OBJECTION
AGAINST THE CASTLE
MOUNTAINS RESTORATION PROJECT

1. **Objector's Names and Address, Phone Number**

Lead Objector Native Ecosystems Council (NEC), Director Sara Johnson,
PO Box 125, Willow Creek, MT 59760; phone 406-579-3286

Alliance for the Wild Rockies (AWR), Director Mike Garrity, PO Box 505, Helena, MT 59624; phone 406-4599-5936

Signed for Objectors on the 9th day of September, 2019

Sara Johnson

2. Name of the Proposed Project

Castle Mountains Restoration Project

3. **Name of the Responsible Official**

William Avey, Forest Supervisor Helena-Lewis and Clark National Forest

4. Location of the Proposed Project

Belt Creek-White Sulphur Springs Ranger District
Helena-Lewis and Clark National Forest

5. Attachments to the Objection

This objection includes 5 attachments. Appendices A, B, and C include relevant portions of literature, reports or e-mail correspondence cited in the Objection. Appendix D includes several maps, including both halves of a very large landscape map of the Castle Mountains landscape. Appendix E includes a declaration by Sara Johnson addresses several specific points that are made in the objection, including her summaries of goshawk monitoring on the Lewis and Clark National Forest and photos from 2 field trips to the Castle Mountains on September 30, 2010 and October 22, 2015.

6. Statement that Demonstrates Connection between Proposed Project and Prior Specific Written Comments by Objectors

NEC and AWR requested to be involved in the public involvement process for the Castle Mountains Restoration Project on April 22, 2013. We reaised 44 specific issues/comments in this letter. On May 19, 2015, NEC and AWR provided joint scoping comments on the Castle Mountains Restoration Project. These comments addressed 15 specific issues and concerns. On April 30, 2018, NEC and AWR provided joint comments on the Draft Environmental Impact Statement (DEIS) for the Castle Mountains Restoration Project. These comments included 29 pages addressing 18 issues, questions and concerns.

As noted previously Sara Johnson has attended 2 Forest Service field trips driving through the Castle Mountains. The trip on September 30, 2010 included just the Belt Creek –White Sulphur Springs District Ranger and a Forest Service person from the Supervisors Office. October 22, 2015, there were over half a dozen Forest Service individuals on the field trip. The main topic of the field trip was goshawk management. Sara then wrote up a series of notes on this field trip. These notes have been included in Appendix C of this objection.

Due to the extensive comments, issues and questions that NEC and AWR have raised during the public involvement process for the Castle Mountains Restoration Project, we will only briefly identify these in order to avoid repetition. In general, the areas of concern include the following: a stand-alone EIS is required for the proposed amendments in the Castle Mountains; a significant Forest Plan amendment is required to change the current management direction in the Castle Mountains for the 1986

Management Area designations to management of the Historic Range of Variation (HRV); deletion of the Management Area (MA) C hiding cover standard is inconsistent with remaining MA direction, which also then needs to be amended; most of the MAs in the Castle Mountains emphasize wildlife habitat maintenance, which means that the new HRV direction is inconsistent with all these MAs; the proposed amendments have essentially no actual analysis as per the National Environmental Policy Act (NEPA), as is required by the National Forest Management Act (NFMA); there is no analysis of Alternative 4, which would maintain the hiding cover amendments; the proposed intensive management of the Castle Mountains Inventoried Roadless Area (IRA) violates the Roadless Area Conservation Rule; the benefits of the proposed treatments in the IRA to resources, including wildlife, are never identified as valid restoration activities; there is no analysis of the impact of large openings on wildlife, including clearcuts up to almost 400 acres, in the EIS; there is no analysis of project impacts on elk winter range; there is no analysis of project impacts to goshawk foraging habitat; the impacts to goshawk postfledging areas (PFA) are summarized for all combined 11 PFAs, so the impact on individual PFAs is not disclosed; monitoring on the Forest has demonstrated that PFAs are critical as well as limited on the Forest, yet some portions of these PFAs will be altered by the project; snag habitat is summarized across the landscape, which means that mitigation for associated species is actually what habitat is left that is not going to be destroyed with the project; the Forest Service has never documented that averaging snags across the entire landscape provides a valid proxy for snag-associated wildlife; there is no rationale provided for burning sagebrush, a highly-important wildlife forage; there is no analysis of project impacts on old growth species, with information limited to whether or not the 5% standard on commercial forest lands will be met; no connection is ever made between the MIS for old growth, the goshawk, and the Forest Plan standard of 5% on commercial forest lands; the issue of elk displacement from public lands to private lands is at best a brief mention in the EIS; the measures of habitat effectiveness and elk security are never actually provided.

One new issue that we are bringing forward in our objection is the extensive treatment on unsuitable timber lands. This program of managing unsuitable timber lands was only very briefly mentioned in the EIS, and we were not aware of how extensive the planned logging and management of unsuitable timber lands was going to be.

7. Incorporation by Reference

Due to the length of NEC and AWR's comments on the DEIS, we are incorporating these comments by reference, instead of repeating them in this objection.

8. Suggested Remedies

The massive change of management direction in the Castle Mountains, from largely maintaining natural undisturbed conditions for wildlife, to a massive intervention to achieve HRV, which is not Forest Plan direction, is clearly a violation of the NFMA and the NEPA, due to a lack of any amendments being completed for these changes. These changes are also significant as per land area and mountain ranges impacted, including the entire Castle Mountains. Any amendments thus require a "stand alone" EIS as a result. This project cannot go forward until these amendments are completed to ensure that management actions are consistent with the Forest Plan, as is required by the NFMA. Any management actions in the Castle Mountains also need to be consistent with the Roadless Area Conservation Rule. To date, the agency has failed to demonstrate that the proposed actions in this IRA will "restore" wildlife habitat. Also, the massive disturbances that would be required within the IRA are entirely inconsistent with the purpose of these protected areas, which include providing undisturbed habitat for wildlife.

We also believe that Forest Plan direction needs to be developed for goshawk management, using the extensive information that the agency has obtained over the years on the goshawk monitoring program. It is clear that timber and fuels management activities could have a profound impact on goshawks. Thus to continue these programs without a reasonable level of conservation measures for the goshawk is a clear violation of the NFMA, where a diversity of wildlife species are maintained. We note that the goshawk has been identified by monitoring individuals, as well as by Dr. Nate Bickford, who has been studying goshawks on the Lewis and Clark National Forest, as an excellent indicator of forest health. With all the rhetoric about managing for forest health in logging projects, the only actual indicator of such to date is the goshawk.

8. Description of how those Aspects of the Project Specifically Violate Law, Regulation, or Policy

A. The Forest Service is violating the Forest Plan direction without completing any Forest Plan amendments for changing the existing management area direction to management for the historic range of variation (HRV), which requires huge changes in management; in addition, the claims of HRV conditions for the Castle Mountains are implausible, which is a violation of the NEPA that requires that agencies provide high-quality information to the public; the agency's plans to implement the HRV as management direction for the Castle Mountains is clearly a violation of the NFMA, the NEPA and the APA as a result.

The EIS at 64 notes that the purpose of the project is to restore the historic range of variation (HRV), and that this is consistent with the Forest Plan. The EIS at 65 describes how the HRV has been developed in Region 1 and the Helena Lewis and Clark National Forest. This development does not include any Forest Plan amendment. Since the proposal to implement HRV for forest management includes the entire forest, this would be a programmatic amendment, requiring a new analysis of impacts to resources, including wildlife, and public involvement. To date, there has been no programmatic public involvement in the agency decision to implement HRV as the management direction for the Helena Lewis and Clark National Forest.

The EIS at 608 and 625 notes that a large part of the Castle Mountains burned in a stand replacing fire in approximately 1900. This means that most of the forests, with the exception of those that did not burn, are about 118 years old. Since fire has not been eliminated from this landscape, it is not clear why the current forest conditions are considered abnormal.

The claim that the project is being done to restore the HRV is also absurd because it is not possible that grassland habitat types in the Castle Mountains

were 40% in historical times, which would be about 1850 as per the EIS at 608-609, 625, while they have been reduced to only 25% due to forests growing over the meadows in the last 170 years or so. Somehow the Castle Mountains have grown an additional 12,800 acres of forest in the last 170 years. That would be an average increase of 75 forested acres per year. However, if you look at Figure 21 in the EIS at 46, and Figure 34 at EIS 570, the growth of trees into the adjacent meadow is clearly very slow. This is because the meadow conditions are unsuitable for forests. As per the current best science (Pfister et al. 1977), if trees can successfully regenerate on a site, it is a forested habitat type, and will always grow a forest. It would never be a meadow habitat. The additional acres of new forest on 12,800 acres in the Castle Mountains are never mapped for verification.

The EIS at 557 states that meadows and openings are inherently incapable of providing treed habitat.

It is also absurd for the agency to claim that the project will implement HRV by logging. Logging and burning will not change the species of trees that will grow on a site (Pfister et al. 1977). A seral lodgepole pine site will regenerate into a seral lodgepole pine. So the goal of reducing lodgepole pine forest acres by implementing the HRV is really just a goal to reduce the older mature stands of lodgepole pine by converting them to new young stands. This is a standard timber management practice.

As is demonstrated in the EIS at 68-69, this change in management from current management area direction in the Forest Plan to achieving new "desired vegetation conditions" based on HRV requires massive changes in the forest landscape. The new goals based on HRV include increasing grasslands, logging limber pine forests to reduce stand density, reducing Douglas-fir forests and lodgepole pine forests through logging and burning while increasing ponderosa pine forests, and overall, creating open forest conditions through logging and fire. Another objective is to keep insects and disease low.

Table 30 at the EIS 74 summarizes the required changes in the landscape of the Castle Mountains of 79,909 total acres to implement the RNV. Douglas-fir forests will have to be reduced from their current acreage of 27,169 (34% of the Castle Mountains) to 13,265 acres (16.6% of the Castle Mountains). This will require reduction of 13,904 acres of Douglas-fir forest. Lodgepole pine forests will have to reduced from 23,397 acres (29.3%) down to 18,288

acres (22.9%). This requires a reduction of lodgepole pine forests of 5,109 acres. Thus the total forest reduction required to implement the HRV is 19,013 acres. This is 23.8% of the Castle Mountain landscape.

Along with a targeted reduction of forests by 23.8% in the Castle Mountains to implement the HRV, grasslands will need to be increased from 24.4% (19,358 acres) to 40.3% (32,184 acres). This would be an increase of 12,826 acres. Table 30 in the EIS at page 74 shows that the HRV for grasslands may have been as high as 92% of the Castle Mountains, or largely an unforested mountain range. This would be impossible. Pfister et al. (1976) defines forest habitat types as any acre than contains at least 10 trees per acre. All of the currently-forested acres in the Castle Mountains, which is identified in Table 29, EIS 74, as 60,455 acres, have always been a forested habitat type, and thus contained forests. Even if they burned, they would still remain a forested habitat type. This is approximately 76% of the landscape. It is impossible that at any time in the past that these were grassland habitat types. Yet the EIS at page 74, Table 30, claims that the HRV average forest area averaged only 46.4% of the landscape. The claim that the HRV had 30% less forest than at present is impossible, as forest habitat types will never change; they will always grow trees, with the exception of climate change. The HRV for forests had to be close to 76%, with some give and take for ecotones, which expand and shrink back depending on fire effects. In particular, the western portion of the Castle Mountains is heavily forested, as shown on the cover the EIS, as well as in figure 6, page 7 of the EIS. It would be impossible that these heavily forested areas were grasslands prior to settlement, starting around 1850.

The Forest Service is clearly using a goal of implementing the HRV as a means of dodging Forest Plan direction, which for the Castle Mountains is largely for wildlife, with some emphasis on range. The desired conditions are actually just standard timber management goals. This is indicated by the 3 measures of impacts for this project, called "resource indicators." These are summarized in the EIS at 88-94 for the action alternatives. All these indicators are standard timber production goals.

Resource indicator 1: this will increase ponderosa pine and aspen with logging in order to reduce the "over-representation" of Douglas fir in the Castle Mountains; Douglas fir representation in logging units will be reduced due to thinning; clearcutting will also address the "over-representation" of lodgepole pine and subalpine fir in the Castle Mountains.

Resource indicator 2: change in fuel classes; this will be done by increasing early seral, seedling and sapling stand which will have lower fuel levels than mature stands; fuel will also be reduced by logging forests to make them more open with less fuels; this will also decrease insects and increase tree growth.

Resource indicator 3: again, this indicator will reduce stand densities, canopy layers, and canopy density with logging; this will also reduce the insect hazard in forests in the Castle Mountains.

There is no a single resource indicator for wildlife, even though almost all the MAs in the Castle Mountains emphasize wildlife management.

Throughout the EIS, it is repeatedly noted that the proposed treatments are to increase growth of timber, or to promote timber production. For example, the EIS a 582 states that Douglas-fir forests will be commercially thinned to reduce densities and produce timber volume. The EIS at 585 states that procommercial thinning will improve tree growth. The EIS at 585 states that clearcutting will be done to create a new age class of lodgepole pine. The EIS at 588 states that burning of inaccessible lodgepole pine will be done to create a mosaic of age classes. The EIS at 589 states that burning of logged sites will be done to increase regeneration of serotinous cones for regeneration, and to reduce competing vegetation. The EIS at 474 states that reducing tree densities will be done to reduce fuel loading. The EIS at 614 notes that prescribed burning of meadows and underburning in the Castle Mountains has been done on 2500 acres to range improvements.

