially caught.

Because there is a potential of capturing and holding grizzly bears in wolf traps and foot snares set for wolves or mountain lions, ID WS is also proposing that the following "self-imposed" measure be considered in this BA by the USFWS:

1. Foothold traps and foot snares set for mountain lions or wolves between March 16 and November 30 in the Idaho portion of the Cabinet-Yaak Recovery Zone boundary, Selkirk Mountains Recovery Zone boundary and Greater Yellowstone PCA boundary will be checked daily and anchored sufficiently to hold an adult grizzly bear should one inadvertently be captured. Adequately anchoring the traps would enable WS specialists to remove the trap from the bear and reduce risk of a bear leaving the trap location with a trap still on its foot.

2. WS generally does not anticipate using grain bait rodenticides in occupied Canada lynx habitat. In the unlikely event that WS would propose this type of action on non-federal lands, WS would re-initiate consultation. If work is being proposed for federal lands, ESA consultation would be the responsibility of the federal agency requesting ID WS assistance.

II. CANADA LYNX

A. Species Description / Critical Habitat

Canada lynx are medium-sized cats, 75 - 90 cm long (30 - 35 in.) with long legs; large, well-furred paws; long ear tufts; and a short, black-tipped tail. Adult males average 10 - 17 kg. (22 - 37 lbs.) in weight and 85 cm (33.5 in.) in length (head to tail), and females average 8.5 kg (19 lbs.) and 82 cm (32 in.) (Quinn and Parker 1987, Haglund 1966). The winter pelage of the lynx is dense and has a grizzled appearance with grayish-brown mixed with buff or pale brown fur on the back, and grayish-white or buff-white fur on the belly, legs, and feet. Summer pelage of the lynx is more reddish to gray-brown (McCord and Cardoza 1982). The lynx's long legs and large feet make it highly adapted for hunting in deep snow.

Critical habitat was designated for the threatened population of Canada lynx in the contiguous United States (74 FR 8616-8702). In Idaho, only Bonner County is included in the Designated Critical Habitat for lynx.

B. Home Range and Dispersal

Lynx home range size varies by their gender, abundance of prey, season of the year, and the density of the lynx population (Hatler 1988; Koehler 1990; Poole 1994; Slough and Mowat 1996; Aubry et al. 2000; Mowat et al. 2000). Documented home ranges vary from 8 to 800 square kilometers (3 to 300 square miles; Saunders 1963; Brand et al. 1976; Mech 1980; Parker et al. 1983; Koehler and Aubry 1994; Mowat et al. 2000; Squires and Laurion 2000). Preliminary research supports the hypothesis that lynx home ranges at the southern extent of the species' range are generally large compared to those in the core of the range in Canada (Koehler and Aubry 1994; Squires and Laurion 2000).

Daily movement distances vary. G. Mowat et al. (2000) documented a difference in daily cruising radius, from 2.7 km (1.6 miles) during moderate to high snowshoe hare (*Lepus americanus*) densities, to a 5.4 km (3.2 miles) during low snowshoe hare densities (<0.5 hares/ha or <0.2 hares/acre). Parker et al. (1983) reported a female's daily cruising distance as 8.8 km (5.3 miles) in winter and 10 km (6 miles) in summer. Ongoing studies in Montana, Wyoming and southern British Columbia have documented exploratory movements by resident lynx during the summer months (Squires and Laurion 2000; Apps 2000). Aubry et al. (2000) described this type of movement as long-distance movements beyond identified home range boundaries, but returning to the original home range. Distances of exploratory movements in Montana ranged from about 15 km (9 miles) to 40 km (25 miles), and duration away from the home range was one week to several months (Squires and Laurion 2000).

Lynx disperse primarily when snowshoe hare populations decline (Koehler and Aubry 1994; Poole 1997). In the taiga, both adult and subadult lynx are known to make long-distance movements during periods of prey scarcity: recorded distances have been up to 1,000 km (600 miles) (Mech 1980, Slough and Mowat 1996, Poole 1997). During dispersal, the minimum daily travel rate was 1.7 to 8.3 km (1-5 miles) per day (n=3) (Mowat et al. 2000), suggesting that dispersing lynx do not travel further per day than resident lynx (Mowat et al. 2000). There have been no successful dispersals (where breeding has been documented after moving to a new location) observed in the southern part of the range (Aubry et al 2000). Lynx populations in the northern boreal forests of Canada and Alaska undergo extreme fluctuations in response to snowshoe hare population cycles. Lynx disperse during cyclic lows of snowshoe hare populations but lynx home range size changes relatively little during years of high hare abundance (Mowat et al. 2000). The extent to which the northern lynx populations influence lynx occurrence in the contiguous United States is not known.

C. Diet

Snowshoe hares are the primary prey of lynx, comprising 35% -97% of the diet throughout the range of the lynx (Koehler and Aubry 1994). Red squirrels have been shown to be an important alternate prey species, especially during snowshoe hare populations lows (Koehler 1990, O'Donoghue et al. 1997). Other prey species include the ruffed grouse (*Bonasa umbellus*), spruce grouse (*Dendragapus canadensis*), dusky grouse (*Dendragapus obscurus*), ptarmigan (*Lagopus spp*.), ground squirrel (*Spermophilus spp*.), porcupine, beaver, deer mice (*Peromyscus spp*.), voles (*Microtus spp*.), shrews (*Sorex spp*.), fish, and ungulates as carrion or occasionally as prey (Koehler 1990; Staples 1995; O'Donoghue et al. 1998; McCord and Cardoza 1982; Ward and Krebs 1985, Major 1989, Murray et al. 1994). Southern populations of lynx may prey on a

wider diversity of species than northern populations because of lower average hare densities and differences in small mammal communities.

D. Den Site Selection

Lynx use large woody debris, such as downed logs, root wads, and windfalls, to provide denning sites with security and thermal cover for kittens (McCord and Cardoza 1982; Koehler 1990; Mowat et al. 2000; Squires et al 2007). The age of the forest stand does not seem as important as the amount of downed, woody debris available (Mowat et al. 2000). Downed logs and overhead cover provide protection of kittens from predators, such as owls, hawks, and other carnivores during this period. This structure must be available throughout the home range because lynx, like other carnivores, may frequently move their kittens until they are old enough to hunt with their mother. These structures are likely also needed when the kittens are old enough to travel but not hunt (Bailey 1974).

E. Reproduction

Breeding occurs through March and April in the north (Quinn and Parker 1987). Kittens are born in May to June in south central Yukon (Slough and Mowat 1996). During periods of hare abundance in the northern taiga, litter size of adult females averages 4 to 5 kittens (Mowat et al. 1996). Koehler (1990) suggested that the low number of kittens produced in north central Washington was comparable to northern populations during periods of low snowshoe hare abundance. In his study area, radio-collared females (n=2) had litters of 3 and 4 kittens in 1986, but only one each in 1987 (the actual litter size of one of the females in 1987 was not determined) (Koehler 1990). Of the known-size litters in Washington, only one kitten survived the first winter. In Montana, Squires and Laurion (2000) reported that one marked female produced two kittens in 1998. In 1999, two of three females produced litters of two kittens each. In Wyoming (Squires and Laurion 2000), one female produced four kittens in 1998, but snow tracking indicated that the kittens were not with the female in November and presumed dead. The same female produced two kittens in 1999.

F. Mortality

Reported causes of lynx mortality vary among studies. The most commonly reported causes include starvation of kittens (Quinn and Parker 1987; Koehler 1990), and human-caused mortality, mostly fur trapping (Ward and Krebs 1985; Bailey et al. 1986). Various studies have shown that, during periods of low snowshoe hare abundance, starvation can account for up to two-thirds of all natural lynx deaths. Trapping mortality may be additive rather than compensatory during the low period of the snowshoe hare cycle (Brand and Keith 1979). Hunger-related stress, which induces dispersal, may increase the exposure of lynx to other forms of mortality such as trapping and highway collisions (Brand and Keith 1979; Carbyn and Patriquin 1983; Ward and Krebs 1985; Mowat et al. 2000; Bailey et al. 1986).

Paved roads have been a mortality factor in lynx translocation efforts within historical lynx range. In New York, 18 translocated lynx were killed on highways (Brocke et al. 1990). It has been suggested by Brocke et al. (1990) that translocated animals may be more vulnerable to highway mortality than resident lynx. Although little is known about the indirect effects of roads or trails on lynx, none of the 89 lynx studied with radio-telemetry in Washington, Wyoming, the southern Canadian Rockies, Minnesota, or Nova Scotia were killed in vehicle collisions. Among 37 radio-marked animals that died during these studies, 19 were shot or trapped, 8 died of starvation, 6 from predation, and 4 from unknown natural causes.

