

## **ISSUE 17: RIPARIAN AREAS**

### **Changes from the Draft to the Final EIS**

The following is a summary of the changes between the Draft and Final EIS:

- The existing baseline alternative was clarified. Alternative 2 represents the existing condition due to the Montana/Dakota OHV decision being in effect at the present time. Alternative 1 represents the “old” baseline wherein user-built roads and off-route travel was not technically illegal.
- The discussion on effects by alternative was expanded.
- New references were added including Ehrhart and Hansen 1997, Eubanks 2004, Leonard and others 1997, Moore and others 1987, Prichard 1998.
- The cumulative effects discussion was expanded based on the General Description of Other Activities and Programs report compiled by Christiansen, 2006. A summary is provided in this report with a detailed description of effects of other programs and activities in the project file (Feigley, 3/10/06).
- The programmatic direction discussion was modified to address Alternative 7-M proposed programmatic language direction.

### **Introduction**

This section addresses the potential effects that the Travel Plan alternatives may have on riparian and edge habitat. A riparian area is the area between flowing water and upland areas (Ehrhart and Hansen 1997). Riparian zones are diverse, dynamic and complex habitats. They provide habitat for a variety of species including rare and threatened species, and are sites of biological and physical interaction at the terrestrial/aquatic interface (Kauffman et al. 2001). Riparian zones have a high degree of biodiversity related to their position on the landscape. Riparian zones are at the lowest point on the landscape and are therefore strongly shaped by gravitational forces relative to the input of sediment and organic matter. The microclimate of riparian zones is also influenced by their position on the landscape and is different than the surrounding forest as characterized by increased humidity, more shade, and increased air movement (Thomas 1979).

Riparian zones, though a relatively small percentage of the landscape, provide habitats for a disproportionate number of wildlife (Thomas 1979). While water is the distinguishing characteristic, the components of soil, vegetation, and land form are essential for management area consideration (Ehrhart and Hansen 1997). Many species such as moose rely heavily on riparian areas and associated edge habitat during all or portions of the year to carry out their life cycle. Riparian zones serve as natural corridors or migration routes for many species of game and non-game species. They tend to be more structurally diverse and productive in plant and animal biomass (Manci 1989). This structural diversity creates numerous niches for wildlife. Riparian habitats along streams and meadow edges host unique vegetation assemblages making them important foraging habitats. Coniferous and/or deciduous riparian areas surrounded by grassland/shrub habitat supply cover and food for migrating birds during the breeding season and into the fall.

Riparian cover types make up less than 0.5% of all land area in the Northern Region of the Forest Service, yet tends to incur a disproportionate amount of human activity (for example, home building, recreation and livestock grazing). Riparian habitats have been largely altered from historic conditions due to road construction and to some extent, mining, past grazing practices and decline of beaver. Roads influence riparian habitat integrity.

Roads and trails passing through or parallel to riparian areas can affect many wildlife species both directly and indirectly. Many roads are located along streams, resulting in direct loss of these habitats when built in riparian zones. Riparian areas that have roads or trails directly adjacent to these important areas likely cause some species to be displaced or disturbed due to human use. Species such as the grizzly bear use riparian areas in the spring for forage and can be disturbed by roads and the vehicles traveling on them. Streams tend to be desirable places to camp and recreate, which can result in indirect effects of trampling of vegetation, concentration of human activities and subsequent wildlife displacement.

## **Affected Environment**

Riparian areas occur throughout the Gallatin National Forest. They range from high elevation lakes and willow carrs to high-gradient forested streams to slow-moving deciduous/grassland creeks. In many cases, transportation systems for recreational use are juxtaposed with riparian systems on the landscape. The effects of this relationship are complex, but can be described through the typical wildlife associations and various recreational and administrative use impacts that contribute to physical and biological compromises to riparian integrity.

Large riparian systems provide a high degree of habitat structural complexity and create a high potential for wildlife species diversity. They also tend to be where many roads are located on the Gallatin Forest. For example, moose winter habitat corresponds to large lower-elevation drainages with wider valley bottoms and/or riparian development. This would include, but is not limited to, the following areas:

- 1) Upper Shields Basin in the Crazy Range (Shields TPA).
- 2) Boulder Canyon (Main Boulder TPA).
- 3) Soda Butte Creek (Cooke City TPA) and Mill Creek (Mill Creek TPA) in the Absaroka Range.
- 4) Rock Creek (Tom Miner/Rock TPA) and adjacent Big Creek (Gallatin Crest TPA) on the east slope of the Gallatin Range.
- 5) South Fork Madison River, Duck Creek, Cougar Creek (Hebgen Lake Basin TPA).
- 6) Wapiti Creek (Taylor Fork TPA) in the Hebgen Basin/ Madison Range.

