

## **Appendix C – Cumulative Effects**

## Stonewall Vegetation Project Cumulative Effects Activities

The area analyzed in cumulative effects analysis is usually not limited to the project area; it varies with the resource or species analyzed. Each resource has different “boundaries” for its effects analysis. Quantified, detailed information regarding effects, leading to specific reasoned conclusions can be found in the cumulative effects section of each specialist report located in the project record.

Available information was reviewed. Many fires in the affected watersheds had no accompanying written information; however, fire occurrence data provides a glimpse of the fire suppression history in the project area. Fire information within all ownerships in the Stonewall Vegetation Project area and adjacent areas was considered. Records note there were 193 fires reported from 1920 till 2014. Acreage for fire size classes are as follows: (A) less than 0.25 acres, (B) 0.26-9.9 acres, (C) 10-99 acres, (D) 100 – 299 acres, (E) 300-999, (F) greater than 1,000 acres.

**Table C- 1. Number of fires in the Stonewall watersheds by decade and size class**

| DECADE                | A   | B  | C | D | E | F | TOTAL |
|-----------------------|-----|----|---|---|---|---|-------|
| 1920-1929             | 2   |    |   |   |   |   | 2     |
| 1930-1939             | 12  | 1  |   |   |   |   | 13    |
| 1940-1949             | 14  |    |   |   | 1 |   | 15    |
| 1950-1959             | 9   | 2  | 1 |   |   |   | 12    |
| 1960-1969             | 20  |    | 1 |   |   |   | 21    |
| 1970-1979             | 9   | 6  | 1 |   |   |   | 16    |
| 1980-1989             | 15  | 5  | 1 |   |   |   | 21    |
| 1990-1999             | 40  | 9  | 1 | 1 |   |   | 51    |
| 2000-2009             | 27  | 8  | 1 |   | 1 |   | 37    |
| 2010-2014             | 1   | 2  | 1 |   |   | 1 | 5     |
| Total number of fires | 149 | 32 | 6 | 1 | 2 | 1 | 193   |

(Kurtz 2009; updates L. Burns *personal communication*)

Fires that escaped detection are not included. Fire occurrence data was digitized as point-source data from historical maps that portrayed fires by year, size class, and cause for 1920 to 1969 (Kurtz 2009). For 1920 to 1969, no more than 1,243 acres on all ownerships have burned based on the maximum acreage per size class and the number of fires that occurred in that size class. For the period from 1970 to 2009, fire occurrence information was developed from Kansas City fire database (KCFast). The records from this period have detailed information including acreage, cost, and physical location. During the period from 1970 to 2009, 125 fires burned approximately 531 acres within the watershed area. Therefore, no more than 1,774 acres have burned across all ownerships since 1920, or less than 4 percent of the project area. The Snow/Talon fire burned 37,905 acres adjacent to the project area in 2003, approximately 87 acres burned within the project boundary. The Keep Cool Fire burned 302 acres within and adjacent to the project area in 2006, approximately 261 acres burned within the project boundary. In 2007, the Bull Mountain Fire burned 30 acres.

The following tables of past, present, and reasonably foreseeable activities have been used by the interdisciplinary team members in determining the cumulative effects for their respective resource. Each resource specialist has determined which of the following activities are applicable to their analysis, depending on their cumulative effects boundary.

Areas considered in the tables below include the Stonewall Vegetation Project area (Stonewall Project), watersheds (6th Code HUCs) in and adjacent to the project area, and Stonewall Project area and combined boundary (Stonewall Combined Boundary) (used for selected specific species). These represent the cumulative effects areas required for most resources, except for the inventoried roadless area. Activities are sorted by decade. Information on past activities beyond the HUC areas is available from the Forest-wide Hazardous Tree Removal and Fuels Reduction – Healthy Forests Restoration Act Project analysis. Harvest/fire records prior to 1950 are not available. Harvest and fuel treatments are noted in the table below by the respective boundaries. Harvest activities are sorted by intermediate and regeneration treatments (see definitions). “Fuels activities” includes prescribed fire (including hand slashing), pile burning and jackpot burning. Timber harvest and/or fuel treatment acres could overlap on the same piece of ground so total acres reflected in the table may double-count some parcels of ground; refer to Figure C-1 for clarification. Current stand conditions as a result of past disturbances are reflected in existing condition reports by resource area. Present or ongoing projects are those projects in the implementation phase, or that occur on a somewhat routine basis (e.g., road maintenance, personal firewood cutting). Reasonably foreseeable projects are in the planning or analysis phase, which means there is potential for change (e.g., public input, changed conditions). In addition, natural processes such as succession, and natural events such as droughts are always occurring and may affect final project design.

## Past Activities

**Table C- 2. Acres of fuels treatments and prescribed burning from 1950-present**

| <b>Row Labels</b>  | <b>1950s</b> | <b>1960s</b> | <b>1970s</b> | <b>1980s</b> | <b>1990s</b> | <b>2000s</b> | <b>2010s</b> | <b>Grand Total Acres</b> |
|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------------------|
| Fuels treatments   | 25           | 1,751        | 1,097        | 1,569        | 2,460        | 1,020        |              | <b>7,922</b>             |
| Prescribed burning |              |              |              |              |              | 2,841        |              | <b>2,841</b>             |
| Other              |              |              |              |              |              | 382**        | **           | <b>382</b>               |
| <b>Grand Total</b> | <b>25</b>    | <b>1,751</b> | <b>1,097</b> | <b>1,569</b> | <b>2,460</b> | <b>4,243</b> |              | <b>11,145</b>            |

\* Past fire and fuels management activities obtained from Helena National Forest GIS spatial and tabular databases.

