5.0 Interpretation and Trends

The purpose of this chapter is to provide our interpretation of the information displayed in Chapters 3 and 4 or to put it into a "So What?" context. We also attempted to identify what is broken or out of balance within the landscape/watershed and then to identify some possible opportunities to improve the condition of the landscape in recommendations covered in Chapter 6.

Each resource specialist has interpreted the trend for the reporting unit i.e. PVEG, HUC, or species, and will describe what caused the trend and what some of the results of the current trend may be. Reporting units should provide more clarity to discuss the cause, and results of, the indicator trends identified in Chapters 3 and 4. Indicators are all interrelated and a good interpretation cannot be done without discussing all the indicators at once.

The definition of synthesis in the *Federal Guide for Watershed Analysis is:*

"Synthesis – The integration of separate ecosystem elements to understand the whole system: a primary goal of watershed analysis."

5.1 Vegetation Dynamics

Trend

The purpose of this chapter is to provide our interpretation

Structure

Forest structure in the analysis area is out of balance. Across all cover types the mature/old class is over represented (Table 5.1-1). The young/mid class is under represented in all cover types and the seedling/sapling class is severely under represented in Douglas-fir and aspen. Past timber harvest has contributed some structural diversity to the analysis area accounting for the slightly lower percentage in the mature/old and slightly higher percentage in the seedling/sapling classes for the lodgepole cover type.

Non-forested structure as a whole is slightly out of balance. The sagebrush and mountain shrub cover types are over represented in the late seral. Some structural diversity can be contributed to the spray project in the 1960s and 1980s and recent prescribed burning.

Table 5.1-1: Reference/Desired Condition, Current Condition and Trend for Structure within BFW

Cover Type	Landscape Scale Reference/Desired Condition*		Current Condition	Trend
Douglas-fir	Grass/Seedling/Sap Young/Mid Mature/Old	10-30% 30-50% 30-50%	2% 0% 98%	The distribution of structure classes across the **landscape is outside the reference/desired condition**. The lack of disturbance and succession has moved the majority of the stands into the Mature/Old structure class
Aspen	Grass/Seedling/Sap Young/Mid Mature/Old	20-40% 20-40% 20-40%	1% 0% 99%	The distribution of structure classes across the **landscape is outside the reference/desired condition**. The lack of disturbance and succession has moved the majority of the stands into the Mature/Old structure class.
Lodgepole	Grass/Seedling/Sap Young/Mid Mature/Old	10-30% 30-50% 30-50%	35% 7% 58%	The distribution of structure classes across the **landscape is outside the reference/desired condition**. The higher percentage in the seedling sap in this type can be contributed to timber harvest and past large fires.
Mixed Conifer	Grass/Seedling/Sap Young/Mid Mature/Old	0-10% 10-30% 30-40%	<1% 0% 100%	The distribution of structure classes across the **landscape is outside the reference/desired condition**. Succession has moved the majority of the stands into the Mature/Old structure class.
Sagebrush/ Grass	Balance range of structural stages • Early Seral • Mid Seral • Late Seral	 20-40% 20-40% 20-40%	 32% 52% 16%	The distribution of structure classes across the **landscape is outside the reference/desired condition**. Natural occurring canopy covers and some disturbance has contributed to the distribution of structural stages. There is more mid seral and not enough late seral within this type
Mountain Brush	Balance range of structural stages • Early Seral • Mid Seral • Late Seral	 20-40% 20-40% 20-40%	 20% 57% 23%	The distribution of structure classes across the **landscape is slightly outside the reference/desired condition**.

Species Composition

Table 5.1-2 below describes the reference/desired condition, current condition, and trend for species composition.

Table 5.1-2: Reference/Desired Condition, Current Condition and Trend for Composition within BFW

Cover Type	Landscape Scale Reference/Desired Condition*		Current Condition	Trend
Douglas-fir	Douglas-fir Spruce/Fir	65-100% Ave >75% 0-35% Ave. <25%	>74% No Data	**Within DFC**, however subalpine fir is increasing within this type.
Aspen	Aspen Conifer	70–100% Ave 85% 0-30% Ave. <15%	<85% No Data	Aspen is being replaced by conifer. **Outside DFC**.
Lodgepole	Lodgepole Other Conifer	70 –100% Ave. >80% 0-30% Ave. <20%	>80% No Data	**Within DFC**, however subalpine fir is increasing within this type..
Mixed Conifer	Subalpine fir Douglas-fir Lodgepole Aspen	30-100% Ave. >40% 0-50%* 0-50%* 0-50%*	~40% No Data No Data No Data	**Within DFC**, subalpine fir is going to continue towards dominance
Sagebrush/Grass	Sagebrush dominants historical habitat acres on Sagebrush does not dominant historical acres on	95 to 100% 0-5%	~90% ~10%	Sagebrush composition is probably **within DFC**. However, more than 5% of the historical habitat is not dominated by this type
Mountain Brush	Mosaic of brush and herbaceous understory components.		No Data	Given that structure is within DFC, in general a balance exists.

Disturbance Regimes

Table 5.1-3 below describes the reference/desired condition, current condition, and trend for disturbance regimes.

Table 5.1-3: Reference/Desired Condition, Current Condition and Trend for Disturbance within BFW

Cover Type	Landscape Scale Reference/Desired Condition		Current Condition	Trend
Douglas-fir	Fire (G3/4) Frequency Regime	16-66 Ave 41 yrs Non-Lethal to Mixed	110 Years + Mixed to Lethal Timber Harvest 4% Past Large Fire 1%	Average post settlement fire interval is twice that of the historic fire interval. Probably have lost the non-lethal regime on dry sites. Insect and disease both have increased slightly, but remain at endemic levels
	Insects Disease	Endemic Endemic	Endemic Endemic	

Aspen	Fire (G4) Frequency Regime	16-97 Ave. 54 yrs Mixed to Lethal	90 Years + Mixed to Lethal	Average post settlement fire interval in more than twice that of pre-settlement. Insect and disease both have increased slightly, but remain at endemic levels.
	Insects Disease	Endemic Endemic	Endemic Endemic	
Lodgepole	Fire (G6/4) Frequency Regime Insects Disease	29-97 Ave. 54 yrs Mixed to Lethal Endemic Endemic	110 Years + Lethal Timber Harvest 31% Past Large Fire 6% Endemic Endemic	Average post settlement fire interval is twice that of the historic fire interval. Probably have lost the mixed severity regime in many sites. Insect and disease both have increased slightly, but remain at endemic levels
Mixed Conifer	Fire (G6/4) Frequency Regime Insects Disease	11-191 Ave 77 yrs Mixed to Lethal Endemic Endemic	110 Years + Mixed to Lethal Endemic Endemic	Average post settlement fire interval is approaching the upper range of the historic fire interval.. Probably have lost the mixed severity regime in many sites. Insect and disease both have increased slightly, but remain at endemic levels
Sagebrush/ Grass	Fire Frequency Regime	25-76 years Lethal	Approximately 50yrs + Lethal Recent Prescribed Fire 1%	Average post settlement fire interval is approaching the upper range of the historic fire interval.
Mountain Brush	Fire Frequency Regime	25-76 years Mixed	Approximately 50yrs + Mixed Severity Past Large Fire 5%	Average post settlement fire interval is approaching the upper range of the historic fire interval.

Noxious Weeds

Land disturbance activities such as roads, grazing, past logging, and recreation increase the potential for noxious weed establishment in the watershed analysis area. Increased motorized vehicle use within the Blackfoot Watershed Area as well as the dispersal of noxious weed seeds by wildlife and recreational stock are also contributing factors to the spread of noxious weeds.

