

**Appendix**

**G**

BIGHORN NATIONAL FOREST

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Land and Resource Management Plan - Draft

# Emphasis Species

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## Selected Emphasis Species

The following table displays the emphasis species for the Revised Forest Plan. For a description of the process used to select these species and a summary of those considered but not selected, refer to the project record for the Emphasis Species Categories document. A total of 38 TES species are listed below, followed by 6 MIS species, 36 species of local concern, and 14 demand species. These species would be addressed in project analyses and design with plan implementation. TES designation requires the preparation of Biological Assessments/Evaluations for projects, while MIS require specific analyses in project level NEPA. Species of Local Concern and Demand species would likely also be analyzed in projects, though with less rigor than the previous two categories. A short section on rationale for selection of MIS follows this table of all of the emphasis species. Monitoring prescribed for emphasis species is addressed in Chapter 4 of the plan. It is also anticipated that changes to TES and Local Concern species designation may occur during the life of the plan as new information becomes available. However, it is not anticipated that the change of these lists would require any amendment or revision to the plan, unless habitat management issues are in conflict with plan direction or outputs.

Table G-1. Bighorn National Forest emphasis species categories.

| Common Name  | Scientific Name                     | Federal/State Ranking <sup>1</sup> | Natural Heritage Ranking <sup>2</sup> | Habitat  | Occurrence on Forest            |
|--|-------------------------------------|------------------------------------|---------------------------------------|----------|---------------------------------|
| <b>Threatened, Endangered, Proposed, Candidate and Region 2 FS Sensitive Species (TES)</b> |                                     |                                    |                                       |          |                                 |
| <b>Fish</b>  |                                     |                                    |                                       |          |                                 |
| Yellowstone cutthroat trout  | <i>Oncorhynchus clarki bouvieri</i> | Sensitive                          | G4T2S2                                | Riverine | Known to limited streams.       |
| Mountain sucker  | <i>Catostomus platyrhynchus</i>     | Sensitive                          | G5/S5                                 | Riverine | Known to Tongue River drainage. |

<sup>1</sup> See descriptions of federal/state ranking codes at the end of the table.

<sup>2</sup> See descriptions of Wyoming Natural Diversity Database codes at the end of the table.

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| Common Name              | Scientific Name                  | Federal/ State Ranking <sup>1</sup> | Natural Heritage Ranking <sup>2</sup> | Habitat                      | Occurrence on Forest   |
|--------------------------|----------------------------------|-------------------------------------|---------------------------------------|------------------------------|--|
| <b>Amphibians</b>        |                                  |                                     |                                       |                              |  |
| Northern leopard frog    | <i>Rana pipiens</i>              | Sensitive                           | G5S3                                  | Ponds, wetland, riparian     | Known to limited areas.                                      |
| Columbia spotted frog    | <i>Rana luteiventris</i>         | Sensitive                           | G4S2S3                                | Ponds, wetland, riparian     | Known to limited areas.                                      |
| Wood frog                | <i>Rana sylvatica</i>            | Sensitive                           | G5S2                                  | Ponds, wetland, riparian     | Known to limited areas.                                      |
| <b>Mammals</b>           |                                  |                                     |                                       |                              |  |
| Fringed myotis           | <i>Myotis thysanodes</i>         | Sensitive NSS2                      | G5/S1B/S1 N                           | Caves/mines & forested areas | Known to limited sites.                                      |
| Spotted bat              | <i>Euderma maculatum</i>         | Sensitive NSS2                      | G4/S1B/SZ/N                           | Caves/mines & forested areas | None known, but locations near Forest and potential habitat. |
| Townsend's big-eared bat | <i>Corynorhinus townsendii</i>   | Sensitive NSS2                      | G4/S1B/S2 N                           | Caves/mines                  | Known to limited sites.                                      |
| Water vole               | <i>Microtus richardsoni</i>      | Sensitive NSS3                      | G5/S2S3                               | Riparian                     | Known, but very limited in known distribution.               |
| American marten          | <i>Martes americana</i>          | Sensitive                           | G5/S3                                 | Late successional conifer    | Known to several areas.                                      |
| Wolverine                | <i>Gulo gulo</i>                 | Sensitive NSS3                      | G4/S2                                 | Spruce-fir, alpine tundra    | Historic/Potential with occasional sightings.                |
| Canada lynx              | <i>Lynx canadensis</i>           | Threatened NSS2                     | G5/S1                                 | Spruce-fir forests           | Historic/Potential with most recent sighting in 2003.        |
| <b>Birds</b>             |                                  |                                     |                                       |                              |  |
| Harlequin duck           | <i>Histrionicus histrionicus</i> | Sensitive/ PIF II NSS3              | G4/S1B/SZ?N                           | Wetland/lake                 | Historic/Potential as sighted nearby.                        |