\*\*Forestwide Hazardous Tree Removal and unspecified amount of public fire wood

**Table C- 3. Past activities**

| Activity/Name                          | Decade/Year | Drainage        | Scope Of Activity  | Resource Effects  |
|--|-------------|-----------------|--|---|
| <b>1950- 1959</b>                      |             |                 |  |   |
| Forest Service<br>Timber Harvest       | Pre 1960    | See figure c- 1 | Timber harvest primarily tractor logging, use of skid trails and haul use of local roads.<br>Stonewall<br>Regeneration harvest: 198 acres<br>by HUCs<br>Beaver Creek: Regeneration harvest: 199 acres<br>Humbug Creek, Keep Cool Creek, Lincoln Creek No records<br>Stonewall Combined Boundary<br>Regeneration harvest: 305 acres | Harvest regeneration treatments created an early seral stage, of which a few are still providing most of the early seral in the project area. A reduction in wildlife cover and forage occurred immediately following harvest; sites affected by these treatments now provide increased levels of herbaceous and woody forage on most sites, although some stands have closed canopy conditions and provide hiding and thermal cover with little forage. Effects of these disturbances on vegetation are reflected in the existing condition. |
| Fire/Fuels                             | Pre-1960    | Multiple        | Stonewall<br>Fuels treatments: 25 acres<br>by HUCs<br>Beaver Creek: Fuels treatments: 25 acres<br>Humbug Creek, Keep Cool Creek, Lincoln Creek: No records<br>Stonewall Combined Boundary<br>Fuels treatments: 25 acres  | Effects included a short-term (<10 years) reduction in fuels, cover and forage that has since been restored. Effects of these disturbances on vegetation are reflected in the existing condition.   |
| Mining                                 | 1950s       | Multiple        | Small scale hard rock mining   | Small, localized temporary disturbance to soils and streamside banks.   |
| Private and state lands timber harvest | 1950s       | Multiple        | Unspecified acres; primarily tractor logging, haul use of local existing roads.  | Removal of live, and dead and dying trees and potential for the spread of invasive species. Habitat for species that utilize mature forest was reduced on some of the acres affected. Because off-forest lands occur at lower elevations in highly fragmented portions of the analysis area, most activities did not reduce landscape-level connectivity or adversely affect movement of  |

| Activity/Name                                  | Decade/Year | Drainage                       | Scope Of Activity   | Resource Effects   |
|--|-------------|--------------------------------|---|--|
|  |             |                                |   | wildlife species that are sensitive to fragmentation and human activity.   |
| <b>1960 - 1969</b>                             |             |                                |   |  |
| Forest Service timber harvest                  | 1960 - 1969 | See table c- 1                 | <p>Stonewall<br/> Regeneration harvest: 1,608 acres; Sanitation harvest: 37 acres;<br/> Intermediate: 254 acres; Reforestation: 1,144 acres<br/> By HUCs:<br/> Beaver Creek: Regen harvest: 589 acres; Intermediate harvest. 126 acres<br/> Humbug Creek: No records<br/> Keep Cool Creek: Regen harvest: 1,241 acres; Intermediate harvest. 1 53 acres:<br/> Lincoln Creek: Regen harvest: 258 acres; Sanitation harvest: 37 acres<br/> Stonewall Combined Boundary<br/> Regeneration Harvest: 3,535 acres; Intermediate Harvest: 254 acres;<br/> Sanitation Harvest: 60 acres; Reforestation: 2,340 acres</p> | <p>Regeneration and salvage treatments created an early seral stage, of which a few are still providing most of the early seral in the project area. Intermediate treatments reduce stand densities to improve vigor of remaining trees. Reforestation efforts increases stocking of desired tree species. A reduction in wildlife cover and forage occurred immediately following harvest; sites affected by these treatments now provide increased levels of herbaceous and woody forage on most sites, although some stands have closed-canopy conditions and provide hiding and thermal cover with little forage. Effects of these disturbances on vegetation are reflected in the existing condition.</p> |
| Fire/Fuels                                     | 1960-1969   | See figure c- 1 and table c- 1 | <p>Stonewall<br/> Fuels treatments: 1,751 acres<br/> By HUCs<br/> Beaver Creek: Fuels treatments: 729 acres;<br/> Humbug Creek: Fuels treatments: 11 acres;<br/> Keep Cool Creek: Fuels treatments: 1,633 acres;<br/> Lincoln Creek: Fuels treatments: 78 acres</p>   | <p>Effects included a short-term (&lt;10 years) reduction in fuels, cover and forage, which have since been restored. Effects of these disturbances are reflected in the existing condition.</p>   |
| Livestock grazing on federal and private lands | 1960-1969   | Multiple                       | <p>Stonewall, HUC and Stonewall combined boundary: Grazing of cattle, sheep and horses.</p>   | <p>Grazing removed wildlife cover and forage on the sites, reduced species diversity, and increased the spread of invasive plants. While impacts still exist, these effects have been reduced due to more recent grazing management regimes, monitoring and mitigation. Effects of these disturbances on vegetation are reflected in the existing condition.</p>   |

| Activity/Name                          | Decade/Year | Drainage                       | Scope Of Activity  | Resource Effects  |
|--|-------------|--------------------------------|--|---|
| Mining                                 | 1960s       | Multiple                       | Small scale hard rock mining   | Small, localized temporary disturbance to soils and streamside banks.   |
| Private and state lands timber harvest | 1960s       | Multiple                       | Unspecified acres; primarily tractor logging, haul use of local existing roads.  | Removal of live, and dead and dying trees and potential for the spread of invasive species. Habitat for species that utilize mature forest was reduced on some of the acres affected. Because off-forest lands occur at lower elevations in highly fragmented portions of the analysis area, most activities did not reduce landscape-level connectivity or adversely affect movement of wildlife species that are sensitive to fragmentation and human activity.   |
| <b>1970 - 1979</b>                     |             |                                |  |   |
| Forest Service timber harvest          | 1970 - 1979 | See figure c- 1                | <p>Stonewall:<br/>                     Regeneration harvest: 502 acres<br/>                     Sanitation harvest: 82 acres</p> <p>By HUCs<br/>                     Beaver Creek: Regeneration harvest: 388 acres; Sanitation harvest: 21 acres<br/>                     Humbug Creek: Regeneration harvest: 37 acres<br/>                     Keep Cool Creek: Regeneration harvest: 116 ac.; Sanitation harvest: 24 ac.<br/>                     Lincoln Creek: Regeneration harvest: 116 acres; Sanitation harvest: 61 acres</p> | Regeneration and salvage treatments created an early-seral stage, of which a few are still providing most of the early-seral in the project area. Intermediate treatments reduce stand densities to improve vigor of remaining trees. Reforestation efforts increases stocking of desired tree species. A reduction in wildlife cover and forage occurred immediately following harvest; sites affected by these treatments now provide increased levels of herbaceous and woody forage on most sites, although some stands have closed-canopy conditions and provide hiding and thermal cover with little forage. Effects of these disturbances on vegetation are reflected in the existing condition. |
| Fire/Fuels                             | 1970-1979   | See figure c- 1 and table c- 1 | <p>Stonewall<br/>                     Fuels activities 1,097 acres</p> <p>By HUCs<br/>                     Beaver Creek: Fuels treatments: 875acres</p>  | Effects included a short-term (<10 years) reduction in fuels, cover and forage, which have since been restored. Effects of these disturbances are reflected in the  |