The indicators used to track the Vegetation Dynamics issue (structure, density, species composition, and disturbance regimes), are very interrelated, and the trend (or departure from reference conditions) often has common or closely related causes. Because of this close causal relationship, the interpretation of the trend and the assessment of risk and opportunities will be displayed/reported by cover type.

Interpretation of Trend

Fire was the disturbance agent that played the greatest role in shaping the structure, density, species composition and pattern of vegetation at the landscape scale, prior to the

creation of the Forest Service. Insects, disease and weather also played a role but their affects tended to be at the stand scale.

The vegetation structure, density and species composition that we see today is the result of the fires that occurred prior to the area becoming National Forest and the management that has taken place since. Native American use of fire may have been very important in some types. Post Native American, fire suppression, grazing and mining activities are the management activities that have had the greatest impacts; timber harvest has also played a role.

Early grazing levels directly impacted structure, density and species composition of sagebrush/grass, and mountain brush and potentially some early succession forest stands. Grazing also had an indirect impact on forest types; it severed as a means of fire control. During the early years of the Forest Service while permitted grazing limits were at the peak there was very little available fine fuel in the sagebrush/grass, and mountain brush communities, this kept the fires that did occur small.

As permitted animal numbers went down the range conditions began to improve. Fire suppression techniques also improved. The Forest Service became highly effective at suppressing fire post World War II. So fire that had been controlled indirectly by the lack of fine fuel could be controlled by the will of man.

In an attempt to describe this dynamic landscape and the ecology and natural processes that affect it; vegetation age, structure, species composition and fire regime have been assessed using the *Interagency Fire Regime Condition Class Guidebook (2004).* This method for assessing landscapes uses these same ecological components. Each component was assessed, then using the method outlined in the *guidebook* a fire regime condition class assessment was completed and the results are displayed below.

Fire Regime and Condition class was assessed using a method described by Wendel Hann (2004) and outlined in the *FRCC Guidebook* (2004) for mapping fire regime condition class at the watershed and project level. The assessment determined that the Upper Blackfoot Watershed had a natural fire regime of "*III – Infrequent Mixed and Surface*" and a condition class of "*2 Moderate Departure from natural conditions.*" The Table 5.1-4 below shows the condition class for vegetation and fuels and frequency and severity for the forested and non-forested portion of the landscape. The forested landscape was divided into two classes or potential natural vegetation groups (PNVG) based on the apparent natural disturbance regimes in the landscape. The PNVG's used for the forested portion were *Interior West Upper Subalpine forest #1 (SPFI2) and Interior Lower Subalpine forest #5 (SPFI5),* and PNVG for the non-forested portion was *Sagebrush-Cool Mountain Big* (CSAG1) described in the FRCC guidebook and the FRCC website. The SPFI2, SPFI5, and CSAG1 were modified slightly to reflect the information in Barrett's 1994 Fire regime report on the Caribou National Forest.

Table 5.1-4: PNVG Condition Class: Condition class definitions can be found in **Table 5.1-5**

PNVG (% of project area)	Veg-Fuel Condition Class	Frequency-Severity Condition Class	PNVG Condition Class
SPFI2 (62%)	2	2	2
SPFI5 (11%)	2	1	2
CSAG1 (27%)	2	1	2
Project Area	**2**	**2**	**2**

The landscape overall FRCC departure score was 43, which is the middle range for fire regime condition class (FRCC) 2 (34-66%). FRCC 2 means vegetation composition, structure, and fuels have moderate departure from the natural regime and predispose the system to risk of loss of key ecosystem components. In this landscape the score was driven by the departure in the vegetation/fuels composition and structure much more than the frequency/severity departure, which scored only 32. According to the nomogram at the end of the FRCC report, restoration efforts for landscapes in this condition should focus on restoration of the vegetation composition, structure, and fuels.

The effects of fire exclusion in forests with fire regimes III and IV are more apparent at the landscape scale than the stand level (Long, 2003). This means that viewing a single stand or a small group of stands does not tell the whole picture, (e.g. a mature/old stand or a group of stand is not out of the ordinary, but landscapes dominated by any single stand age structure class are).

It is apparent that vegetation in this landscape lacks age class structural diversity when viewed at the landscape scale. This landscape is mature, dense and species composition is trending towards climax. A landscape in this condition can be considered at moderate risk to loss of key ecosystem components (condition class 2). The lack of diversity in age structure and the high percentage of stands that have a dense understory of subalpine fir (ladder fuels) created by the lack of past disturbance creates a landscape that is susceptible to catastrophic fire, insects, and wind events that are outside the natural range. It also creates a landscape that is less resilient to these type events.

Table 5.1-5: Fire Regime & Condition Class Definitions

Natural (historical) **fire regime classes** from Hardy et al. (2001) and Schmidt et al. (2002) as interpreted by Hann (2004) for modeling landscape dynamics at project and watershed scales.

Fire Regime Class	Frequency (Mean Fire Return Interval)	Severity	Modeling Assumptions
I	0 – 35+ Years, Frequent	Surface and Mixed	Open forest, woodland, shrub, and savannah structures maintained by frequent fire; also includes frequent mixed severity fires that create a mosaic of different age post-fire open forest, woodlands, shrub or herb patches that make a mosaic of structural stages, with patches generally < 40 hectares. Mean fire interval can be greater than 35 in systems with high temporal variation.
II	0 – 35+ Years, Frequent	Replacement	Shrub or grasslands maintained or cycled by frequent fire; fires kill non-sprouting shrubs which typically regenerate and become dominant within 10 -15 years; fires remove tops of sprouting shrubs which typically resprout and dominate within 5 years; fires typically remove most tree regeneration.
III	35 – 100+ years, Less Infrequent	Mixed and Surface	Mosaic of different age post-fire open forest, early to mid-seral forest structural stages, and shrub or herb dominated patches generally < 40 hectares; maintained or cycled by infrequent fire. Interval can range up to 200 years.
IV	35 – 100+ years, Less Infrequent	Replacement	Large patches generally > 40 hectares, of similar age post-fire shrub or herb dominated structures, or early to mid-seral forest cycled by infrequent fire. Interval can range up to 200 years.
V	200+ years	Replacement Mixed, and Surface	Variable size patches of shrub or herb dominated structures, or early to mid to late seral forest depending on the type of biophysical environment. Cycled by rare fire or other disturbance events. Often have complex structures influenced by small gap disturbances and understory regeneration.

Condition Classes from Hardy et al. (2001) and Schmidt et al. (2002) as interpreted by Hann for modeling landscape dynamics and departures from historical or natural range of variability at project and watershed scales.

Class	Departure	Description
Condition Class 1	Low	Vegetation composition, structure, and fuels are similar to those of the natural regime and do not predispose the system to risk of loss of key ecosystem components. Wildland fires are characteristic of the natural fire regime behavior, severity, and patterns. Disturbance agents, native species habitats, and hydrologic functions are within the natural range of variability.
Condition Class 2	Moderate	Vegetation composition, structure, and fuels have moderate departure from the natural regime and predispose the system to risk of loss of key ecosystem components. Wildland fires are moderately uncharacteristic compared to the natural fire regime behaviors, severity, and patterns. Disturbance agents, native species habitats, and hydrologic functions are substantially outside the natural range of variability.
Condition Class 3	High	Vegetation composition, structure and fuels have high departure from the natural regime and predispose the system to high risk of loss of key ecosystem components. Wildland fires are highly uncharacteristic compared to the natural fire regime behaviors, severity, and patterns. Disturbance agents, native species habitats, and hydrologic function are substantially outside the natural range of variability.