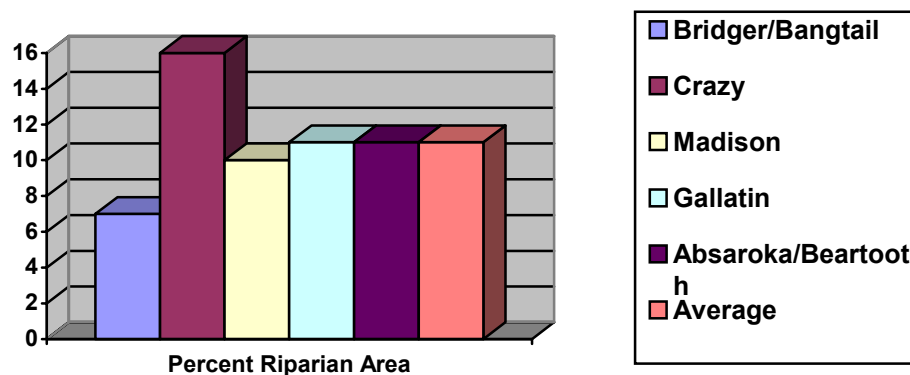
Riparian areas provide more breeding habitat for birds than any other vegetation type in North America (Kauffman et al. 2001). In the Rocky Mountain region, they contain more listed and vulnerable bird species than any other habitat type (Finch 1991). Numerous migratory songbird species are relatively restricted to the shrubs or deciduous trees associated with riparian environments (Hutto and Young 1999). These species include ruffed grouse, willow flycatcher, cedar waxing, yellow warbler and song sparrow, all of which occur on the Gallatin National Forest. Additional species that occur in the Travel Planning Areas (TPAs) that are restricted to riparian bottomlands include the belted kingfisher, bank swallow, least flycatcher, veery, gray catbird, and

American goldfinch. See Issue 14: Migratory Birds and Issue 3: Biological Diversity and Ecological Sustainability for more information.

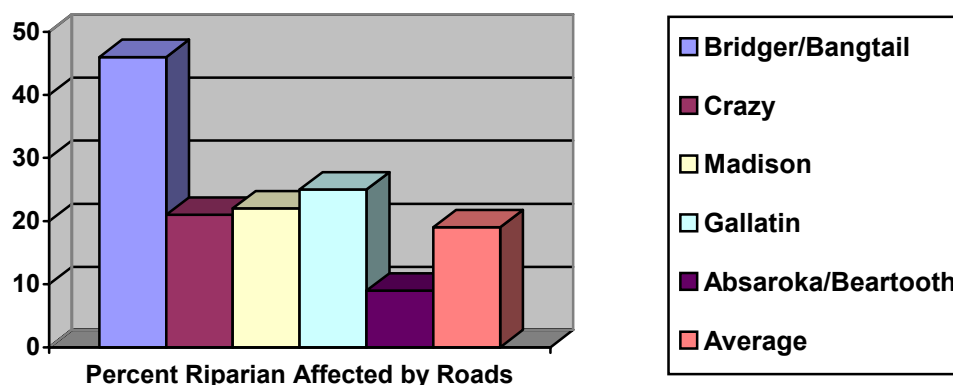
Mammals use riparian zones disproportionately more than upland habitats. This is because of the high structural diversity, proximity to water, and favorable microclimates that create high plant diversity resulting in a varied and abundant forage supply. Riparian areas are found throughout the Forest in association with perennial and intermittent streams, springs, seeps and perched water tables.

According to Cherry (unpublished paper), the following Figure 3.17. 1 gives a relative comparison of perennial stream habitat or riparian area by mountain range. The Crazy Mountains (Shields, Ibex and East Crazies TPAs) have the greatest percentage of existing riparian habitat at 16%. The Bridger/Bangtails (North Bridger, West Bridger North and South, Fairy Lake, Bridger Canyon and Bangtail TPAs) not only have the least riparian habitat at 7%, but also are the most affected by roads with 46% of riparian habitat potentially impacted (see Figure 3.17.2). The Gallatin, Madison, and Crazy Mountains have over 20% of riparian habitat influenced by roads.

**Figure 3.17. 1 Percent riparian area by mountain range defined by perennial streams buffered by 100 m on each side.**



**Figure 3.17. 2 Percent riparian area by mountain range (perennial stream buffered by 200 m on each side) potentially impacted by the proximity of roads.**



Recommendations from the Roads Analysis (Cherry, unpublished paper) include reducing effects of roads by permanent closures if possible in the following hydrologic unit codes (HUCs): Slushman, Bangtail, Brackett, Jackson, Flathead and Sixteenmile. Other heavily-impacted riparian areas are found in the following HUCs: Shields in the Crazies; Buck, South Plateau and West Fork Gallatin in the Madison Range; Trail, Bozeman-Bear and Squaw in the Gallatin Range; and Bridger and Soda Butte in the Absaroka Beartooth Range. The analysis recognized that a number of these HUCs are heavily-influenced by private land and roads where road densities may not ever be reduced, and suggested that lands acquired by the Gallatin National Forest through land exchange in some of these areas could be managed to reduce roads. Additionally, other roads managed by the Forest could be closed.

## **Analysis Methodology**

To determine the impacts to riparian habitat and associated edge habitat, the analysis focused on the current and potential impact of roads and trails to riparian habitats within each TPA. The analysis focused on routes used during the summer. See the Migratory Birds and Biodiversity Issues for discussion of additional effects to riparian habitats.