G. Interspecific Relationships with Other Carnivores

Buskirk et al. (2000) described the two major competition impacts to lynx as exploitation (competition for food) and interference (avoidance). Of several predators examined (birds of prey, coyote, gray wolf, mountain lion and bobcat), coyotes were found to be most likely to pose local or regionally important exploitation competition impacts on lynx. Both coyotes and bobcats were deemed to be potential interference competitors for lynx. Mountain lions were described as interference competitors, possibly impacting lynx during summer and in areas lacking deep snow in winter, or when high elevation snow packs develop a crust in the spring.

Predation on lynx by mountain lion, coyote, gray wolf, and other lynx has been confirmed (Koehler et al. 1979; Slough and Mowat 1996; O'Donoghue et al. 1997; Squires and Laurion 2000). Squires and Laurion (2000) reported two of six mortalities of radio-collared lynx in Montana were due to mountain lion predation. However, records of predation on lynx are uncommon and the significance of predation on lynx populations is unknown.

H. Population Status and Distribution

In Canada and Alaska, lynx undergo extreme fluctuations in response to snowshoe hare population cycles, enlarging or dispersing from their home ranges and ceasing the recruitment of young into the population when hare populations decline (Mowat et al. 2000). In the southern portion of the range in the contiguous United States, lynx populations appear to be limited by the availability of snowshoe hares, as suggested by large home range size, high kitten mortality due to starvation, and greater reliance on alternate prey.

The term "resident population" refers to a group of lynx that has exhibited long-term persistence as demonstrated by a variety of factors such as evidence of reproduction, successful recruitment into the breeding cohort, and maintenance of home ranges. The term "transient" refers to a lynx moving from one place to another within suitable habitat. The term "dispersing" refers to lynx that have left suitable habitat for various reasons such as competition or lack of food. When dispersing lynx leave suitable habitat and enter habitats that are unlikely to sustain lynx, these individuals are considered lost from the metapopulations unless they return to boreal forest (65 FR 16052-16086).

The historic and present range of the lynx north of the contiguous United States includes Alaska and that part of Canada that extends from the Yukon and Northwest Territories south along the United States border and east to New Brunswick and Nova Scotia. In the contiguous United States, lynx historically occurred in the Rocky Mountain Range in Montana, Wyoming, Idaho, eastern Washington, eastern Oregon, northern Utah, and Colorado; the western Great Lakes Region; and the northeastern United States Region from Maine southwest to New York (McCord and Cardoza 1982; Quinn and Parker 1987).

In the contiguous United States, the distribution of lynx is associated with the southern boreal forests, subalpine coniferous forest in the West and primarily mixed coniferous and deciduous forest in the East (Aubry et al. 2000). In Canada and Alaska, lynx inhabit the boreal forest ecosystem known as the taiga (McCord and Cardoza 1982; Quinn and Parker 1987; McKelvey et al. 2000). Within these general forest types, lynx are most likely to persist in areas that have deep snows as they are highly adapted for such conditions (Ruggiero and McKelvey 2000).

The complexities of lynx life-history and population dynamics, combined with a general lack of reliable population data for the contiguous United States, make it difficult to ascertain the past or present population status of lynx in the contiguous United States. It is impossible to determine with certainty whether reports of lynx in many States were (1) merely animals dispersing from northerly populations that were effectively lost because they did not join or establish resident populations, (2) animals that were a part of a resident population that persisted for many generations, (3) animals making exploratory movements outside of their normal home range, or (4) a combination of the above.

The final rule determining threatened status for the lynx in the contiguous United States summarized lynx status and distribution across four regions that are separated from each other by ecological barriers consisting of unsuitable lynx habitat. These distinct regions are the Northeast, the Great Lakes, the Northern Rocky Mountains/Cascades, and the Southern Rocky Mountains. While these regions are ecologically unique and discrete, the lynx is associated with southern boreal forest in each and, with the exception of the Southern Rocky Mountains Region, each area is geographically connected to the much larger population of lynx in Canada.

Northern Rocky Mountain / Cascades Region

The Northern Rocky Mountain/Cascades Region consists of the states of Washington, Oregon, Idaho, Wyoming, and Utah. In this region, the majority of lynx occurrences are associated at a broad scale with the "Rocky Mountain Conifer Forest". Primary vegetation that contributes to lynx habitat is lodgepole pine (*Pinus contorta*), subalpine fir, and Engelmann spruce (*Picea engelmannii*) (Aubry et al. 2000, Reudiger et al. 2000). In extreme northern Idaho, northeastern Washington, and northwestern Montana, cedar-hemlock habitat types may also be considered primary vegetation. In central Idaho, Douglas-fir (*Pseudotsuga menziesii*) on moist sites at higher elevations may also be considered primary vegetation. Secondary vegetation types that when interspersed within subalpine forests, may also contribute to lynx habitat, include cool, moist Douglas-fir, grand fir (*Abies grandis*), western larch (*Larix occidentalis*), and aspen forests. Dry forest types (e.g., ponderosa pine (*Pinus ponderosa*), climax lodgepole pine) do not provide lynx habitat (Reudiger et al. 2000). Within this forest type, most of the occurrences are in moist Douglas-fir and western spruce/fir forests (McKelvey et al. 2000), and are in the 1,500 to 2,000-meter (4,920 to 6,560-feet) elevation class (McKelvey et al. 2000). These habitats are found in the Rocky Mountains of Montana, Idaho, eastern Washington, and Utah, and the Cascade Mountains in Washington and Oregon. The majority of verified lynx occurrences and confirmed presence of resident populations are from this region. The boreal forest of Washington, Montana, and Idaho is contiguous with that in adjacent British Columbia and Alberta, Canada. The Northern Rocky Mountains/Cascades Region supports the most viable resident lynx populations in the contiguous United States, although, at best, lynx in the contiguous United States are naturally rare.

I. Environmental Baseline

1. Status of the Species within the Action Area

According to Rust (1946), lynx were not abundant but were distributed throughout northern Idaho in the early 1940s, occurring in eight of the ten northern and north-central counties. McKelvey et al. (2000) located a number of lynx specimen records, collected from Idaho during the early 1900s. Early trapping and harvest records for Idaho are unreliable because no distinction was made between lynx and bobcats until 1982 when IDFG initiated a mandatory pelt tagging program. Historical records and reports of lynx in Idaho were compiled by Lewis and Wenger (1998) which indicated occurrence of lynx

in atypical habitats. Based on the time frames, many of these records correlated with lynx movement out of Canada and may have represented dispersing, transient individuals. For the period for 1960 to 1991, 35 verified records exist for Idaho, with 13 of these from 1982 to 1991 (McKelvey et al. 2000). ID WS captured and released a lynx in Idaho in 1991. There were no records of lynx from 1991 to 1997 but there were also no surveys for lynx during that period (Anonymous 1999, Unpublished as cited in McKelvey et al. 2000). A radio-collared male lynx captured on the Bridger-Teton Forest in Wyoming, has made excursions into northeastern Idaho near the Island Park area during the summers of 2000 and 2001.

Lynx presence has been well documented, historically and currently, throughout the Panhandle of Idaho. In 1998, a survey for lynx using hair-snagging techniques and DNA analyses was conducted in the Priest Lake, Bonners Ferry, and Sandpoint areas of northern Idaho. Lynx hair was collected at 5 separate locations across the survey area (Weaver 1999). Interviews of Idaho residents documented additional records of lynx in the Salmon, Upper Snake, and Bear River watersheds as well (Lewis and Wenger 1998). Other areas in Idaho that have consistent historical records over time include the Stanley Basin, the Henry's Lake/Island Park area, the Lemhi Range, and the upper Bear River watershed (Ruediger et al. 2000). Based on historical and current documentation of lynx presence, mapped lynx habitat is considered 'occupied' on the following National Forests in Idaho (USFS and USFWS 2006): Idaho Panhandle, Clearwater, Kootenai, and Targhee. (Biological Opinion - Modified Idaho Roadless Rule 14420-2008-F-0586)

In 2012, a minimum of two lynx were documented in Idaho. One confirmation occurred in the Salmon-Challis National Forest when a Canada lynx was inadvertently captured in a foothold trap legally set for bobcat. IDFG (2012) responded to the scene and the lynx was released unharmed. The second confirmation occurred in the Purcell Mountains of north Idaho. Trail cameras set within approximately an 11.3 kilometer radius captured lynx at three separate locations during the months of August and September (M. Lucid, IDFG. pers. comm., 2012). With the lack of DNA samples for confirmation, these three sightings were considered one individual lynx rather than the possibility of multiple animals (M. Lucid, IDFG. pers. comm., 2012).