The agency attempts to "dodge" the problem of throwing out the existing Forest Plan for HRV by completing 2 site-specific amendments. The EIS at 36 and 102 identifies these as an amendment of Forest wildlife standard C-1(5), which requires elk summer/fall ranges to have at least 30% hiding cover per drainage or elk herd unit, and Management Area (MA) C standard requiring an average of 40% hiding cover per timber compartment, with no lower than 35% in any subcompartment. The requirement to exempt any hiding cover standards to implement HRV means that there is a huge conflict between managing for some vague, most likely fictional HRV versus adhering to existing Forest Plan direction. The EIS at 102 clearly states that these hiding cover standards have to be exempted in order for the restoration project objectives to be implemented.

The impact of these amendments on existing Forest Plan landscape management is clearly demonstrated in the EIS summary of alternatives at iii. Alternative 2 with amendments would treat 21,703 acres in the Castle Mountains. Alternative 3 with amendment would treat 19,081 acres in the Castle Mountains. Alternative 5 with amendments would treat 22,550 acres in the Castle Mountains, which is 28% of the project area (EIS 98). Alternative 4 would not amendment any hiding cover standards, and thus would only treat 3,233 acres, which is 4% of the project area (EIS 95).

The agency falsely assumes that site specific amendments for hiding cover addresses all the violations of existing direction in the Forest Plan. This is not valid, as the management area direction with goals, objectives and wildlife standards for MA C, H, G, J, and E were not amended to be consistent with the proposed action. MA requires maximizing habitat effectiveness for elk, and also to "maintain" important wildlife habitat, including big game winter range, summer range, and nongame habitat. MA H requires minimization of impacts to wildlife, while maintaining the same habitat values as in MA C. Also, MA G, J, and E also have the same wildlife standard as C for maintaining important wildlife habitat from elk winter range to nongame habitat. None of the proposed management actions are consistent with these wildlife standards for these MAs. As a result, Forest Plan direction will be violated for all these MAs, in violation of the NFMA which requires management actions be consistent with the Forest Plan.

B. The agency is violating the NEPA and APA by claiming that the purpose of the project is to implement desired conditions of the HRV, when in fact this is just another logging/grazing program; the objectives to promote timber and grazing are not consistent with any of the MAs in the project area except MA D, so MA direction to maintain wildlife habitat is being violated for all remaining MAs, in violation of the NFMA.

The EIS at 84-87 defines the various types of treatments proposed. These are all standard activities in timber management to promote tree growth and reduce insects. Also, a standard rationale for clearcutting is to create a diversity of age classes. The ecotone removal and prescribed burning of

meadows is also just a standard range management program, as is noted in the Forest Plan for standards for various MAs. There is essentially no connection ever made between why these proposed activities implement desired conditions for HRV, other than burning out ecotones to increase meadows and aerial ignition of forests. In this case, it is not clear why forests in the Castle Mountains should be killed with burning in order to thin the forests out. It is obvious that the Forest Service is using the HRV as a cover for managing timber in the Castle Mountains at the cost to wildlife, which violates the Forest Plan.

Commercial thinning is being done to promote tree growth, enhance diameter growth, and reduce insect infestations; remaining trees will grow faster.

Precommercial thinning will improve tree growth, quality and vigor, and reduce future insects.

Stand Improvement thinning will remove trees under 12 inches dbh to promote tree growth and vigor; residual trees will grow faster.

Clearcutting of lodgepole pine stands will diversity age classes and reduce future pine beetle infestations.

Logging of conifer trees from aspen stands will increase new aspen shoots.

Slashing and burning of meadows will remove ecotones and push back the conifer seed source.

Broadcast burning of harvest units is a standard practice to reduce dangerous fuels created by logging, and to create bare ground to promote new conifer regeneration.

Aerial ignition will kill half of the overstory trees to reduce their density; understory trees will also be killed.

Underburning of forests will kill the smaller understory trees to increase growth of the larger trees.

For all the affected MA, except MA D, the primary emphasis is to maintain and/or improve wildlife habitat. Logging and burning will not meet this standard.

The purpose and need of the project does not include any wildlife management, but instead is for timber and fuels management. Table 50 of the EIS at 101 identifies the following measures for attaining purpose and need:

-tree species diversity
-a mosaic of tree age classes
-restoring fuel structure (thinning forests)
-reducing insects and disease (increasing resilience)

C. The Forest Service is violating the Forest Plan direction by implementing extensive timber management activities on unsuitable timber lands.

The draft ROD identifies at page 5, Table 1, that Alternative 5 will log 1,114 acres of Douglas-fir, clearcut 1,155 acres of lodgepole pine, and do stand improvement thinning on 1,799 acres. The EIS at 106 identifies that only 120 acres of Douglas-fir logging is on suitable timberlands; only 531 acres of lodgepole pine clearcutting is on suitable acres. And only 230 acres of stand improvement thinning are on suitable acres. This means that the majority of the timber harvest and timber production activities (78.3%) will occur on unsuitable lands, as follows:

Alternative 5 as per EIS 106 shows the following activities for suitable timber lands, which comprise 881 total acres:

Douglas-fir thinning: 120 acres
Lodgepole pine clearcuts: 531 acres
Stand Improvement Thinning: 230

Total Suitable Land Timber Management: 881 acres

The draft ROD at page 5, Table 1 shows the following activities for timber harvest and timber production activities, for a total of 4068 acres of timber production and timber harvest:

Douglas-fir thinning: 1,114 acres
Lodgepole pine clearcuts: 1,155
Stand improvement thinning: 1,799

Total timber management acres: 4,068

Thus the percentage of timber management that will occur on unsuitable timber lands is tabulated by dividing 881 acres of suitable lands by total timber management acres of 4,068, which comes to 21.7%. Thus 78.3% of the proposed timber management activities are scheduled for unsuitable timber lands. The EIS at 106 claims that this massive timber management program on unsuitable timber lands is allowed because this is benefiting other resources. The severe impact of the timber management activities on 2 forest MIS, including elk and the goshawk, demonstrate that timber management on unsuitable acres is not benefiting another resource, but is only being done for timber production. Timber management on this huge expanse of unsuitable lands is also only possible with the exemption of the project from Forest Plan and Management Area C hiding cover.

There are 1155 acres of clearcutting in lodgepole pine planned (EIS 106), of which 10 of the 13 units are over 40 acres in size. The EIS does not identify which units over 40 acres are located on unsuitable lands. Regardless, only 513 acres of the proposed clearcutting are located on suitable timber lands (EIS 106). This means that 642 acres of clearcuts, or 56% of the clearcuts, are located on unsuitable timber lands. It is not possible that clearcuts are beneficial to any of the 3 MIS for the Forest, including elk, goshawks and three-toed woodpeckers.

D. The Forest Service is violating the Roadless Area Conservation Rule by implementing management activities within the Castle Mountains Inventoried Roadless Area (IRA) that will degrade habitat for wildlife, including the proposed wolverine, the MIS elk, the MIS goshawk, the MIS three-toed woodpecker, and for plants, including the sensitive species whitebark pine.

1. Whitebark pine

Whitebark pine is a sensitive species on the Helena-Lewis and Clark National Forest (e.g., EIS viii; Response to Comments 36). It is also defined a "keystone species" (EIS 145). The Forest Service claims that it is threatened by a lack of fire, pine beetles, and competition from other conifer species (e.g., Response to Comments 36). As a result, they are proposing extensive treatments in whitebark pine stands within the Castle Mountains IRA, treatments that include thinning of various tree species, especially subalpine fir, and prescribed burning. No data was ever provided to demonstrate that this management intervention will benefit whitebark pine. We have the following concerns about the proposed management intervention on whitebark pine.

a. The proposed management intervention of whitebark pine is highly questionable based on the characteristics of these whitebark pine stands described in Pfister et al. (1977); these stands appear to be natural meaning management intervention is not needed to restore healthy whitebark pine.

The current condition of whitebark pine stands in the Castle Mountains IRA appears to be completely natural which means management intervention is not necessary to "restore" healthy conditions. Pfister et al. (1977) describes the types of whitebark pine forests in Montana. At page 111-112, this document discusses the whitebark pine-subalpine fir habitat type. This habitat type has both subalpine fir and whitebark pine, but the subalpine fir depends upon the protective canopy of whitebark pine for good growth to grow tall. Otherwise subalpine fir may only grow to 20 feet tall. In some areas, these forests are defined as "wind timber." Another whitebark pine habitat type (Pfister et al. 1977) at page 114-115 is too dry for subalpine fir, and is above the cold limits of Douglas fir and limber pine; also tree growth may be limited by drought; as a result, these stands are largely composed of just whitebark pine, many of which are dominated by pole-sized trees. A photo of such a stand is provided at page 114 of Pfister et al. (1977) that was taken in the Little Belt Mountains, which is just north of the Castle Mountains. This appears to be the dominant whitebark pine forest type in the Castle Mountains. For example, the EIS at 76 notes that whitebark pine habitat in the Castle Mountains is primarily pole-sized trees (5-9.9 inches dbh), while the EIS at 146 notes that 93% of the whitebark

pine stands are pole-sized. Also, Figure 4, EIS page 5, shows a relatively dead whitebark pine stand with very few other tree species. And Figure 22 at 47 of the EIS show a dead whitebark pine stand that is also almost completely just whitebark pine. So it appears that these whitebark pine habitat types are not suffering from competition from other tree species. They are the most hardly, cold tolerant species which allows them to dominate these sites that are too harsh for other tree species.

b. The proposed treatments are based on timber production strategies employed at lower elevations in better growing conditions, and may actually be harmful in the harsh growing conditions of affected whitebark pine stands.

Thinning small diameter whitebark pine stands, or 10-15 feet around immature whitebark pine, and thinning around mature cone producing whitebark pine for up to 30 feet (EIS 47) appears to be based on a timber production strategy, which is done to increase growth in remaining trees. It seems likely that opening these stands by removing subalpine fir, a dense stubby tree that mitigates climate conditions, may create a threshold of cold, windy and harsh colder conditions that whitebark pine may not be able to survive. After all, it is present on these sites due to its cold hardiness, but there are limits, which is why above timberline there are no trees growing. Also, growing larger whitebark pine will also increase their vulnerability to the bark beetle, which selects larger trees as hosts. And it is also not clear that there is very much actual competition between whitebark pine and other tree species, such as subalpine fir, and whitebark pine is the best adapted to these harsh growing conditions.

The EIS does not provide any long term data that demonstrates that this thinning strategy has promoted the development of cone-producing whitebark pine at these high elevations. Experimental treatments are not appropriate within an IRA, especially if they actually may cause damage to the treated trees.

c. It is not clear why burning and thus killing whitebark pine regeneration within treated stands will benefit this sensitive species.

Figure 4 at page 5 of the EIS shows a whitebark pine stand that has been heavily harmed by the pine beetle. However, there is an understory of young

whitebark pine regeneration developing. It is not clear how prescribed burning will avoid killing most or all of these young whitebark pine trees.

d. The agency treatment proposals for whitebark pine are highly questionable because they define clearcutting lodgepole pine outside the IRA as "restoration" of whitebark pine.

The EIS at 89 notes that unit 207 is a 72 acre clearcut of lodgepole pine. Because this stand contains some whitebark pine, this clearcutting is defined as whitebark pine restoration because efforts will be made to protect the whitebark pine trees from cutting. It is not clear why lodgepole pine trees will not again dominate this clearcut within several decades after clearcutting. The EIS did not provide any science or monitoring that demonstrated that lodgepole pine clearcuts grow into whitebark pine stands.

2. MIS Elk

a. The massive acreage to be treated in the Castle Mountains IRA will create massive disturbances for elk in the summer.

The proposed treatments in the Castle Mountain IRA include 14 acres of aspen thinning, 69 acres of stand improvement thinning, 1,962 acres of meadow treatment where ecotones will be removed, burning forests on 3,659 acres (5.7 square miles) with up to 50% mortality of the overstory, and 844 acres of treating whitebark pine as discussed above. Thus in the 29,498 acre IRA, a total of 6548 (our figures) to 6773 acres (FS figures in Table 1, Draft ROD 5) will be treated. This will be 22% of the IRA. Elk is an MIS for the Forest, and disturbance/displacement effects to elk indicate the level of disturbance/displacement on other wildlife as well. This displacement will take quite a few years, given the large acreage planned for treatment. The EIS has no measures to indicate that this displacement/disturbance effect will be balanced out by a similar level of benefits to elk. The elk population, which is managed by the Montana, Fish, Wildlife and Parks (MFWP) is about double the MFWP objective, so elk are clearly not limited by forage that may be created in treated areas. As per Table 152 in the DEIS at 435, the elk population objective of 600 (range from 480-720) was 1545 in 2013-14, 1766 in 2014-15, and 1501 in 2015-16. The DEIS notes that elk populations are above objectives for all measured Montana Final Elk Management Plan parameters for the Castle Mountains elk management unit.

Given that resource management activities have occurred, and are planned to occur extensively in the adjacent non-IRA areas of the Castle Mountains, the value of the IRA for summer undisturbed habitat is likely high.