For this analysis, a similar procedure to what was used for the Forest-wide Roads Analysis (Cherry, unpublished paper) was followed. Streams and riparian areas were buffered by 100 m to determine the total riparian habitat in acres on the Forest. All roads and motorized trails, including project and administrative roads, were buffered on each side by 100 m. Only system roads were included; user-built roads were not considered, unless they were being considered as a proposed designated route in an alternative. All non-motorized trails were buffered by 50 m on each side. The total riparian habitat was intersected with the motorized and non-motorized routes to determine the number of acres and percentage of riparian habitat impacted. Joslin and Youmans (1999) cite studies of fragmented riparian corridors where maintaining a minimum riparian corridor width of 100 m was recommended. In addition, the zone of influence averaged about 75 m, but extended to more than 100 m for some species. Riparian habitats on the Gallatin Forest are generally narrower than 200 m total. While this may overestimate the percent of total riparian habitat, it will incorporate associated edge habitat and can be used to show relative effect by TPA. Effects parameters to determine the effects of travel routes on riparian areas include area and percent of total riparian habitat intersected by roads, motorized trails, and non-motorized trails. Some site-specific impacts to riparian areas are discussed.

## **Effects Parameters**

Effects of travel planning will be displayed as number of acres and percentage of total riparian habitat potentially lost due to the physical presence and use of motorized and non-motorized routes as described in the methodology.

## Direct and Indirect Effects

### Effects by Travel Planning Area (TPA)

Human use of transportation routes could, with time, impact both riparian area function and vegetation integrity. The following table (Table 3.17.1) displays the area and percent of total riparian habitat intersected by roads, motorized trails, and non-motorized trails by TPA for the existing condition. This most closely resembles Alternative 2 (with the Montana/Dakota OHV decision in place).

**Table 3.17. 1 Riparian habitat lost to Gallatin Forest travel routes, existing baseline.**

| Travel Planning Area         | Net Riparian Habitat | Riparian Habitat Lost to Routes |         |                  |         |                      |         |                  |         |
|------------------------------|----------------------|---------------------------------|---------|------------------|---------|----------------------|---------|------------------|---------|
|                              |                      | Roads                           |         | Motorized Trails |         | Non-motorized Trails |         | Total All Routes |         |
|                              |                      | Acres                           | Percent | Acres            | Percent | Acres                | Percent | Acres            | Percent |
| AB Beartooth Plateau         | 10,146               | 0                               | 0.0     | 0                | 0.0     | 490                  | 4.8     | 490              | 4.8     |
| AB Wilderness                | 77,021               | 18                              | 0.0     | 23               | 0.0     | 7,752                | 10.1    | 7,793            | 10.1    |
| Bangtails                    | 3,364                | 1,181                           | 35.1    | 51               | 1.5     | 3                    | 0.1     | 1,235            | 36.7    |
| Bear Canyon                  | 1,450                | 200                             | 13.8    | 83               | 5.7     | 36                   | 2.5     | 319              | 22.0    |
| Big Sky                      | 2,882                | 215                             | 7.5     | 92               | 3.2     | 252                  | 8.7     | 559              | 19.4    |
| Bozeman Creek                | 2,776                | 497                             | 17.9    | 49               | 1.8     | 170                  | 6.1     | 716              | 25.8    |
| Bridger Canyon               | 1,648                | 460                             | 27.9    | 34               | 2.1     | 28                   | 1.7     | 522              | 31.7    |
| Cabin Creek                  | 11,629               | 481                             | 4.1     | 962              | 8.3     | 185                  | 1.6     | 1,628            | 14.0    |
| Cherry Creek                 | 4,264                | 109                             | 2.6     | 14               | 0.3     | 245                  | 5.7     | 368              | 8.6     |
| Cooke City                   | 1,740                | 275                             | 15.8    | 0                | 0.0     | 98                   | 5.6     | 373              | 21.4    |
| Deer Creeks                  | 12,851               | 1,652                           | 12.9    | 1,805            | 14.0    | 0                    | 0.0     | 3,457            | 26.9    |
| East Boulder                 | 7,596                | 587                             | 7.7     | 326              | 4.3     | 16                   | 0.2     | 929              | 12.2    |
| East Crazies                 | 15,795               | 524                             | 3.3     | 725              | 4.6     | 366                  | 2.3     | 1,615            | 10.2    |
| Fairy Lake                   | 2,809                | 860                             | 30.6    | 47               | 1.7     | 29                   | 1.0     | 936              | 33.3    |
| Gallatin Crest               | 20,382               | 260                             | 1.3     | 2,826            | 13.9    | 1,128                | 5.5     | 4,214            | 20.7    |
| Gallatin River Canyon        | 7,262                | 933                             | 12.8    | 228              | 3.1     | 236                  | 3.2     | 1,397            | 19.2    |
| Gallatin Roaded              | 12,212               | 3,905                           | 32.0    | 414              | 3.4     | 0                    | 0.0     | 4,319            | 35.4    |
| Gardiner Basin               | 4,476                | 600                             | 13.4    | 270              | 6.0     | 109                  | 2.4     | 979              | 21.9    |
| Hebgen Lake Basin            | 5,783                | 767                             | 13.3    | 10               | 0.2     | 0                    | 0.0     | 777              | 13.4    |
| Hyalite                      | 4,361                | 1,916                           | 43.9    | 256              | 5.9     | 13                   | 0.3     | 2,185            | 50.1    |
| Ibex                         | 3,225                | 407                             | 12.6    | 509              | 15.8    | 0                    | 0.0     | 916              | 28.4    |
| Lionhead                     | 11,923               | 1,138                           | 9.5     | 828              | 6.9     | 166                  | 1.4     | 2,132            | 17.9    |
| L-M Wilderness Hilgards      | 5,675                | 0                               | 0.0     | 0                | 0.0     | 512                  | 9.0     | 512              | 9.0     |
| L-M Wilderness Monument      | 5,470                | 0                               | 0.0     | 0                | 0.0     | 447                  | 8.2     | 447              | 8.2     |
| L-M Wilderness Spanish Peaks | 15,387               | 4                               | 0.0     | 0                | 0.0     | 1,700                | 11.0    | 1,704            | 11.1    |
| Main Boulder                 | 3,842                | 194                             | 5.0     | 49               | 1.3     | 143                  | 3.7     | 386              | 10.0    |
| Mill Creek                   | 12,430               | 2,551                           | 20.5    | 566              | 4.6     | 140                  | 1.1     | 3,257            | 26.2    |
| Mission                      | 1,786                | 206                             | 11.5    | 74               | 4.1     | 47                   | 2.6     | 327              | 18.3    |