The mapped lynx range within the Idaho-WS proposed action area falls in the Northern Rocky Mountains/Cascades Region (Montana, Idaho, Washington, Oregon, Utah, and Wyoming) (65 FR 16052-16086).

Within the action area, most lynx and lynx habitat occurs on Federal lands. USFWS has been working to define the boundaries of lynx habitat. Lynx habitat has been delineated by Lynx Analysis Units (LAUs). LAUs do not depict actual lynx home ranges, but their scale is intended to approximate the size of an area used by an individual lynx. Direction for delineating LAUs was provided in the Canada Lynx Conservation and Assessment Strategy (Ruediger et al. 2000). Suitable habitat is present throughout much of Idaho and the presence of lynx outside the mapped areas on occasion is highly possible. During PDM activities, ID WS incidentally captured and released a lynx in atypical habitat in Power County, Idaho in 1991.

2. Risk Factors Impacting Lynx in the Project Area

In some areas, timber management and fire suppression have affected lynx habitat. Conversion or alteration of native vegetation communities in and adjacent to lynx habitat would decrease prey populations. Pre-commercial thinning has a direct negative effect

on snowshoe hare habitat, at least in the short term. Similarly, some grazing practices can change native plant communities and degrade snowshoe hare habitat.

Grazing use levels, by livestock and/or wild ungulates, may increase competition for forage resources with lynx prey. Road and trail access and recreational use that results in snow compaction may allow ingress of coyotes into lynx habitat, and increased competition for prey (Buskirk et al. 2000).

Occasionally, lynx are incidentally trapped by licensed hunters and trappers, especially in during the trapping seasons for other carnivores, particularly bobcat (Squires and Laurion 2000). Predator control activities on federal lands are commonly conducted throughout this geographic area, but the level of activity is currently lower than historical levels. Such efforts are aimed specifically at the offending animal or target species and take place outside of lynx habitats, in lower elevation rangelands. Since the ban on poisons such as 1080, predator control activities on federal lands conducted by USDA Wildlife Services probably have a low potential to impact lynx (Reudiger et al. 2000).

Highways which pass through occupied lynx habitats and potential landscape linkages may affect both resident and dispersing individuals. Private land development, especially along road corridors in mountain valleys, may fragment habitat and impede movement by lynx.

J. Impacts of the ID WS Program

In March 2002, ID WS requested informal and formal consultation with the USFWS on PDM activities in Idaho's 34 southernmost counties. As a result of that consultation, the USFWS issued a BO which included an incidental take statement of one (1) lynx (File # 140.0000, FWS #1-4-02-F-0058) (USFWS 2002*a*). At this time, the ID WS program is seeking to expand the lynx consultation to address risks to lynx from WS WDM actions throughout the state of Idaho.

Idaho-WS activities do not affect lynx habitat. As noted in the BO (USFWS 2002*a*), in spite of not taking any special precautions to avoid capturing lynx prior to listing, only one lynx has been captured by ID WS in Idaho during the last 40 years (that lynx was released unharmed). This suggests that even if ID WS were implementing no special precautions to avoid taking a lynx, the likelihood of a lynx being taken is extremely low. Since May 2000, however, ID WS has implemented a number of self-imposed restrictions to even further reduce the likelihood of accidentally taking a lynx. Idaho WS intends to continue implementing the following measures to reduce the likelihood of any incidental take of a lynx in Idaho. These measures will apply whenever ID WS employees are conducting PDM activities in areas identified as lynx habitat in the most current version of the lynx habitat map prepared by the USFS in consultation with the USFWS.

The 2002 ID WS' BO on Canada lynx (USFWS 2002*a*) stipulates the following reasonable and prudent measure as necessary and appropriate to minimize ID WS' potential for incidental take: "(1) In lynx habitats (i.e., LAUs), Idaho WS shall restrict their normal predator damage management activities to minimize and/or avoid the take of lynx." In addition to this measure, ID WS will implement the following 5 measures as necessary and appropriate to minimize ID WS' potential for incidental take lynx:

1. When conducting WDM in occupied lynx habitat, shooting will receive priority as the preferred management method, whenever it can be used practically, effectively and safely,

since it is 100% species selective and poses no lethal risks to lynx. Traps would only be used if shooting was impractical or unsuccessful.

2. Foothold traps, large cage traps and foot snares will be used in occupied lynx habitat only under the following conditions:

a) Foothold traps placed for coyotes or red foxes will not be used in conjunction with any visual attractants of the type normally expected to attract bobcats or other feline species (i.e., pieces of fur, feathers, shiny metal, fabric, etc.).

b) Foothold and large cage traps placed for coyotes and red foxes will not be used in conjunction with any olfactory attractants containing fish oil, catnip, anise, or castor as ingredients, to reduce the likelihood of attracting lynx or other feline species.

c) Foothold traps and foot snares set to capture larger predators (e.g., mountain lions, black bears, or adult wolves) will have pan-tension adjusted such that it would require 8-10 pounds of pressure to trigger the trap (this would be expected to minimize the likelihood of capturing a lynx or any other animal up to about 30-35 pounds in weight).

d) Foothold traps, foot snares and large cage traps set within lynx occupied habitat specifically for coyotes, foxes, or bobcats or other felids will be checked daily.

3. Neck snares will not be used for coyotes, red foxes or bobcats within occupied lynx habitat.

4. If dogs were being used to pursue target mountain lions or black bears and it is determined that they were following a lynx track, the dogs will be removed from the track as soon as possible.

5. Wildlife Services generally does not anticipate using grain bait rodenticides in occupied Canada lynx habitat. In the unlikely event that WS would propose this type of action on non-federal lands, WS would re-initiate consultation. If work is being proposed for federal lands, ESA consultation would be the responsibility of the federal agency requesting ID WS assistance.

III. BULL TROUT

A. Species Description / Critical Habitat

Bull trout, a char in the salmonid family, were commonly known as Dolly Varden until recognized as a separate species by the American Fisheries Society in 1980. Char are distinguished from trout and salmon by the absence of teeth in the roof of the mouth, presence of light colored spots, small scales, and differences in the structure of their skeleton. Their spotting pattern is easily recognizable, showing pale yellow spots on the back, and pale yellow and orange or red spots on the sides. Bull trout fins are tinged with yellow or orange, while the pelvic, pectoral, and anal fins have white margins. Bull trout have no black or dark markings on the fins. They have an elongated body covered with cycloid scales, somewhat rounded and slightly compressed laterally. Unlike Dolly Varden, the head of a bull trout is more broad and flat on top, and hard to the touch. The bull trout was first described by Girard in 1856 from a specimen collected in the lower Columbia River.

Bull trout Critical Habitat in Idaho occupies 8,771.6 miles of stream/shoreline and 170,217.5 reservoir surface acres (75 FR 63898-64070). (Biological Opinion - Modified Idaho Roadless Rule 14420-2008-F-0586)

B. Life History

Bull trout exhibit resident and migratory life-history strategies through much of the current range (Rieman and McIntyre 1993). Resident bull trout complete their entire life cycle in the tributary (or nearby) streams in which they spawn and develop. Migratory bull trout spawn in tributary streams where juvenile fish develop from one to four years before migrating to either a lake (adfluvial), a river (fluvial), or in certain coastal areas to salt water (anadromous) where they grow to maturity (Fraley and Shepard 1989; Goetz 1989). Growth of resident fish is generally slower than migratory fish; resident fish tend to be smaller at maturity and less fecund (Fraley and Shepard 1989; Goetz 1989). The size and age of maturity for bull trout is variable depending upon life-history strategy, but they typically reach sexual maturity in 4 to 7 years. Bull trout can live as long as 12 years.

Preferred bull trout spawning habitat consists of low gradient streams with loose, clean gravel (Fraley and Shepard 1989) and water temperatures 5^{o} to 9^{o} C (41^{o} to 48^{o} F) (Goetz 1989). Spawning occurs late summer to early fall in the upper reaches of clear streams in areas of flat gradient, uniform flow, and uniform gravel or small cobble. Bull trout typically spawn from August to November during periods of decreasing water temperatures. However, migratory bull trout frequently begin spawning migrations as early as April, and move upstream as far as 250 kilometers (km) (155 miles (mi)) to spawning grounds (Fraley and Shepard 1989). Temperatures during spawning generally range from 4^{o} to 10^{o} C (39^{o} to 51^{o} F), with redds often constructed in stream reaches fed by springs or near other sources of cold groundwater (Goetz 1989; Pratt 1992; Rieman and McIntyre 1996). Depending on water temperature, incubation is normally 100 to 145 days (Pratt 1992), and juveniles remain in the substrate after hatching. Time from egg deposition to emergence may surpass 200 days. Fry normally emerge from early April through May depending upon water temperatures and increasing stream flows (Pratt 1992; Ratliff and Howell 1992). Fry and juvenile fish are strongly associated with the stream bottom and are often found at or near it.