| Activity/Name                                  | Decade/Year | Drainage                       | Scope Of Activity  | Resource Effects   |
|--|-------------|--------------------------------|--|--|
|  |             |                                | Humbug Creek: Fuels treatments: 49acres<br>Keep Cool Creek: Fuels treatments : 524 acres<br>Lincoln Creek: Fuels treatments: 161 acres   | existing condition.  |
| Livestock grazing on federal and private lands | 1970-1979   | Multiple                       | Grazing of cattle, sheep and horses.   | Grazing removed wildlife cover and forage on the site, reduced species diversity, and increased the spread of invasive plants. While impacts still exist, these effects have been reduced due to more recent grazing management regimes, monitoring and mitigation. Effects of these disturbances on vegetation are reflected in the existing condition.   |
| Mining   | 1970s       | Multiple                       | Small scale hard rock mining   | Small, localized temporary disturbance to soils and streamside banks.  |
| <b>1980 - 1989</b>                             |             |                                |  |  |
| Forest Service timber harvest                  | 1980 - 1989 | See figure c- 1                | Stonewall:<br>Regeneration harvest: 575 acres<br>Sanitation harvest: 17 acres<br>By HUCs<br>Beaver Creek: Regeneration harvest: 371 acres<br>Keep Cool Creek: Regeneration harvest: 8 acres<br>Lincoln Creek: Regeneration harvest: 205 acres<br>Sanitation harvest: 17acres | Regeneration treatments created an early seral stage, of which a few are still providing most of the early seral in the project area. Sanitation and intermediate treatments reduce stand densities to improve vigor of remaining trees. Reforestation efforts increases stocking of desired tree species. A reduction in wildlife cover and forage occurred immediately following harvest; sites affected by these treatments now provide increased levels of herbaceous and woody forage on most sites, although some stands have closed-canopy conditions and provide hiding and thermal cover with little forage. Effects of these disturbances on vegetation are reflected in the existing condition. |
| Fire/Fuels                                     | 1980-1989   | See figure c- 1 and table c- 1 | Stonewall<br>Fuels activities 1,569 acres<br>By HUC's<br>Beaver Creek: Fuels treatments: 791 acres   | Effects included a short-term (<10 years) reduction in fuels, cover and forage, which have since been restored. Effects of these disturbances are reflected in the   |

| Activity/Name                                  | Decade/Year | Drainage        | Scope Of Activity  | Resource Effects  |
|--|-------------|-----------------|--|---|
|  |             |                 | Humbug Creek: Fuels treatments:11 acres<br>Keep Cool Creek: Fuels treatments: 141 acres<br>Lincoln Creek: Fuels treatments: 780 acres  | existing condition.   |
| Livestock grazing on federal and private lands | 1980-1989   | Multiple        | Grazing of cattle, sheep and horses.   | Grazing removed wildlife cover and forage on the site, reduced species diversity and increased the spread of invasive plants. While impacts still exist, these effects have been reduced due to more recent grazing management regimes, monitoring and mitigation. Effects of these disturbances on vegetation are reflected in the existing condition.   |
| Private and state lands timber harvest         | 1980s       | Multiple        | Unspecified acres; primarily tractor logging, haul use of local existing roads.  | Removal of live, and dead and dying trees and potential for the spread of invasive species. Habitat for species that utilize mature forest was reduced on some of the acres affected. Because off-forest lands occur at lower elevations in highly fragmented portions of the analysis area, most activities did not reduce landscape-level connectivity or adversely affect movement of wildlife species that are sensitive to fragmentation and human activity. |
| Mining   | 1980s       | Multiple        | Small scale hard rock mining   | Small, localized temporary disturbance to soils and streamside banks.   |
| <b>1990 - 1999</b>                             |             |                 |  |   |
| Forest Service timber harvest                  | 1990 – 1999 | See figure c- 1 | Stonewall<br>Regeneration harvest: 787 acres<br>Sanitation harvest: 220 acres<br>Intermediate harvest: 17 acres<br>By HUCs<br>Beaver Creek<br>Regeneration harvest: 275 acres<br>Intermediate harvest: 16 acres<br>Sanitation harvest: 186 acres<br>Humbug Creek | Regeneration treatments created an early seral stage, of which a few are still providing most of the early seral in the project area. Sanitation and intermediate treatments reduce stand densities to improve vigor of remaining trees. Reforestation efforts increases stocking of desired tree species. A reduction in wildlife cover and forage occurred immediately following harvest; sites affected by these treatments now                                |

| Activity/Name                                  | Decade/Year | Drainage                       | Scope Of Activity   | Resource Effects   |
|--|-------------|--------------------------------|---|--|
|  |             |                                | Intermediate harvest: 49 acres<br>Keep Cool Creek<br>Regeneration harvest: 393 acres<br>Intermediate harvest: 78 acres<br>Sanitation harvest: 279 acres<br>Lincoln Creek<br>Regeneration harvest: 432 acres<br>Intermediate harvest: 17 acres<br>Sanitation harvest: 28 acres | provide increased levels of herbaceous and woody forage on most sites, although some stands have closed canopy conditions and provide hiding and thermal cover with little forage. Effects of these disturbances on vegetation are reflected in the existing condition.  |
| Fire/Fuels                                     | 1990-1999   | See figure c- 1 and table c- 1 | Stonewall<br>Fuels activities: 2,460 acres<br>By HUCs<br>Beaver Creek: Fuels treatments: 1,196 acres<br>Humbug Creek: Fuels treatments: 1,145 acres<br>Keep Cool Creek: Fuels treatments: 1,957 acres<br>Lincoln Creek: Fuels treatments: 779 acres                           | Effects included a short-term (<10 years) reduction in fuels, cover and forage, which have since been restored. Effects of these disturbances are reflected in the existing condition.   |
| Livestock grazing on federal and private lands | 1990-1999   | Multiple                       | Grazing of cattle, sheep and horses.  | Grazing removed wildlife cover and forage on the site, reduced species diversity and increased the spread of invasive plants. While impacts still exist, these effects have been reduced due to more recent grazing management regimes, monitoring and mitigation. Effects of these disturbances on vegetation are reflected in the existing condition.  |
| Private and state lands timber harvest         | 1990s       | Multiple                       | Unspecified acres; primarily tractor logging, haul use of local existing roads.   | Removal of live, and dead and dying trees and potential for the spread of invasive species. Habitat for species that utilize mature forest was reduced on some of the acres affected. Because off-forest lands occur at lower elevations in highly fragmented portions of the analysis area, most activities did not reduce landscape-level connectivity or adversely affect movement of wildlife species that are sensitive to fragmentation and human activity |
| Mining   | 1990s       | Multiple                       | Small hand-scale placer mining  | Small, localized temporary   |