| Travel Planning Area              | Net Riparian Habitat | Riparian Habitat Lost to Routes |         |                  |         |                      |         |                  |         |
|-----------------------------------|----------------------|---------------------------------|---------|------------------|---------|----------------------|---------|------------------|---------|
|                                   |                      | Roads                           |         | Motorized Trails |         | Non-motorized Trails |         | Total All Routes |         |
|                                   |                      | Acres                           | Percent | Acres            | Percent | Acres                | Percent | Acres            | Percent |
| North Bridgers                    | 3,164                | 609                             | 19.2    | 378              | 11.9    | 0                    | 0.0     | 987              | 31.2    |
| Porcupine Buffalo Horn            | 10,280               | 106                             | 1.0     | 1,512            | 14.7    | 191                  | 1.9     | 1,809            | 17.6    |
| Sawtooth                          | 2,630                | 15                              | 0.6     | 0                | 0.0     | 154                  | 5.9     | 169              | 6.4     |
| Shields                           | 7,767                | 3,152                           | 40.6    | 122              | 1.6     | 12                   | 0.2     | 3,286            | 42.3    |
| South Plateau                     | 7,425                | 2,557                           | 34.4    | 39               | 0.5     | 0                    | 0.0     | 2,596            | 35.0    |
| Taylor Fork                       | 16,356               | 1,732                           | 10.6    | 1,259            | 7.7     | 638                  | 3.9     | 3,629            | 22.2    |
| Tom Miner Rock                    | 2,136                | 334                             | 15.6    | 38               | 1.8     | 27                   | 1.3     | 399              | 18.7    |
| West Bridgers North               | 4,939                | 203                             | 4.1     | 652              | 13.2    | 0                    | 0.0     | 855              | 17.3    |
| West Bridgers South               | 3,214                | 29                              | 0.9     | 1,028            | 32.0    | 7                    | 0.2     | 1,064            | 33.1    |
| Yankee Jim Canyon                 | 5,788                | 434                             | 7.5     | 144              | 2.5     | 134                  | 2.3     | 712              | 12.3    |
| Yellowstone                       | 3,834                | 973                             | 25.4    | 425              | 11.1    | 33                   | 0.9     | 1,431            | 37.3    |
| Forest Total including Wilderness | 337,718              | 30,084                          | 8.9     | 15,838           | 4.7     | 15,507               | 4.6     | 61,429           | 18.2    |
| Forest Total without Wilderness   | 224,019              | 30,062                          | 13.4    | 15,815           | 7.1     | 4,606                | 2.1     | 50,483           | 22.5    |

The amount of riparian habitat lost was compared between TPAs to get a relative comparison of the magnitude of potential effects as modeled. Those TPAs that have lost more than 30% of riparian habitat (gray shaded TPAs displayed in Table 3.17. 1 ) include Bangtails (37%), Bridger Canyon (32%), Fairy Lake (33%), Gallatin Roaded (35%), Hyalite (50%), North Bridgers (31%), Shields (42%), South Plateau (35%), West Bridgers South (33%), and Yellowstone (37%). These relative comparisons are consistent with those HUCs identified as potentially impacted by the proximity to roads in the Roads Analysis as described under the Affected Environment. Roads adjacent to streams prevent natural flooding, or redirects surface flow movement, causing negative effects of reduced water flow, drying soil, and reduced vegetation (Eubanks 2004). Roads and human presence facilitated by roads impact wildlife through exploitation (hunting, trapping, shooting), disturbance, habitat modification, and pollution. Vehicle crossings in riparian habitat also create adverse impacts.

Motorized trails also substantially contribute to the loss of riparian habitat. The following TPAs indicate a greater loss of riparian habitat to motorized trails than to roads: Cabin Creek (8.3%), Deer Creeks (14.0%), East Crazies (4.6%), Gallatin Crest (13.9%), Ibex (15.8%), North Bridgers (11.9%), Porcupine-Buffero Horn (14.7%), West Bridgers North (13.2%), West Bridgers South (32.0%).