Resident and juvenile migratory bull trout prey on terrestrial and aquatic insects, macro-zooplankton, amphipods, mysids, crayfish, and small fish (Wyman 1975; Rieman and Lukens 1979 in Rieman and McIntyre 1993; Boag 1987; Goetz 1989; Donald and Alger 1993). Adult migratory bull trout are an apex predator that is primarily piscivorous, known to feed on various trout (*Salmo spp*.) and salmon (*Onchorynchus spp.*), whitefish (*Prosopium spp*.), yellow perch (*Perca flavescens*), and sculpin (*Cottus spp*.) (Fraley and Shepard 1989; Donald and Alger 1993). Growth varies depending upon life-history strategy. Resident adults range from 150 to 300 millimeters (mm) (6 to 12 inches (in.)) total length, and migratory adults commonly reach 600 mm (24 in) or more (Pratt 1985; Goetz 1989).

Older individuals are found in deeper and faster water compared to juveniles. Adults are often found in pools sheltered by large, organic debris or "clean" cobble substrate (McPahil and Murray 1979). Migratory bull trout may use a wide range of habitats ranging from first-to-sixth order streams and varying by season and life stage. In intermountain areas, lower-elevation lakes and rivers constitute important habitats for maturing and overwintering fluvial and adfluvial bull trout. Resident populations are generally found in small headwater streams where they spend their entire lives. Stream resident bull trout occupy small, high-elevation streams.

Where suitable migratory corridors exist, extensive migrations are characteristic of this species. Retention and recovery of migratory life history forms and maintenance or re-establishment of stream migration corridors is considered crucial to the persistence of bull trout throughout their geographic range. Migratory bull trout facilitate the interchange of genetic material between local subpopulations and are necessary for recolonizing habitat where subpopulations are or become extirpated by natural or human-caused events. (Biological Opinion - Modified Idaho Roadless Rule 14420-2008-F-0586)

C. Habitat Needs

Bull trout have habitat requirements that are more specific than those for many other salmonids (Rieman and McIntyre 1993). Four elements relate to suitable bull trout habitat, known as the "Four C's": 1) CLEAN substrate composition that includes free interstitial spaces, 2) COMPLEX cover including large woody debris, undercut banks, boulders, shade, pools or deep water, 3) COLD water temperatures, and 4) CONNECTED habitats through migratory corridors. Stream temperatures and substrate types are especially important to bull trout, with water temperature representing a critical habitat characteristic for bull trout. Temperatures above 15^{o} C (59^{o} F) are thought to limit bull trout distribution (Rieman and McIntyre 1993). Spawning bull trout require hiding cover such as logs and undercut banks. Strict habitat requirements make spawning and incubation habitat for bull trout limited and valuable (Fraley and Shepard 1989). Strong populations require high stream channel complexity, and are likely to be found in areas with low road densities, on forested lands, and in mid-size streams at relatively high elevations (> 5000 feet) (Quigley and Arbeldide 1997). However, because bull trout exhibit a patchy distribution, even in undisturbed habitats (Rieman and McIntyre 1993), fish are not likely to simultaneously occupy all available habitats (Rieman et al. 1997). (Biological Opinion - Modified Idaho Roadless Rule 14420-2008-F-0586)

D. Threats

Bull trout are vulnerable to many of the same threats that have reduced salmon populations in the Columbia River Basin. They are more sensitive to increased water temperatures, poor water quality, and low flow conditions than many other salmonids. Past and continuing land management activities such as timber harvest, livestock grazing, road construction, and mining have degraded stream habitat, especially those along larger river systems and stream areas located in valley bottoms, to the point where bull trout can no longer survive or successfully reproduce. Cumulative impacts of these activities are increased stream temperatures, more fine sediment in spawning gravels, loss of stream channel stability, and the creation of migration barriers. Road construction and maintenance account for a majority of man-induced sediment loads to streams in forested areas (Shepard et al. 1984; Cederholm and Reid 1987; Furniss et al. 1991). Sedimentation affects streams by reducing pool depth, altering substrate composition, reducing interstitial space, and causing braiding of channels (Rieman and McIntyre 1993), which reduce carrying capacity. Sedimentation negatively affects bull trout embryo survival and juvenile bull trout rearing densities (Shepard et al. 1984; Pratt 1992).

Large dams built for flood control and power production have eliminated riverine habitat and restricted bull trout movement. Culverts installed at road crossings may also act as barriers to bull trout movement. Additionally, irrigation withdrawals including diversions can dewater spawning and rearing streams, impede fish passage and migration, and cause entrainment. Discharging pollutants such as nutrients, agricultural chemicals, animal waste, and sediment into spawning and rearing waters is also detrimental. The loss and degradation of habitat has isolated many populations, increasing the risk of extinction due to demographic, genetic, and

environmental stochasticity, and other natural catastrophic events. In many watersheds, remaining bull trout are small, resident fish isolated in headwater streams.

Historically, both intentional reductions and liberal harvest regulations posed a threat to some bull trout populations. Bull trout can no longer be legally harvested in Idaho, but misidentification of bull trout as brook trout (*Salvelinus fontinalis*) or lake trout (*Salvelinus namaycush*) is resulting in some fish being killed accidentally. Illegal poaching of spawning adults is a problem in some areas.

Hybridization, competition, and predation from non-native species has also been detrimental to bull trout. Brook trout readily spawn with bull trout creating a hybrid that is often sterile. Lake trout have out-competed and replaced adfluvial populations of bull trout in some lakes. Overall, interspecific interactions, including predation, with non-native species may exacerbate stresses on bull trout from habitat degradation, fragmentation, isolation, and species interactions (Rieman and McIntyre 1993).

Warmer temperature regimes associated with global climate change represent another risk factor for bull trout. Increased stream temperature is a recognized effect of a warming climate (ISAB 2007). Species at the southern margin of their range that are associated with colder water temperatures, such as the bull trout, are likely to become restricted to smaller more disjunct habitat patches or become extirpated as the climate warms (Rieman et al. 2007). Climate warming is projected to result in the loss of 22 to 92% of suitable bull trout habitat in the Columbia River basin (ISAB 2007). Habitat conservation and restoration will be needed to mitigate these habitat losses. (Biological Opinion - Modified Idaho Roadless Rule 14420-2008-F-0586)

E. Environmental Baseline

1. Status of the Species in the Action Area

Bull trout are found throughout the action area in spawning and early rearing habitat (local populations) as well as in habitat used for feeding, migrating, and overwintering (FMO). Spawning and early rearing habitat is typically found in headwater areas while mainstem rivers provide FMO habitat.

As the proposed action is programmatic in nature and encompasses a large area, the analysis presented in this BA will assess bull trout baseline status at the core area level as opposed to the smaller, local population scale. The draft recovery plan (USFWS 2002*b*) identified a bull trout core area as the closest approximation of a biologically functioning unit for bull trout. By definition, a core area includes a combination of core habitat (*i.e.*, habitat that could supply all elements for the long-term security of bull trout). Core areas contain both spawning and early rearing habitat and FMO. Core areas constitute the basic unit on which to gauge recovery (USFWS 2002*b*).

Table 3 is derived from Table 3 in the Service's Bull Trout Core Area Conservation Status Assessment (USFWS 2005) and displays the risk rankings for core areas in Idaho. The risk rankings are outputs of the Natural Heritage Ranking process used in the core area assessment and incorporate input on population size, population distribution, population trend, and threats. Refer to the USFWS's (2005) core area assessment for more information (Biological Opinion - Modified Idaho Roadless Rule 14420-2008-F-0586).

Table 3. Bull Trout Habitat Condition by Core Area [adapted from Table 3 in the Service's Bull Trout Core Area Conservation Status Assessment (USFWS 2005)].