| Common Name           | Scientific Name                  | Federal/ State Ranking <sup>1</sup> | Natural Heritage Ranking <sup>2</sup> | Habitat                   | Occurrence on Forest   |
|-----------------------|----------------------------------|-------------------------------------|---------------------------------------|---------------------------|--|
| Bald eagle            | <i>Haliaeetus leucocephalus</i>  | Threatened/ PIF I                   | G4/S2B/ S3N                           | Riparian/lake             | No critical habitat or known nesting, only migration or foraging use and no winter roosts. Potential future nesting. |
| Northern harrier      | <i>Circus cyaneus</i>            | Sensitive/ PIF III                  | G5/S4B/ S5N                           | Grasslands, shrub-steppe  | Known with many observations.  |
| Northern goshawk      | <i>Accipiter gentilis</i>        | Sensitive/ NSS4/PIF I               | G5/S2S3B /S4N                         | Mature conifer or aspen   | Known with several observations.   |
| Peregrine falcon      | <i>Falco peregrinus anatum</i>   | Sensitive/ NSS3/PIF I               | G4T3/S1B S2N                          | Canyons, cliffs, riparian | Known, though sporadic but historic nesting on Forest.   |
| Greater sage grouse   | <i>Centrocercus urophasianus</i> | Sensitive/ PIF I                    | G4/S3                                 | Sage steppe               | No leks (breeding) on Forest. Late summer brood rearing primarily on west side of Forest.                            |
| Flammulated owl       | <i>Otus flammeolus</i>           | Sensitive                           | G4/SA?B                               | Mature ponderosa/aspen    | None currently known on Forest, though north of it. Limited potential habitat.                                       |
| Short-eared owl       | <i>Asio flammeus</i>             | Sensitive/ PIF I                    | G5/S2S3                               | Grassland, sage steppe    | Known, though somewhat limited potential.  |
| Boreal owl            | <i>Aegolius funereus</i>         | Sensitive/ NSS4/PIF II              | G5/S2                                 | Mature conifer            | Known, but from limited sightings.   |
| Lewis' woodpecker     | <i>Melanerpes lewis</i>          | Sensitive/ NSS3/ PIF II             | G4/S2B/ SZN                           | Conifer/riparian          | Known, but from limited sightings.   |
| Three-toed woodpecker | <i>Picoides tridactylus</i>      | Sensitive/ PIF II                   | G5/S3                                 | Mature conifer            | Known to several areas of Forest.  |

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| Common Name             | Scientific Name                | Federal/ State Ranking <sup>1</sup> | Natural Heritage Ranking <sup>2</sup> | Habitat  | Occurrence on Forest                            |
|-------------------------|--------------------------------|-------------------------------------|---------------------------------------|--|---|
| Olive-sided flycatcher  | <i>Contopus cooperi</i>        | Sensitive                           | G4/S4B/SZN                            | Mature conifer   | Known to several areas of Forest.               |
| Loggerhead shrike       | <i>Lanius ludovicianus</i>     | Sensitive/ PIF II                   | G5/S4B/SZN                            | Grassland  | Known on fringes of Forest where meadows occur. |
| Brewer's sparrow        | <i>Spizella breweri</i>        | Sensitive/ PIF I                    | G5/S3B/SZN                            | Sage steppe  | Known to several areas of Forest.               |
| Sage sparrow            | <i>Amphispiza belli</i>        | Sensitive/ PIF I                    | G5/S3B/SZN                            | Sage steppe  | None known on Forest, but potential.            |
| Grasshopper sparrow     | <i>Ammodramus savannarum</i>   | Sensitive/ NSS4/PIF II              | G4S3                                  | Grasslands   | Known from limited sightings.                   |
| <b>Plants</b>           |                                |                                     |                                       |  |   |
| Mountain lady's slipper | <i>Cypripedium montanum</i>    | Sensitive/ SSC                      | G4G5/S1                               | Shady forests and riparian shrublands at mid-elevations. | Known from 3 occurrences on Forest.             |
| Yellow lady's slipper   | <i>Cypripedium parviflorum</i> | Sensitive/ SSC                      | G5/S1S2                               | Damp mossy forests, and streamsides at mid-elevations.   | Known from 2 occurrences on Forest.             |
| Russet cotton-grass     | <i>Eriophorum chamissonis</i>  | Sensitive/ SSC                      | G5/S1S2                               | Montane swamps and bogs.                                 | Known from 1 occurrence on Forest.              |
| Hall's fescue           | <i>Festuca hallii</i>          | Sensitive/ SSC                      | G3G4/S2                               | Montane meadows  | Known from 1 vague historical (1898) record.    |
| Grass-of-parnassus      | <i>Parnassia kotzebuei</i>     | Sensitive/ SSC                      | G4/S2                                 | Moist seeps.   | Known from 1 occurrence on Forest.              |
| Cary beardtongue        | <i>Penstemon caryi</i>         | Sensitive/ SSC                      | G3/S3                                 | Disturbed areas on sedimentary soils.                    | Known from 14 occurrences on Forest.            |