One factor that is never clearly defined in the EIS is what the motorized use will be in order for 6,548 acres of treatment activities to be completed in the IRA. The motorized route density during IRA treatments is never identified. It is also not clear why motorized activity is suitable for the IRA. Without motorized access, it is difficult to understand how these 5.7 square miles of treatments can be completed. This motorized access will clearly degrade elk summer habitat. Extensive disturbances to MIS elk in the IRA is inconsistent with the purpose of roadless areas where natural processes are to be maintained. Disturbance of wildlife with treatments is not a natural process.

b. The treatments planned in the Castle Mountains IRA will exacerbate the lack of elk security in the Castle Mountains, and increase elk displacement to private lands in the fall hunting season; the proposed treatments will reduce MIS elk fall use in the IRA for the long term until hiding cover redevelops on treated acres after in several decades or longer; reducing MIS elk fall use in this IRA for decades does not constitute restoration of ecological conditions.

It is clear that the Castle Mountains suffers from the same elk displacement problem that occurs across many herd units in Montana, where elk seek refuge on private lands in the fall hunting season to escape hunters (Dickson 2014). This problem is created by a lack of adequate security on public forest lands. Security is defined by the current best science as blocks of contiguous forest cover at least 250 acres in size, and at least 0.5 miles from an active motorized route (Hillis et al. 1991). This definition of elk security is also used by MFWP (Profitt et al. 2013). It was based in part by research by Weber (1996) on the location of elk kill sites, and by selection of habitat by elk in the fall hunting season (Lyon and Canfield 1991). The concerns of elk displacement to private lands in the fall hunting season on the Helena-Lewis and Clark National Forest have been extensively raised by MFWP (MFWP 2014). This issue has also been reported on in MFWP's magazine, Montana Outdoors (Dickman 2015). It was also reported in the Bozeman Daily Chronicle in 2013 (Lundquist 2014). Elk populations have grown too high in 80 of Montana's 138 elk management areas (58%) that have population objectives (Dickson 2015).

The burning and thus killing of up to 50% of mature trees, plus the understory, on 3,659 acres of the IRA forests will eliminate and fragment elk hiding cover, and remove it as security habitat for up to 50 years, or when hiding cover regrows in these burned areas. The IRA is currently providing high quality elk security area in the Castle Mountains, with much of the remaining area of these mountains lacking in hiding cover and containing many motorized routes. Even if the new proposed Forest Plan management direction based on HRV claims trumps the Roadless Area Conservation Rule, historic vegetation conditions would not have included the vast network of roads that now cover our national forests developed for logging. Pfister et al. (1977) at page 15 noted that about half of the forest lands in Montana had been logged by 1973. As an example, the Castle Mountains Restoration proposal outside the IRA includes 1,114 acres of Douglas-fir logging, 1,155 acres of clearcutting, and 676 acres of stand improvement commercial thinining, for a total of 2945 acres of hiding cover removal. When the noncommercial stand improvement thinning is added, or 1123 acres, this comes to 4068 acres of planned removal of hiding cover outside the IRA, which is 6.4 square miles. It should also be noted that the one of the proposed clearcuts is larger than the minimum security area size of 250 acres. Unit 173 is 391 acres. The average size of the 14 units proposed for clearcutting is 82 acres. The average size of clearcuts in Management Area C, which is to emphasize elk, is 109.5 acres.

Due to a lack of analysis regarding the valid definition of elk security by Hillis et al. (1991), it is not clear that any elk security exists in the Castle Mountain public lands outside the IRA. This clearly demonstrates that one of the most important ecological functions of this IRA is to provide elk security.

Elk security will also be degraded by the slashing/burning of ecotones along meadow edges (1,962 acres of treatment in meadows). This treatment is also very widespread, as it will occur in 35 units spread across the IRA. The acreage of ecotones that will be removed is never identified. In fact, there is no actual category of habitat for ecotones in the Castle Mountain analysis. It is also unknown what the total acreage of ecotones are in the Castle Mountains IRA, or what percentage will be removed with slashing and burning. Ecotones provide both hiding cover and additional security for elk (Groves et al. 2005).

Although the Forest Service claims that removing trees from ecotones, such as are shown in Figure 21 at EIS 46, will restore grasslands, this is not actually true. The MFWP has noted that if a site grows at least 10 trees per acre, it is a forest habitat type (FS-MFWP MOU 1998). Ecotones are a natural expansion of forests out into grasslands based on conifer seed dispersal. The removal of ecotones is a range management practice, as is clearly noted in the Lewis and Clark Forest Plan (e.g., "use prescribed fire to control tree/shrub encroachment and to maintain and/or enhance forage production on the range" (Forest Plan at 3/16 for MA C, 3-23 for MA D). This practice clearly is not new management for HRV, nor is it management for MIS elk. There have been 2500 acres of prescribed burning in the project area in the past, including broadcast burning and understory burning, for range management purposes (EIS 636).

3. MIS Goshawk

a. **Burning up to half of the lodgepole pine forests on 3,659 acres in the Castle Mountains IRA, which will kill both overstory and understory trees, will remove and fragment habitat for the MIS goshawk; since the goshawk indicates the health of wildlife populations associated with older forest habitat on the Helena-Lewis and Clark National Forest, this activity will be detrimental to many forest species; degradation of native wildlife species habitat within a roadless area does not constitute ecological restoration.**

The lodgepole pine forests in the Castle Mountains IRA have been impacted by the mountain pine beetle (see cover of EIS). This effect will reduce habitat for an important goshawk prey species in Montana, the red squirrel (Clough 2000). On the other hand, this process will increase habitat for 2 other important goshawk prey species in Montana as well, including the snowshoe hare (Id.) and woodpeckers (Johnson 2015). Similar goshawk diets have also been observed in Wyoming (Squires 2000). Based on many years of the Forest's monitoring program for goshawks, the primary foods of goshawks are snowshoe hares, squirrels, grouse, three-toed woodpeckers, flickers and gray jays, with cottontails becoming important prey at lower elevations (Johnson 2015).

The red squirrel requires relatively dense, multi-aged older forest stands that produce an abundance of conifer cones, which provide the primary food eaten by squirrels, which provide hiding cover from predators, and provide

cool moist sites that prevent germination of cones while they are being stored (Patton 1986). Thinning of forests has been shown to reduce red squirrel populations (Sullivan and Moses 1986; Holloway and Malcolm 2006; Herbers and Klenner 2007). This reduction of red squirrels generally corresponds to the amount of forest removed (Id.).

Insects and disease are an important process for several goshawk prey species. The red squirrel has been reported to feed extensively on the spruce bark beetle in Canada (Pretzlaw et al 2006). The MIS three-toed woodpecker feeds heavily on the bark beetle, and breeds on the Helena-Lewis and Clark National Forest in dense snag patches (up to 70 snags per acre over 9 inches dbh) created by bark beetle infestations (Saab et al. 2012). Bark beetles infestations also create a burst of snag habitat across the forest (Id.), which benefits the 25% of forest birds that nest in dead trees (Bull et al. 1997). The current best science has reported that snag habitat is limited for wildlife because as few as 4% of existing snags may be soft enough to allow cavity construction (Vizcarra 2017).

Pine beetle infestations also create habitat for snowshoe hares. This species is heavily tied to dense understory vegetation provided by subalpine fir and spruce trees (Holbrook et al. 2017; Squires 2009; USDA 2011) The low branches of subalpine fir and spruce provide hiding cover for hares, while the young lodgpole pine trees provide the highest quality winter food source of all conifer species (Holbrook et al. 2017). Subalpine fir responds to the death of lodgepole pine by increasing, which in turn provides prime habitat for snowshoe hares. This effect is increasingly recognized. In a publication by the Forest Service Rocky Mountain Research Station, it was noted that beetles may impart a characteristic critically lacking in many pine forests today, which is structural complexity and species diversity. The title of this report is "From death comes life: recovery and revolution in the wake of epidemic outbreaks of mountain pine beetle." Their findings include the following: surviving understory trees respond vigorously as beetle-killed canopies open and more water and nutrients become available; bark beetle outbreaks promote diversity in the species composition, age and structure of forests they infest, which may benefit forest health through increased resilience following future disturbance; untreated beetle-killed stands may be of great benefit to non-human forest inhabitants; the prevalence of fir following beetle outbreaks could be a boon for wildlife species that rely on the complex vertical structure that is generally lacking in lodgepole pine-dominated stands; by driving these shifts at a huge spatial scale, beetles

might even be viewed as a biological mechanisms for creating the habitats that now limit some of the species we care most about, including the Canada lynx which benefits form the creation of hare habitat.

In conclusion, burning up lodgepole pine forests that have been impacted by the mountain pine beetle in the Castle Mountains IRA will be detrimental for two of the Helena-Lewis and Clark MIS, the goshawk and the three-toed woodpecker, which represent effects on many other species as well. The project EIS did not provide any information as to why degradation of MIS habitat in this IRA constitutes ecological restoration.

4. MIS Three-toed Woodpecker

Research on the Helena-Lewis and Clark National Forest has found that the three-toed woodpecker, a forest MIS, thrives in pine beetle-infested forests. Saab et al. (2012) reported that this woodpecker nested in ponderosa pine beetle-infested stands with up to 70 snags per acre. The Lewis and Clark National Forest reported in their 2011 viability assessment that research has shown that in Idaho and Montana, 59 of 61 three-toed woodpecker nests were in unlogged study plots; it was also noted that harvest of old growth forests reduces habitat for this MIS species. Goggans et al. (1988) recommended that management for this species be based on 528 acres of older, unmanaged forests per pair of three-toed woodpeckers. Management at 60% of the potential for this species would be roughly habitat for 6 pairs of three-toed woodpeckers, which would be a contiguous area of 3,168 acres of unmanaged forest. *Id.* These "woodpecker management areas" would have no timber harvest of any kind, including salvage. *Id.* These woodpecker management areas are clearly one of the key values of IRAs, where natural processes, including pine beetle infestations, are allowed to occur for the benefit of wildlife. The proposed management intervention in the Castle Mountains IRA to burn up to half of 3,659 acres of forests infested with pine beetles contradicts the ecological purpose of IRAs, which is to protect natural processes from human intervention.

5. Sensitive Species Black-backed Woodpecker

The Forest Service claims that one of the purposes of the management intervention into the Castle Mountains IRA is to reduce the chances of "uncharacteristic wildfire." The actual definition of uncharacteristic wild

fires is never identified with any definition, or with any actual science. Yet the sensitive black-backed woodpecker is highly dependent upon mixed severity wildfires for viability (Hutto 1995). Hutto and Patterson (2016) reported that of 50 bird species, 60% were detected more frequently inside than outside burned forest habitat in a mixed conifer forest in western Montana. Hutto et al. (2016) reported that many plant and animal species use, and have sometimes evolved to depend on severely burned forest conditions for their persistence, including the black-backed woodpecker. Management intervention in the Castle Mountains IRA to reduce the potential for severe fires, and viable populations of the black-backed woodpecker, violates the NFMA by ensuring that habitat diversity is provided across the landscape. Where better to allow natural fires, fires that will not be subject to subsequent salvage operations, than within an IRA.

6. Wolverine

The wolverine is considered a sensitive species in Region 1, and is currently proposed for listing under the Endangered Species Act (ESA) (EIS 648). This species has been identified as being on the Helena-Lewis and Clark National Forest within the last 3 years (EIS 661). Although the EIS at 652 notes that survival of wolverine in Montana have been due to the availability of inaccessible habitats, including wilderness areas, the agency claims that the only impact of any of the proposed vegetation treatments in the Castle Mountains, including the IRA, will be temporary displacement of the wolverine during the 5-10 years of the project (e.g., EIS 654, 657, 659). It is also claimed that these disturbances will be controlled by limiting treatments to one watershed at a time (EIS 656, 661). It is not clear this will actually be done. Figure 1 in Appendix B, page 1, shows the watersheds for the Castle Mountains, including within the Castle Mountains IRA. It appears that there are at least 7 different watersheds across the IRA. It is also clear that many of the proposed treatment units cover more than one watershed. There is no information in the EIS as to how one treatment unit will be broken down by watershed and treated at separate times. The Forest Service also claims that these disturbance/displacement effects will be no greater than what occurred naturally, prior to human settlement (EIS 657). Since historic disturbances, including fire, would not have been accompanied by humans, this claim is surprising.

The EIS claims that the proposed treatments, including in the IRA, will not change prey species for the wolverine because the variety and abundance of

prey species will increase (e.g., EIS 654, 659). Identified prey species include the red squirrel and snowshoe hare on the Helena-Lewis and Clark National Forest (Gehman et al. 2014), and the EIS at 657 also identifies pine marten, marmots, and ground squirrels as wolverine prey. As previously noted, red squirrels and snowshoe hares depend upon forest habitats, and will decline when forests in the IRA are burned. Marmots and ground squirrels are not forest species, so will not be affected by treatments in the IRA, while pine marten depends on forest habitats in the winter (Sherburne and Bissonette 1994). The EIS also noted that elk are one of the primary sources of carrion and prey for wolverine year round. This would include what is defined as "large prey events" such as winter-killed elk and elk/moose killed by other predators, as mountain lions (Gehman et al. 2013; Scrafford and Boyce 2018), elk calves (Kuglin 2018), and elk wounded by hunters as well as elk gut piles (Gehman et al. 2014).