Management Unit – Core Area - In Idaho	**Risk of extirpation**	**Management Unit – Core Area - In Idaho**	**Risk of extirpation**	**Management Unit – Core Area - In Idaho**	**Risk of extirpation**
Coeur d'Alene – Coeur d'Alene Lake	High risk	Salmon – Upper Salmon	Potential risk	SW Idaho – Anderson Ranch	At risk
Clark Fork – Lake Pend Oreille	Potential risk	Salmon – Pahsimeroi R.	At risk	SW Idaho – Lucky Peak	High risk
Clark Fork – Priest Lakes	High risk	Salmon – Lake Cr.	At risk	SW Idaho – Upper SF Payette R.	At risk
Kootenai – Kootenai River	At risk	Salmon – Lemhi R.	At risk	SW Idaho – MF Payette R.	At risk
Clearwater – NF Clearwater	At risk	Salmon – Middle Salmon R. – Panther	At risk	SW Idaho – Deadwood R.	High risk
Clearwater – Fish Lake (NF)	High risk	Salmon – Opal Lake	Potential risk	SW Idaho – NF Payette R.	High risk
Clearwater – Lochsa R	At risk	Salmon – Middle Fork Salmon	Low risk	SW Idaho – Squaw Creek	High risk
Clearwater – Fish Lake (Lochsa)	At risk	Salmon – Middle Salmon-Chamberlain	Potential risk	SW Idaho – Weiser R.	High risk
Clearwater – Selway R.	Potential risk	Salmon – SF Salmon	At risk	SW Idaho – Little Lost	At risk
Clearwater – SF Clearwater	At risk	Salmon – Little-Lower Salmon	High risk	Sheep	Unknown
Clearwater – Middle-Lower	At risk	SW Idaho – Arrowrock	At risk	Granite	Unknown

2. Factors Affecting Bull Trout in the Action Area

As previously described in the Status of the Species section, bull trout distribution, abundance, and habitat quality have declined rangewide primarily from the combined effects of habitat degradation and fragmentation, blockage of migratory corridors, poor water quality, angler harvest, poaching, entrainment, loss or reduction in runs of anadromous salmonids, and the introduction of nonnative fish species such as the brook trout.

Land and water management activities that depress bull trout populations and degrade habitat include dams and other water diversion structures, forest management practices, livestock grazing, agriculture, road construction and maintenance, mining, and urban and rural development. All of these activities have occurred or are occurring in the action area to varying degrees with resulting adverse impacts on bull trout and bull trout habitat. The bull trout draft Recovery Plan (USFWS 2002*b*) contains detailed discussions on these activities and effects within each core area.

Road building and land management activities have been extensive in some core areas. Roads directly affect natural sediment and hydrologic regimes by altering streamflow, sediment loading, sediment transport and deposition, channel morphology, channel stability, substratecomposition, stream temperatures, water quality, and riparian conditions within a watershed (Lee et al. 1997, Jones et al. 2000, Luce et al. 2001). Roads contribute more sediment to streams than any other land management activity (Gibbons and Salo 1973, Meehan 1991), and most land management activities, such as mining, timber harvest, grazing, recreation and water diversions are dependent on roads.

Because of the numerous ecological effects of road construction, including temporary roads (which present most of the same risks posed by permanent roads, although some may be of shorter duration), and associated activities such as timber harvest (Jones et al. 2000, Trombulak and Frissell 2000) road density can be used as an indicator of watershed condition where less than one mile of road per square mile of watershed indicates high condition, one to three miles indicates moderate condition, and greater than three miles indicates low condition (NMFS 1996). Core area road density ranges from 2.2 miles/square mile for Kootenai River to zero for Opal Lake and Granite Creek. The mean road density for all core areas is approximately 1 mile/square mile, equating with a moderate rating for habitat condition.

There appears to be an inverse relationship between watershed road density and bull trout occurrence in that bull trout typically do not occur where road densities exceed 1.7 miles per square mile (USFWS 2002*b*). The USFWS (1998) found that bull trout are exceptionally sensitive to the direct, indirect, and cumulative effects of roads. Bull trout population strongholds occur most often in roadless areas (Quigley and Arbelbide 1997, Kessler et al. 2001). Dunham and Rieman (1999) demonstrated that disturbance from roads was associated with reduced bull trout occurrence. They concluded that conservation of bull trout should involve protection of larger, less fragmented, and less disturbed (lower road density) habitats to maintain important strongholds and sources for naturally recolonizing areas where populations have been lost.

Brook trout, an introduced species that competes and hybridizes with bull trout (and is therefore considered a threat factor), are present in all but seven of the core areas. For the core areas with brook trout, the percentage of key streams occupied ranges from 87% (Kootenai River) to two percent (Squaw Creek).

Changes in hydrology and temperature caused by changing climate have the potential to negatively impact aquatic ecosystems in Idaho, with salmonid fishes being especially sensitive. Average annual temperature increases due to increased carbon dioxide are affecting snowpack, peak runoff, and base flows of streams and rivers (Mote et al. 2003). Increases in water temperature may cause a shift in the thermal suitability of aquatic habitats (Poff et al. 2002). For species that require colder water temperatures to survive and reproduce, warmer temperatures could lead to significant decreases in available suitable habitat. Increased frequency and severity of flood flows during winter can affect incubating eggs and alevins in the streambed and over- wintering juvenile fish. Eggs of fall spawning fish, such as bull trout, may suffer high levels of mortality when exposed to increased flood flows (ISAB 2007). (Biological Opinion - Modified Idaho Roadless Rule 14420-2008-F-0586)

3. Summary of Environmental Baseline

Of the 33 core areas in Idaho with a designated threat ranking, nine are at High risk, 16 are At Risk, five are at Potential Risk, one is at Low Risk, and 2 are unknown. Core areas at High Risk include Coeur d'Alene, Priest Lakes, Fish Lake (North Fork), Little-Lower Salmon River, Lucky Peak, Deadwood River, North Fork Payette River, Squaw Creek, and Weiser River.

Core areas that are At Risk include Fish Lake (Lochsa), Lochsa River, Middle-Lower Clearwater River, North Fork Clearwater River, South Fork Clearwater River, Kootenai River, Lake Creek, Lemhi River, Middle Salmon River-Panther, Pahsimeroi River, South Fork Salmon River, Anderson Ranch, Arrowrock, Little Lost River, Middle Fork Payette River, and Upper South Fork Payette River. Core areas at Potential Risk include Lake Pend Oreille, Selway River, Middle Salmon- Chamberlain, Opal Lake, and Upper Salmon. The only core area at Low Risk is the Middle Fork-Salmon River. The status of Sheep and Granite Creeks is unknown. (Biological Opinion - Modified Idaho Roadless Rule 14420-2008-F-0586)

F. Impact of Idaho WS Program Activities

The use of quick-kill (e.g., Conibear-type) traps for aquatic mammal damage management activities may occur in bull trout occupied streams. The use of quick-kill traps for beaver would only occur if ID WS receives a request for assistance and confirms the damage is threatening property, natural resources, human health and safety or T/E species. No fish species have been captured or killed by ID WS with quick-kill traps (MIS 2011).

Beaver dam removal with binary explosives could have impacts on bull trout mainly from 1) the increased flow of water following the removal of the dam and the rapid loss of water from the pond, 2) the potential that juvenile bull trout could be swept downstream, and 3) sediment in the bottom of the pond could be picked up by the stream causing sediment load in the waters to increase. In addition, the rapid loss of water from the pond itself could strand fish in puddles above the dam. Post-blasting monitoring from certified blasters indicate that the explosion itself rarely kills fish (K. Sullivan, Chair, WS' Explosives Committee, pers. comm. 2012).

For aquatic mammal damage management activities, ID WS will implement the following three measures as necessary and appropriate to minimize ID WS' potential for incidental take of bull trout:

1. Quick-kill traps would only be used in bull trout occupied streams if other capture devices (foothold traps, neck/body snares, shooting) are deemed ineffective or impractical for situational use.

2. ID WS will consult informally with the USFWS prior to beaver dam removal in bull trout critical habitat in order to determine if there may be adverse effects to bull trout or critical habitat. If adverse impacts are anticipated, ID WS will reschedule the beaver dam removal at a time that minimizes adverse impacts. If rescheduling is not feasible, ID WS will use the least amount of binary explosives necessary to successfully breach the dam in order to minimize discharge sediment. Larger dams will be breached by hand if possible; however, if binary explosives are needed, smaller explosive charges will be used to remove smaller portions of the dam to minimize the rush of water.

3. Any stranded bull trout found in isolated puddles above beaver dams removed with binary explosives could be netted and immediately transported and released downstream.