Douglas-fir

The cover type represents approximately 23% of the forested acres within the analysis area and is mostly composed of the mature/old structure class (98%). This represents an imbalance in structural stages, which may represent a sustainability problem. A comparison of the 1913 data and current condition indicates the overall percent of the landscape in the Douglas-fir cover type has increase slightly. This increase of Douglas-fir has come at the cost of: mountain brush, aspen and sagebrush types. These changes are likely the result of an interruption in the natural disturbance regime.

Douglas fir can function as a seral or climax cover type. In general on dry sites Douglas-fir functions as a climax species/type and on moist sites it functions more as seral or intermediate species/type. Below an interpretation of the trend is made that tries to distinguish between these two roles for this cover type. This is an attempt to not over generalize.

Dry Sites

Most of the gain in overall area of the Douglas-fir type has been made on these types of sites, where the lack of disturbance has allowed the densities to increase. With a more natural fire regime many of these sites would have been classified as mountain brush because fire would have kept the trees thinned to the point that brush species would have dominated the site.

Moist Sites

The lack of natural disturbance (fire) has created a shortage of seedling-sapling and young/mid structure classes. The high percentage of acres were subalpine fir is percent in the understory indicates a lack of disturbance. Under a more natural disturbance regime these sites would have seen fire slightly less often then the dry sites so would have been dominated by Douglas-fir most of the time. However, due to the mixed severity nature of historic fires the sites structure would have been much more mosaic like. Alpine fir would still be a component, occurring in isolated pockets that had been missed by fire for one or more fire cycles.

Aspen

The cover type represents approximately 22% of the forested acres within the analysis area and is mostly composed of the mature/old structure class (99%). This represents an imbalance in structural stages, which may represent a sustainability problem. Available data also shows species composition shifting to latter successional species such as subalpine fir. A quick comparison of the 1913 data and current condition indicates its overall percent in the landscape has decreased. When looking at the data spatially it is obvious that there has been a change, some areas that were in aspen are now in conifer cover types and some that were mountain brush or sagebrush are now in aspen. In general patch size has also gotten smaller. These changes are likely the result of an interruption in the natural disturbance regime.

Historically fire was likely the dominant disturbance in this type. The absence of fire for 90+ years has allowed the aspen type to reach its current condition of predominantly mature old structure that is succumbing to invading conifer. Under natural conditions stands that reached this point became susceptible to fire and the fire cleared the way for the aspen to successfully sprout and rejuvenate the clone. In the absence of disturbance trees die of old age the clones are unable to sprout replacements due to the existing shade from the invading conifer. As time passes and the photosynthetic ability of the clone is reduced (i.e. trees die) the ability of the clone to respond to more favorable conditions (disturbance) decreases. Long periods with reduced aspen and increased conifer may also create site conditions that will make in difficult for aspen to recover (i.e. change is soil PH).

Aspen can function as a seral or climax cover type, so caution needs to be used not to over generalize. The generalities relate to the aspen where it functions as seral cover type, which is the majority of the acreage within this analysis. Where it acts a climax type conifer are not encroaching, it is encroaching on other types.

Lodgepole Pine

The cover type represents approximately 15% of the forested acres within the analysis area and over half is composed of the mature/old structure class (58%). Of the forested vegetation this type is closest to a balance with regards to structure. However the young/mid structural class is under represented, and the seedling/sapling and mature/old structural classes are slightly over represented. Available data also shows species composition shifting to latter successional species such as subalpine-fir. These changes are likely the result of an interruption in the natural disturbance regime.

Timber harvest and past large fires has created structural diversity by moving mature/old stands to the seedling/sapling and young/mid structure classes. Some of the harvest units have decreased the average patch/stand size within the landscape.

The percentage of the cover type in the mature/old structure class (58%) is of concern in this short-lived species. The available data suggest that most of the mature lodgepole in the assessment area are over 100 years old. This puts it at increase risk of mountain pine beetle epidemics.

Mixed Conifer Types

The cover type represents approximately 11% of the forested acres within the analysis area and is mostly composed of the mature/old structure class (100%). This represents an imbalance in structural stages, which may represent a sustainability problem.

This type is difficult to assess because most of the other cover types without large scale stand initiating disturbance will end up here (i.e. dominated by subalpine fir). However, some sites historically experienced very long periods without stand initiating disturbances and stayed in this type for long periods. This situation is rare within this assessment area

but there are some stands within the area that are well within historical conditions. Most stands in this type however have experience a type conversion due to succession.

Sagebrush Types

The cover type represents approximately 25% of the non-forested acres within the analysis area and the majority is in a mid-late ecological status (>10 percent canopy cover). This puts the type very close to desired/historical conditions. The sagebrush types within the analysis area is mountain big sagebrush *(Artemisia tridentata* var. *vaseyana)* habitat types. Mountain big sagebrush is usually dominant. Mountain snowberry *(Symphoricarpos orephilus)* is also well represented and sometimes codominant. Other shrubs include Wood's rose (*Rosa woodsii*), green rabbitbrush (*Chrysothamnus viscidiflorus*), and antelope bitterbrush (*Purshia tridentata*). They form a medium shrub layer 2 to 3 feet tall. The understory consists of perennial grasses, along with a large number of perennial forbs. Associated grasses and forbs include but not limited to, Kentucky bluegrass (*Poa pratensis*), bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*), prairie Junegrass (*Koeleria macrantha*)*)*, needle-and-thread grass (*Hesperostipa comata*), Sandberg bluegrass (*Poa secunda*), and bottlebrush squirreltail (*Elymus elymoides).* Most recent research indicates that big sagebrush is the climax species on its present-day range, and that invasion into other types is uncommon. Sagebrush species do not appear to have increased their range on a large scale, but reviewers agree that big sagebrush has increased in density in many places in response to historic grazing and altered fire regimes. The combination of historic grazing and the altered fire regime has also given an opportunity for Douglas-fir, lodgepole, and aspen to slowly move into this type and other non-forested types.

Minor sagebrush community types include Black sagebrush (*Artemisia nova)*, Threetip sagebrush (A*rtemisia tripartita*), Spiked sagebrush (A*rtemisia spiciformis).*

Mountain Brush Types

The cover type represents approximately 2% of the non-forested acres within the analysis area and is very close to a balanced of age classes. Several tree/shrub species such as chokecherry (Prunus virginiana), serviceberry (Amelanchier alnifolia), gooseberries (Ribes), mountain snowberry, elderberry (Sambucus), and snowbrush (Ceanothus) characterize the mountain brush cover type. These species may occur alone and form rather distinct types or they may have a mixed composition. These species re-sprout after fires and generally prefer slightly higher moisture regimes than sagebrush, with an annual precipitation of 15 to 25 inches. The mountain brush complex is found intermingled with sagebrush at mid elevations and conifer/aspen forests at higher elevations. This heterogeneous community is important because it provides diversity within a landscape. A variety of herbaceous understory species provides the needed ground cover to help maintain watershed values. The dense growth of snowbrush often inhibits establishment of very many associated undercover forbs and grasses, but its compact growth provides an excellent soil cover.

5.2 Hydrologic Processes & Water Quality

Interpretation of Trend

Relative to hydrology and riparian resources, multiple trends are occurring in the watershed and the composite trend is mixed. The timeframes of change for trends of different processes vary widely as well. Specific areas depicting changes overtime that have impacted water resources are listed below. These impacts provide for watershed improvement opportunities with specific recommendations identified in Chapter 6.