The proposed treatments in the IRA include 6,548-6,773 acres of disturbance and human activity. This will reduce the availability of elk to wolverine in the summer due to disturbances during project activities. Displacement of elk from the IRA in the hunting season due to disturbances and a reduction in elk security will reduce the availability of wounded elk and gut piles to wolverine in the fall for the longer term, as restoration of security will take up to 50 or more years for good hiding cover to redevelop in burned areas (USDI 2011). Prescribed burning of meadows and thus ecotones and sagebrush within them in the spring will reduce the availability of elk calves to wolverine in the early summer. Degradation of elk winter range by removing trees and sagebrush in the IRA will reduce the availability of elk carrion to wolverine in the winter as reductions in thermal and hiding cover (various tree species) and forage (trees species as well as sagebrush) likely will push more elk to private lands. The proposed treatments in the IRA will clearly have an adverse impact on food availability for the wolverine. This impact is denied in the EIS. The EIS at 659 states that the project will increase the variety and abundance of wolverine prey, and thus will have no negative effects.

In addition to claiming that the treatments will increase abundance of wolverine prey, without citing any actual research, the agency also attempts to dismiss the disturbance impacts on the wolverine in the Castle Mountains IRA by suggesting that there is no suitable maternal habitat (undefined) (EIS Table 237-240). And there is only a small amount of primary habitat (undefined) (708 acres out of a total 2,760 acres) that will be affected. And

since the area has no maternal habitat, the affects on 2,830 acres of persistent snow habitat out of a total 14,184 acres is not relevant (EIS 656). The EIS also claims there will be no impact on linkage habitat between the Crazy Mountains and the Little Belt Mountains because there will be plenty of dispersal habitat remaining. Dispersal habitat is also never defined. In addition, the EIS claims that vegetation treatments are not known to affect wolverine as per the 2013 analysis of the U.S. Fish and Wildlife Service for proposing listing of the wolverine.

The EIS infers that wolverine habitat can be specifically identified by category, and impact to these various categories is a valid measure of environmental impacts, outside of disturbance effects. However, monitoring of wolverine habitat on the Helena-Lewis and Clark National Forest has suggested that in fact, wolverine habitat use varies as per landscapes that are being used, and that high-quality wolverine habitat does not necessarily fit the standard definitions. Gehman et al. (2014) reported that wolverine habitat in this landscape does not fit the currently-described features for wolverine habitat; they noted that wolverine habitat use in the Ogden Mountain to Nevada Creek region represents valuable and heavily used wolverine habitat that would not even be considered as wolverine habitat in other analyses; their wolverine habitat use data contradicts attempts to define wolverine habitat based on elevation and/or persistent snow; areas wolverine were using would not be considered good wolverine habitat based on current definitions of wolverine habitat. This Forest monitoring data was never used in the analysis of project impacts for the wolverine in the Castle Mountains Restoration Project.

Other information that was not used in the Castle Mountains Restoration Project analysis of wolverine is the importance of winter carrion to wolverine, including within the IRA. Management of winter carrion for wolverine has been identified as a key factor in sustaining wolverine (Scrafford and Boyce 2018).

One of the functions of IRAs is to provide natural habitats for wildlife where management activities do not displace animals, as well as do not change the habitats based on human goals and objectives. In the Castle Mountains, the only difference the Forest Service sees between the IRA and remaining areas of this mountain range, however, is the prohibition of logging and roads in the IRA. Any other type of resource management activity is considered acceptable, regardless of impacts to natural ecosystems and the wildlife that

exist in them. The proposed treatments in the IRA include 6,548-6773 acres, or almost 30% of the IRA. None of the current science identifying the high sensitivity of wolverine to the "human footprint" and human disturbances was cited in the analysis (Stewart et al. 2016; Scrafford et al. 2018; Fisher et al. 2013). The highest sensitivity appears to be to motorized routes (Scrafford et al. 2018; Ray 2018). However, Heinemeyer et al. (2019) found that wolverine avoided areas of non-motorized recreation by humans in the winter, even at low levels of human use; dispersed or off-road recreational use elicited a stronger response than recreation along roads and groomed routes; they concluded that this avoidance results in potentially important indirect habitat loss when a significant portion of an animals home range receives recreation use. This study cited other research that supported their observations that spatially predictable or confined recreation travel patterns may be perceived by wolverines as less risky. All of the various proposed treatments in the Castle Mountain IRA will require extensive human activity, be widely dispersed and be unpredictable for wolverine. These types of disturbances would not have occurred in the HRV.

There is no actual information in the EIS as to how the 6,773 acres of treatments in the IRA will be accomplished as per motorized access, including possible reconstruction of some roads and trails.

There is no scientific-based benefit to the proposed treatments of up to 6,773 acres of wolverine habitat in the Castle Mountains IRA. The loss of food resources, and what appears to be a 5-10 year disturbance period over time, does not represent promotion of ecological characteristics of this IRA for wolverine. The value of the IRA for wolverine is clearly demonstrated in the proposed treatments in the rest of the Castle Mountains. Treatments on 15,777 acres adjacent to the IRA will require 20 miles of new road construction, including conversion of trails to roads. This landscape will be heavily disturbed, which means that the IRA should be providing the only suitable dispersal habitat for the wolverine in the Castle Mountains. Provision of secure habitat free of human management activities is clearly an important ecological value of IRAs.

7. Canada Lynx

The agency claims that there will be no adverse impacts to the threatened lynx due to the Castle Mountain Restoration Project, including treatments of 6548-6773 acres within the Castle Mountain IRA (EIS 588). The

disturbances required to treat these acres over a 5-10 year period in the IRA are considered temporary and thus not important (EIS 601). And it is claimed that there are no lynx using the Castle Mountains, although there have been no surveys. The EIS also claims the Castle Mountains have never had lynx present (EIS 572), although the 1998 lynx distribution map developed by the MFWP shows the Castles to be occupied by at least one lynx territory. The EIS also claims that lynx while lynx "may be present," EIS 580), they at the same time state that they are not present in the Castle Mountains because there is not sufficient snowshoe hare habitat to provide foraging. These habitats are summarized in Table 214 of the EIS. Multistory habitat and stand initiation habitat, both considered lynx foraging habitat, comprise only 9% in lynx analysis unit (LAU) CA1, and 20% of the landscape in LAU CA2 (1727 acres of the total 18,995 LAU acres in CA1, and 3807 acres out of the total 19,000 acres in LAU CA2). These estimates of lynx foraging habitat are based on "estimates" of whether their primary prey, is present or absent. There have been no actual snowshoe hare surveys, such as by measuring pellets or tracks.

These estimates of snowshoe occupancy of forests in the Castle Mountains are far lower than what snowshoe hare occupancy generally has been found in western Montana. Holbrook et al. (2017) surveyed hare pellets on 3.6 million acres in Montana, and found on average snowshoe hares occurred on 67% of the forested sites. They also found that there was a gradient of hare densities, with use increasing along with horizontal cover. The range of hare use measured by pellets were 0.28/ha, 0.81/ha, 1.48/ha, and 4.21/ha. Thus the analysis method used for hare habitat in the Castle Mountains, including for the IRA, that hares are either present or absent, is inconsistent with the current best science. Also, there is no actual science ever cited in the Northern Rockies Lynx Management Direction (hereafter "Lynx Amendment") as to how it was determined that there are no snowshoe hares in forests that are not multistoried. There was also no pellet monitoring in the Castle Mountains used to estimate hare habitat. It is clear that hare habitat in the Castle Mountains is likely much higher than claimed in the EIS, which means that treatment impacts on hare habitat will be greater than claimed. This underestimation of project impacts on hares means that the determination of no adverse impacts to lynx may not be accurate.

Underestimating project impacts on lynx for the Castle Mountains Restoration Project means that the impacts of treatments in the IRA are likely much greater than reported in the EIS. Habitat degradation for lynx

and hares outside the IRA will increase the importance of habitat within the IRA. The most significant degradation will occur with the prescribed burning on 3,659 acres of lodgepole and Douglas-fir forests within the IRA. The EIS at 588 claims that lodgepole pine forests that are inaccessible will be burned to create a mosaic of age classes. Figure 36 at EIS 578 shows a mature lodgepole pine stand without a current understory, which may be typical of those proposed for burning in the IRA. Although this stand may have limited hare use at present, the current best science notes that over time, this type of stand can provide high quality hare and lynx habitat (Malcolm 2012). This publication by the U.S. Forest Service Rocky Mountain Research Station, notes that various disturbance processes, including insects, in lodgepole pine forests, promote stand structure which include subalpine fir; this species which is able to develop in the shade of lodgepole pine logs, while lodgepole pine continues to regenerate in areas that have full sun. This process promotes structural complexity and tree species diversity thanks to the mountain pine beetle, and in turn favors the expansion of wildlife species of conservation concern, including the lynx. The complex mix of subalpine fir, that provides good cover for hares, and lodgepole pine seedlings and saplings, which provide the highest quality conifer nutrition to hares (Holbrook et al. 2917), provides the highest quality year-round habitat for both hares and lynx. Thus allowing the lodgepole pine forests in the Castle Mountains IRA to gradually progress into more complex stands promotes the lynx. Preservation of these natural processes is the purpose of IRAs. Although hares can reach high densities within young, developing forests, at some point in time these younger areas will be created by natural fires, without the extensive human intervention that would be required for burn forests in the IRA. Also, it is not clear that these managed fires will replicate natural fire conditions to create high densities of lodgepole pine saplings in burned areas. Also, since the Castle Mountains are generally considered "dispersal habitat" instead of "breeding habitat," the need for dense young regenerating stands that provide female lynx with kittens easy access to hares may not be as important as having security linkage habitat, which require high levels of contiguous cover to protect lynx from predation from other carnivores, as mountain lions. Lynx mortality by lions is a significant cause of lynx mortality (31% of total mortality in Squires et al. 2006). Predation may be one important factor why lynx are known to avoid areas of low cover (Holbrook et al. 2018). The proposed treatments in whitebark pine, where cover will be reduced, including subalpine fir, may have the same effects of degrading linkage habitat for lynx.

8. Old Growth

The EIS at 609 states that old growth forests in the Castle Mountains based on FIA data is likely 12%. FIA data does not identify the location of any old growth stands. The acres of old growth that will be treated within the IRA is not actually identified in the EIS. However, it appears that treatment of old growth within this IRA will be at least 367 acres. The EIS at 613 states that all alternatives will treat some old growth on noncommercial forest lands. In the EIS section on old growth, it is noted that Alternative 5 will burn 301 acres of forest, and doing commercial thins on 66 acres of Douglas-fir. These Douglas-fir units appear to be units 265b and 265c. The location of the 301 acres of burning old growth likely includes the IRA, which are noncommercial forest lands. Burning forests in the IRA for Alternative 5 includes 3,659 acres (Table 3 in Appendix of draft ROD). Prescribed fire on the 301 acres would be to reduce wildfire hazard (EIS 613). Treatment on the 66 acres of Douglas-fir old growth would be to improve stand health and vigor. Thus these treatments are for fire prevention and timber management, not ecosystem management in this IRA.

The EIS at 606 notes that there are 48 species of wildlife that as associated with old growth forests in Region 1 of the Forest Service. The estimated amount of old growth in the Castle Mountains of 12% is below the recommended levels for wildlife associated with old growth forests of 20-25% (Reynolds et al. 1992; Montana Partners in Flight 2000). Historical levels of old growth in the northern Rocky Mountains is estimated at 20-50% based on fire cycles by Lessica (1996). The level of old growth within the Castle Mountains IRA has not been determined or mapped; only 20,000 acres of forest in the project area were surveyed for old growth. Reducing functional old growth within the Castle Mountains IRA will exacerbate existing shortfalls of old growth, and be detrimental to the 48 wildlife species associated with older forests, in violation of the Roadless Area Conservation Rule.

9. Aspen

The EIS infers that management of aspen stands is necessary in order to eliminate competition with conifers with logging. This lack of regeneration (EIS 150) across the Castle Mountains is attributed to conifers. Examples of

a lack of aspen regeneration are obvious in Figure 2 at EIS 3, and Figure 20 at EIS 45. The latter figure is provided to demonstrate that aspen regeneration has responded to the removal of conifers. However, aspen in this photo has the typical characteristic of livestock damage, where saplings are unable to grow more than a foot or so high due to repeated browsing by cows. Restoration of aspen will require removal of livestock, not conifers.

E. The agency is violating the NEPA, the NFMA and the APA with their analysis and proposed management of old growth and the 48 wildlife species associated with this habitat.

1. Failure to Inventory Old Growth to Meet Forest Plan Standard.

There has been no complete inventory of old growth in the Castle Mountains. The agency "estimates" there is 12% old growth forest based on FIA data and survey efforts, or 8,138 acres (EIS 610). Old growth is likely higher on commercial forest lands. There were 2,790 acres of old growth over 20 acres on 21,980 acres surveyed (Table 221), which would be 12.7% old growth. The location of old growth stands in the project area is never mapped, which is due to a lack of inventory data. The types of old growth stands identified (Douglas-fir, lodgepole pine, whitebark pine, for example) are never reported in the EIS, even though the type of old growth has a significant effect on the values to wildlife. Due to a lack of inventory, the agency cannot report the patch size of old growth in the Castle Mountains. The patch size of known old growth stands was not reported. The EIS at 606 cites a reference that 60% of the 48 old-growth associated wildlife species in Region 1 of the Forest Service are thought to require stands larger than 80 acres.