APPENDIX A: LIST OF WILDLIFE DAMAGE MANAGEMENT METHODS CURRENTLY USED OR POTENTIAL USE BY THE IDAHO WS PROGRAM

Mechanical Capture and Management Methods/Devices
Cage-Live Capture Style Traps
- Small Cage Traps
- Large Cage Traps
- Culvert Traps
- Avian Cage Traps
- Corral Traps

Quick-kill/body gripping Traps
Basket-type Traps
Foothold Traps
Padded-jaw Pole Traps
Foot/Leg Snares
Neck/BodySnares
Raptor Traps
Aerial Operations
- Shooting
- Telemetry/Surveillance
- Hazing

Ground Shooting
Calling
Trained Dogs
Glue Board and Glue Trays
Cannon and Rocket Net
Net Gun
Mist Net
Bow Nets
Hand Net
Egg, Nest and Hatchling Removal and Destruction

Chemical Damage Management Methods (Pesticides)
DRC-1339
Zinc Phosphide
Avitrol®
Livestock Protection Collar (Compound 1080)
Gas Cartridges (Rodent and Denning)
Aluminum Phosphide
M-44 (Sodium Cyanide)
Anticoagulant Rodenticides
Strychnine

Chemical Wildlife Damage Management Methods (Animal Handling)
Alpha-Choralose
Injectable Immobilization Drugs
- Ketamine Hydrochloride (HCL)
- Xylazine HLC
- Telazol®

Tranquilizer Trap Device
Euthanasia (Chemical and Physical)

Beaver Dam Breaching and Water-level Control
Binary Explosives
Hand Tools
Water-level Control Devices

Hazing and Exclusionary Methods/Devices
Propane Exploders
Pyrotechnics
Lasers
Physical Harassment by Radio-controlled Vehicles
Other Scare Methods/Devices
- Electronic Guard
- Scarecrows and Scarecrow like Devices
- Surface Covering
- Dogs
- Tactile Repellents

Fences and Other Barriers
- Temporary Fencing
- Beaver Exclusion Systems
- Barriers, Netting, Wire Grids and Other Exclusion Methods
- Sheathing and Tree Protectors
- Abrasives

Site Access
Pickup Trucks, Snow Mobiles, ATVs, Aircraft and Horse Back Riders

-End-

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APPENDIX C: M-44 USE RESTRICTIONS

M-44 Cyanide Capsules
M-44 Use Restrictions
EPA Registration No. 56228-15
October 7, 2010

1. Use of the M-44 device shall conform to all applicable Federal, State, and local laws and regulations.

2. Applicators shall be subject to such other regulations and restrictions as may be prescribed from time-to-time by the U.S. Environmental Protection Agency (EPA).

3. Each applicator of the M-44 device shall be trained in: (1) safe handling of the capsules and device, (2) proper use of the antidote kit, (3) proper placement of the device, and (4) necessary record keeping.

4. M-44 devices and sodium cyanide capsules shall not be sold or transferred to, or entrusted to the care of any person not supervised or monitored, by the Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) or any agency not working under a WS cooperative agreement.

5. The M-44 device shall only be used to take wild canids: (1) suspected of preying on livestock or poultry; (2) suspected of preying on Federally designated threatened or endangered species; or (3) that are vectors of a communicable disease.

6. The M-44 device shall not be used solely to take animals for the value of their fur.

7. The M-44 device shall only be used on or within 7 miles of a ranch unit or allotment where losses due to predation by wild canids are occurring or where losses can be reasonably expected to occur based upon recurrent prior experience of predation on the ranch unit or allotment. Full documentation of livestock depredation, including evidence that such losses were caused by wild canids, will be required before applications of the M-44 are undertaken. This use restriction is not applicable when wild canids are controlled to protect Federally designated threatened or endangered species or are vectors of a communicable disease.

8. The M-44 device shall not be used: (1) in areas within national forests or other Federal lands set aside for recreational use, (2) areas where exposure to the public and family and pets is probable, (3) in prairie dog towns, or (4) except for the protection of Federally designated threatened or endangered species, in National or State Parks; National or State Monuments; federally designated wilderness areas; and wildlife refuge areas.

To determine whether the applicable land management agency has set aside any area on Federal Lands for recreational use either on a permanent or temporary basis, the APHIS State Director or his/her designated representative who are considering authorizing or are responsible for ongoing use of M-44 capsules on public lands, must contact each applicable land management agency quarterly to determine whether any portions of the projected or current M-44 use areas are, or are to be, set aside for recreational use. Within 30-days of that contact, the APHIS State Director, or his/her designated representative, must provide the applicable land management agency with written documentation specifying the applicable land management agency's determinations of what projected or current M-44 use areas are to be set aside for recreational use. For purposes of this Use Restriction, areas set aside for recreational use include areas where and when there are scheduled recreational events, areas identified on maps with "recreation" in the

title, areas where developed or known camping occurs, areas near designated or known recreational trail heads and designated or known vehicle access sites.

9. The M-44 device shall not be used in areas where federally listed threatened or endangered animal species might be adversely affected. Each applicator shall be issued a map, prepared by or in consultation with the U.S. Fish and Wildlife Service, which clearly indicates such areas.

(1) Except as provided in paragraph (2) below, the M-44 device shall not be used in areas occupied by any federally listed threatened or endangered species or any federally listed experimental populations as set forth in the most current versions of maps that have been prepared or approved by the U.S. Fish and Wildlife Service (FWS). At the time of application, the applicator must be in possession of the most current map, if such map exists, that covers the application site. If maps covering the application site do not exist, then the M-44 applicator must, prior to application, consult with FWS to determine whether the application site is in an area occupied by listed animal species. Any use of the M-44 thereafter shall be consistent with any conditions or limitations provided by FWS through such consultation.

(2) Notwithstanding paragraph (1), the M-44 device may be used in areas occupied by endangered, threatened, or experimental populations if use in such areas a) has been addressed by FWS in special regulations pursuant to section 4(d) of the ESA, in requirements imposed through incidental take statements or incidental take permits, or in other applicable agreements with the FWS, and b) the applicator's use of the M-44 is consistent with any conditions or limitations provided by FWS for such use.

10. One person other than the individual applicator shall have knowledge of the exact placement location of all M-44 devices in the field.

11. In areas where more than one governmental agency is authorized to place M-44 devices, the agencies shall exchange placement information and other relevant facts to ensure that the maximum number of M-44's allowed is not exceeded.

12. The M-44 device shall not be placed within 200 feet of any lake, stream, or other body of water, provided that natural depression areas which catch and hold rainfall for short periods of time shall not be considered "bodies of water" for purposes of this restriction.

13. The M-44 device shall not be placed in areas where food crops are planted.

14. The M-44 device shall be placed at least at a 50-foot distance or at such a greater distance from any public road or pathway as may be necessary to remove it from sight of persons and domestic animals using any such public road or pathway.

15. The maximum density of M-44's placed in any 100 acre pasture land areas shall not exceed 10; and the density in any 1 square mile of open range shall not exceed 12.

16. No M-44 device shall be placed within 30 feet of a livestock carcass used as a draw station. No more than four M-44 devices shall be placed per draw station and no more than five draw stations shall be operated per square mile.

17. Supervisors of applicators shall check the records, warning signs, and M-44 devices of each applicator at least once a year to verify that all applicable laws, regulations, and restrictions are being strictly followed.

18. Each M-44 device shall be inspected at least once every week, weather permitting access, to check for interference or unusual conditions and shall be serviced as required.

19. Damaged or nonfunctional M-44 devices shall be removed from the field.

20. An M-44 device shall be removed from an area if, after 30 days, there is no sign that a target predator has visited the site.

21. All persons authorized to possess and use sodium cyanide capsules and M-44 devices shall store such capsules and devices under lock and key.

22. Used sodium cyanide capsules shall be disposed of by deep burial or at a proper landfill site.

Incineration may be used instead of burial for disposal. Place the capsules in an incinerator or refuse hole and burn until the capsules are completely consumed. Capsules may be incinerated using either wood or diesel fuel.

23. Bilingual warning signs in English and Spanish shall be used in all areas containing M-44 devices. All such signs shall be removed when M-44 devices are removed.

a. Main entrances or commonly used access points to areas in which M-44 devices are set shall be posted with warning signs to alert the public to the toxic nature of the cyanide and to the danger to pets. Signs shall be inspected weekly to ensure their continued presence and ensure that they are conspicuous and legible.

b. An elevated sign shall be placed within 25 feet of each individual M-44 device warning persons not to handle the device.

24. Each authorized or licensed applicator shall carry an antidote kit on his person when placing and/or inspecting M-44 devices. The kit shall contain at least six pearls of amyl nitrite and instructions on their use. Each authorized or licensed applicator shall also carry on his person instructions for obtaining medical assistance in the event of accidental exposure to sodium cyanide.

25. In all areas where the use of the M-44 device is anticipated, local medical people shall be notified of the intended use. This notification may be through a poison control center, local medical society, the Public Health Service, or directly to a doctor or hospital. They shall be advised of the antidotal and first-aid measures required for treatment of cyanide poisoning. It shall be the responsibility of the supervisor to perform this function.