Stream Function- ***Beaver Reductions and Grazing***

The reduction in beaver that occurred by uncontrolled trapping in the 1800's has been stopped, and beaver began to recover in the early 1900s. However over time, the exclusion of fire that became more widespread starting about 1910s began to affect the amount of streamside aspen in some areas as conifer or other species that invade aspen clones have increased. Fire cycles in this area are commonly in the 100 to 150 year range, so the exclusion of fire over the last 100 years now having a more pronounced affect. Aspen are a very important food source to beaver, and many streams are stabilized by beaver, so indirectly the stability of some streams is affected.

Reduction in the soil-hydrologic sponge that occurred in the late 1800's to early 1900's from historic intensive grazing recovery of impacts from historic intensive grazing for creeks in the basin have occurred and are continuing for the most part to show an upward trend, but some trends are more strongly upward than others. Recovery from the reduction/elimination of the "O" and "A" soil layers is occurring so slowly as to not be readily apparent. Below are a few areas where specific grazing impacts are affecting water resource conditions that need to be addressed to ensure a positive trend.

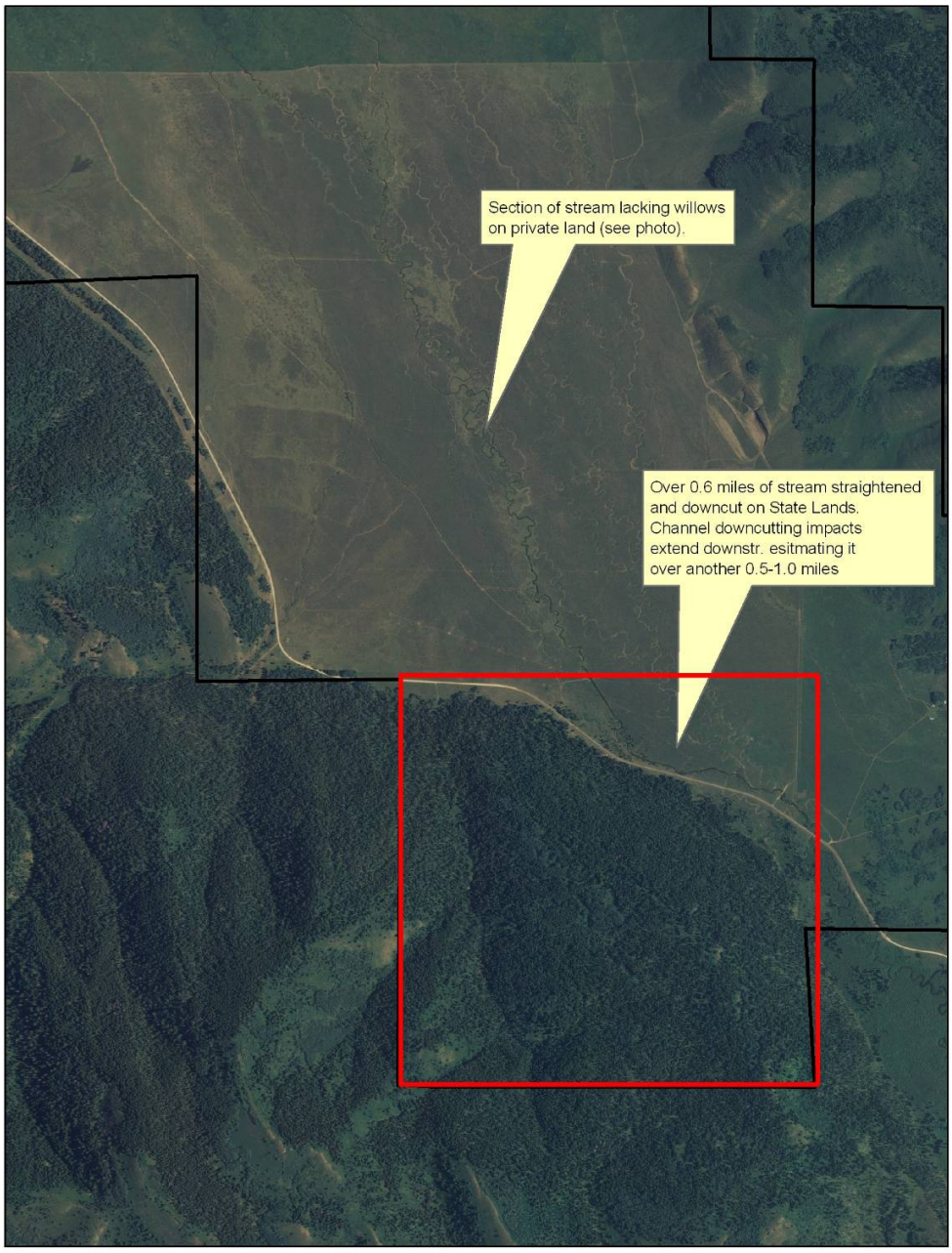
- ***Diamond Creek Enclosure Buck & Pole Fence****:* There is an old buck & pole enclosure fence on Diamond Creek about 1000 feet upstream of the Forest boundary that is in disrepair. The fence appears to have been beneficial to the stream in this reach and is suggested for repair.
- ***Diamond Creek FR630 Closure and Stream Capture:*** An old game or livestock trail is capturing the flow of Diamond Creek.

Stream Function - ***Channelization***

The channelizations of various stream segments have occurred in the Upper Blackfoot Watershed. Straightening the channel of necessity increases the channel gradient and flow velocity. This usually has a destabilizing effect upon reaches above and below as the stream attempts to even out its gradient and sediment relationship over a larger reach. Also, if the increased gradient produces a flow velocity above about 2 feet per second, it can create a barrier to upstream movement of juvenile trout and possibly other species as well. The Blackfoot River channelized reach above Sucker Trap (near the County Road Crossing) is one example of a channelized and straightened reach. The exact length that was treated is unknown, but may be as much as 0.5 miles.

Another example is Diamond Creek as shown in **Error! Reference source not found.** is one example of past stream straightening that has occurred negatively impacting stream function, stability, and water quality.

Figure 5.2-1: Red square represent State Land in Section 16 where Diamond Creek was potentially moved and straightened.



Stream Function - *Loss of Riparian Vegetation*

The loss or elimination of willows has occurred thought the Upper Blackfoot with evidence of this on Angus, Diamond, Lanes, Slug Creeks. The trends indicate a negative

impact to stream function, aquatic habitat, water quality, and wildlife habitat. Willows (and/or other riparian woody plants) along these channels and potential others were reduced and/or eliminated, particularly in the reaches that flow through wide, flat valleys. Willow and other woody riparian plants are critical to maintaining bank stability and shading to the stream. Some of these systems have downcut lowering the water table and the water holding capacity of these riparian areas that provide critical water during low flow periods. **Error! Reference source not found.** below is one example of willows lost which also correspond to the area in **Error! Reference source not found.** above.

Figure 5.2-2: Fence line contrast looking east with Diamond Creek flowing right to left on private land. Notice no willows to the right of the fence. From the fence upstream to state land (roughly 2.2 linear miles) contains very few willow which are believe to be eliminated. Downstream to the confluence with Lanes Creek (3 linear miles) lack historic extent of willow complexity and could use enhancement.