| Common Name              | Scientific Name                                | Federal/ State Ranking <sup>1</sup> | Natural Heritage Ranking <sup>2</sup> | Habitat  | Occurrence on Forest  |
|--------------------------|--|-------------------------------------|---------------------------------------|--|---|
| Woolly twinpod           | <i>Physaria lanata</i>                         | Sensitive/ SSC                      | G5/S2                                 | Rocky outcrops and rocky soil, without dense grass or shrub cover. Forested areas. | Known from 3 occurrences on Forest.                               |
| Tranquil golden-weed     | <i>Pyrrocoma clementis</i> var. <i>villosa</i> | Sensitive/ SSC                      | G3G4T?/ S1                            | Sagebrush grasslands and montane meadows.  | Known from 3 occurrences on Forest.                               |
| Northern blackberry      | <i>Rubus acaulis</i>                           | Sensitive/ SSC                      | G5/S1                                 | Riparian area along Sourdough Cr.  | Known from 1 occurrence on Forest.                                |
| Lesser bladderpod        | <i>Utricularia minor</i>                       | Sensitive/ SSC                      | G5/S1S2                               | Submerged in ponds, slow moving streams  | Known from 1 occurrence on Forest.                                |
| <b>MIS/Focal Species</b> |  |                                     |                                       |  |   |
| <b>Fish</b>              |  |                                     |                                       |  |   |
| Rainbow trout            | <i>Oncorhynchus mykiss</i>                     | None                                | G5SE                                  | Riverine, lakes  | Known and widespread.   |
| <b>Mammals</b>           |  |                                     |                                       |  |   |
| Beaver                   | <i>Castor canadensis</i>                       | Furbearer                           | G5/S5                                 | Riparian   | Known to several areas on Forest. Reduced from historical levels. |
| Rocky Mountain elk       | <i>Cervus elaphus nelsoni</i>                  | Big game                            | G5/S5                                 | Generalist/ Mature conifer security areas.   | Widespread on Forest.   |
| Red squirrel             | <i>Tamiasciurus hudsonicus</i>                 | Small game                          | G5/S5                                 | Mature conifer with CWD.   | Widespread on Forest.   |
| <b>Birds</b>             |  |                                     |                                       |  |   |
| Red-breasted nuthatch    | <i>Sitta canadensis</i>                        | Non-game                            | G5/S5                                 | Mature conifer w/snags   | Widespread on Forest.   |
| Brewer's sparrow         | <i>Spizella breweri</i>                        | Non-game/FS sensitive               | G5/S3                                 | Sagebrush  | Widespread where habitat occurs.                                  |