| Activity/Name  | Decade/Year  | Drainage                       | Scope Of Activity   | Resource Effects   |
|--|--------------|--------------------------------|---|--|
|  |              |                                |   | disturbance to soils and streamside banks.   |
| <b>2000 - 2010</b>   |              |                                |   |  |
| Forest Service timber harvest                                | 2000-2010    | See figure c- 1                | Stonewall<br>Regeneration harvest: 154 acres<br>By HUCs:<br>Beaver Creek: No records;<br>Humbug Creek: Intermediate harvest: 60 acres;<br>Keep Cool Creek: Regeneration harvest: 5 acres;<br>Lincoln Creek: Regeneration harvest: 154 acres<br>Sanitation harvest. 16 acres | Regeneration treatments created an early-seral stage, of which a few are still providing most of the early seral in the project area. Sanitation and intermediate treatments reduce stand densities to improve vigor of remaining trees. A reduction in wildlife cover and forage occurred immediately following harvest; sites affected by these treatments now provide increased levels of herbaceous and woody forage on most sites, although some stands have closed-canopy conditions and provide hiding and thermal cover with little forage. Effects of these disturbances on vegetation are reflected in the existing condition. |
| Fire/Fuels   | 2000 to 2010 | See figure c- 1 and table c- 1 | Stonewall<br>Fuels activities: 1,020_acres<br>By HUCs<br>Beaver Creek: Fuels treatments: 181 acres<br>Humbug Creek: Fuels treatments: 166 acres<br>Keep Cool Creek: Fuels treatments: 285 acres<br>Lincoln Creek: Fuels treatments: 571 acres                               | Effects included a short-term (<10 years) reduction in fuels, cover and forage, some of which may have since been restored. Effects of these disturbances are reflected in the existing condition.   |
| Pheromone control  | 2002         | Lincoln Gulch                  | Placement of MCH caps, occurred just w/in Stonewall Vegetation area.  | Small, localized temporary disturbance from site visits  |
| Livestock grazing on federal, state lands, and private lands | 2000-2010    | Multiple                       | Grazing of cattle, sheep and horses.  | Grazing removed wildlife cover and forage on the site, reduced species diversity and increased the spread of invasive plants. Effects of these disturbances on vegetation are reflected in the existing condition.   |
| Mining   | 2000s        | Multiple                       | Small hand-scale placer mining  | Small, localized temporary disturbance to soils and streamside banks.  |

## Ongoing Activities

Table C- 4. Ongoing Activities 2010-present

| ACTIVITY/NAM<br>E  | DECADE/YEA<br>R                  | DRAINAG<br>E       | SCOPE OF ACTIVITY   | RESOURCE EFFECTS   |
|--|----------------------------------|--------------------|---|--|
| Pine Grove Campground Fencing                                      | 2011                             | Beaver Creek       | Fence enclosure of 8 acres to keep livestock out of the developed campground area.  | Removed impact from livestock use  |
| Alice Creek, Hogum Creek, and Poorman prescribed burns             | 2010-present                     |                    | BMSS IRA 2,841 acres<br>Specimen Creek IRA 793 acres<br>Hand pile, hand slashing, pile burning and prescribed burns for wildlife habitat improvement.   | Temporary, localized disturbance during operations. Some felling of small diameter trees and reduction in fuels. Short-term increase in growth of shrubs and forbs. Potential for weed persistence or spread.  |
| Forestwide hazardous tree removal and fuels reduction HFRA project | Ongoing                          | Forestwide         | Stonewall: 382 acres<br>BMSS IRA: 82 acres<br>By HUCs: total 568 acres<br>Beaver Creek: 172 acres<br>Keep Cool Creek: 270 acres<br>Lincoln Creek: 127 acres   | Temporary, localized disturbance during operations. Felling and removal of dead and damaged “hazardous” trees from roadsides. Very minor effects on live tree stocking, stand structures, and species compositions. Potential for weed persistence or spread.  |
| Pine Grove campground  | Ongoing annual use & maintenance | Upper Beaver Creek | Developed recreation site, overnight use (free-use facility). Season of use 5/15 – 11/15.   | Localized noise disturbance, road use.   |
| Livestock grazing Permits  | Ongoing                          |                    | The Stone Dry area includes 3 allotments; 1 sheep and two cattle (see Stone Dry NFMA Report for more detail – pp. 1-3).<br>Keep Cool Liverpool allotment: project area 3,171 acres<br>Stonewall allotment: project area 2,000 acres<br>By HUCs: total 4,486 acres<br>Beaver Creek 3,510 acres; Keep Cool Creek HUC 785 acres; Lincoln Creek HUC 191 acres<br>Portions of several allotments overlap the Bear-Marshall-Scapegoat-Swan (BMSS) IRA.<br>Keep Cool Liverpool allotment: BMSS IRA 4,344 acres, Keep Cool Creek 7,500 acres<br>Stonewall allotment: BMSS IRA 203 acres, LG IRA 124 acres<br>Arrastra allotment: LG IRA 202 acres<br>Alice Creek allotment: BMSS IRA 12,963 acres | Potential impacts on aspen and conifer regeneration in proposed treatment units analyzed. Proposed Unit 57 (93 acres) and most of Unit 43 (about 80 acres) are within livestock allotments. Grazing removes wildlife cover and forage on the site, and reduces species. Potential for spread of existing weed populations as well as introduce new populations, but with implementation of BMPs populations should not expand substantially. Continued potential negative effects to riparian areas, water quality, fish and fish habitat, with some potential for improvements from current conditions in some locations. |

| ACTIVITY/NAM<br>E                                  | DECADE/YEA<br>R | DRAINAG<br>E | SCOPE OF ACTIVITY  | RESOURCE EFFECTS   |
|--|-----------------|--------------|--|--|
| Livestock grazing on state trust and private lands | Ongoing         | Multiple     | Grazing of cattle, sheep and horses. May result in riparian vegetation, stream bank and upland impacts.  | Removal of live, and dead and dying trees and potential for the spread of invasive species. Habitat for species that utilize mature forest was reduced on some of the acres affected. Because off-forest lands occur at lower elevations in highly fragmented portions of the analysis area, most activities did not reduce landscape-level connectivity or adversely affect movement of wildlife species that are sensitive to fragmentation and human activity. Potential for spread of existing weed populations as well as introduce new populations. Continued potential negative effects to riparian areas, water quality, fish and fish habitat, with some potential for improvements from current conditions in some locations.  |
| Mining Activity                                    | Ongoing         | Multiple     | Overall, permitted mining activity on the Lincoln Ranger District in recent years has been limited to small operations with mainly hand work.  | Small, localized temporary disturbance to vegetation, soils and streamside banks.  |
| Noxious Weed Treatment                             | Ongoing         | Multiple     | Herbicide treatment is primarily along roads and in patches that are accessible to mechanized equipment, and backpack/horsepack equipment; some biocontrol treatment (insects), grazing control (sheep), and mechanical.<br>Stonewall Vegetation Project area 1,111 acres<br>Bear-Marshall-Scapegoat-Swan IRA 386 acres<br>Lincoln Gulch IRA 261 acres | Potential impacts to small trees along roadsides and in proposed regeneration units. Of the 1,111 acres within the project area, 443 acres are within intermediate treatment units, 50 acres are in prescribed burn units, and 492 are on roadsides. Applying herbicides for control of noxious weeds would have little potential impact to desirable tree stocking in these areas. 126 acres are within proposed regeneration harvest units, with herbicide application having minimal impacts if appropriate application methods are used. Potential short-term impacts to water quality if stream set-backs are not adhered to or if spills occur. Potential impact to sensitive plant populations, known populations would be protected from disturbance, but some habitat or individuals could be impacted. |
| Lincoln compound                                   | Ongoing         | Humbug Creek | Humbug Creek HUC 110 acres   | Continued disturbance within a developed area.   |