26. Each authorized M-44 applicator shall keep records dealing with the placement of the device and the results of each placement. Such records shall include, but need not be limited to:

a. The number of devices placed.
b. The location of each device placed.
c. The date of each placement, as well as the date of each inspection.
d. The number and location of devices which have been discharged and the apparent reason for each discharge.
e. Species of all animals taken.
f. All accidents or injuries to humans or domestic animals.

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Riverdale, MD 20737-1237
October 7, 2010

APPENDIX D: POTENTIAL IMPACT AND CONCLUSION MATRIX

	Class -->	Mammals				Birds	Invertebrates			
Methods and Tools	Method	Grizzly Bear	S. Selkirk Mtns. Caribou	Canada Lynx	N. Idaho Ground Squirrel	Yellow-billed Cuckoo	Banbury Spring Limpet	Bliss Rapids Snail	Snake River Physa Snail	Bruneau Hot Springsnail
Capture Devices	Small Cage Trap	NE-1	NE-1	NE-1	NLAA, BE	NE-1	NE-1,2	NE-1,2	NE-1,2	NE-1,2
	Culvert and Large Cage Trap	LAA	NE-1	NLAA	NE-1,2	NE-1	NE-1,2	NE-1,2	NE-1,2	NE-1,2
	Avian Cage Trap	NE-1	NE-1	NE-1	NE-1	NE-1,3	NE-1	NE-1	NE-1	NE-1
	Corral Trap	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Quick-kill/body-griping Trap	NE-1	NE-1	NE-2,3	NE-3	NE-1,2	NE-1	NE-1	NE-1	NE-1
	Basket-Type Trap	NE-1,2	NE-1,2	NE-1,2	NE-1,2	NE-1,	NE-1	NE-1	NE-1	NE-1
	Foothold Trap	LAA	NLAA, BE	LAA, BE	NLAA, BE	NE-1,2	NE-1,2	NE-1,2	NE-1,2	NE-1,2
	Foot Snare	LAA	NLAA, BE	LAA, BE	NE-1	NE-1,2,3	NE-1,2,3	NE-1,2,3	NE-1,2,3	NE-1,2,3
	Padded-Jaw Pole Trap	NE-1,2	NE-1,2	NE-1,2	NE-1,2	NE-1	NE-1,2	NE-1,2	NE-1,2	NE-1,2
	Raptor Trap	NE-1,2	NE-1,2	NE-1,2	NE-1,2	NE-1	NE-1,2	NE-1,2	NE-1,2	NE-1,2
	Snares (neck and body)	NLAA	NLAA	LAA	NE-1,2	NE-1,2	NE-1,2	NE-1,2	NE-1,2	NE-1,2
	Glue Board or Tray	NE-1,2	NE-2	NE-2	NE-2,3	NE-1	NE-1	NE-1	NE-1	NE-1
	Cannon and Rocket Net	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Net Gun	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Mist Net	NE-1,2	NE-1,2	NE-1,2	NE-1,2	NE-1, 3	NE-1,2	NE-1,2	NE-1,2	NE-1,2
	Bow Net	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Hand Net	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
Chemical - Damage Management Methods	DRC-1339	NE-1,3	NE-1,3	NE-1,3	NE-1,3	NE-1	NE-1,3	NE-1,3	NE-1,3	NE-1,3
	Zinc Phosphide	NE-3	NE-1	NE-3	NLAA	NE-1	NE-1	NE-1	NE-1	NE-1
	Avitrol	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Compound 1080	NLAA	NE-1	NE-1,3	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Gas Cartridges (rodent and denning)	NE-1	NE-1	NE-1	NLAA, BE	NE-1	NE-1	NE-1	NE-1	NE-1
	Aluminum Phosphide	NE-3	NE-1	NE-3	NLAA, BE	NE-1	NE-1	NE-1	NE-1	NE-1
	M-44 Sodium Cyanide	NLAA	NE-1	NE-3	NLAA, BE	NE-1	NE-1	NE-1	NE-1	NE-1
	Anticoagulant	NE-1,3	NE-1,3	NE-1,3	NE-3	NE-1	NE-1,3	NE-1,3	NE-1,3	NE-1,3
	Strychnine	NE-5	NE-3,5	NE-3	NE-5	NE-1	NE-1	NE-1	NE-1	NE-1
Chemical Animal Handling	Alpha-chorolose	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Ketamine/Xylazine and Telazol	NE-4	NE-1	NLAA, BE	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Tranquilizer Trap Device	NE-3	NE-1	NE-3	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Euthanasia.	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
Beaver Dam Removal	Beaver Dam Breaching - Explosives	NE-1	NE-1	NE-1	NE-1	NLAA, BE	NE-3	NE-3	NE-3	NE-3
	Beaver Dam Breaching - Hand Tools	NE-1	NE-1	NE-1	NE-1	NLAA, BE	NE-3	NE-3	NE-3	NE-3
	Water-level Control Device	NE-1	NE-1	NE-1	NE-1	NE-1,2	NE-3	NE-3	NE-3	NE-3
Hazing-Exclusion	Propane Exploder	NLAA, BE	NE-3	NLAA	NLAA	NE-1	NE-1,3	NE-1	NE-1,3	NE-1,3
	Pyrotechnic	NLAA, BE	NE-3	NLAA	NE-3	NE-1	NE-1	NE-1,3	NE-1,3	NE-1,3
	Laser and Strobe Light	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Physical Harassment by Radio Controlled Boat	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Other Scaring Devices (alarm calls, effigies, etc.)	NLAA, BE	NE-3	NLAA	NE-3	NE-1	NE-1	NE-1	NE-1	NE-1
	Electric/Temporary Fencing	NLAA, BE	NE-3	NE-3	NE-3	NE-1	NE-1	NE-1,3	NE-1	NE-1
	Sheathing and Tree Protector	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Barriers, Netting, Wire Grid and other Exclusion Methods	NE-3	NE-3	NE-3	NE-3	NE-1	NE-1	NE-1	NE-1	NE-1
	Abrasives	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
Aerial	Aerial Shooting	NLAA	NE-3	NLAA	NE-2	NE-3	NE-3	NE-3	NE-3	NE-3
	Aerial Telemetry-Surveillance	NLAA	NE-1	NLAA	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Aerial Hazing	NE-3	NE-3	NE-3	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
Miscellaneous	Ground Shooting	NLAA	NLAA, BE	NLAA, BE	NLAA, BE	NE-2	NE-3	NE-3	NE-3	NE-3
	Calling (mouth and electronic)	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Egg, Nest and Hatchling Removal and Destruction	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Trained Dog	NLAA	NE-1	NLAA, BE	NLAA, BE	NE-1	NE-1,3	NE-1,3	NE-1,3	NE-1,3
	Site Access (pick-up truck, ATV, etc.)	NLAA	NLAA	NLAA	NLAA	NLAA	NE-3	NE-3	NE-3	NE-3

NE-1 denotes no effect to associated species due to trap design, tool and/or technique.
NE-2 denotes no effect to associated species due to location of trap
NE-3 denotes no effect to associated species due to no use in species occupied area.
NE-4 denotes no effect to associated species as WS is not lead Agency
NE-5 denotes no effect to associated species when label directions are followed
BE- denotes beneficial effect associated with species.
NLAA - Not Likely to Adversely Affect
LAA - Likely to Adversely Affect