Travel Management / Recreation

Travel management of trails and road has occurred that have corrected unneeded road and trails improving watershed conditions which are continually being implenmented as funding becomes available (2005 Forestwide Roads Analysis for the Revised Caribou NF Travel Plan). However the increased recreational uses in this area have created "user-created" or illegal roads and trails that continually impact water resource conditions. The increased numbers of dispersed campsites have also created negative impacts to water resources. Improvement to these area have occurred in the Diamond Creek drainage in 2007 closing off user created road and dispersed camp site adjacent to stream which have adding the improving trend.

Impacts to streams from route both trails and road crossings are a particular problem in areas where silty, non-cohesive soils occur and in these areas the trend is mostly downward. In particular, where unarmored stream crossings are present, effects to channel stability have been substantial and trend is downward. Other ford motorized stream crossings are present in the basin that are causing a downward trend in stream conditions or will do so if crossing use increases or persists. The same is true for motorized routes that are in AIZs, but do not cross streams, but the effect is to a lesser extent. Below are a few specific examples of travel related watershed impacts.

- ***Diamond Creek Crossing at Campbell Creek:*** The Diamond Creek crossing on Campbell Creek Rd (FR103) crosses Diamond Creek at a point where the creek is sharply incised about 6-10 feet.
- ***Flat Valley Road at Lanes Creek:*** The Flat Valley Road (FR107) is turnpiked at Lanes Creek and constricts the 500 feet wide willow-wetland complex into a single culvert. Most of the crossing is on private land.
- ***Trail 122 (Coyote Creek):*** Trail 122 closely parallels NF Coyote Creek for about one mile. In places the trail is incised up to 3 feet, is contributing sediment and altering drainage.
- ***South Stewart Creek Riparian Fence and Culvert:*** The reach of South Stewart Creek upstream and downstream of the Diamond Creek Road (FR102) has become incise disconnecting the stream from its floodplain accelerating bank erosion and increasing bank instability. The current culvert was installed at this incise stream conditions which will have to be evaluated if restoration activities occur along with the fence that was designed to reduce grazing impacts.
- **Trail Creek Culvert at County Road**

Mining Activities

As indicated in the historic and current human uses Chapters (3 & 4) there are 11 historic phosphate mines that have operated within the Upper Blackfoot Watershed and there are currently three active mines; Dry Valley Panels C and D, South Rasmussen, and North Rasmussen Ridge Mines. Mining interest exists in the area whereby new areas could be opened to future phosphate mining activity. Techniques for reclamation of mine sites have changed over the years decreasing the potential impacts to the water and aquatic resources. However, as IDEQ has discovered through water quality sampling (IDEQ 2007), selenium concentrations have exceeded the acute aquatic life (CMC) standard of 0.02 mg/L in East Mill Cr and nearby Spring Cr which are just upstream of the Blackfoot Narrows. This has elevated the future water quality and aquatic resource concerns. Future efforts in addressing remediation of Maybe Canyon Mines will be critical in reducing selenium concentrations within the Upper Blackfoot Watershed. In addition, mine remediation activities should be evaluated in areas contributing to selenium levels greater or equal to the chronic aquatic live (CCC) standard of 0.005 mg/L (milligrams per liter) for aquatic life as measured in the Blackfoot River, Goodheart Cr, Spring Cr, State Land Cr, and East Mill Cr. drainages as well as future monitoring of these sites to better understand surface and groundwater interactions.

5.3 Soil Resources

Interpretation of Trend

The watershed contains a large amount of public land, which is managed with a multiple-use mission, emphasizing watershed protection. Private land-owners have the benefit of easy access to the latest farm conservation practices and incentive programs via local NRCS, Farm Services, and University Extension experts. In many respects, the soil resource conditions are in good condition and are expected to be even better-protected in the future.

However, a few challenges exist and these need to be met. The main changes in ecosystem conditions from a soil quality perspective are the increase in anthropogenic disturbances. On National Forest System lands, we need to ensure environmental laws and Forest Plan standards and guidelines are met, and that applying these standards and guidelines is moving us toward our stated desired conditions.

Key Question #1: Domestic livestock grazing practices have continued to improve, and as Forest personnel use the Grazing Implementation Guide, and continue to implement watershed improvements, the trend of rangeland health is stable or improving. Some sites where historic over-use continued for many years may not recover previous soil quality and production. Other areas are impaired, but may respond well to restoration efforts.

Key Question #2: Interest in phosphate mining will continue into the foreseeable future, and the impacts of mining continue to challenge resource managers. Positive steps toward topsoil conservation and use in reclamation, and current research and implementation of heavy metal thresholds for reclamation materials will help address some of the concerns. More research is still needed, however, managers are using adaptive management and incorporating new information as is becomes available.

Key Question #3: Continued implementation of Revised Forest Plan Standards and Guidelines, as well as Regional guidance, and Best Management Practice interdisciplinary reviews will continue to improve soil conservation efforts and effectiveness in vegetation management activities.

Key Question #4: Continued implementation of the Caribou Travel Plan FEIS Record of Decision will be effective at controlling the impacts of motorized access and recreation. The recent increase in the popularity of motorized recreation is a concern, and will need to be addressed to protect resources.

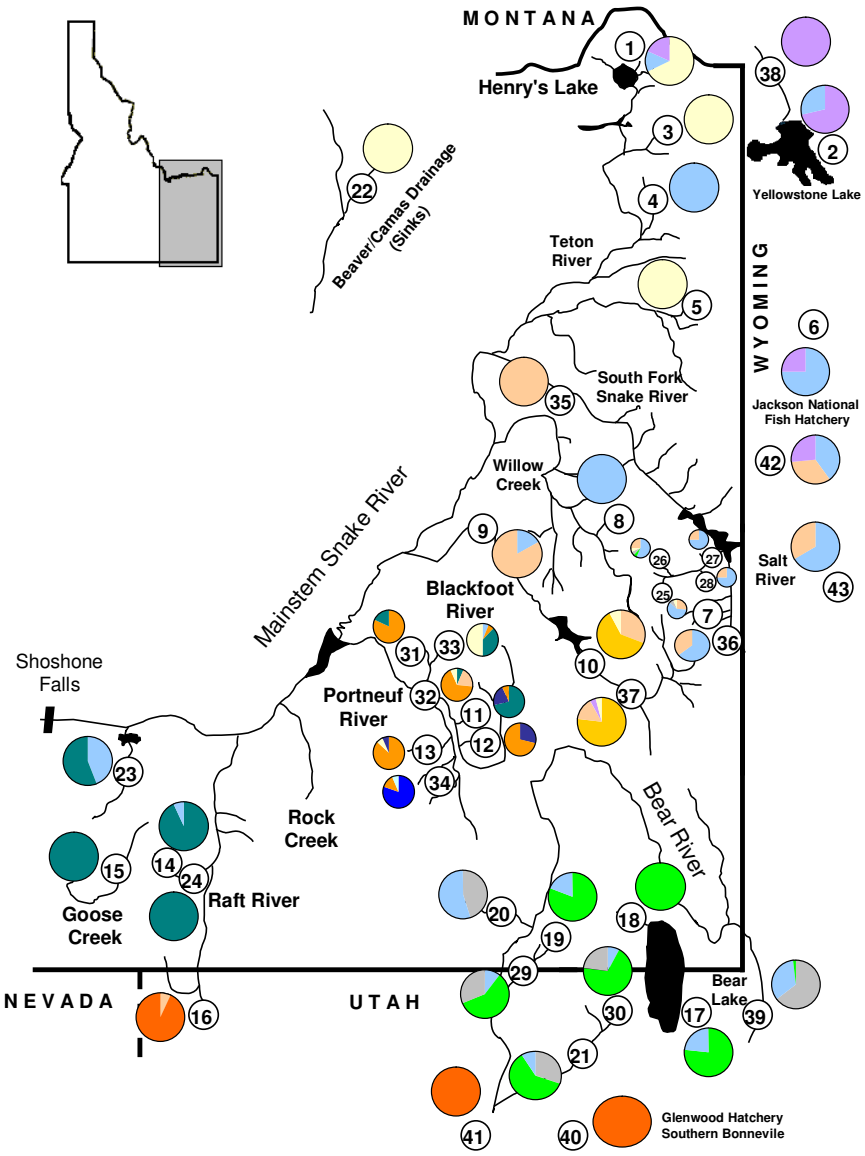
5.4 Fisheries and Aquatic Habitat

Interpretation of Trend

This section melds the past and current fisheries conditions and attempts to define the response from aquatic systems within the watershed. Observed trends in the Blackfoot River and several of its tributaries will be discussed.