As stated above, a substantial amount of the riparian habitat lost can be attributed to roads and/ or motorized trails. The potential for damage increases from human to pack stock to motorized vehicles (Eubanks 2004). Exceptions to this are those TPAs containing acres of designated Wilderness or unroaded portions of Wilderness Study Areas. These show a higher percentage of riparian habitat lost to non-motorized trails due to the absence of roads and/ or motorized trails. This is also evident in the difference between the Forest total amount of riparian habitat lost to non-motorized routes including Wilderness (4.6%) and excluding Wilderness (2.1%). Non-motorized

uses, particularly stock use, can have similar negative effects on riparian areas but these tend to be localized and lesser in extent. See the Soils Issue for more information on the impacts of motorized and non-motorized use.

## **Effects by Alternative**

This section addresses the potential effects that the Travel Plan alternatives may have on riparian habitat. The presence of roads and trails and associated human use can directly and indirectly affect riparian habitat. Directly, road or trail building (which is not proposed under the Travel Plan alternatives) through riparian habitat can reduce the total amount of habitat available and disrupt movement corridors. Indirectly, the impacts of roads and subsequent human use include reduced complexity in the structure and production of biomass, decreased diversity and number of species utilizing riparian habitat, and reduced integrity due to habitat degradation.

### **Alternative 1**

Alternative 1 has the greatest negative effect on riparian habitat by virtue of the existing disturbance that has occurred, and would continue to occur. Without the Montana/Dakota OHV decision in place (as in Alternative 2 through 7-M), the effects of this alternative would not remain static but would worsen with time. Motorized off-route travel would continue creating mechanical damage to riparian vegetation, compacting soils, contributing sediment, and disrupting wildlife. This practice would serve to increase the amount of ATV and motorcycle routes and accelerate riparian degradation. Even when system travel routes are located in close proximity to riparian habitat and are used heavily, or maintenance standards are not met, degeneration of these habitats and disturbance to wildlife species occurs.

Project and administrative roads would continue to be used by Forest personnel but the physical presence of the prism would also encourage use by both motorized (ATV and motorcycle) and non-motorized travelers. Main arterial roads would likely see an increase in frequency and duration of public use patterns. A majority of main access Forest roads are adjacent to high quality riparian areas (Main Boulder, Mill Creek, Taylor Fork, Hyalite Creek, etc.). These high standard roads provide public use and fragment riparian corridors. Many species learn to adapt to established visitor use patterns although wildlife movement and riparian integrity are diminished over time. Additional access is provided from these main arterial roads directly to stream or lakesides on “go-down” routes, which in turn facilitate trampling of vegetation and may cause wildlife displacement. Both motorized and non-motorized uses near mountain lakes or high quality riparian areas would continue to have negative effects to wildlife from disturbance and vegetative damage.

### **Alternative 2**

Alternative 2 is the existing condition baseline alternative, which is basically Alternative 1 with the Montana/Dakota OHV decision in place. Non-public administrative roads would continue to be used by Forest personnel but would see a decrease in ATV or motorcycle motorized use through the designation of type of use allowed on each. Project roads would be targeted for restoration. Reducing the total amount of miles of motorized trails and project roads, and the designation of non-motorized use on existing motorized routes that bisect riparian habitat would correspond to a

concurrent reduction in wildlife displacement and substantially improve the quality and integrity of riparian vegetation.

Riparian resource damage from various recreation uses has occurred throughout the Forest. Some drainages are heavily impacted by roads or trails, which has degraded riparian habitat. In some cases, this has been caused by illegal motorized use or user-built access roads and associated campsites prior to the Montana/Dakota OHV decision implementation causing extensive damage to willow and other riparian vegetation. This is occurring in the following TPAs: Gallatin Roaded, Lionhead, Hebgen Basin, Main Boulder, Taylor Fork, Bear Canyon, Cabin Creek, Mill Creek, and Deer Creeks.

Meadow and riparian damage from motorized use has been noted in upper elevation riparian habitats, which may limit optimal use by wildlife, due to the proximity of disturbance to key habitats. In addition, both motorized use and heavy livestock use has caused damage in fragile vegetation types and riparian areas around high mountain lakes. However, the drainages that receive non-motorized stock (horse) use also show direct impact to riparian habitat.

As in Alternative 1, main arterial roads in the Bangtails, Bridger Canyon, Fairy Lake, Gallatin Roaded, Hyalite, North Bridgers, Shields, South Plateau, West Bridgers South, and Yellowstone TPAs would continue to fragment riparian corridors and facilitate public access. Wildlife species would be least affected, and would benefit the most, if motorized use within riparian areas were eliminated. However, these roads provide primary access to all activities including recreating, hunting, fishing, camping, hiking, sightseeing, skiing, and would not be removed from the Gallatin system road inventory. See “Alternatives Considered But Not Studied in Detail” in Chapter 2.