Candidate species
Proposed species

	Class -->	Fish					Plants					
Methods and Tools	Method	Bull Trout	Chinook Salmon	Sockeye Salmon	Steelhead	White Sturgeon (Kootenai)	Spalding's Catchfly	Mac-Farlane's Four-o'clock	Water Howellia	Ute Ladies' tresses	Slickspot Pepper-grass	Whitebark Pine
Capture Devices	Small Cage Trap	NE-2	NE-1,2,3	NE-1,2,3	NE-1,2,3	NE-1,2,3	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Culvert and Large Cage Trap	NE-1,2	NE-1,2,3	NE-1,2,3	NE-1,2,3	NE-1,2,3	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Avian Cage Trap	NE-2	NE-1,2,3	NE-1,2,3	NE-1,2,3	NE-1,2,3	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Corral Trap	NE-1	NE-1,2,3	NE-1,2,3	NE-1,2,3	NE-1,2,3	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Quick-kill/body-griping Trap	NLAA, BE	NE-2,3	NE-2,3	NE-2,3	NE-2,3	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Basket-Type Trap	NE-3	NE-3	NE-3	NE-3	NE-2,3	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Foothold Trap	NE-1,2	NE-1,2	NE-1,2	NE-1,2	NE-1,2,3	NE-3	NE-3	NE-3	NE-3	NE-3	NE-1
	Foot Snare	NE-1,2,3	NE-1,2,3	NE-1,2,3	NE-1,2,3	NE-1,2,3	NE-1,2,3	NE-1,2,3	NE-1,2,3	NE-1,2,3	NE-1,2,3	NE-1,2
	Padded-Jaw Pole Trap	NE-1,2	NE-1	NE-1	NE-1	NE-1	NE-1,2	NE-1,2	NE-1,2	NE-1,2	NE-1,2	NE-1
	Raptor Trap	NE-1,2	NE-1	NE-1	NE-1	NE-1	NE-1,2	NE-1,2	NE-1,2	NE-1,2	NE-1,2	NE-1
	Snares (neck and body)	NE-1,2	NE-1,2	NE-1,2	NE-1,2	NE-1,2,3	NE-3	NE-3	NE-3	NE-3	NE-3	NE-1
	Glue Board or Tray	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Cannon and Rocket Net	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Net Gun	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Mist Net	NE-1,2	NE-1	NE-1	NE-1	NE-1	NE-1,2	NE-1,2	NE-1,2	NE-1,2	NE-1,2	NE-1
	Bow Net	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Hand Net	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
Chemical - Damage Management Methods	DRC-1339	NE-1,5	NE-1,5	NE-1,5	NE-1,5	NE-1,5	NE-1,3	NE-1,3	NE-1,3	NE-1,3	NE-1,3	NE-1
	Zinc Phosphide	NE-1,5	NE-1,5	NE-1,5	NE-1,5	NE-1,5	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Avitrol	NE-1,5	NE-1,5	NE-1,5	NE-1,5	NE-1,5	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Compound 1080	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Gas Cartridges (rodent and denning)	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Aluminum Phosphide	NE-1,5	NE-1,5	NE-1,5	NE-1,5	NE-1,5	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	M-44 Sodium Cyanide	NE-1,5	NE-1,5	NE-1,5	NE-1,5	NE-1,5	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Anticoagulant	NE-1,5	NE-1,5	NE-1,5	NE-1,5	NE-1,5	NE-1,3	NE-1,3	NE-1,3	NE-1,3	NE-1,3	NE-1
	Strychnine	NE-1,5	NE-1,5	NE-1,5	NE-1,5	NE-1,5	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
Chemical Animal Handling	Alpha-chorolose	NE-1,5	NE-1,5	NE-1,5	NE-1,5	NE-1,5	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Ketamine/Xylazine and Telazol	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Tranquilizer Trap Device	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Euthanasia	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
Beaver Dam Removal	Beaver Dam Breaching - Explosives	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Beaver Dam Breaching - Hand Tools	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Water-level Control Device	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
Hazing-Exclusion	Propane Exploder	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Pyrotechnic	NE-1,3	NE-1,3	NE-1,3	NE-1,3	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Laser and Strobe Light	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Physical Harassment by Radio Controlled Boat	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Other Scaring Devices (alarm calls, effigies, etc.)	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Electric/Temporary Fencing	NE-1	NE-1,3	NE-1,3	NE-1,3	NE-1	NE-1,3	NE-1,3	NE-1,3	NE-1,3	NE-1,3	NE-1
	Sheathing and Tree Protector	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Barriers, Netting, Wire Grid and other Exclusion Methods	NE-1,3	NE-1,3	NE-1,3	NE-1,3	NE-1	NE-1,3	NE-1,3	NE-1,3	NE-1,3	NE-1,3	NE-1,3
	Abrasives	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
Aerial	Aerial Shooting	NE-3	NE-3	NE-3	NE-3	NE-3	NE-3	NE-1	NE-1	NE-1	NE-1	NE-1
	Aerial Telemetry-Surveillance	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Aerial Hazing	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
Miscellaneous	Ground Shooting	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Calling (mouth and electronic)	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Egg, Nest and Hatchling Removal and Destruction	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Trained Dog	NE-1,3	NE-1,3	NE-1,3	NE-1,3	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1
	Site Access (pick-up truck, ATV, etc.)	NE-1,3	NE-1,3	NE-1,3	NE-1,3	NE-1,3	NE-1	NE-1	NE-1	NE-1	NE-1	NE-1

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NLAA - Not Likely to Adversely Affect
LAA - Likely to Adversely Affect

Candidate species
Proposed species

APPENDIX E: NORTHERN IDAHO GROUND SQUIRREL PROBABLE HISTORIC DISTRIBUTION

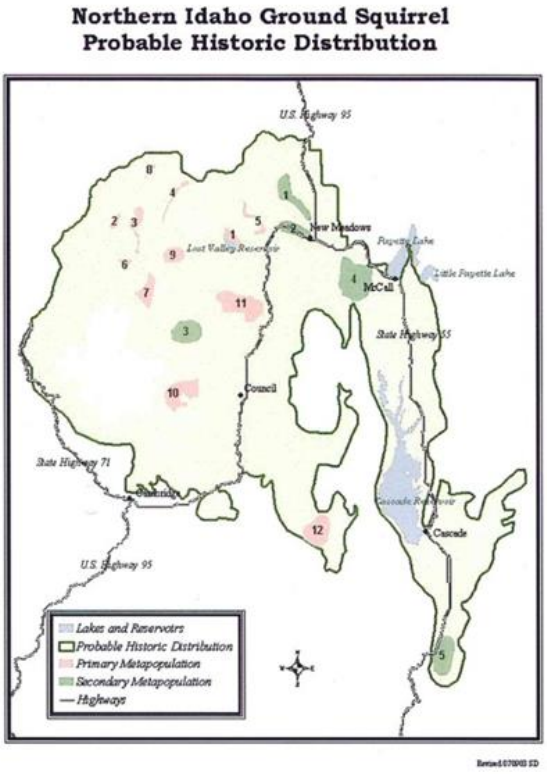

Figure 3 Northern Idaho ground squirrel probable historical distribution map and primary and secondary metapopulation sites (see also Table 3) (U.S. Forest Service 2003).

5

APPENDIX F: U. S. ARMY CORPS OF ENGINEERS BRANCH GUIDANCE LETTER 96-01 ON THE REGULATION OF REMOVAL OF BEAVER DAMS

CENPW-OP-RF 16 September 1996

Branch Guidance Letter 96-01

SUBJECT: Regulation of Removal of Beaver Dams

1. The following guidance applies only to the regulation of the removal of beaver dams in the State of Idaho by the Walla Walla District, Corps of Engineers under the authority of Section 404 of the Clean Water Act.

2. In the August 25, 1993 Federal Register, the Corps of Engineers amended permit regulations defining discharges of dredged material. Under these amendments, commonly referred to as the "Excavation Rule", the definition of the phrase "discharge of dredged material" was revised to include mechanized landclearing, ditching, channelization, or other excavation activities which destroy or degrade waters of the United States.

3. The removal of beaver dams normally involves the incidental discharge of dredged material. Soil and debris imbedded in the dam to seal and solidify the structure are released downstream into the waterway. In addition, organic matter and soil which has accumulated in the pond upstream of the dam are released downstream. Furthermore, aquatic habitats including wetlands upstream of the dam are dewatered and lost.

4. The removal of beaver dams is normally considered to be an excavation activity which will destroy or degrade waters of the United States. Therefore, this activity is normally subject to regulation under Section 404 of the Clean Water Act and requires a Department of the Army permit.

5. Under the following circumstances, the removal of beaver dams will normally be considered to be an excavation activity which will not destroy or degrade waters of the United States. Therefore, under these circumstances, this activity will normally not be regulated and does not require a Department of the Army permit. However, we reserve the right to require a Department of the Army permit for the removal of a beaver dam on a case by case basis if we determine that the activity will destroy or degrade waters of the United States.

a. Recently constructed beaver dams (less than 1 year old). The removal of recently constructed beaver dams is normally considered to be an excavation activity which does not destroy or degrade waters of the United States and is not normally

regulated. This is based on the observation that recently constructed beaver dams have not had sufficient time to trap much soil in the structure, to accumulate organic matter and soil in the pond, nor to develop important and valuable aquatic habitats upstream of the dam.

b. Beaver dams located on man-made irrigation delivery and return canals constructed in uplands. These waterways are not considered to be waters of the United States if constructed in uplands. A permit is not required to remove beaver dams located in these waterways. This does not include waterways which have been modified and/or relocated to carry both natural streamflows and irrigation water.

c. Beaver dams located on natural waterways in the immediate vicinity (generally within 100 feet) of an authorized irrigation diversion structure which are adversely affecting the operation of that structure. This activity is considered exempt from permit regulations under 33 CFR 323.4(a)(3) as the maintenance of structures appurtenant and functionally related to irrigation ditches.

A. Bradley Daly

A. BRADLEY DALY
Chief, Regulatory Branch