Once referred to by anglers as a "fisherman's paradise", today's Blackfoot River angler experience no longer compares. Non-native fish introductions, irrigation developments, mining impacts, willow eradication efforts, piscicide applications, livestock grazing, and road construction/maintenance/use over the last 100 years have affected the native fish populations and their habitat.

The Blackfoot River watershed was stocked with several non-native species with the potential to affect Yellowstone cutthroat trout genetic integrity, including rainbow, Henrys Lake, and Bonneville cutthroat trout. Despite this, recent genetic studies have indicated the genetic traits unique to the Blackfoot River Yellowstone cutthroat trout population still exist. The map below, adapted from Campbell et al. (in press), illustrates genetic characteristics for Yellowstone cutthroat trout populations throughout southeast Idaho. The different colors in the pie charts depict unique genetic haplotypes that are attributed to particular populations. Notice the orange color in some pie segments unique to the Blackfoot River populations. That genetic material represented by orange was not detected in any of the other Yellowstone cutthroat trout populations in surrounding populations in SE Idaho.



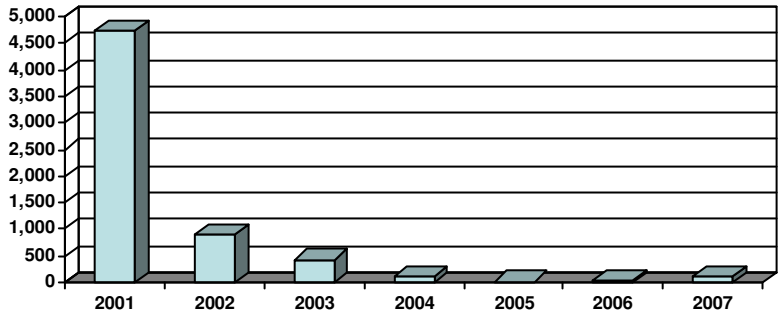
Yellowstone cutthroat trout genetic haplotype charts for the SE Idaho region adapted from Campbell et al. (in press)

Although irrigation diversions have been identified as a concern because they have been documented blocking fish migration and entraining fish in the watershed, apparently only one diversion has been screened to date. Blackfoot Dam has no fish passage facility and has blocked fish migrations within the analysis watershed, but there apparently has been no past discussions investigating fish passage over it.

Irrigation projects have also changed physical aspects of fish habitat. An important example of this is the creation of Blackfoot Reservoir. The reservoir provided ideal habitat for avian predators and, partially due to mammalian predator eradication on a reservoir island, avian predator populations increased significantly. These birds have affected trout populations in the reservoir. Idaho Department of Fish and Game has been

monitoring adult Yellowstone cutthroat trout spawning migrations as they leave the reservoir and lower river to spawn in the upper river and its tributaries. There has been a significant decline in recent years, attributed greatly to avian predation.

YCT escapement estimates for the Blackfoot River (Teuscher 2008).



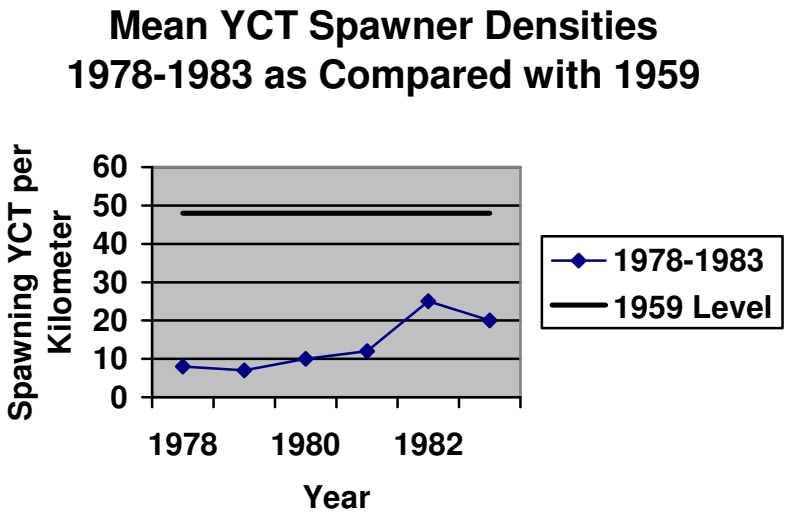
Recent years have seen an increased effort to document the concentration of phosphate mining-related selenium concentrations in the water and fish tissues within the Blackfoot River watershed. Although temporal trend data is limited, a recent effort by IDEQ, IDFG, and others have compared selenium concentrations in fish tissue within mining-impacted streams with those in streams not impacted by mining but within the Phosphoria formation and streams not impacted by mining and outside the Phosphoria formation. They determined the streams impacted by phosphate mining had higher than background levels of selenium in fish tissues (Teuscher 2008). The concentration of selenium documented in the tissue of fish in some locations of the Blackfoot watershed is a concern. The proposed EPA standard for fish tissue concentration of selenium (7.9 mg/kg) has been exceeded in several streams within the Blackfoot Watershed, including the Blackfoot River, Dry Valley Creek, East Mill Creek, Spring Creek (downstream of the mouth of Mill Creek), Angus Creek, and Stewart Creek. Mining has also affected fish physical habitat, primarily through sedimentation.

Other physical habitat impacts have been caused by willow eradication projects. The early projects were sponsored by the Soil Conservation Service. Although government agencies do not support willow eradication project today because most professionals understand the value of willows to overall ecosystem health, there may still be some private individuals spraying on private lands within the watershed. The frequency of willow eradication efforts is much less than in the past, but impacts from past projects still linger in areas.

The extensive application of piscicides to the Blackfoot system in the 1960's and 1970's had affected Yellowstone cutthroat trout populations within the watershed. These fish have apparently never fully rebounded to pre-treatment numbers. This is likely due to many factors, many of which are mentioned in this document. However, the migratory

nature and rearing patterns of these fish, coupled with the fact that some areas were not treated, prevented extirpation (Moore et al. 1986). Genetic data collected over the last decade indicate genetic traits unique to the Blackfoot Watershed are still present in populations.

Grover (1984) summarized Yellowstone cutthroat trout adults observed during redd counts in the Blackfoot River and its tributaries from 1979 to 1983 and compared them to those documented in 1959. Although the recent average cutthroat trout spawner densities were significantly less than in 1959, his work did indicate a positive long term trend.



From Grover (1984)

The Forest developed and maintains a road system in the watershed. The agency continues to identify opportunities to improve the road system to benefit aquatic habitat and species.

Some stream-specific trends were readily apparent within the watershed. These are described below.