There are 46,716 acres of commercial forest lands in the Castle Mountains (EIS 610, Table 221). Only 21,908 acres, or 47% of the commercial forest lands, were surveyed for old growth characteristics. *Id.* Three timber compartments do not have 5% old growth on commercial forest lands identified (compartments 626, 715 and 716). *Id.* It is unknown if these 3 compartments meet the Forest Plan standard. The amount of planned harvest

on developing old growth in these compartments is unknown, or old growth on noncommercial lands. The 367 acres of treatment in old growth stands in Alternative 5 on noncommercial lands may occur in these 3 compartments that are not known to meet the Forest Plan standard. Nor has there been no identified effort to plan for recruitment old growth in these compartments to meet the Forest Plan standard.

The agency has determined that old growth stands less than 20 acres will not be identified for old growth management (Table 222, EIS 612). There is no information provided in the EIS as to how many acres of old growth on commercial forest lands will be treated that are less than 20 acres. Removing old growth stands that are less than 20 acres is size is not a Forest Plan standard, but a recommendation. These stands would contribute habitat for old growth-associated species, including the 11 species that require snags for nesting. And a mosaic of various-aged stands across the Forest is a normal condition due to severe fire, which also burns in a mosaic. Given the paucity of old growth forests on the Helena-Lewis and Clark National Forest, any management actions that can help mitigate this habitat shortage to promote wildlife viability should be implemented, especially on landscapes as the Castle Mountains where maintaining wildlife habitat is the emphasis for almost all the Management Areas.

The 2011 MIS viability assessment on the Lewis and Clark National Forest (USDA 2011) noted at page 106 that the old growth estimate on the Lewis and Clark National Forest is 12.06%; 9.7 % of this old growth is estimated to occur on commercial forest lands, with only 2.36% occurring on noncommercial forest lands. Thus one can not expect landscape old growth to be protected due to its occurrence on noncommercial forest lands. In addition, old growth at higher elevations, which would likely be noncommercial, such as whitebark pine habitat, is not suitable for most old growth-associated species, including the old growth MIS for the Lewis and Clark National Forest. The Castle Mountains EIS at 554, 555, and 562 note that goshawks on the forest do not use whitebark pine habitat because it is too high in elevation.

2. Failure to Evaluate Project Impacts on Old Growth-associated Wildlife

The EIS at 606 states that "**it is assumed that the Forest Plan standard for old growth provides a level of old growth that meets wildlife needs.**" This is the extent of the analysis of the impacts of the project on old growth. The Forest Plan for the Lewis and Clark National Forest was completed in 1986, or over 30 years ago. The Forest Plan standard for old growth is 5% of "commercial forest lands." For the Castle Mountains, there are 46,716 acres of commercial forest land (Table 221 at EIS 610); 5% of these commercial forest lands would be 2,336 acres required by the Forest Plan. The Castle Mountains contains 69,605-69.649 acres (EIS i, 136) of Forest Service lands. Required old growth on 2,336 acres equates to 3.3% (2,336 acres divided by 69,605 total acres).

Old growth forests also do not have to be well distributed on the Forest. There is no requirement to maintain any old growth on noncommercial forest lands. Old growth values on these noncommercial lands may be significantly degraded by management activities, as are planned for the Castle Mountains. In addition, the values of old growth forests to wildlife will decrease as elevation increases, due to the increasing harshness of the climate. Holbrook et al. (2017) noted that protected areas in wilderness areas have lower densities of snowshoe hares, and as a result, these areas will have a lower conservation value for species as the Canada lynx. And as was noted in the Castle Mountains EIS, gowshawks do not use whitebark pine forests due to their high elevation (EIS 554, 555 and 562).

For the Castle Mountains Restoration project there are 917 acres of timber management proposed on commercial forest lands (EIS 106). The total acres to be managed for timber include 4,068 acres (Draft ROD Table 1). Thus 77% of the timber management activities will occur on unsuitable timber lands, which we assume are noncommercial. In addition, within the Castle Mountains IRA, there will be 3659 acres of forest burning. It is likely that much of these acres of lodgepole pine impacted by the pine beetle provide "early phase" old growth to wildlife (Hamilton 1993) due to an abundance of snags. Of the 14 species of birds that are likely present in the Castle Mountains and are associated with old growth (Warren 1990; USDA 2018), 11 of these are cavity nesters that depend upon dead trees for nesting. Insect epidemics provide pulses of snags for these species that increase the chances they will find suitable nesting sites, given that as little as 4% of all snags may be suitable for cavity construction (Vizcarra 2017).

The agency is also deleting any old growth stands on commercial lands that are less than 20 acres (Table 221 at EIS 610). This means that many old growth stands on commercial forest lands will be logged. As noted previously 11 old growth-associated bird species depend upon snags as nesting habitat. The agency did not provide any reason why snags in forest patches under 20 acres in size would not provide important nesting habitat to these species. It is noted in the EIS that a "clumpy distribution" of snags is natural (EIS 632, 634). This would be provided by small patches of old growth forests.

The agency is violating the NEPA by limiting the analysis of the project on old growth to attainment of the Forest Plan direction, instead of impacts on wildlife. Thus the severe impacts this project will have on old growth-associated wildlife are never disclosed to the public. First, the amount of old growth in the Castle Mountains, as estimated, is only 12% of the landscape, while 20-25% old growth is recommended for viable populations of associated species, including the for MIS goshawk (Reynolds et al. 1992, Montana Partners in Flight 2000). These recommendations are actually just estimates, as they are near the minimum of historical old growth reported in the literature. Lessica (1996) estimated historical levels of old growth in the Northern Rocky Mountains at between 20-50%. His estimates were based on fire cycles. A group of lynx experts also estimated the amount of older forest habitats that the lynx likely evolved with. McKelvey et al. (1999, Table 15.1) estimated that based on fire cycles, there would be a mix of old growth forests across the landscape. With a fire cycle of 100 years, 23% of the forest would be older than 100 years, and 13% would be over 200 years in age. Forests over 100 years in age would potentially qualify as "early phase old growth," while forests over 200 years in age would like qualify as "late phase old growth" (Hamilton 1993), providing up to 36% functional old growth to wildlife.

In areas with a fire cycle of 150 years, there would be 25% of the landscape over 100 years old, or potentially be early-phase old growth, with 26% being over 200 years old, which would be late-phase old growth; this fire cycle could provide a total of 51% functional old growth.

In areas with a fire cycle of 200 years, 24% of the forests could be early phase old growth, or over 100 years in age, while another 36% would be over 200 years in age and potentially provide late-phase old growth. This could provide a total of 60% functional old growth across the landscape.

Finally, in areas with a 300 year fire cycle, 20% of the forest would be over 100 years in age, or potentially provide early-phase old growth, while 51% of the forests would be over 200 years in age, or potentially provide late-phase old growth. This could provide a total of 71% functional old growth across the landscape.

Given that there would be a mosaic of old growth habitats across the landscape based on McKelvey et al. (1999), this amount would probably average out relatively closely to the optimum level of old growth, or 50%, reported by Lessica (1996).

The required 3.3% old growth in the Castle Mountains is far below what wildlife evolved with. The EIS did not provide any information as to why this level will maintain a diversity of wildlife, including the 48 species Region 1 of the Forest Service says are associated with old growth (EIS 606).

The agency also has made no effort to ensure that the patch size of old growth will sustain associated species. This patch size does not require just old-phase old growth. It could also include early-phase old growth lodgepole pine forests with abundant snags created by the pine beetle, or mature lodgepole pine and Douglas-fir stands. Over time, mature lodgepole pine stands will develop into high-quality old growth (Malcolm 2012). Also, just because a Douglas-fir stand is under 200 years in age, or the age identified for old growth (EIS 607) does not mean that it has no value to wildlife that also use old growth forests. Due to the manner in which severe forest fires burn, in a mosaic, historical forests would have included a mosaic of mature to old forest habitats. What is key is all of these mature and older forest habitat blocks provide habitat continuity as well as relatively consistent forest conditions, including hiding cover, thermal cover, and shaded microclimates. As per the EIS at 608, tree canopies provide a moderated microclimate that buffers wind and keeps temperatures more constant. Older forest habitats are reported to likely provide thermal buffers for forest birds because structurally-complex forests can be cooler than other forests during spring and summer months (Betts et al. 2017).

And large blocks are critical to habitat connectivity for species as the red squirrel and northern flying squirrel, both of which have difficulty traversing open forest habitats (Duncan 2003; Bakker and Van Vuren 2003). The

northern flying squirrel is almost completely dependent upon trees as a means of traveling across the landscape, as it drops one foot for every 3 feet it glides (Bodie 2014). Clearcuts are also noted to be significant barriers to young goshawks (Johnson 2015). And forest openings and sparse forests also provide barriers to snowshoe hares, likely because of the higher predation risk in areas lacking good cover (Lewis et al. 2011).

Relatively large patches of older forest environments are recommended for many old growth species. For example, blocks of older forests at least 540 acres are recommended to maintain genetic viability of the northern flying squirrel (Duncan 2003). Forest patches of 250 acres are recommended for an old growth species, the brown creeper (Wiggins 2005). For an individual three-toed woodpecker, a Helena-Lewis and Clark National Forest MIS, minimum home range sizes of unmanaged forest blocks of 528 acres are recommended (Goggans et al. 1988). Minimum blocks of older, undisturbed forests for the sensitive black-backed woodpecker are 956 acres (Goggans et al. 1988).

There is clearly a lack of any management for functional old growth for the 48 species that are associated with older forest habitats for the Castle Mountains project. The EIS at 613 notes that most stands of old growth that are proposed for designation would have forest management applied in adjacent stands. Treating older forest stands adjacent to old growth forests would be detrimental to old growth-associated species both by eliminating and fragmenting functional habitat. The EIS at 632 and 635 notes that openings adjacent to untreated forests will increase the wind effects, blowdown, of these adjacent stands; forest burning is included as forest openings that will degrade adjacent untreated stands.

3. Failure to evaluate old growth habitat availability for the old growth MIS on the Lewis and Clark National Forest, the goshawk.

The current best science indicates that 20% old growth forests are needed for ensure adequate prey levels for the goshawk (Reynolds et al. 1992). Although the goshawk is not limited to old growth habitat on the Lewis and Clark National Forest, it is dependent upon older forest habitat for foraging due to the presence of key prey species, including the red squirrel, snowshoe hare, and woodpeckers (Johnson 2015; Murphy 2014; Clough 2000). For the

Castle Mountains project, with a limited amount of old growth forests, there was no analysis of how this level of old growth is ensuring viability of the goshawk. This analysis is required since the project will impact old growth habitat. Since the Forest Plan has been in effect for over 30 years, this type of information is essential for timber management, as it reduces old growth forests. Although the monitoring on the Forest indicates that goshawks are not limited by old growth (USDA 2011), the agency needs to complete a forest plan amendment if they are no longer going to use the goshawk as an MIS for old growth.

F. The agency is violating the NEPA and the NFMA by limiting the analysis of project impacts on snag-associated wildlife to adherence to the Forest Plan, even though there has been no monitoring to indicate that landscape snag density is a valid proxy for the MIS three-toed woodpecker; the Forest Plan snag standard has also been invalidated by research by the Forest Service; the agency is also violating the NEPA, NFMA and APA by falsely claiming that the proposed Forest Plan amendments on elk hiding cover will have no impact on snag habitat.

1. The Forest Service limited the analysis of project effects on snag-associated wildlife to attainment of the Forest Plan standard for snags.

The entire analysis of snag habitat in the EIS is a very detailed summary of estimated snag densities across the Castle Mountains by forest type (e.g., Table 231 at EIS 633). There is no mention of the 25% of forest birds that are dependent upon snags as habitat (Bull et al. 1997). The total average snag densities, averaged across the entire Castle Mountains, will remain above the Forest Plan standard for the various timber types in spite of snag removal and/or reduction on 13,400 acres of the Castle Mountains in Alternative 5 (EIS 638). This is 22-25% of the total forests in this mountain range (EIS 637), which are 60,455 acres (EIS 628). Thus the Forest Plan standard will be met. This standard is actually a violation of the NEPA,

because the mitigation for logging is that snags will remain in untreated acres. In other words, existing habitat is being used as "mitigation" for snags that will be lost in harvest units. This is not actual mitigation, since natural snag habitat will clearly decrease and impact associated species. It is impossible for snags in forested areas to substitute for a lack of snags in harvest units, except for on paper. If there are no snags in harvest units, there will be no snag-associated species, even those that will actually nest in more open areas, as the mountain bluebird and northern flicker (EIS 631).

This snag analysis is thus a violation of the NEPA, because the significant loss of snag habitat are not evaluated or disclosed to the public. Instead, the agency claims that the proposed management strategy that averages out snags across the entire landscape will meet wildlife needs (EIS 637). Yet the EIS at 631, 638 also notes that snag habitat will be lost, but that this is necessary to benefit other wildlife species that will benefit from logging and burning. These other wildlife species are not actually discussed. Nor are the wildlife species that will lose snag habitat discussed either.