### **Alternatives 3 through 7-M**

All other alternatives would have lesser effects to riparian habitat than what is displayed in Table 3.17.1. Alternatives 3 through 7-M would also realize the benefits of the Montana/Dakota OHV decision implementation as described for Alternative 2, reducing the negative effects to riparian areas by motorized off-route travel. The number of miles of roads would decrease slightly by alternative overall although backcountry roads would decrease and passenger car roads would increase in all of these alternatives. Motorized trails decrease in number of miles and non-motorized trails increase slightly. Specifically, ATV routes would decrease Forest-wide with an increased designation on existing road systems. Motorized trails, particularly those developed for ATVs and modern motorcycles, would not further add to the loss of riparian habitat. Trails identified for stock and mountain bike use would decrease slightly under these alternatives, further reducing impacts to riparian habitat. With the implementation of any of the Alternatives 3 through 7-M, riparian habitat would increase in complexity and diversity. The number of species using riparian habitat for foraging, nesting, cover, or as movement corridors would increase while displacement and disturbance would decrease. Habitat degradation would be minimized or eliminated indicated by an increase in biomass production and structure.

However, some alternatives include actions that may locally magnify effects directly through additional routes within the same riparian buffer zone. An example of an Alternative that identifies objectives for additional routes is Alternative 4, which calls for creating a new motorcycle/ATV



route parallel to the Fairy Lake road, on the opposite side of Fairy Creek (Fairy Lake TPA). While this may not significantly increase the area and percent of riparian habitat lost to an additional route, locating motorized access features on both sides of a creek in and near riparian habitat would have negative effects on the integrity of the riparian vegetation and a wide range of wildlife species. Another example of construction of additional routes within a riparian buffer zone meant to minimize user conflict is the proposed objective to accommodate non-motorized traffic from the mouth of Hyalite Canyon to Hyalite Reservoir (Hyalite TPA). This is stated as TPA Objective 1(3). Depending on how this accommodation was facilitated (widening the road vs. constructing a separate trail), this provision could require considerable construction along the riparian zone of Hyalite Creek, which is already heavily influenced by high traffic volumes on the main road. Further fragmentation of riparian habitat along Hyalite Creek would have negative impacts on a number of wildlife species, including many bird species, big game, carnivores, small mammals, reptiles and amphibians. New construction of the magnitude proposed for a separate trail through important riparian habitat could have serious negative effects on wildlife in the Hyalite drainage. In addition, new connector routes to accommodate loops for motorized uses would have similar consequences. Joslin and Youmans (1999) recommend that parallel routes and new connector routes be relocated at least 600 meters from a riparian area to mitigate for detrimental effects to riparian habitat. Additional NEPA analysis would have to be completed for any newly constructed or relocated routes. Effects on riparian habitat would be addressed again at that time. See the Fisheries and Migratory Bird Issues for more information.

## **Cumulative Effects**

### **Net Effects of Past and Present Programs and Activities**

Many of the programs and activities that occur on the Gallatin National Forest have some influence on riparian habitat. Adverse or negative effects considered together have contributed to the current baseline condition on the Gallatin Forest against which the alternatives were evaluated. Based on the past and current vegetation management of the Gallatin Forest, including timber harvest, livestock grazing, prescribed fire, invasive species program and other vegetation projects, riparian habitat conditions are maintaining or improving through better management direction. The effects of different types of dispersed recreation including the outfitter/ guide program, recreation residences; developed recreation sites; fire suppression; developed ski areas; and the lands, minerals, and non-recreation special use programs on the Gallatin Forest may contribute to a direct loss or modification of riparian habitat due to levels of infrastructure and human presence. All of these activities combined currently occur and contribute to the baseline from which effects to riparian habitat were evaluated.

### **Projected Combined Effects of Reasonably Foreseeable Programs and Activities**

There would be no cumulative effects expected to occur from timber harvest, prescribed fire, livestock grazing, invasive species control, or other vegetation projects. The reasonably foreseeable projects for the Gallatin Forest would continue to implement SMZ rules in timber harvest areas, follow herbicide chemical label restrictions when treating noxious weeds, and use riparian

utilization standards in conjunction with adaptive management of livestock grazing. These efforts would maintain or further restore riparian habitat where these activities overlap.

There may be some level of cumulative impacts to riparian habitat from different types of dispersed recreation including the outfitter/ guide program, recreation residences; developed recreation sites; fire suppression; developed ski areas; facilities; and the lands, minerals, and non-recreation special use programs on the Gallatin Forest. The greater potential for cumulative adverse impacts and pressure on riparian habitat is likely to be the result of human activity, particularly on off-Forest lands. Private lands within the Forest boundary or immediately adjacent to the Gallatin Forest (including developed ski areas) continue to be developed and may be the most significant impact on riparian habitat. It is not known what wildfires may occur in the future, or how successfully they will be suppressed, creating or destroying riparian habitat over time. Trends indicate increased levels of road improvements on National Forest and road construction adjacent to National Forest on private lands at lower elevations. Recent trends to update travel plans on adjacent National Forests through designation of a route system to comply with the 2005 OHV Final Rule (Federal Register, November 9) have halted further negative effects associated with adverse effects caused by the presence of humans. However, construction of roads on private lands may contribute to a direct loss or modification of riparian habitat or loss of function. Management of facilities may improve riparian integrity overall but may also encourage human use within riparian areas. It is assumed that the trend toward consolidation of National Forest lands would continue to incrementally add acres of riparian habitat to the total amount on the Gallatin Forest. There are no mineral development projects anticipated for the Gallatin Forest other than those currently occurring and abandoned mines would continue to be closed. Small scale and temporary special uses have minor impacts individually, but together with additional permits requiring permanent human infrastructure, may contribute to large scale effects. It is unknown at this time the number and scale of any future special use permit requests so the significance of this effect is not known.