Lanes Creek, habitat for Yellowstone cutthroat trout, has been impacted by sedimentation in the past. FS Road 134 continues to serve as a sediment source. This has the potential to affect aquatic habitat, including fish spawning gravel quality and rearing habitat. Irrigation diversion impacts to fish and habitat were documented in Lanes Creek that apparently have not yet been addressed.

Large migratory Yellowstone cutthroat trout have been documented spawning in Sheep Creek in the past, but recent data are lacking. An irrigation diversion has been documented on Sheep Creek, but its impacts to fisheries resources are unknown.

Livestock impacts to Daves Creek were documented in the 1970's and 2000's by fisheries surveyors. Low densities of Yellowstone cutthroat trout were documented in the stream in the 1970's and, when visited in drought conditions, none were observed.

Platts observed brook trout and Yellowstone cutthroat trout in Olsen Creek in the 1970's. Although brook trout had dominated the salmonid community, cutthroat trout were still present. Today, we cannot find Yellowstone cutthroat trout in the stream.

Yellowstone cutthroat trout remain the only trout in Lander and Corrailsen creeks. The riparian habitat in Lander Creek was described in the past and present as good.

Past surveys of Browns Canyon Creek documented the salmonid community consisting of Yellowstone cutthroat trout. Currently, the stream supports a population of cutthroat trout and brook trout, but cutthroat trout still dominate the system. The stream provides good habitat, although isolated impacts such as dispersed campsites were documented along the stream.

Past surveys have documented only Yellowstone cutthroat trout in Bacon Creek. Today, a small component of the salmonid community is rainbow trout. The reminder is Yellowstone cutthroat trout.

In Diamond Creek, past surveys have documented the salmonid community consists primarily of Yellowstone cutthroat trout with a lower number of brook trout. Recent surveys have documented that cutthroat and brook trout populations are now more even in numbers. Grazing impacts were documented in both the past and present.

The brook trout documented in Spring Creek in past conditions persisted into current conditions. They primarily occur upstream of its confluence with East Mill Creek. The fish community downstream of the mouth of East Mill Creek is dominated by native fish, including Yellowstone cutthroat trout. Selenium concentrations are higher downstream of the mouth of East Mill Creek than upstream, indicating East Mill Creek is a source of mining-related selenium contamination.

Timothy Creek was documented as a Yellowstone cutthroat trout nursery stream in the past. Currently, its salmonid community includes native cutthroat trout and non-native rainbow and brook trout. Impacts from grazing sheep were documented in current condition, but not noted in past conditions.

Cabin Creek had a low population of Yellowstone cutthroat trout in past conditions, but recent surveyors did not observe fish in the stream during drought conditions.

Coyote and Bear creeks were surveyed in 1975 and the presence of Yellowstone cutthroat trout and livestock grazing-related impacts were documented. The streams have not been surveyed since.

The presence of Yellowstone cutthroat trout was documented in Timber and Stewart Canyon creeks in past and current conditions. No non-native fish were documented. A crossing of Stewart Canyon Creek was recently improved for fish passage, but erosion downstream of the culvert that was the result of the old, undersized culvert remains to be addressed.

In 1975, Hornet Creek supported a small population of Yellowstone cutthroat trout but had a very low flow. When surveyed in 2002, it was dry and fishless due to drought conditions. Campbell Creek was dry and fishless in both the 19790's and 2002.

Recent surveys of Kendall Creek have documented brook trout in the salmonid community where past surveys did not. Currently, native Yellowstone cutthroat trout outnumber brook trout 2:1.

Biologists concern about the phosphate mining dump proposed for upper East Mill watershed was apparently well founded. The stream used to support a Yellowstone cutthroat trout population but recently does not, although it still has available habitat. Extremely high selenium levels have been documented in the stream.

Impacts to aquatic habitat from phosphate mining have been documented in the past in Angus Creek also. Yellowstone cutthroat trout populations described in the past as high density are now extremely low. Although northern leathersides have been collected in the stream in the past, they have not been observed there recently. Selenium concentrations have been recently documented as elevated in Angus Creek.

A low density population of Yellowstone cutthroat trout was documented in lower Mill Creek in past and current surveys. There has been past impacts from a phosphate mine dump site located in its headwaters and some campsites encroach upon the stream in the lower watershed.

Data from past conditions indicate Slug Creek was overrun by non-native brook trout early on. Brook trout still dominate the salmonid community in current conditions.

Non-native rainbow and brook trout have impacted the Yellowstone cutthroat trout population in Dry Valley Creek. This has been documented in past conditions. Elevated selenium concentrations have been recently documented in the stream, in addition to potential continued willow spraying on private land. Elevated selenium levels have also been documented in Mabey Creek.

In the past, only Yellowstone cutthroat trout were documented in Johnson Creek. Today, only non-native brook trout occur there.

Although no historic fisheries information exists for Goodheart Creek, current surveys have documented significant livestock impacts and elevated selenium concentrations. Recent extensions of an exclosure fence is in response to concerns over livestock grazing impacts.

5.5 Wildlife and Rare Plants

Interpretation of Trend

Canada lynx (*Lynx canadensis*) Existing and future conditions of the private lands between the pieces of National Forest lands may cause the biggest barrier to wildlife that attempt to migrate between these areas. Housing development is expected to increase on private land in the future. This may have the most impact to suitable linkage habitat. However, recent movements of lynx indicate that collisions with vehicles on wide interstate highways are the largest barrier. (Ruediger et al. 2000)

Townsend's (Western) big-eared bat (*Corynorhinus townsendii*) Habitat has increased with underground mines. However, cave and mine habitat can be impacted by human disturbance during critical time periods. Trends are slowly increasing with bat friendly grates on cave and mine entrances. Large diameter snags with loose bark also represents a trend toward greater potential habitat.

Gray wolf (*Canis lupus*) trend is increasing in the area. Due to the recent (2008) injunction, the wolf can not be legally hunted. Wolf mortality is still possible from wolf – human or livestock interaction but the population trend is expected to be maintained.

Wolverine (G*ulo gulo*) The Blackfoot River Watershed is within the home range of wolverines Alpine cirque and talus slopes are important for den sites and is available in limited quantity within the watershed. Travel corridors are usually located in spruce/subalpine fir forested areas near natural openings with limited human activity and an adequate prey base (prefers carrion) (Ruggiero and others 1994, Groves and others 1997, Spahr and others 1991). The movements of dispersing or spatially unattached wolverine may include lowland vegetation communities generally considered non-typical in nature for wolverine (Copeland, per. Comm.). Trend is not known due to low population levels and large territories and dispersal areas (Inman 2004).

Bald eagle (*Haliaeetus leucocephalus*) Eliminating the use of DDT and protection by the ESA provided allowed the eagle to recover.

Northern goshawk (*Accipiter gentilis*) Succession to mature forest stands has created an abundance of habitat for old growth dependent wildlife. There is a lack of young- and middle-age stands to provide the diversity to maintain the composition and structure needed over the long term for wildlife.

Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*) in 2000 the USFWS determined that listing was not warranted. They recognized that there have been declines in populations primarily attributed to the loss and degradation of important shrub steppe, grassland, and riparian habitats. They also recognized that various State and Federal agencies are actively managing the populations to try and improve their overall status and/or attempting to restore them to currently unoccupied habitats. CRP lands (68,500 acres in Caribou County and 27,043 acres in Bear Lake County) provide nesting

and brood rearing habitat in the watershed. The local population is still adequate to allow a hunting season. With changes in the program, CRP lands may decrease.