| ACTIVITY/NAM<br>E                         | DECADE/YEA<br>R               | DRAINAG<br>E                     | SCOPE OF ACTIVITY   | RESOURCE EFFECTS   |
|---|-------------------------------|----------------------------------|---|--|
| Outfitting                                | Ongoing                       | Multiple                         | Outfitter and guide special use permits for big game and spring bear seasons, day use and overnight camping.  | Temporary displacement of use of area.   |
| Road maintenance                          | Annual                        | Multiple                         | Grading and spot-gravelling performed as needed. Culvert maintenance may include clean out and or replacement where warranted for water flow.   | Potential impacts to water quality from inadvertent side casting of road material into stream channels and erosion of freshly bladed surface, but longer-term benefits based on road drainage improvements and fish passage.   |
| Trail maintenance                         | Annual<br>Ongoing             | Multiple                         | Routine and spot maintenance forest system trails   | Potential short-term soil/water/wildlife/fish/recreation effects. Potential trail closures or restrictions   |
| Road special use permit                   | Ongoing                       | Multiple                         | Re-issuance of existing road access permit for long-term.   | Continuation of existing use.  |
| Personal use firewood cutting             | Ongoing                       | Multiple                         | Dead trees with approximately 100 feet of existing travel routes within the analysis are being removed by the public for firewood.  | Temporary disturbance, reduction of some down wood within travel corridors. Potential for weed spread.   |
| Private land timber sale                  | Ongoing                       | Private property, state property | Unspecified acres; primarily tractor logging using existing roads for hauling.  | Temporary, localized disturbance during operations. Removal of live, and dead and dying trees and potential for the spread of invasive species. Habitat for species that utilize mature forest may be reduced on some of the acres affected. Because off-forest lands occur at lower elevations in highly fragmented portions of the analysis area, most activities did not reduce landscape level connectivity or adversely affect movement of wildlife species that are sensitive to fragmentation and human activity. Felling and removal of trees, potential for weed persistence or spread. |
| DNRC timber sale (Liverstone)             | Ongoing                       | Stonewall/<br>Beaver<br>Creeks   | Timber sale on State Trust Land. Harvest of approx.. 260 acres  | Potential harvest effects to watersheds and wildlife. Site-specific effect disclosed in the DNRC EA (per MEPA).  |
| Private land development                  | Ongoing                       | Multiple                         | Development for housing in several areas in the vicinity of the town of Lincoln.  | Increased disturbance and road use may displace wildlife. Habitat alteration for developed sites.  |
| Blackfoot-North Divide Winter Travel Plan | DN signed 09/14/13<br>Ongoing | Lincoln RD                       | The Blackfoot-North Divide Winter Travel Plan would provide for a variety of motorized and non-motorized winter recreational opportunities.<br>Total area affected by this decision. North of Hwy 200 in or adjacent to the | Displacement or effects of noise to animals by over-snow use in winter. Recreation/social/economic effects.in the  |

| ACTIVITY/NAM<br>E | DECADE/YEA<br>R | DRAINAG<br>E | SCOPE OF ACTIVITY  | RESOURCE EFFECTS |
|-------------------|-----------------|--------------|--|------------------|
|                   |                 |              | Stonewall project is 102,330 acres.(58,250 acres open for snowmobile use and 44,080 acres closed to snowmobile use). | Lincoln area.    |

Reasonably Foreseeable Future Activities

Table C- 5. Foreseeable future activities

| ACTIVITY/NAME                      | ESTIMATED<br>IMPLEMENTATION | DRAINAGE   | SCOPE OF ACTIVITY  | RESOURCE EFFECTS   |
|------------------------------------|-----------------------------|------------|--|--|
| Blackfoot Travel Plan (non-winter) | Currently Under analysis    | Lincoln RD | The Lincoln Ranger District is currently developing the Blackfoot Travel Plan (non-winter) that would designate motorized public access routes on motor vehicle use map. This plans is being developed in accordance with 36 CFR 212, Subpart B, Designation of Roads, Trails, and Areas for Motor Vehicle Use | Action alternatives would reduce overall road density and related effects such as potential for weed spread, sedimentation delivery from roads to area streams, and disturbance to wildlife. Under the action alternatives use of roads may change from motorized to non-motorized; opportunities for both motorized and non-motorized recreation would continue to be available across the district. There is a potential for ground disturbance from road and trail reroutes, construction of connectors and reconstruction of routes. |
| Road maintenance                   | Continuation                | Multiple   | Grading and spot-gravelling performed as needed. Culvert maintenance may include clean out and or replacement where warranted for water flow.  | Temporary displacement of animals due to human activity. Potential impacts to water quality from inadvertent side casting of road material into stream channels and erosion of freshly bladed surface, but longer-term benefits based on road-drainage improvements and fish passage.  |