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| Common Name                     | Scientific Name           | Federal/ State Ranking <sup>1</sup> | Natural Heritage Ranking <sup>2</sup> | Habitat                  | Occurrence on Forest   |
|---------------------------------|---------------------------|-------------------------------------|---------------------------------------|--------------------------|--|
| <b>Species of Local Concern</b> |                           |                                     |                                       |                          |  |
| <b>Mammals</b>                  |                           |                                     |                                       |                          |  |
| Long-eared myotis               | <i>Myotis evotis</i>      | NSS2                                | G5/S1                                 | Caves/mines              | Known, but to limited sites.   |
| Hoary bat                       | <i>Lasiurus cinereus</i>  | None                                | G5/S2B/SZ/N                           | Aspen/conifer, snags     | None/Potential. Due to lack of aspen on Forest, may be less potential than other areas of state. |
| Rocky Mountain bighorn sheep    | <i>Ovis canadensis</i>    | Big game                            | G4G5                                  | Rock/alpine meadow       | Known/historic. Shell watershed currently with <30 animals.                                      |
| <b>Birds</b>                    |                           |                                     |                                       |                          |  |
| Common loon                     | <i>Gavia immer</i>        | PIF II/NSS1                         | G5/S2B/SZN                            | Wetland/lake             | Known observations, but no known breeding.   |
| Merlin                          | <i>Falco columba-rius</i> | NSS3/ PIF II                        | G5/S2B/SZN                            | Ponderosa pine, riparian | Known, but to few areas due to limited potential habitat. Nests in trees.                        |
| Swainson's hawk                 | <i>Buteo swainsoni</i>    | PIF I                               | G5/S4B/SZN                            | Grassland, riparian      | Known to few areas. Nests in trees.  |
| Great gray owl                  | <i>Strix nebulosa</i>     | NSS4/ PIF II                        | G5/S2                                 | Mature conifer           | Suspected occurrence, and potential habitat.   |
| Pygmy nuthatch                  | <i>Sitta pygmaea</i>      | NSS4/ PIF II                        | G5/S2S3                               | Mature conifer           | Known, but from limited sightings.   |
| Rufous hummingbird              | <i>Selasphorus rufus</i>  | PIF II                              | G5/S2B                                | Meadows, riparian, shrub | Known but limited occurrences.   |
| Calliope hummingbird            | <i>Stellula calliope</i>  | PIF II                              | G5/S2B/SZN                            | Conifer, riparian        | One known occurrence.  |

| Common Name            | Scientific Name               | Federal/ State Ranking <sup>1</sup> | Natural Heritage Ranking <sup>2</sup> | Habitat   | Occurrence on Forest                     |
|------------------------|-------------------------------|-------------------------------------|---------------------------------------|---|--|
| Golden-crowned kinglet | <i>Regulus satrapa</i>        | PIF II                              | G5/S3                                 | Spruce-fir  | Known, but through limited occurrences.  |
| Baird's sparrow        | <i>Ammodramus bairdii</i>     | PIF I/ NSS4                         | G4/S1B/ SZN                           | Grassland, riparian, shrub  | Known from limited sightings.            |
| <b>Plants</b>          |                               |                                     |                                       |   |  |
| Musk root              | <i>Adoxa moschatellina</i>    | None/SS C                           | G5/S1                                 | Shady, moist, moss-rich limestone cliffs                            | Known – 2<br>1 in Leigh pRNA             |
| Aromatic pussytoes     | <i>Antennaria aromatica</i>   | None/ Watch                         | G3G4/S2                               | Open slopes/ridges, limestone talus at or above timberline          | Known -1                                 |
| Pygmy pussytoes        | <i>Antennaria monocephala</i> | None/SS C                           | G4G5/S1                               | Wind swept, open slopes, ridges in alpine or subalpine tundra       | Known – 1<br>Cloud Peak Wilderness       |
| Upward lobed moonwort  | <i>Botrychium ascendens</i>   | None/ SSC                           | G2G3/S1                               | Hummocky marshes and bogs   | Known from 1 occurrence on Forest.       |
| Lance-leaved grapefern | <i>Botrychium lanceolatum</i> | None/SS C                           | G5/S1                                 | Riparian areas, organic rich hummocks                               | Known -1                                 |
| Mingan moonwort        | <i>Botrychium minganense</i>  | None/SS C                           | G4/S1                                 | Wide variety: riparian, moist meadows, sand dunes, prairies, woods. | Known – 2<br>1 in Mann Cr. potential RNA |
| Rattlesnake fern       | <i>Botrychium virginianum</i> | None/SS C                           | G5/S1                                 | Calcium rich, moist shady areas                                     | Known - 1<br>Mann Cr. potential RNA      |
| Mud sedge              | <i>Carex limosa</i>           | None/ SSC                           | G5/S2                                 | Wetlands, often limey   | Known from 1 occurrence on Forest.       |