2. The Forest Plan snag standard that does not require snags within a forested habitat is severely outdated.

Research by the Pacific Northwest Research Station of the Forest Service reported in 1997 that simply providing snags in harvest units does not meet the foraging needs of associated species (Bull et al. 1997). This research report defines snag habitat "within" forests, including open and closed forests. This research identifying that snags must be in forested habitats is noted in the EIS at 623. An earlier research project in Oregon also noted that woodpeckers require natural forests as habitat, not a few snags in logged forests (Goggans et al. 1988). Yet the Helena-Lewis and Clark National Forest continues to use the outdated snag standard, even though they are amending the Forest Plan for the Castle Mountains project to eliminate the hiding cover requirements for elk. There is no reason they should not do a site-specific amendment for snag habitat as well, to provide actual functional habitat for wildlife. A recent review of snag-associated species on the Flathead National Forest provided a tally of snag-associated birds in the Northern Rocky Mountains (USDA 2018). It is likely that almost 30 of these species occur in the Castle Mountains.

The only way that snag-associated wildlife will be maintained is to provide "woodpecker management areas" where large blocks of undisturbed forests are protected from treatment so that foraging habitat is provided for woodpeckers, who in turn will create nesting cavities for other wildlife (Goggans et al. 1988). As noted previously, the three-toed and black-backed woodpeckers, both MIS for the Helena-Lewis and Clark National Forest, require patches from over 500 up to almost 1,000 acres of natural unlogged forests as a territory. This means that for a viable population, relatively huge patches of forest are required.

Research on the Helena-Lewis and Clark National Forest has also demonstrated that a snag standard requiring a few snags in logged habitats is invalid. Saab et al. (2012) reported that the three-toed woodpecker nested in forests with over 70 larger snags per acre.

3. The Forest Service is using an invalid proxy to estimate the viability of the MIS three-toed woodpecker.

The EIS claims that meeting the Forest Plan snag standard ensures that the MIS three-toed woodpecker will remain viable on the Forest (EIS 620, 639). The EIS at 638 claims that populations of all cavity nesting species known or suspected to inhabit the project area appear viable. No data was cited to demonstrate specifically how viability of the three-toed woodpecker has been monitored. The proxy for this MIS, as stated in the EIS for averaging out snags across the entire landscape, was never addressed as to how it has been shown to be a valid measure of viability of the three-toed woodpecker, which would in turn indicate viability of several dozen other wildlife species.

4. The agency falsely claims that the Forest Plan amendments to eliminate the hiding cover requirements in the Castle Mountains will not impact snag habitat.

It is clear that the Forest Plan amendments to eliminate MA C hiding cover standards, and Forest-wide hiding cover standards, will allow a huge increase in logging treatments, especially as the Castle Mountains currently do not meet these standards at present. Yet the EIS at 639 claims that these amendments will not impact snag habitat. This determination is only possible because the agency has used an invalid measure of project impacts

on snag habitat, which is as long as the total snag habitat averaged out across the entire Castle Mountains remains above the Forest Plan standard, there will be no impact on snag-associated wildlife. A comparison of treatments allowed without these amendments for Alternative 5, and for Alternative 4 which does not include amendments, indicates there will be a huge loss of snag habitat due to the amendments. Table 1 at EIS iii shows a total of treatment acres for Alternative 5, not including meadow burning, at 13,765 acres. Alternative 4 shows 1,663 acres of treatment. Thus the Forest Plan amendments will increase impacts on snag habitat by 12,102 acres, or over 8 times more than what would occur without the amendments.

G. The Forest Service will violate the NEPA, the NFMA, and the APA due to the invalid analysis on goshawks, due to violations of the Forest Plan, and due to a failure to use the current best science obtained locally and in Montana for designing a conservation strategy for goshawks in the Castle Mountains.

1. The analysis of project impacts on the goshawk is invalid.

The analysis of impacts to the goshawk for the Castle Mountains project was based on an average of habitat changes across 11 goshawk territories (EIS 542). These territories are noted to be highly productive in recent years, with 10 of the 11 territories being active in 2016, and 7 producing young (EIS 549). In 2016, 16 young goshawks were produced, with 13 being produced in 2015 with one less active territory (EIS 551). It is clear that the Castle Mountains currently provide good quality goshawk habitat. This is true even though forest habitat is quite limited across this mountain range (see 2 colored aerial photo maps of the Castle Mountains in Objection Appendix D). What constitutes mature (10 inched bhb or larger) and overmature forests (over 15 inches dbh) is summarized in Table 205 of the EIS at 547. These 2 categories equate to the Reynolds et al. (1992) southwest goshawk guidelines as mature and old growth forests, with a somewhat smaller dbh in Montana. This would equate to about 40% of the forest habitat being ideal foraging habitat for the goshawk (Reynolds et al. 1992). These 2 categories of forest total about 41% of the 80,000 acre project area in the Castle Mountains (35.7% and 4.8%) in Table 205). As was noted in the EIS at 542 that Reynolds et al. (1992) reported that ideal

goshawk home ranges would consist entirely of older forests with small dispersed openings, they didn't want to have a bottleneck over time when large amounts of older forest are lost at the same time.

Goshawk nesting habitat is the optimal structure for goshawk foraging, and it is reported to be 17,220 acres in the project area (EIS 559). This would be 28% of the 60,455 acres of forest in the project area (EIS 562), and only 21% in the entire landscape of 80,000 acres. The EIS at 559 shows that Alternative 5 would impact from 21-27%, although the reason for this range is unknown; 27% would be 4,649 acres of nesting habitat impacted by the project. This would leave 12,571 acres of prime nesting habitat, which would be 20.7% of the forested habitat of the project area, and 15.7% of the entire project area.

Table 208 at EIS 556 includes a measure of foraging habitat as per Brewer et al. (2009). This measure of foraging habitat is based on Clough (2000) who did not study foraging habitat. This measure is not comparable to the southwest goshawk guidelines, and it is not clear what it actually measures as per goshawk foraging habitat. This measure shows that the project area has 72% goshawk foraging habitat within the forested landscape (43,732 acre divided by 60,455 acres of forest) and 54% across the entire landscape. This provides a questionable measure of foraging habitat. As well, the

a. PFA Habitat

The impact on the PFAs within individual territories was never identified in the EIS. Instead, all the PFA areas are summarized together in Table 206-207 at FEIS 548-550. An average measure of habitat conditions for all 11 goshawk territories does not provide either the current or proposed habitat levels within individual territories. The proposed habitat levels per territory are essential in order for the agency to make a determination as to whether or not the proposed project will reduce this habitat below a minimum threshold recommended for persistence of the territory. The analysis method of averaging out goshawk habitats within the postfledging area and foraging habitat conceals the impact on individual territories.

The analysis of nesting habitat was similar to the PFA analysis, where it was stated that 240 acres of nesting habitat will be retained in each home range. However, the location of either the home ranges or this nesting habitat was never provided in the EIS. Also, the southwest goshawk guidelines require

that all nesting stands be located within the PFA, not scattered somewhere across the territory. This is also the recommendation provided by monitoring of goshawks on the Helena-Lewis and Clark National Forest (Johnson 2015). The agency is not using on-site monitoring data for the analysis of project impacts in the Castle Mountains.

It was acknowledged in the EIS at and 552 that opening of habitat within the PFAs may possibly increase the risk of predation of young goshawks by great horned owls and red-tailed hawks. The EIS at 544 notes that the PFA is the area where young goshawks learn to fly and hunt, and it provides protection from predators such as great horned owls and red-tailed hawks.

The EIS at 554 notes that the various treatments will reduce both the overstory and understory of treated areas within PFAs. The EIS text identifies that Alternative 5 will have Douglas-fir thinning on 165 acres in PFAs, and stand improvement thinning would occur in 121 acres of PFAs (EIS 554). There would be 1,128 acres of prescribed fire treatments within the PFAs (EIS 555). It is noted that this treatment will include total removal of forests, as well as opening up dense understory vegetation. The snowshoe hare is dependent upon this dense understory vegetation, while red squirrels are dependent upon the overstory of the forest. There will be a total impact of treatments on 1,414 acres of PFA habitat.

Treatments within the PFAs is also summarized in Tables 208-209. Table 209 at EIS 558 shows that the biggest impact will occur to the most important goshawk PFA habitat, or trees over 10 inches dbh; there will be about a 20% removal of PFA habitat due to the project (468 acres out of 2,488 acres in technician-estimated PFAs, and 1,489 acres out of 7,420 acres in the 420-acre circle PFAs as per Table 209. However, Table 208 shows an impact of 6,559 acres in PFA habitat in the entire project area boundary. Where is the additional PFA habitat coming from, that was not included in Table 209? The reason for this huge difference is unclear. Regardless, the impacts to individual PFAs by either measure is unknown.

There will be temporary roads built within 3 PFAs, including 0.85, 0.11, and 0.5 miles (EIS 555).

In spite of the significant treatment of goshawk PFA habitat, including up to 6,559 acres, the EIS at 557 concludes that these habitat reductions are not expected to reduce the qualify of habitat to the point where goshawks would

no longer use it because adequate nesting habitat would remain in each territory, and outside of nesting habitat, goshawks appear to be forest generalists to meet their life history requirements; the loss of 6,231 acres of PFA habitat would still leave 25,872 acres of PFA habitat, as there would still be adequate PFA habitat available for goshawks to continue to successfully use their territories; the 16 territories in the Castle Mountains would require only 6,720 acres of PFA habitat, or 420 acres per territory; this is noted to be 4 times the amount needed by goshawks.

The above analysis, that there would be 4 times the acreage of PFA habitat needed for 16 goshawk territories, or 25,872 total acres, contradicts the information provided in Table 209, EIS 558. This table shows there is an estimate of from 2,488 acres to 7,420 acres of PFA habitat in known goshawk territories, of which about 20% of either PFA size would be impacted. The technician-estimated PFAs would be far more accurate than the 420-acre PFAs, which are just a circle of habitat around known nests (EIS 559), including any openings (see Objection Appendix D for maps of technician-estimated PFAs in the project area). The EIS at 555 notes that the southwest goshawk guidelines do not count meadows as goshawk habitat, which is consistent with the technician-estimated PFAs excluding meadows. The EIS notes at 559 that in the technician-estimated PFAs, open habitats were excluded. The technician-estimated PFAs are shown in Objection Appendix D maps of the Castle Mountain landscape as per aerial photos. It is clear that these PFAs are based on actual goshawk habitat use.

The claim that PFA habitat in the Castle Mountains project area will remain at 4 times the amount needed for goshawks, or 25,872 acres, is clearly an invalid conclusion. As is noted in the EIS at 557, this estimate of 41% PFA habitat in the Castle Mountains is based on a tally of all suitable habitat across the Castle Mountains, even if it is not located within a PFA. Since most of these acres are not located in an actual PFA, they cannot be identified as PFA habitat. This method of measuring project impacts on PFA habitats clearly is inappropriate, and conceals the impact of impacts on actual PFAs.

The agency will treat at least 20% of known PFA habitat, yet it is claimed that these reduction are not expected to be severe enough to cause local goshawks to abandon their territories (EIS 559). This claim is consistent with previous notations in regards to project impacts on goshawks. For example, the EIS at 543 notes that no adverse effects are anticipated for the

goshawk. The EIS 561 notes that after treatment there will still be enough habitat for 16 pairs of goshawks.

Monitoring on the Helena-Lewis and Clark National Forest has identified a critical importance of maintaining current PFA habitat (Johnson 2015; Murphy 2014). This monitoring has not been implemented for the Castle Mountains Project, since PFAs will be degraded with treatments. In his conclusions on goshawk PFA monitoring, based on 8 years of field work on this species (2006-2014), Victor Murphy noted that habitat in PFA, ranging from 180-300 acres, with some exceptions, provides essential habitat for nesting goshawks and their young; in addition to providing habitat essential for young goshawks to learn to fly and hunt in relative safety, these areas also provide cover from strong prevailing winds and to ameliorate the effects of frequent severe weather events like late spring and early summer heavy snow storms and cold, drenching rains and to protect goshawk young from violent summer thunderstorms; while the area surrounding the nest is comprised of dense forest, the area within the PFA surrounding the nest sites retain a relatively high canopy cover, but is often interspersed with many small openings, 1/8 to 2 acres in size, and small areas of 1/8 to 4 acres of forest too dense for goshawks to commonly use; however, the PFAs necessarily contain areas of contiguous canopy cover and relatively open understory structure throughout in order to provide hiding cover and flight lands for adult and juvenile goshawks. Large openings adjacent to PFAs constitute a practical boundary to the PFA.

Murphy (2014) noted that goshawks would prefer to nest in larger PFAs on the forest, but the type of areas that are acceptable are rare on the forest; instead, PFAs are generally limited in size by habitat that is either too sparse to provide adequate hiding cover, or too dense to allow adequate fledgling movement; on the forest, goshawks seem to place their nests in relatively small areas of adequate nesting habitat within larger, very prey-productive expanses and then try to "made-due" with whatever PFA habitat is available down to approximately 120 acres in size; consequently, the availability of adequate contiguous PFA habitat of sufficient size to meet goshawk family needs may be the limiting factor to goshawk population increase on this forest.

b. Foraging habitat

The EIS includes 2 resource indicators for measuring project impacts on goshawks. These include goshawk postfledging habitat (PFAs) (EIS 549) and goshawk nesting habitat (EIS 551). There is no resource indicator for goshawk foraging habitat, although foraging habitat is added as a resource indicator at page 555, along with PFA habitat. The EIS at 555 notes that all treatment types except precommercial thinning impact goshawk foraging habitat, including Douglas-fir thinning, clearcutting, aspen treatments, stand improvement thinning, and prescribed fire. The EIS also correctly notes that Reynolds et al. (1992) does not count meadows as goshawk habitat. This document states that all openings over 4 acres in size should not be counted as goshawk foraging habitat.