This increasing trend would continue with the selection of any proposed Travel Plan alternative. While these management activities may continue to impact riparian habitat, these were considered through the direct and indirect effects analysis as part of the baseline.

## **Cumulative Effects of Past, Present and Reasonably Foreseeable Programs and Activities with the Travel Plan Alternatives**

Cumulative effects assessment requires consideration of past, present and reasonably foreseeable actions. Riparian habitats have been largely altered from historic conditions due to private land development, agriculture, historical mining, past grazing practices, timber harvest in riparian areas, and road construction. The existing species richness and abundance is considerably diminished in these impacted areas because of these cumulative impacts. Future foreseeable actions that may occur and impact riparian areas include additional housing development and continued or increased access to private inholdings and the road systems to support this private access.

Some negative effects from non-motorized use would continue with all alternatives. The proposed Forest-wide and individual TPA goals, objectives, and standards would improve riparian habitat relative to road and trail management strategies. Any future federal actions incurred by the implementation of the selected travel alternatives will undergo separate NEPA analysis to determine

the consequences to riparian habitat. There are no foreseeable road or trail proposals that could result in an additive effect with the Travel Plan alternatives. Also see Issue 14: Migratory Birds.

### **Alternative 1**

Alternative 1 has the greatest negative effect on riparian habitat by virtue of the existing disturbance that has occurred, and would continue to occur. Without the Montana/ Dakota OHV decision in place (as in Alternative 2 through 7-M), the effects of this alternative would not remain static but would worsen with time. Assuming human recreational activities increase in the future, this alternative has the most potential to affect riparian habitat long term. The implementation of Alternative 1 would result in a continued downward trend in riparian habitat.

### **Alternative 2**

Alternative 2 was used as a baseline from which to compare all the other alternatives. Despite Alternative 2 serving as the 'baseline' for this project, it may add direct, indirect and cumulative effects to the existing situation long-term. The decrease in total amount of miles and use of administrative roads, motorized and non-motorized trails, and restoration of project roads, would provide some benefit to riparian habitat. This management change, in addition to other management activities and programs, would minimize adverse affects that may contribute to the cumulative effects described above. Compared to Alternative 1, Alternative 2 reverses the current downward trend and there would be no more cumulative effects as establishment of user-built roads and motorized trails would be eliminated.

### **Alternative 3 through 7-M**

Alternatives 3 through 7-M indicate there would be lesser effects to riparian habitat than Alternative 1 or 2. The implementation of the Montana/Dakota OHV decision, in conjunction with decreased miles of roads and motorized trails would reduce impacts to riparian habitat. With the implementation of any of the Alternatives 3 through 7-M, riparian habitat would increase in complexity and diversity, which may serve to ameliorate the effect of other management activities over time. There would be no additional cumulative effects to riparian habitat from proposed routes under Alternatives 3 through 7-M (Feigley, 3/10/06).

## **Effects of Proposed Goals, Objectives, Standards and Guidelines**

### **Alternative 1**

There would be no change in management under this alternative. Forest Plan direction that applies to travel management would continue to be followed. Relative to riparian habitat, Management Area 7 (unmapped riparian areas) standards and guidelines for road design, location, and bridge or culvert installation would continue to provide some protection of riparian habitat.

### **Alternative 2-6**

Goals, objectives and standards proposed for Alternatives 2-6 to maintain Yellowstone cutthroat trout habitat and restore or stabilize roads to minimize sediment would serve to maintain riparian areas in good condition and minimize potential impacts to wildlife species within riparian areas. These include: Bangtails [Goal 3, Objective 3(1)], Bear Canyon [Goal 3, Objective 3(1), Standards 3(2) to 3(5)], Bridger Canyon [Goal 3], Cabin Creek [Goal 4], Cooke City [Goal 3, Objective 3(1-2)], Deer Creeks [Goal 3], East Boulder [Goal 4], East Crazies [Goal 4], Fairy Lake [Goal 4],

Gallatin Crest [Goal 3], Gallatin Roaded [Goal 3, Objectives 3(1) to 3(3), Standard 3(4)], Gardiner Basin [Goal 3], Hyalite [Goal 3], Ibex [Goal 3], Lionhead [Goal 4], Mill Creek [Goal 3], Mission Creek [Goal 3, Objective 3(1)], Sawtooth [Goal 3], Shields [Goal 3, Objective 3(1)], South Plateau [Goal 3], Taylor Fork [Goal 4, Objective 4(1-2)], Tom Miner-Rock [Goal 3], Yellowstone [Goal 3].