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| Common Name                | Scientific Name                            | Federal/ State Ranking <sup>1</sup> | Natural Heritage Ranking <sup>2</sup> | Habitat   | Occurrence on Forest               |
|----------------------------|--|-------------------------------------|---------------------------------------|---|------------------------------------|
| Short-leaved sedge         | <i>Carex misandra</i>                      | None/SS<br>C                        | G5/S1                                 | Alpine wet meadows, willows, streambanks                    | Known – 1 McClain potential RNA    |
| Leafy thistle              | <i>Cirsium foliosum</i>                    | None/SS<br>C                        | G5/S1                                 | Moist areas along roads, meadows, slopes                    | Known -1                           |
| Fragile rockbrake          | <i>Cryptogramma stelleri</i>               | None/SS<br>C                        | G5/S1                                 | Moist wooded slopes and limestone cliffs                    | Known – 1 Cloud Peak Wilderness    |
| White arctic whitlow-grass | <i>Draba fladnizensis var. pattersonii</i> | None/SS<br>C                        | G4T2T3/<br>S2                         | Fellfields and talus slopes above 1000 feet                 | Known – 2 Cloud Peak Wilderness    |
| Howard forget-me-not       | <i>Eritrichium howardii</i>                | None/<br>SSC                        | G4/S1                                 | Limestone outcrops and dry rocky areas                      | Known from 1 occurrence on Forest. |
| Woodland horsetail         | <i>Equisetum sylvaticum</i>                | None/SS<br>C                        | G5/S1                                 | Preacher Rock Bog - riparian                                | Known - 1                          |
| Low fleabane               | <i>Erigeron humilis</i>                    | None/SS<br>C                        | G4/S2                                 | Granite and limestone cliff faces on moist mossy microsites | Known – 1 Cloud Peak Wilderness    |
| Three-flower rush          | <i>Juncus triglumis var. triglumis</i>     | None/SS<br>C                        | G5T5/S1                               | Wet gravel slopes below melting snows                       | Known – 1 Cloud Peak Wilderness    |
| Watson’s prickly-phlox     | <i>Linanthus watsonii</i>                  | None/<br>SSC                        | G3G5/S1                               | Dry ledges on sedimentary cliffs.                           | Known from 1 occurrence on Forest. |
| Northern twayblade         | <i>Listera borealis</i>                    | None/<br>SSC                        | G4/S2                                 | Moist, shady spruce forests.                                | Known from 2 locations on Forest.  |
| Broad-leaved twayblade     | <i>Listera convallarioides</i>             | None/<br>SSC                        | G5/S1                                 | Moist, shady spruce forests.                                | Known from 1 occurrence on Forest. |
| Sheathed musineon          | <i>Musineon vaginatum</i>                  | None/SS<br>C                        | G3?/S2                                | Limestone outcrops, chugwater redbeds                       | Known - 6                          |

| Common Name           | Scientific Name                                 | Federal/State Ranking <sup>1</sup> | Natural Heritage Ranking <sup>2</sup> | Habitat  | Occurrence on Forest  |
|-----------------------|---|------------------------------------|---------------------------------------|--|---|
| Alpine poppy          | <i>Papaver kluanense</i>                        | SSC                                | G5T3?/S2                              | Alpine meadows, talus slopes and fellfields  | Known – 1 Cloud Peak Wilderness plus additional unconfirmed reports |
| Mountain lousewort    | <i>Pedicularis pulchella</i>                    | None                               | G3S2                                  | Alpine meadows and alpine scree slopes   | Known – 2 Cloud Peak Wilderness                                     |
| Large-leaved pondweed | <i>Potamogeton amplifolius</i>                  | SSC                                | G5/S1                                 | Slow moving streams and lakes  | Known – 1 Cloud Peak Wilderness                                     |
| Hairy prince's plume  | <i>Stanleya tomentosa</i> var. <i>tomentosa</i> | None/None                          | G4T3/S2                               | Limber pine woodlands, juniper shrublands on limey-sandstone ridges, dry dolomite cliffs/talus | Known -1 Near Shell Canyon Research Natural Area                    |

#### Demand Species

##### Fish

|                             |                                   |      |         |                 |  |
|-----------------------------|-----------------------------------|------|---------|-----------------|--|
| Brook trout                 | <i>Salvelinus fontinalis</i>      | None | G5SE    | Riverine, lakes | Known and widespread.  |
| Brown trout                 | <i>Salmo trutta</i>               | None | G5SE    | Riverine, lakes | Known to several streams.  |
| Snake River cutthroat trout | <i>Oncorhynchus clarki</i> ssp. 2 | None | G4T1T2Q | Riverine, lakes | Known (Subspecies of YCT, introduced species with some natural reproduction) |