The conclusions on goshawk foraging, as per prey, claim there will be no adverse impacts to goshawks. The EIS at 541 states that the treatments would sustain goshawk prey species over time. The EIS at 553 states that there are no expectations that goshawk prey would be reduced. The EIS at 553 also notes that the goshawk is a generalist predator so that even if the composition of prey changes, an overall reduction in prey is not expected. In the Response to Comments at 57, it is noted that the project is not expected to change foraging habitat for the goshawk.

At the same time, the EIS at 552 notes that the more mature closed-canopied forest a home range contains, the more optimal the conditions are for goshawk habitation. The EIS at 553 notes that clearcutting and forest thinning will reduce habitat for the red squirrel. This is consistent with published research (Holloway and Malcolm 2006; Herbers and Klenner 2007). The red squirrel has been identified as an important goshawk prey species from research in the Flint Mountains of Montana (Clough 2000), in Wyoming (Squires 2000), from monitoring on the Helena-Lewis and Clark National Forest (Johnson 2015), as well as from research in the southwest (Salafsky et al. 2005; Salafsky et al. 2007).

The EIS at 553 also notes that snowshoe hare habitat "will increase" in about 20 years after treatments. Actually, snowshoe hares in Montana are reported to not use older clearcuts until from 50-70 years after clearcutting (USDA 2011). Snowshoe hares are also an important prey species for goshawks in Montana (Clough 2000) as well as on the Helena-Lewis and Clark National Forest (Johnson 2015). In this regard, the EIS at 554 claims that

precommercial thinning would not affect goshawk prey habitat, but precommercial thinning in known to reduce snowshoe hares (e.g., Lewis et al. 2011), since hares are highly dependent upon dense horizontal cover (Holbrook et al. 2017).

The EIS at 554 notes that clearcutting will completely remove goshawk habitat. There will be 14 clearcuts in the forested foraging habitat for goshawks with this project (Table 1 in Draft ROD); 9 of these will be over 40 acres in size. The sizes range from 2 to 391 acres, with an average size of 82.4 acres. These 1,155 acres of completely remove goshawk foraging habitat across the Castle Mountains. Monitoring on the Lewis and Clark Forest indicates that it takes about 125 years for clearcut forests to redevelop into goshawk foraging habitat, although this may actually be 150 years (Johnson 2015). Of the clearcut acres, only 531 acres would occur on suitable timber areas; 624 acres of the total planned 1,155 acres of clearcuts would occur on unsuitable lands (EIS 106). Yet the EIS at 106 states that cleracutting on unsuitable lands is designed to meet resource objectives other than timber. It is not clear what these objectives are, however, since clearcutting involves total habitat loss for two of the Forest MIS, the goshawk and the three-toed woodpecker. In addition, a clearcut of 391 acres is larger than the average PFA for goshawks on the Helena-Lewis and Clark National Forest of 180 to 300 acres (Johnson 2015; Murphy 2014). Murphy (2014) noted that large forest openings are barriers to young fledged goshawks.

Even when clearcutting does not occur within a goshawk PFA, the impacts on foraging are clear based on research in Montana. Clough (2000) reported in her thesis that the number of young goshawks fledged per nest was negatively correlated with the size of the nonforested openings near the nest. Clough (2000) also noted that goshawks did not use young, regenerating clearcuts in the seedling/sapling stage. She noted that protecting just goshawk nest sites may result in adverse effects to breeding goshawks by fragmenting their territories. Clough (2000) also cited research where large openings are thought to increase competition from open-forest raptors. This is a well-known conservation issue for goshawks. For example, La Sorte et al. (2004) noted there is likely a threshold beyond which goshawk habitat becomes red-tailed hawk habitat due to forest removal and opening. This problem was also noted in a Region 1 Forest Service paper by Samson (2006). At page 25 of this paper, the following is provided:

La Sorte et al. (2004 (Table 3) compared habitat use by sympatric red-tailed hawks and northern goshawks on the Kaibab Plateau in Northern Arizona. Encroachment by the red-tailed hawk into northern goshawk territories is considered to be a conservation concern. The pattern that emerged from this study is that habitat use by the red-tailed hawk and northern goshawk was distinctively different at the fine and midscale. The red-tailed hawks displayed more variation in habitat use with non-forested areas and step slopes important to their territories.

This paper at 34 also noted that the goshawk forages in a broad diversity of habitat types areas with 40% or more forest canopy.

There is no analysis in the EIS in regards to the large openings that will be created in goshawk foraging habitat, even though there is forest monitoring work that identifies competition between red-tailed hawks and goshawks as a concern. Victor Murphy's work noted that goshawks and red-tailed hawks are very competitive on the Lewis and Clark National Forest; surveyors frequently witness conflicts between these species; both species likely kill each other's nestling and fledglings; in relatively dense forest, the goshawk is dominant, while in open areas, the red-tailed hawk is dominant; however, the great horned owl is likely the chief predator of goshawk young on the Lewis and Clark National Forest; like red-tailed hawks, this owl seems to become more prevalent when forests are opened up as a result of fire or active management; as a result, treatment of a goshawk PFA with fire or thinning that reduced overstory and horizontal tree cover could increase predation on goshawk nestlings and fledglings (Johnson 2015; Murphy 2014).

NEC Director Sara Johnson studied red-tailed hawks for her doctoral research project. This study was done in the farmlands surrounding Bozeman, Montana. Red-tailed hawks were very common in this landscape, while there were no goshawks present in this open landscape. The general abundance of the red-tailed hawk due to the wide types of habitat it uses, means it is a relatively common raptor species in Montana, and is not identified by the Montana Natural Heritage Program as a "Species of Concern," while the goshawk was recently upgraded to a higher level of concern in this category. Gary Swant's Montana birding column in the Montana Standard on 1/29/15 noted that there were 540 observations of the northern goshawk between 2003 and 2011 in the Montana Natural Heritage

Program, while over this same period of time, there were 2,947 observation reports of the red-tailed hawk.

The objectives for the proposed forest thinning of Douglas-fir stands in the Castle Mountains project is displayed in several figures in the EIS. Figure 2 at EIS 3, Figure 3 at EIS 4, Figure 12 at EIS 39, and Figure 14 at EIS 41 all display typical goshawk habitat in the Castle Mountains landscape. The Forest Service objective is to change the condition of these stands with logging so that they will look like the forests in Figures 15 at EIS 42, and Figure 18 at EIS 44. These forest thinning effects in prime goshawk habitat will degrade them for goshawks, and improve them for red-tailed hawks and great horned owls.

Also within these Douglas-fir treatments for commercial thinning and stand improvement thinning, the understories will be essentially removed. The EIS at 76 notes that Douglas-fir stands can have many seedlings and saplings. Figures 23-24 at EIS 48-49 provide examples of understory removal activities. These treatments will clearly remove snowshoe hare habitat, even though the hare is an important prey species for goshawks on the Helena-Lewis and Clark National Forest (Johnson 2015; Murphy 2014). What small trees are not destroyed with slashing will likely be killed by broadcast burning after logging or stand treatments. Burning all treatment units will be done to reduce slash, and to create bare mineral soil for regeneration sites for new trees (EIS 51).

The remaining treatments will also degrade or remove goshawk foraging habitat by reducing species associated with mature forests with snags, including the three-toed woodpecker, red squirrel, and the gray jay (Hutto 1995), as well as eliminating the dense understory required by snowshoe hares. These treatments, in addition to the complete elimination of goshawk foraging habitat in 1155 acres of clearcuts, will impact foraging habitat with 1114 acres of Douglas-fir thinning, 1799 acres of stand improvement thinning and logging, 410 acres of precommercial thinning, 287 acres of logging in aspen stands, and 8063 acres of forest burning. This impact on goshawk foraging habitat comes to 12,837 acres. The total forest in the Castle Mountains is 60,455 acres (EIS 562). Thus roughly 20% of the goshawk foraging habitat in the entire Castle Mountains will be removed and/or degraded. The actual impact on goshawks is unknown, as the losses are not identified per goshawk territory. And the losses are also not evaluated against the southwest guidelines. Instead, the analysis of impacts

on foraging habitat is limited to the Region 1 whitepaper by Brewer and others (2009). The actual impact of the treatments cannot be measured using this whitepaper, as the habitat categories are different from the southwest guidelines, and as well, overlap. These habitat criteria were based on a study of goshawk nesting habitat in Montana, not foraging habitat, and have never had any type of peer review. There are 3 authors to this paper, none of which are associated with a Forest Service research station. The authors include Cough-Brewer, who did her master's thesis on goshawk nesting habitat (Clough 2000); she did not study foraging habitat; there were no peer-reviewed publications by her cited in the whitepaper. Canfield, the second author, has no published papers on goshawks, and her background was limited to an office analysis of detection probability of goshawks based on vegetation; her master's thesis was on elk. Bush is the 3rd author; she has 4 vegetation reports cited in the whitepaper.

In comparison, the southwest goshawk guidelines by Reynolds and others (1992) was based on 9 individuals termed the Scientific Committee (Appendix 6). Reynolds, the lead author, was working as a research scientist at the Rocky Mountain Forest and Range Experiment Station. Graham was working as a research scientist at the Intermountain Research Station. Kennedy was a professor at Colorado State University, specializing in goshawks. Three individuals were working at the southwest regional office. of the Forest Service. And 3 authors were working on different national forests. As of 2011, Dr. Reynolds had been studying goshawks for 42 years.

It would be possible for the agency to measure goshawk habitat as per the southwest guidelines by Reynolds and others, as has been done on the Custer National Forest (USDA 2008). This silviculturist report measured goshawk habitat by the 6 categories defined in the southwest guidelines, including (1) grass/forb/shub stage, age 1-15 years; (2) seedling/sapling stage, age 15-40 years; (3) young forest, 40-80 years; (4) mid-aged forest, 80-120 years; (5) mature forest, 120-150 years; and (6) old forest, 150-200 years. This breakdown of goshawk habitat is actually very consistent with monitoring done on the Lewis and Clark National Forest, where suitable goshawk habitat is noted to develop in about 125 years, which would be mature lodgepole pine forest, and remains good goshawk habitat into the old forest stage, or at 225 years (Johnson 2015).

Overall, it is clear that goshawk foraging habitat is close to the recommended level for mature and old forest as per the southwest guidelines

(Figure 1 at page 2 of Reynolds et al. 1992). The 40% mature and old forest habitat level recommended in the southwest guidelines may be met as per Table 208, with 40% of the forests in the Castle Mountains being 10 inch dbh or larger. The small pole stands, which would be another 34% of forest habitat in the Castles as per Table 208, may also provide some goshawk foraging habitat, although the size is generally below the 10 inch dbh needed for important prey species for the goshawk (Johnson 2015), woodpeckers (Bull et al. 1997), and the age may also be lower than the 125 years or older in lodgepole pine forests that goshawks use on this forest (Johnson 2015).

The project would remove 8388 acres of forest, most or all of which may be mature or prime goshawk foraging habitat (does not include precommercial thinning on 419 acres, or meadow burning). This information is never provided in the EIS. This could reduce the landscape average of prime foraging habitat from 40% down to 23 927 acres, or to 30%. However, the impact within individual goshawk territories is unknown. From the 2 landscape aerial photo maps provided in Objection Appendix D, it is clear that forest habitat is very limited in the eastern portion of the Castle Mountains. This is also where most of the treatments are planned, since the western portion contains the IRA, which is 34% of the Castle Mountains.

There is no information ever provided in the EIS as to the forest conditions within the 11 goshawk territories in the Castle Mountains. Some estimates of the distribution of this forest habitat can only be surmised from the hiding cover measures for the 19 watersheds that occur in the Castle Mountains, in Table 189 of the EIS at 492. There is a map of these watershed locations in the DEIS, Figure 30 at page 461. There are 8 watersheds located in the IRA, which have a range of hiding cover from 30-46%, with an average of 36.8%. Outside of the IRA, there are 4 watersheds that occur largely within the project area boundary. These have a range of 23-30% hiding cover, with an average of 27%. This is consistent with maps in Objection Appendix D that forests decline from the west to the east of the Castle Mountains. Also in the eastern portion of the Castle Mountains, another 4 watersheds occur roughly half inside and half outside the project area. The hiding cover levels of these 4 watersheds ranges from 19-26%, or averages 23%. And there are 3 additional watersheds that are almost completely outside the project area boundary on the eastern portion of the Castle Mountains. The hiding cover level in these 3 watersheds averages 24.3%. There is no information provided on an undisclosed number of watersheds at the very eastern edge of the Castle Mountains because this is claimed to be entirely winter range.

The impact of the proposed treatments on goshawks within each of these watersheds is identified as very limited. Table 189 of the EIS has an average level of hiding cover for the current condition as 30%, with the average level of hiding cover after treatments at 28% across 19 watersheds. This is because out of 12,837 of treatments including commercial thinning, clearcutting, aspen treatments, stand improvement thinning, and forest burning on 12,837 acres, only 1,679 acres are reported to reduce hiding cover (EIS 518). This means that 11,158 acres, or 87% of hiding cover losses are not actually counted in the hiding cover analysis.