Additionally, in Alternatives 2-6 there are proposed goals, objectives, and standards for other TPAs that provide for road or trail systems that protect soil and watershed conditions, which would also serve to maintain riparian areas in good condition and minimize potential impacts to wildlife species within riparian areas. These TPAs are: Lee Metcalf-Monument [Goal 3, Objective 3(1)], Mill Creek [Goal 4, Objective 4(1)], Porcupine-Buffalo Horn [Goal 3, Objective 3(1)], Shields [Goal 4, Objective 4(1)]. While this is inherent in the goals and objectives for soil and watershed conditions, these could be strengthened to specifically address riparian areas. Additional TPAs that do not include these goals and standards relative to protection of soil and watershed conditions and for which riparian areas would benefit from travel planning direction include those TPAs identified above as having lost more than 30% of riparian habitat. These include the Bangtails, Bridger Canyon, Fairy Lake, Gallatin Roaded, Hyalite, South Plateau, and Yellowstone TPAs. In particular, the North Bridger and West Bridger TPA riparian areas would improve with these goals and standards, as they are not targeted for Yellowstone cutthroat trout. Meeting all of these goals, objectives, and standards would lessen impacts to riparian areas and the direct and indirect effects on wildlife as described above.

Additional suggested mitigation, in the form of programmatic direction, includes management guidance relative to newly constructing or relocating parallel or connector roads and trails, designating routes to access water “go-downs” and obliterating the remainder, and restricting wheeled vehicle travel within the excepted 300-foot buffer zone if intersecting riparian areas. These mitigation measures would allow for expansion and protection of riparian areas and reduce overall direct and indirect impacts to wildlife species.

Proposed Forest-wide goals, objectives and standards that would be adopted into the Travel Plan in Alternatives 2-6 would ensure riparian habitats would be protected. Specifically, Goal G Wildlife and Objective G-1, in conjunction with Goal M Resources, and Standards M-2, 3 and 7 would reduce or eliminate existing impacts to riparian habitat.

Generally, the seasonal restrictions proposed from March 30 through either May, June or July 15 to protect facilities and prevent erosion, would alleviate some of the impacts to wildlife in riparian areas and riparian habitat by reducing the total volume of use each year and eliminating use during the early spring when many species of wildlife, and riparian vegetation, can be most vulnerable.

### **Alternative 7-M**

As with Alternatives 2-6, Goals, objectives and standards proposed for Alternatives 7-M to maintain Yellowstone cutthroat trout habitat and restore or stabilize roads to minimize sediment would serve to maintain riparian areas in good condition and minimize potential impacts to wildlife species within riparian areas. Also similar to Alternatives 2-6, the seasonal motorized use restrictions proposed from March 30 through either May, June or July 15 to protect facilities and prevent erosion, would alleviate some of the impacts to wildlife in riparian areas and riparian habitat by

reducing the total volume of use each year and eliminating use during the early spring when many species of wildlife, and riparian vegetation, can be most vulnerable.

As stated for Alternatives 2-6, the proposed goals, objectives, and standards for TPAs that provide for road or trail systems that protect soil and watershed conditions, would also serve to maintain riparian areas in good condition and minimize potential impacts to wildlife species within riparian areas. However, Alternative 7-M extends this programmatic direction to include those TPAs for which the analysis identified a greater than 30% loss of riparian habitat to roads and trails. The language for this proposed programmatic direction focuses on a goal for ‘other resource protection’ that accommodates traffic consistent with protecting soil and watershed condition. In addition, two objectives are proposed to repair eroding roads and trails and using educational signing to encourage motorized users to minimize impacts to lakes, ponds, rivers and streams. These additional TPAs would benefit from travel planning programmatic direction and include the Bangtails, Bridger Canyon, Fairy Lake, Gallatin Roaded, Hyalite, North Bridger, South Plateau, West Bridger, and Yellowstone TPAs. Meeting all of these goals, objectives, and standards would lessen impacts to riparian areas and the direct and indirect effects on wildlife.

Alternative 7-M proposes Forest-wide goals, objectives and standards that would be adopted into the Travel Plan that would further reduce or eliminate existing impacts to riparian habitat above that proposed in Alternative 2-6. The Alternative 7-M proposal for programmatic direction is a modification or addition to that proposed in Alternatives 2-6 and includes Standard A-8, section GOAL E, and section GOAL H. These mitigation measures, in the form of programmatic direction, would allow for expansion and protection of riparian areas and reduce overall direct and indirect impacts to wildlife species.

Alternative 7-M includes programmatic direction to consider proposals to authorize locations for public recreational aircraft at designated sites. If such proposals are brought forth in the future, consideration of effects to riparian areas would be made at that time.

## **Consistency with Laws, Regulations, Policy, and Federal, Regional, State and Local Land Use Plans (including the Forest Plan)**

Alternatives 2 through 7-M are consistent with Gallatin National Forest Plan direction applicable to riparian areas. The direction proposed, as well as the route-by-route management specified under each action alternative, is consistent with the existing Forest-wide goal to “*provide habitat for viable populations of all indigenous wildlife species and for increasing populations of big game animals.*” (Gallatin Forest Plan, Goal 7, p. II-1), and the Forest-wide standard that “*emphasis will be given to management of special and unique wildlife habitats such as wallows, licks, talus, cliffs, caves, and riparian areas*” (Gallatin Forest Plan, Standard 6.A.8, p. II-18). The unique habitat that riparian areas provide would improve over time relative to road and trail management strategies. Alternative 1 would not be consistent with management direction applicable to riparian areas due to the long term direct, indirect, and cumulative effects.