##### Mammals

|            |                            |          |       |                  |  |
|------------|----------------------------|----------|-------|------------------|--|
| Mule deer  | <i>Odocoileus hemionus</i> | Big game | G5/S5 | Generalist       | Known and widespread/Stable            |
| Moose      | <i>Alces alces shirasi</i> | Big game | G5/S5 | Willow, riparian | Known and widespread/Stable-Increasing |
| Black bear | <i>Ursus americanus</i>    | Game     | G5/S5 | Generalist       | Known and widespread/Stable            |

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| Common Name                | Scientific Name                     | Federal/State Ranking <sup>1</sup> | Natural Heritage Ranking <sup>2</sup> | Habitat                                     | Occurrence on Forest  |
|----------------------------|-------------------------------------|------------------------------------|---------------------------------------|---|---|
| Mountain lion              | <i>Felis concolor</i>               | Game                               | G5/S5                                 | Generalist                                  | Known and widespread/Stable   |
| <b>Birds</b>               |                                     |                                    |                                       |   |   |
| Ruffed grouse              | <i>Bonasa umbellus</i>              | Upland game                        | G5/S5                                 | Forested areas                              | Known to northern portion of Forest/Stable  |
| Blue grouse                | <i>Dendragapus obscurus</i>         | Upland game                        | G5/S5                                 | Spruce-fir                                  | Known and widespread/Stable   |
| Merriam's turkey           | <i>Meleagris gallopavo merriami</i> | Upland game                        | G5/S5                                 | Ponderosa pine                              | Known primarily to southeast Forest/Stable-Increasing   |
| Gray partridge             | <i>Perdix perdix</i>                | Upland game                        | G5/S5                                 | Prairie, meadow, shrub                      | Fringes of Forest mostly west side. Likely stable.  |
| Plains sharp-tailed grouse | <i>Tympanuchus phasianellus</i>     | Upland game                        | G4/S4                                 | Grassland, mountain shrub                   | Known to southeast corner of Forest.  |
| Chukar partridge           | <i>Alectoris chukar</i>             | Upland game                        | G5/S5                                 | Grassland, mountain shrub                   | Known primarily on west side of Forest  |
| <b>Plants</b>              |                                     |                                    |                                       |   |   |
| Sweetgrass                 | <i>Hierochloe odorata</i>           | None/HSS                           | None                                  | Moist meadows.                              | Likely common. High demand for burning incense and basketry.  |
| Purple cone flower         | <i>Echinacea angustifolia</i>       | None                               | G4/S3                                 | Dry open prairies and plains on sandy soils | Occurs near the Forest boundary, but has not been observed on the Forest, despite searches. High demand for medicinal properties. |

| Common Name  | Scientific Name | Federal/State Ranking <sup>1</sup> | Natural Heritage Ranking <sup>2</sup> | Habitat | Occurrence on Forest |
|--|-----------------|------------------------------------|---------------------------------------|---------|----------------------|
| <p><b>NSS</b> = Native species status; state ranking; numbers 1 through 3 indicate those species recognized as high priorities for conservation action, with a 1 indicating possible extirpation.</p> <p><b>PIF</b> = Partners in Flight; state ranking; levels I and II identify species which may be of viability concern.</p> <p><b>SSC</b> = Species of special concern; derived primarily from the Fine Filter Analysis for the Bighorn National Forest (Welp et al 2000).</p>  |                 |                                    |                                       |         |                      |
| <p><b>G</b> = Global rank, based on the rangewide status of a species. <b>T</b> = Trinomial rank, based on the rangewide status of a subspecies or variety. <b>S</b> = state rank, based on the status of a taxon in Wyoming (state rank may differ in other states). <b>1</b> = critically imperiled because of extreme rarity or because of some factor of a subspecies' life history that makes is vulnerable to extinction. <b>2</b> = imperiled because of rarity or because of factors demonstrably making a species vulnerable to extinction. <b>3</b> = rare or local throughout its range or found locally in a restricted range. <b>4</b> = apparently secure, although the species may be quite rare in parts of its range, especially at the periphery. <b>5</b> = demonstrably secure, although the species may be quite rare is parts of its range, especially at the periphery. Source: Wyoming Natural Diversity Database (WYNDD).</p> |                 |                                    |                                       |         |                      |

## Management Indicator Species (MIS) Synopsis

This section provides a summary of the process followed to select Management Indicator Species (MIS) for the Revised Plan. A complete document describing the five principles and seven steps in the selection process is available in the project record. MIS were selected based on Regional guidance documents and input from the Wyoming Game and Fish Department. MIS are not the only monitoring tool for tracking the effects of management activities on species and their habitat; other monitoring has been prescribed in Chapter 4 (Monitoring and Evaluation) of the Revised Plan, particularly for other species at risk (e.g., threatened or sensitive species).