It is clear that goshawk foraging habitat is sensitive to timber management activities. Dr. Reynolds noted in an interview with the Black Hills National Forest (USDA 2000) that in Arizona productivity of goshawks decreased when seed cuts (basically clearcuts with a few trees left for seed production) were within one-half mile of a nest; the more area within one-half mile of a nest that has been altered with seed-tree harvest or affected by fire or windthrow, the fewer young were produced; seed cuts are detrimental to the food web on which goshawks depend. Due to the importance of goshawk prey, Reynolds was deeply concerned about the Forest's proposal to manage for goshawks only on the 600 acres surrounding the nest. He recommended that a balance of structural stages be reflected within a 10-mile radius circle across the landscape, with 40% of these stages being in the mature to late succession, which is what is recommended by the southwest goshawk guidelines (Reynolds et al. 1992). The 3 goshawk experts interviewed in this report all recommended that the southwest goshawk guidelines be applied to the Black Hills National Forest.

Dr. Reynolds also discussed goshawk management with NEC director Sara Johnson on a phone interview on February 27, 1998 (Reynolds, pers. Com.). He noted among other things that birds with a high proportion of seed tree and stand thinning within 0.5 miles of a nest are breeding less; if openings are created, they should be small; when the forest is opened, squirrel habitat is destroyed; although open stands may provide enough trees for perche sites for foraging, the prey densities are too low; when a large portion of the territory has a reduced canopy closure, the birds don't breed as often; they may only breed during excellent years, and not breed in marginal conditions; he defined seed tree cuts as stands with a basal area of 40 square feet per acre; a basal area of 80 square feet also had an effect, although somewhat

lower that a 40 basal area. The Castle Mountains project will thin Douglas-fir forests down to a 50-80 square feet basal area (EIS 86).

Even though the management of prey is the key criteria for managing for goshawks in the southwest goshawk guidelines (Reynolds et al. 1992), there is no such strategy on the Helena-Lewis and Clark National Forest. Research and forest monitoring both identify several key goshawk prey species in Montana (Clough 2000) as well as on this forest, including the snowshoe hare, red squirrel, and woodpeckers (Murphy 2014). The red squirrel has bee defined as a "key prey species" in Arizona because it's density explained more in regards to goshawk productivity than any other prey species (Salafsky et al. 2005, Salafsky et al. 2009). The high populations of snowshoe hares on the Helena-Lewis and Clark National Forest in recent years is likely why goshawk productivity has been very high (Johnson 2015). Both of these important prey species (squirrels and hares), along with woodpeckers, will be severely impacted in treatment units that will be clearcut, commercially thinned, burned, or undergo stand improvement thinning, some of which will include commercial harvest. Although goshawks can switch to alternate prey species (Salafsky et al. 2009), suitable alternative prey must be available in treatment units. To date, the Helena-Lewis and Clark National Forest, including within the Castle Mountains Restoration Project EIS, has not provided any data that indicates that alternate prey in vegetation treatment units will be commensurate to the goshawk prey species that are lost due to management. Yet in response to comments at 57 and 60, the agency stated that a change in goshawk prey species due to vegetation management would have no affect on goshawks.

In regards to alternate prey species, goshawks will use different species if they are available, including cottontails and jackrabbits at lower elevation on the Helena-Lewis and Clark National Forest (Johnson 2015), as well as in the southwestern United States (Salafsky et al. 2005; Salafsky et al. 2009). Sagebrush habitats provide important habitat for both jackrabbits and cottontail rabbits (USDA/MFWP MOU 1998). Yet the Castle Mountains project will burn and remove 485 acres of sagebrush (EIS 504, Table 199; Response to Comments 74). Since there are only 2361 acres of sagebrush habitats in the Castle Mountains, this burning and removal will affect 25% of the existing habitat. The rationale for this sagebrush burning is stated to make sagebrush more resilient and restore it (EIS 637). It is unlikely that killing sagebrush will either restore it or make it more resilient. The actual purpose of burning sagebrush, which will destroy habitat for alternate

goshawk prey species, is to promote livestock use. The EIS at 561, 614, and 636 note that in the past, 2500 acres of meadows and forest understories habitat been burned for range and fuels management. The EIS at 35 indicates that 35 units will impact sagebrush.

Another understory species that will be impacted by the many acres of prescribed burning, are junipers. These junipers can provide a significant amount of horizontal cover for wildlife such as the snowshoe hare, as well as forage as per juniper berries. Figure 3 at EIS 4, Figure 12 at EIS 39, and Figure 18 at EIS 44 show how juniper exists throughout the forest understories in many locations. The EIS at 35 claims that efforts will be made to avoid burning both juniper and sagebrush in prescribed burns, which means the agency recognizes the values of both of these shrub and tree species to wildlife.

Overall, there is no doubt the Castle Mountains project will reduce goshawk foraging by degrading or removing habitat for key prey species, such as the red squirrel, snowshoe hare, and woodpeckers. At the same time, monitoring of goshawks on the Helena-Lewis and Clark Forest indicates that goshawks can reduce prey to levels that nesting is no longer suitable (Johnson 2015; Murphy 2014). It appears that at least some goshawks rotate territories every several years as prey levels become depressed through predation; if a territory is "hunted out," goshawk may abandon it for 2 to 4 years, then come back when the prey base has built back up; the prey base seems to be the key to the time the territory is left empty of goshawks (Id.)

There was a research project on the Helena-Lewis and Clark National Forest from 2007-2015 being conducted by Dr. Nate Bickford. Dr. Bickford is currently a professor of wildlife at Colorado State University in Pueblo, Colorado. Although his research has been submitted for publication, this information is not yet available to the public. However, Dr. Bickford discussed some of the general research findings with NEC Director Sara Johnson on September 5, 2019. He noted that goshawks may abandon territories when the number of a few key species are gone, or reduced, such as squirrels, flickers, and crows; red squirrels are more common in active goshawk nesting sites.

H. The agency is violating the NEPA and the NFMA by failing to evaluate what are clearly significant impacts on MIS elk from the planned amendments to remove hiding cover standards Forest-wide and for MA C; the analysis of project impacts on various habitat features for elk are invalid due to a failure to use the current best science to measure impacts; in addition, there is essentially no analysis of the alternative that would not amend the Forest Plan for the project; the impacts to the Castle Mountains on elk are so severe over such a large area that an EIS is required just to evaluate the amendment impacts on elk.

1. The analysis did not measure the impact of 20 miles of new temporary roads or other roads closed to the public during treatment activities.

Although it is noted that there will be 20 miles of new roads and/or conversion of motorized trails to logging roads (EIS 658), the EIS claims that there would be no impact to elk summer habitat, which is termed "habitat effectiveness" because there will be no increase in roads open to the public (e.g., EIS 64, 79, 483, 484, 489, 513). The reference for this is USDA 2013, which is a white paper by several Forest Service biologist, along with input from MFWP. The information provided in this reference is misrepresented by the Forest Service, including 3 times in Response to Comments at page 79, once at page 80, and twice at 64. However, this white paper does not say that anything other than roads open to the public displace elk in the summer. Instead, they use a valid measure of elk displacement, which is traffic volume. This white paper notes at pages 15 and 18 that elk avoid roads that have 2-4 vehicles per 12 hours. It also notes that a review of the scientific literature provides strong evidence that elk use declines as traffic volume increases; 5 scientific references are cites. It is noted in the EIS, for example at 594, that traffic volume would be high during logging and other activities. In summary, the EIS claims at 511 that all new roads will be closed to the public so that the effects will be immeasurable are false.

2. The analysis did not include the impact of hiding cover losses or roads closed to the public to evaluate project impacts on elk security; the significant current problem with elk displacement from public to private lands during the hunting season was never addressed in regards to a lack of security; the problem of high populations of elk was identified as an indicator of good elk rather than bad elk management; there was not analysis of how the proposed amendments to hiding cover would affect this existing significant problem.

The white paper (USDA 2013 at page 13) on big game management notes that it is necessary to include frequently-used roads used by the non-public during the hunting season in security analyses. However, for the Castle Mountains, the impact of a loss of hiding cover as well as roads closed to the public were not considered as an impact on elk security. For example, in the Response to Comments at 82, it is noted that no new permanent roads would be constructed for the project for elk security would be mostly unchanged. The EIS at 84 notes that hiding cover was not included in the analysis of elk security. The Lewis and Clark viability assessment (USDA 2011) included the correct definition of security for elk, which is at minimum of 250 acres of contiguous forest cover at least 0.5 miles from an open road. This same definition has been used by MFWP in a published research report on elk security in Montana (Proffitt et al. 2013).

It is clear that existing security in the Castle Mountain landscape is already creating significant impacts on fall elk use, in a landscape that have important elk hunting use (EIS 387). The EIS at 67 notes that the current elk population is over double the MFWP objective in the last four years. This is a direct indicator of elk displacement to private lands in the fall hunting season due to a lack of security on public lands, which limits the ability of MFWP to control elk numbers with harvest (MFWP 2014; Dickson 2915; Byron 2017; Lundquist 2014). The huge additional impacts on elk security proposed for the Castle Mountain Restoration Project will aggravate an existing problem that is already serious.

Table 188 in the EIS at 485 summarizes the overpopulation problem with elk in the Castle Mountains landscape. Although the MFWP population objective for elk in this landscape is 600, this population level has been exceeded in all recent years. It was 961 in 2011-2012, 1263 in 2012-2013, 1545 in 2013-2014, 1766 in 2014-2015, and 1501 in 2015-2016. This is not a new issue on the Helena-Lewis and Clark National Forest. In the Lewis

and Clark Forest viability assessment of MIS completed in 2011, it is noted at page 162 that 20 0f 21 hunting districts that overlay the LCNF, during the 2009/2010 and 2010/2011 post-hunting season winter elk surveys 14,352 and 16,881 elk were counted; these count indicate that elk populations in 18 of these 21 hunting districts are over the population objectives established for them in Montana's Elk Management Plan (2005), and significant over population objectives when these hunting districts are considered in aggregate.

The proposed amendments will clearly have a severe adverse impact on elk security not only due to 20 miles of new roads, but because there will be 9 clearcuts that are over 40 acres in size. The average size of these openings will be about 80 acres, with one openings almost 400 acres in size. This one clearcut will be larger than the minimum hiding cover amount (250 acres) that elk need.

3. The analysis of hiding cover in the Castle Mountain Project is invalid and does not display the significant impacts the project will have on elk and other forest wildlife.

The EIS only counts the clearcutting of lodgepole pine and burning of meadows as a loss of hiding cover, even though almost no cover is involved in meadow burning (EIS 510, 511). Only 1,679 acres of hiding cover losses are projected for treatment on 11,158 acres of vegetation treatments. This is a discounting of 87% of the impact on hiding cover. The changes in hiding cover from the proposed action is not known. It is also unknown what the differences in hiding cover would be if the hiding cover amendments were not implemented. Several examples of how hiding cover will be impacted are displayed in the EIS, although logging examples are not provided. Figure 24 at EIS 49 shows what understory slashing will do. Figure 23 at EIS 48 also shows understory removal activities. It is clear hiding cover will be removed, even though these are not clearcuts.

Not all the watersheds were analyzed for hiding cover in the Castle Mountains. Those several watersheds at the eastern edge of the range were excluded from the analysis because they are considered over 50% elk winter range.

4. There was no analysis of management impacts on MIS elk for the one alternative that would not require forest plan amendments to hiding

cover, or alternative 4, even though the lack of cover is contributing to the significant elk displacement issue on the Lewis and Clark National Forest.

There is very limited information provided on Alternative 4 in the EIS. Table 1 in the EIS at iii shows that Alternative 4 would have 1,663 acres of treatment versus 13,765 acres of treatment, excluding the burning of meadows, for Alternative 5. This means that the amendments to hiding cover allow an increase of 8 times more treatments, outside of burning meadows, than if the hiding cover amendments were not implemented. This Table 1 is generally the only information provided on Alternative 4. The EIS at 491 clearly states that Alternative 4 was not analyzed.

Alternative 4 results, as indicated by acres treated as compared to other alternatives, would be consistent with past management in the Castle Mountains. The EIS indicates that between 424-750 acres of past logging has occurred (EIS 636, 105).

Due to the amendments, the proposed project will have extensive logging, including clearcuts up to almost 400 acres in size, as well as the majority of new clearcuts being on unsuitable timber lands.

5. There is no alternative that would not road and log the non-IRA forest areas that are contiguous to the Castle Mountains IRA, or remove hiding cover within the IRA.

There are 10,530 acres of unroaded habitat adjacent to the Castle Mountains IFRA (EIS 385). The value of this undeveloped area for elk security during the fall hunting season is never addressed, even though elk displacement is known to be a significant issue in the Castle Mountains. As well, there was no alternative that would preserve the current level of high quality elk security within the IRA. The extensive forest burning on over 6,000 acres will significantly impact elk security.

6. There is no analysis of vegetation treatments on elk winter range, including the burning of sagebrush.

The EIS at 497 acknowledges that elk and mule deer consume sagebrush on their winter range. Yet 2.9% of the existing 2310 acres of sagebrush on elk

winter range will be burned (EIS Table 9 at 15, 981). This is part of an ongoing program for range management, with 2500 acres of forest understory and sagebrush burned in the past (EIS 614, 636).

Although the elk logging recommendations are included in the appendix for the Lewis and Clark Forest Plan, there was no analysis of how treatments on elk winter range will impact thermal cover.