| ACTIVITY/NAME  | ESTIMATED IMPLEMENTATION       | DRAINAGE                         | SCOPE OF ACTIVITY   | RESOURCE EFFECTS   |
|--|--------------------------------|----------------------------------|---|--|
| Livestock grazing on federal, state trust, and private lands | Continuation                   | Multiple                         | Grazing of cattle, sheep and horses.  | Potential impacts on aspen and conifer regeneration. Grazing removes wildlife cover and forage on the site, and reduces species. Potential for spread of existing weed populations as well as introduce new populations. Continued potential negative effects to riparian areas, water quality, fish and fish habitat, with some potential for improvements from current conditions in some locations.   |
| Private and state trust land timber sales                    | Continuation                   | Private property, state property | Unspecified acres; primarily tractor logging using existing roads for hauling.  | Removal of live, and dead and dying trees and potential for the spread of invasive species. Habitat for species that utilize mature forest may be reduced on some of the acres affected. Because off-forest lands occur at lower elevations in highly fragmented portions of the analysis area, most activities did not reduce landscape-level connectivity or adversely affect movement of wildlife species that are sensitive to fragmentation and human activity. |
| Noxious weed treatment                                       | Continuation                   | Multiple                         | Herbicide treatment is primarily along roads and in patches that are accessible to mechanized equipment, and backpack/horsepack equipment; some biocontrol treatment (insects), grazing control (sheep), and mechanical.<br>Stonewall Vegetation Project area 1,111 acres<br>Bear-Marshall-Scapegoat-Swan IRA 386 acres<br>Lincoln Gulch IRA 261 acres  | Potential impacts to small trees along roadsides and in proposed regeneration units. Applying herbicides for control of noxious weeds would have minimal impacts to desirable tree stocking because appropriate application methods would be used.   |
| Stream restoration   | Summer 2015 (DM signed 2/3/15) | Stonewall Creek                  | Restore approximately 4,200 feet of stream channel impacted by past mining activities. Removal of mining waste rock and channel improvement for improving fish habitat and channel stability utilizing primarily natural materials. Riparian and floodplain revegetation will include planting of native grass sod, forbs and shrubs. The project is a cooperative effort with Trout Unlimited. | Short-term instream disturbance and minor road improvements to NFSR#607 for material and equipment haul to and from the project site.  |
| Copper Creek Wildlife Enhancement                            | 2015                           | Copper Creek                     | Proposed treatment includes reducing/removing conifer competition in aspen clones and around whitebark pine by mechanical treatment. No heavy equipment would be used and no commercial product would be removed from the site.   | Potential effect to Lynx habitat   |

| ACTIVITY/NAME   | ESTIMATED IMPLEMENTATION | DRAINAGE | SCOPE OF ACTIVITY | RESOURCE EFFECTS |
|-----------------|--------------------------|----------|-------------------|------------------|
| (Aspen) Project |                          |          |                   |                  |

Data source: HNF Lincoln RD GIS. Codes categorized as follows:

Fuels treatments: 1111,1112,1113,1115,1117,1120,1130,1150,1152,1153,1154

Regeneration treatments: 4111,4112,4113,4117,4121,4131,4132,4133,4134,4141,4142,4148,4211

Intermediate treatments: 4151,4152,4210,4220

Sanitation treatments: 4230, 4231, 4232

Reforestation treatments:

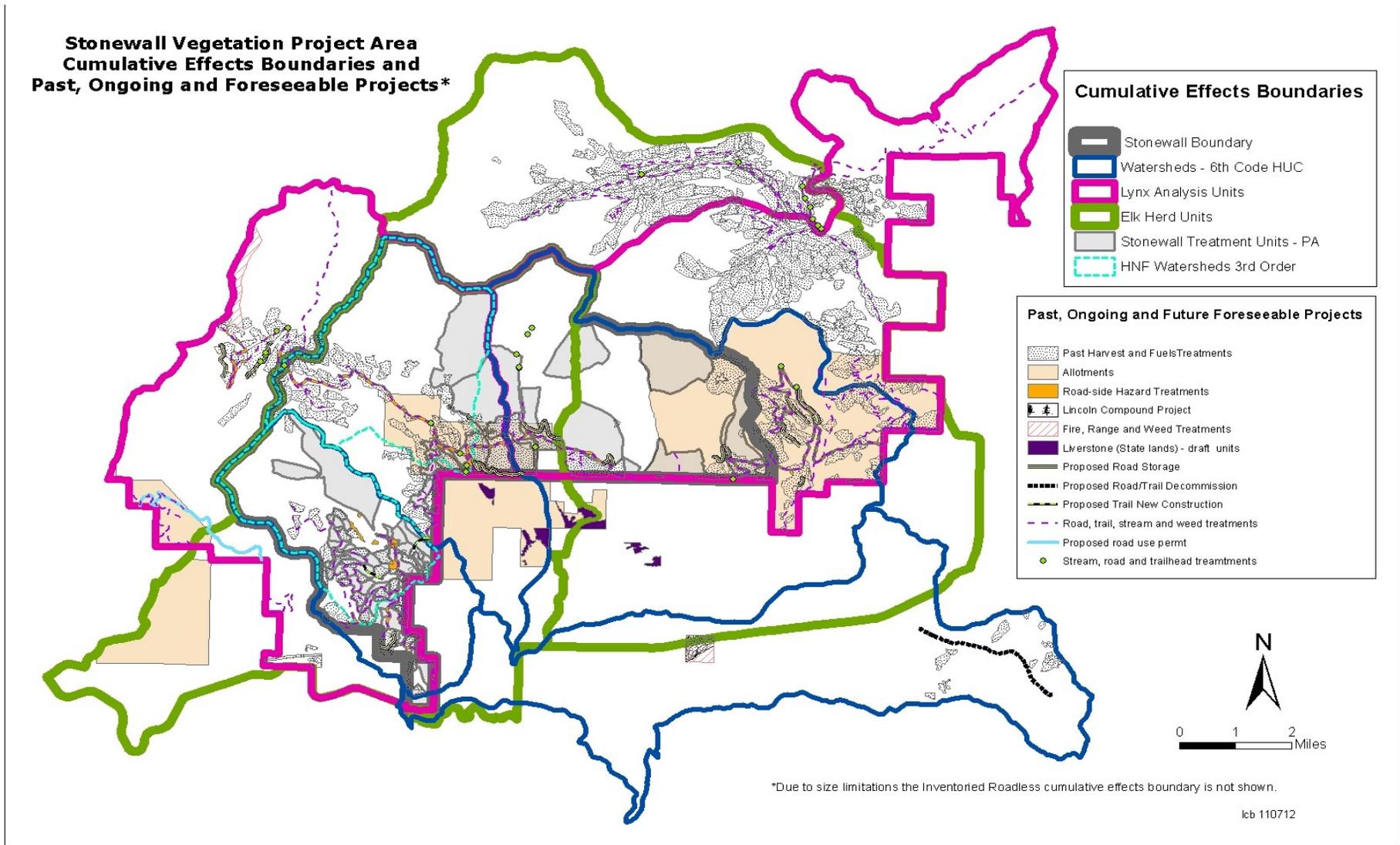


Figure C- 1. Past, Ongoing and Foreseeable Projects within the Cumulative Effects Boundaries (wildfire location information not available, not mapped)

## Past, Ongoing and Future Activities in the Bear-Marshall-Scapegoat-Swan IRA

**Table C- 6. Acres of past harvest and fuels activities in the Bear-Marshall-Scapegoat-Swan IRA**

| <b>Past Harvest and Fuels Activity</b>  | <b>Acres within IRA</b> |
|---|-------------------------|
| Prescribed Burning  | 40,336.0                |
| Wildfire  | 9,460.6                 |
| Man Caused Fire   | 653.2                   |
| Fuels Treatment (yarding, rearranging, compacting, crushing, piling)  | 4,493.5                 |
| Thinning (hazardous fuels reduction, fuel break)  | 7,992.5                 |
| Range Improvement   | 870.9                   |
| Timber Harvest (patch clearcut, stand clearcut, shelterwood establishment cut, seed-tree seed cut, shelterwood staged removal cut, single tree selection cut, group selection cut, liberation cut, commercial thin, sanitation salvage, precommercial thin) | 2,962.3                 |
| Reforestation Needs Created   | 2,708.7                 |
| Reforestation/Planting/Regeneration activities  | 6,856.3                 |
| Wildlife/T&E activities   | 337.8                   |
| <b>TOTAL</b>  | <b>76,671.8</b>         |