## Summary of MIS Selection Process

In the selection of MIS, **the first principle** involved identifying the priority issues for species viability and management effects to habitat that could be monitored and evaluated:

- ◆ Effects of commodity outputs and human uses, including timber harvest, livestock grazing, recreation use, and the associated road and trail networks.
- ◆ Importance of riparian habitat, watershed, and water quality related functions.
- ◆ Lack of information regarding species of limited distribution or with limited habitat requirements.
- ◆ Importance of old growth spruce/fir and all aspen habitat.
- ◆ Lack of ability to proactively manage habitats to maintain structural diversity, including forested and non-forested (shrub) communities.

**The second principle** was consideration of the major activities likely to occur on the Forest in the next planning period: livestock grazing, timber harvest, recreation use, and prescribed burning. In order to facilitate evaluation, the species selected needed to correspond to a forestwide condition or need and project level feasibility. Habitat aspects would be best evaluated if they can either be modeled and/or tracked through GIS systems and remote sensing due to the likelihood of continuing improvements and availability of this technology. The population monitoring requirement of the regulations should also contribute to this function.

**The third principle** was consideration of MIS selected on neighboring National Forests to provide regional consistency. This step was not as relevant in the selection process because there are no National Forests immediately adjacent to the Bighorn, and the closest Forests were all in the process of either revising their plans or amending their lists of MIS.

**The fourth principle** was consideration of whether MIS were the best method to monitor and evaluate the issue. For example, if aspen extent and health or the amount and distribution of old growth conifer were the issues, these habitats can be directly monitored, rather than using a surrogate of MIS. However, MIS are needed to monitor some species because knowledge for scientific habitat management is not complete and all effects are not known.

For the fourth principle, the following five categories of species were reviewed in compliance with the 1982 NFMA regulations at 36 CFR 219.19:

- ◆ Federally listed (under the Endangered Species Act) species.
- ◆ Species with special habitat needs that may be influenced by management activities.
- ◆ Species commonly hunted, fished, or trapped.
- ◆ Non-game species of special interest.
- ◆ Species whose population changes are believed to evaluate the effects of management activities.

Plants, animals, communities, or special habitats were considered as potential MIS. Species' habitat requirements and their population biology elements were considered in relation to management activities.

**The fifth principle** was selecting an adequate but limited number of species. This principle included evaluating the management complexity (e.g., issues, habitat diversity, size, human uses) of the Forest, the budgets available, and the relationship of MIS in the overall monitoring and evaluation plan.

## Results of MIS Selection Process

It is important to recognize that it is not necessary to select a species for each category or each management issue listed above. Species that represent multiple categories of the five listed were also prioritized. From the five principles and seven steps followed, six species were selected from more than 100 total considered (see following table). Rationale for not selecting other species is listed in the MIS document in the administrative record.

Table G-2. MIS species on the Bighorn National Forest and rationale for their selection.

| Species Selected | Rationale (Issue or Habitat Represented, Monitoring Feasibility)   |
|------------------|--|
| <b>Elk</b>       | <p><b>Rationale:</b></p> <p>Their relationship to management issues (vegetation management, road densities).</p> <p>Feasibility of modeling habitat (elk security).</p> <p>Feasibility of monitoring population trends (WGFD data).</p> <p>Possible indication of habitat for other species requiring forested cover away from roads (e.g. marten).</p> <p>Forest-wide distribution; forestwide and project scale analysis feasibility.</p> <p>Past management and public interest and focus all support selection.</p> <p><b>Challenges</b></p> <p>Populations are hunted, are affected by climate (drought and winter), may be less indicative of summer habitat conditions, and elk are capable of exploiting a variety of habitats.</p> <p>Past research provides information to support monitoring, and they were selected in the 2002 amendment as MIS.</p> <p>Unknown if elk behavior will change if security habitat is improved as elk currently use private land for security habitat.</p> |