**Table C- 7. Ongoing and reasonably foreseeable future actions in the Bear-Marshall-Scapegoat-Swan IRA**

| Forest and District         | Project Name and Location   | Acres(miles)<br>in BMSS IRA  | Type of Activity in BMSS IRA   | Effects   |
|-----------------------------|---|--|--|---|
| Flathead NF/Spotted Bear RD | <p>Soldier Addition II EA<br/>(Decision Notice signed December 2011)</p> <p>The portion of the district affected by the vegetation treatments in this project are bounded to the east by the Hungry Horse Reservoir and the South Fork Flathead River, to the north by Sullivan Creek, to the south by Bunker Creek, and to the west by Bruce Ridge</p> | <p>1,333 acres prescribed fire</p> <p>and</p> <p>1 acre of hand cutting of small trees</p> | <p>1,333 acres of prescribed burning to sustain the role of fire in the ecosystem and help restore whitebark pine habitat.</p> <p>and</p> <p>1 acre of hand treatment to reduce hazardous fuels around the Stony Hill Electronic Site to protect the site from future wildland fire.</p> <p>Implementation expected: 2012 - 2022</p> | <p>Short-term effects to solitude and opportunities for primitive and unconfined recreation would be minimal due to the increased presence of people and noise during project implementation. Helicopter use is expected to occur over a 1- to 2-day period during the ignition process; however, helicopter use is not unusual in the area. During the implementation of the fuels treatment at the Stony Hill Electronics Site, solitude may be interrupted by the power saws used in thinning and the presence of personnel on the site for several days.</p> <p>Short-term effects to the undeveloped characteristics while cut stumps are visible at the site; however, when viewed from off-site the area would resemble other subalpine openings. Thinning treatments would not affect the remoteness characteristic of the area.</p> <p>Burning would be expected to enhance the natural integrity and apparent naturalness of the area. Burning would not affect the feel of remoteness in this IRA.</p> |
| Flathead NF/Spotted Bear RD | <p>Spotted Bear River<br/>(Decision Notice signed August 2011)</p> <p>The project area is bounded on the west by the Hungry Horse Reservoir and the South Fork Flathead River, on the north by</p>  | <p>436 acres of prescribed fire</p>  | <p>Prescribed burning on 436 acres to sustain the role of fire in the ecosystem and improve the availability of seasonal habitat for ungulates, grizzly bears, and other wildlife species</p> <p>Expected implementation: 2012-2022. Some of the prescribed burning could begin in 2012. Due to the infrequency of achieving</p>     | <p>Short-term effects to solitude and opportunities for primitive and unconfined recreation would be minimal due to the increased presence of people and noise during project implementation. Helicopter use is expected to occur over a 1- to 2-day period</p>   |

| Forest and District | Project Name and Location  | Acres(miles)<br>in BMSS IRA | Type of Activity in BMSS IRA   | Effects  |
|---------------------|--|-----------------------------|--|--|
|                     | <p>South Fork Dry Park Creek, on the south by a minor ridge off Spotted Bear Mountain just north of the mouth of Cedar Creek, and on the east by the Great Bear Wilderness and Bob Marshall Wilderness boundaries.</p> |                             | <p>the desired combination of weather and fuel/vegetative conditions, implementation of the prescribed burning may take up to 10 years before completed.</p> | <p>during the ignition process; however, helicopter use is not unusual in the area. People who use the area for primitive recreation opportunities would use the area as they did before, although they may be restricted during the time the area is actively burning. Additionally, instead of the area being “green” as it was before, portions of the area would now be considered “black,” but this should not affect their recreational use of the area.</p> <p>Short-term effects to the undeveloped characteristics while cut stumps and areas blackened by fire are visible.</p> <p>Proposed burning is designed to produce effects similar to those expected in a historic natural fire and result in more resilient forest conditions for long-term benefits. The vegetation slashing and subsequent burning is not anticipated to detract from IRA characteristics such as natural integrity and apparent naturalness.</p> |

| Forest and District                                     | Project Name and Location   | Acres(miles)<br>in BMSS IRA | Type of Activity in BMSS IRA  | Effects   |
|---|---|-----------------------------|---|---|
| Lewis and Clark<br>NF/Rocky Mountain RD                 | Benchmark Fuels EA<br>(Analysis Complete – EA being<br>revised due to remanding on<br>appeal)<br><br>T19N R09W and T20N R10W  | 388                         | Use of prescribed fire and mechanical fuels<br>treatments to reduce fuel hazards.<br>Expected implementation: chainsaw and<br>hand-piling Summer/Fall 2013, Mechanical<br>removal of trees may begin Winter 2013.<br>Prescribed burn implementation anticipated<br>to occur over the course of several years.                                 | Short-term effects to solitude and<br>opportunities for primitive and<br>unconfined recreation due to the<br>increased presence of people and<br>noise during project<br>implementation.<br><br>Short-term effects to the<br>undeveloped characteristics while<br>cut stumps and areas blackened<br>by fire are visible.<br><br>Long-term benefits to naturalness<br>as fuel hazards are reduced. |
| Lewis and Clark<br>NF/Rocky Mountain<br>Ranger District | Rocky Mountain Ranger District<br>Travel Plan EIS—Badger -Two<br>Medicine Area<br>(Analysis Complete)<br><br>The project area extends from<br>Birch Creek which is situated<br>about 17 miles west of the town<br>of Dupuyer, Montana, north<br>about 20 miles to Glacier<br>National Park near Highway 2<br>and west to Marias Pass and the<br>Continental Divide. | (7.59)                      | 3.74 miles of road to be converted to non-<br>motorized system trails<br><br>0.26 road miles to be decommissioned<br><br>3.59 trail miles to be decommissioned  | Long-term benefits to<br>opportunities for primitive and<br>unconfined recreation, more<br>effective management of<br>unauthorized motorized use  |
| Lewis and Clark<br>NF/Rocky Mountain<br>Ranger District | Rocky Mountain Ranger District<br>Travel Plan EIS—Birch Creek<br>South Area<br>(Analysis Complete)<br><br>The project area extends from<br>Birch Creek which is situated<br>about 17 miles west of the town<br>of Dupuyer, Montana, south<br>about 70 miles to Red Mountain<br>near Highway 200.  | (20.2)                      | 2 miles of undetermined road adopted as<br>part of the designated transportation system<br>within the IRA.<br><br>12 miles of non-system trail adopted as part<br>of the designated transportation system<br>within the IRA (4 of these miles motorized<br>trails).<br><br>6.2 miles of unneeded existing roads and<br>trails decommissioned. | Long-term benefits to<br>opportunities for primitive and<br>unconfined recreation, more<br>effective management of<br>unauthorized motorized use  |
| Helena NF/Lincoln RD                                    | Forestwide Hazardous Tree<br>Removal and Fuels Reduction—   | approximately<br>82         | Removal of trees that are dead or present a<br>hazard (falling) within 1 ½ tree lengths of the  | Short-term effects to solitude and<br>opportunities for primitive and   |

| Forest and District  | Project Name and Location  | Acres(miles) in BMSS IRA | Type of Activity in BMSS IRA  | Effects  |
|----------------------|--|--------------------------|---|--|
|                      | HFRA<br>(Analysis Complete)  | (2.86)                   | edge of an open road. The trees to be removed in the IRA are all on existing, open roads that provide access to trailheads, trails, private lands, dispersed recreation sites, campgrounds, administrative sites, recreation opportunities and general forest access. Implementation began Fall 2010. | unconfined recreation due to the increased presence of people and noise during project implementation.<br><br>Short- term effects to the undeveloped characteristics while cut stumps are visible.   |
| Helena NF/Lincoln RD | Blackfoot Winter Travel Plan—<br>EA<br>(DN signed 09/14/2013)  | N/A                      | Designate motorized and non-motorized trails for winter use   | Long-term benefits to opportunities for primitive and unconfined recreation, more effective management of unauthorized motorized use   |
| Helena NF/Lincoln RD | Blackfoot Travel Plan (non-<br>winter)—EIS<br>(Under Analysis)   | N/A                      | Designate motorized and non-motorized trails  | Long-term benefits to opportunities for primitive and unconfined recreation, more effective management of unauthorized motorized use   |
| Helena NF/Lincoln RD | Alice Creek Wildlife<br>Enhancement Project<br>(Under Analysis)<br><br>13 miles northeast of Lincoln,<br>MT. Bordered by the Continental<br>Divide along the north and<br>eastern edge, and the<br>Scapegoat Wilderness along the<br>western side. | 2,823                    | Improve big game winter range by reducing conifer encroachment within native grasslands. In addition to creating and maintaining natural openings and improving stand structure, burning would improve forage quality and quantity.   | Short-term effects to solitude and opportunities for primitive and unconfined recreation due to the increased presence of people and noise during project implementation.<br><br>Short-term effects to the undeveloped characteristics while cut stumps and areas blackened by fire are visible.<br><br>Long-term benefits to naturalness as winter range and forage are improved. |
| Helena NF/Lincoln RD | Dry Creek Prescribed Fire<br>(planned future activity in SW<br>Crown)  | 2,000                    | Use of prescribed fire and mechanical fuels treatments to reduce fuel hazards.  | Short-term effects to solitude and opportunities for primitive and unconfined recreation due to the increased presence of people and noise during project implementation.  |

| Forest and District    | Project Name and Location  | Acres(miles)<br>in BMSS IRA | Type of Activity in BMSS IRA  | Effects  |
|------------------------|--|-----------------------------|---|--|
|                        |  |                             |   | <p>Short-term effects to the undeveloped characteristics while cut stumps and areas blackened by fire are visible.</p> <p>Long-term benefits to naturalness as fuel hazards are reduced.</p>   |
| Helena NF/Lincoln RD   | Weed Treatments (ongoing)  | 388                         | Ground based herbicides applied to reduce invasive weed infestations.   | <p>Short-term effects to solitude during project implementation,</p> <p>Long-term beneficial effects to naturalness as weed infestations are reduced.</p>  |
| Helena NF/Lincoln RD   | Grazing Allotments (ongoing)   | 17,511                      | Ongoing grazing in the Alice Creek, Keep Cool Liverpool, and Stonewall Allotments   | No new impacts to roadless resources are anticipated, there may be minor long-term (ongoing) impacts to naturalness due to the presence of livestock.  |
| Lolo NF/Seeley Lake RD | <p>Dick Creek Fuels Management Project (Analysis complete, Decision signed 4/26/2008)</p> <p>Located near McCabe Point within the “Monture Area” of the BMSS</p> | 1,075                       | <p>This project includes prescribed burning on approximately 1,075 acres of transitory range and winter range located near the Blackfoot Clearwater Wildlife Management Area.</p> <p>Implementation of approximately 775 acres of prescribed burning was conducted in 2011.</p> <p>Implementation of remaining approximately 300 acres of prescribed burning planned for fall of 2012, or later depending on available burn window.</p> | <p>This project would not alter the natural character of the BMSS and when completed would appear as a natural fire would; leaving a mosaic of burn patterns on the landscape. Ignition would be conducted aerially, and control lines would utilize natural topographic breaks. No tree felling would be conducted as part of this project that would alter the character of the IRA. The feeling of isolation and solitude could be reduced for a short time period while aerial ignition activities occur. The sight and sounds of the helicopter would affect the feeling of solitude in the lower reaches of the Dick Creek drainage for one to two days.</p> |
| Lolo NF/Seeley Lake RD | Swan Face Prescribed Burn (Analysis Complete, Decisions signed 7/25/2011)  | 2,500                       | This project includes the reintroduction of fire to restore the role of fire and enhance ecosystem processes. Ignition would be   | No tree felling would be conducted as part of this project that would alter the character of   |

| Forest and District  | Project Name and Location   | Acres(miles)<br>in BMSS IRA | Type of Activity in BMSS IRA   | Effects   |
|----------------------|---|-----------------------------|--|---|
|                      | Located near Clearwater Lake in the Swan Front Area.  |                             | <p>conducted by hand and aerially, and control lines would utilize natural topographic breaks.</p> <p>Implementation of prescribed burning planned to be conducted in the fall of 2012.</p>  | the IRA. The feeling of isolation and solitude could be reduced for a short time period while ignition activities occur. The sight and sounds of the helicopter would affect the feeling of solitude in the vicinity of the burn for two to three days. |
| Helena NF/Lincoln RD | <p>Alice Creek Wildlife Enhancement</p> <p>Approximate implementation 2016</p> <p>Alice Creek (Northeast of the Stonewall Project area)</p> | Approximately<br>1700       | Removal of encroaching young conifers (slashing/pile burning and prescribed fire) in a mosaic pattern across about 60% of the 2,823-acre project area. Objective is to enhance big game forage within natural open parks, including enhancing aspen in these areas | Potential lynx habitat effects  |