| Species Selected             | Rationale (Issue or Habitat Represented, Monitoring Feasibility)   |
|------------------------------|--|
| <b>Red squirrel</b>          | <p><b>Rationale</b></p> <p>Their use of Coarse Woody Debris (downed logs) in mature conifer habitats. They are most often associated with structural stages 4B,C and to a lesser extent 3B,C, and occur in higher densities in forested riparian areas, all of which are focuses of management activities.</p> <p>Monitoring feasibility is strong, and species is also serves as a “focal” species, since it is prey for marten, lynx, goshawks, and many other predators.</p> <p>Selected in 2002 amendment as a MIS.</p> <p><b>Challenges</b></p> <p>Tendency of populations to fluctuate with cone crops.</p> <p>Their ability to exploit and cross a variety of conifer habitats.</p> |
| <b>Red-breasted nuthatch</b> | <p><b>Rationale</b></p> <p>Their year-round resident status and dependence on snags for nesting habitat in more mature conifer (structure stages 4B, 4C typically).</p> <p>Due to their audible detections, they are feasible to monitor through avian point counts, and have a forest-wide distribution.</p> <p>They were also selected in the 2002 amendment as an MIS.</p> <p><b>Challenges</b></p> <p>Their ability to use a variety of mature conifer habitats.</p>   |
| <b>Brewer’s sparrow</b>      | <p><b>Rationale</b></p> <p>Their association with mature sagebrush habitats, which are in decline in lands surrounding the Forest, and management activities involve prescribed burning and grazing in these habitats on the Forest.</p> <p>Audible detections in avian point count monitoring and their good distribution in sage habitats across the Forest are also desirable features.</p> <p>They may provide indication of suitability of habitat for sage grouse.</p>   |

| Species Selected            | Rationale (Issue or Habitat Represented, Monitoring Feasibility)   |
|-----------------------------|--|
|                             | <p><b>Challenges</b></p> <p>Their status as a migratory species, with the Forest only used as habitat in the breeding season.</p> <p>They may provide indication of suitability of habitat for sage grouse.</p>  |
| <p><b>Rainbow trout</b></p> | <p><b>Rationale</b></p> <p>Existing population monitoring by WGFD and the Forest.</p> <p>Widespread distribution (unlike Yellowstone cutthroat trout).</p> <p>The species responds well to habitat changes influenced by management activities.</p> <p>Though introduced, it is well distributed across the Forest, and meets the monitoring priority for riparian habitat.</p> <p><b>Challenges</b></p> <p>The influence of climate and fishing harvest, and the possible need to reduce some populations to benefit native trout distribution.</p>   |
| <p><b>Beaver</b></p>        | <p><b>Rationale</b></p> <p>Their documented importance in riparian system functioning.</p> <p>Ability to provide habitat for other species.</p> <p>Acceptable monitoring protocols (cache inventory from aerial or ground based methods) at forest and project scale.</p> <p>Native status.</p> <p>Forestwide distribution (though currently limited).</p> <p>Their need for adequate habitat (willows) in the presence of planned management actions (grazing, recreation use, road maintenance).</p> <p><b>Challenges</b></p> <p>A lack of populations compared to historic levels.</p> <p>Reintroduction efforts.</p> <p>Possible disease interactions.</p> |

## Plan Implementation

It is expected that MIS species will be used in the planning, analysis, and design of projects implemented under the Revised Plan. MIS may be evaluated using qualitative and quantitative habitat measures correlated to existing and likely population and habitat trends. The R2 HABCAP model may be suitable for use with the red-breasted nuthatch and the red squirrel for analysis purposes, comparing forest-wide conditions of habitat with anticipated project results to habitat. Acres of potential versus suitable habitat should be assessed in project level decisions for each applicable MIS. MIS may be selected from the six species listed above for project analysis based on the habitat being manipulated or anticipated project effects.

Monitoring for MIS species is also required at the forest level. The monitoring protocols for each species are described in Chapter 4 – Monitoring and Evaluation.

Revisions to MIS species used for monitoring and evaluation may occur through plan amendment or the next revision in response to improvements in knowledge or monitoring technologies. Some species that could be considered or added in the future may include old growth dependent species (e.g., three-toed woodpecker or marten) once these habitats are inventoried and located on the Forest.

In addition, two particular forest-wide guidelines that were developed to provide guidance for habitat for MIS/TES received considerable debate and needed further clarification with regards to implementation in projects. These two guidelines include **elk security** and the **300' forested riparian area**, and are described in Appendix D.