Greater sage-grouse (*Centrocercus urophasianus*) need vast expanses of big sagebrush rangeland with 10-30 percent sagebrush canopy cover with a healthy understory of native forbs and grasses to thrive. Actions that reduce these values will likely result in reduced greater sage-grouse numbers (IDFG et al. 2004). The trend in rangeland management is to reduce sagebrush densities where needed through prescribed fire to maintain grass and forb production, re-introduce historic fire intervals, and restore watershed functioning. These treatments must comply with the latest sage grouse guidelines of no more than 20 percent of the acres within eleven miles of lek being in early seral condition at one time.

Great gray owl (*Strix nebulosa*) population trend may have increased as stands of lodgepole pine have matured with succession or decreased with recent logging.

Flammulated owl (*Otus flammeolus*) population data are inadequate for trend assessment, but loss and fragmentation of mature forest habitat suggests that populations are declining (NatureServe 2004). Although firewood cutting and logging reduce snags, these represent a small percentage of the mature forested habitat in the watershed.

Boreal owl (*Aegolius funereus*) trend are related to loss of mature forests at higher elevations.

Three-toed woodpecker (*Picoides tridactylus*) mortality from competition, insects, and disease in large trees of all species is expected to continue to provide a supply of suitable foraging habitat for three-toed woodpeckers. Forest fire may lead to local increases in woodpecker populations 3-5 years after a fire (Spahr and others 1991).

Animal Damage Management provided by WS has increased in predator management. Beginning in 2006, Idaho WS also began cooperating with other State and Federal agencies in conducting statewide sampling of live and hunter-killed waterfowl for the presence of avian influenza. Populations of some predators, such as ravens and red fox, which are some of the principal predators on sage grouse nests and chicks, have increased dramatically over historic population levels. During this same period of time, sage grouse populations have experienced significant long-term declines. WS could play an important role in helping to determine whether predation may be contributing to declining sage grouse populations in southern Idaho. WS continues to provide input to local sage grouse working groups regarding the potential impacts of predation on sage grouse. As wolf populations in Idaho continue to expand, WS may also be asked to provide assistance in reducing the impacts of wolf predation on elk herds in specific areas where wolf predation has been documented as a factor contributing to declining elk numbers. (USDA APHIS WS Idaho 2006)

Dead and Down Material, Snag / Cavity Nesting Habitat is usually gathered within 300 feet of roads. This loss represents only 4 percent of the forest. Timber harvest and prescribed burns change the quantity and quality of dead and down material and alter

vegetation structure, composition, and pattern for long periods of time. Because of the current stand ages and structures, the potential for insect epidemics is considered high. Snags levels would increase with insect caused mortality and prescribed burning. Down material will increase or be replaced as these recently killed standing dead trees fall to the ground.

Amphibians: Western boreal toad (*Bufo boreas*) populations appear to be declining in Greater Yellowstone Ecosystem and in other parts of western United States (Groves and others 1997, 6). Anecdotal information exists for the decline of Northern leopard frog (*Rana pipiens*) in Idaho (Groves and others 1997, 11).

Big Game (elk & mule deer) & Winter Range – Elk populations continue to show an increase or remain stable, while deer populations fluctuate greater and are perceived to generally be decreasing due to changes in habitat, primarily winter range.

Diamond Creek Zone (66A, 76) represents some of the most productive habitat found in southeastern Idaho. Three main vegetation types predominate: sagebrush-grassland, aspen, and conifer. Past habitat-use research indicates that aspen habitat types are highly preferred, especially during non-snow periods. Fire suppression efforts and intensive livestock grazing in the past have resulted in increased shrub and conifer cover with a reduction in the aspen component since historical times. (IDFG 2007d)

Other variations of these 3 main types that are important to deer include mixed brush communities, juniper, and mahogany. The current mix of vegetation cover types is a result of intensive grazing by livestock during the early 1900s and ongoing fire suppression efforts. These factors converted what was predominately perennial grass stands into shrublands. Given that current livestock grazing practices are much more conservative and designed to promote grass, and that current shrublands are aging, it is logical that quality mule deer habitat probably peaked earlier in the twentieth century. Additionally, the current conversion of aspen to conifer and replacement of mixed shrub and sagebrush communities by juniper probably will reduce habitat suitability for mule deer. (IDFG 2007d)

Summer range will likely remain adequate despite succession of aspen to conifer and some very slow conversion of rangeland types to conifer. Road density can move big game to other areas and decrease hunter enjoyment or success. Revised Forest Plan prescriptions are designed to maintain low road densities. Winter range has fluctuated in the past century due to changes of livestock grazing, conversion of native vegetation to crop lands, and placing agriculture lands into the Conservation Reserve Program (CRP) authorized in 1985. A decrease of lands under CRP and continued urban sprawl will reduce winter range.

Landbirds that have adapted to habitat changes have increased but other have declined. **Executive Order 13186** directs executive departments and agencies to take certain actions to further implement the **Migratory Bird Treaty Act**, provides a framework for the Federal Government's compliance with its treaty obligations, and is intended to

enhance coordination and communication. The EO also requires Federal agencies "taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations" to develop and implement, within 2 years, a Memorandum of Understanding with USFWS that "shall promote the conservation of migratory bird populations." The protocols developed by this consultation are intended "to be implemented when new actions or renewal of contracts, permits, delegations, or other third party agreements are initiated was well as during the initiation of new, or revisions to, land management plans. At this time the MOU has not been signed.

Idaho Sedge (*Carex idahoa*) is known to occur in Idaho, Montana, Utah and Oregon. For many years Idaho sedge was thought to be restricted to the high valleys of southwestern Montana and adjacent eastern Idaho (MT FG 2008) (IDFG 2008b). According to a recent treatment (Ball and Reznicek 2002 *as referenced in Mancuso 2004*), the range of this species also encompasses disjunct populations in portions of California, Oregon, and Utah. It is apparently uncommon or rare in these other states (Mancuso and Severud 2004). In Idaho and Montana the sedge primarily is found on lands managed by the Forest Service and BLM or owned by the States of Montana and Idaho. The metapopulation on the Forest and adjacent lands is disjunct from the larger populations of the species in southwest Montana and other areas bordering Idaho. Almost all populations are in areas grazed by cattle. Other threats include mowing (private land), mining, and road construction/maintenance. In almost all known populations, Kentucky bluegrass is a common associated species. This exotic species is a rhizomatous grass that may out-compete Idaho sedge, especially in the presence of grazing and trampling by livestock (Lesica, 1998 *as referenced in USDA 2003a*).

Beaver (*Castor canadensis*) – Population estimates for beaver throughout the west are 6-12 million animals, a fraction of the original numbers. (Olson and Hubert 1994, 2). Beaver activity is relative to the amount of available food and construction materials. Beaver dams are found on perennial streams throughout the watershed. Some are inactive or are filling in with sediment. Beaver can and are in some places over utilizing stream bank vegetation causing willow or aspen mortality.

American White Pelican (*Pelecanus erythrorhynchos*) populations are on the increase, but are still listed as a State Species of Greatest Conservation Need in Idaho as well as being considered a species at risk across their range. For some, the recent success of the American white pelican in Idaho has raised some concerns about potential impacts on native fish populations as well as impacts on stocked, intensively managed recreational fisheries. Although research has shown pelicans predominantly feed on non-game fish, such as chubs, carp, and suckers, there is evidence that the birds also feed opportunistically on trout in Idaho, including another sensitive species, the cutthroat trout. Fish and Game is currently studying pelican diets on the Blackfoot Reservoir colony as well as attaching radio transmitters to migrating trout to determine the extent to which pelicans are feeding on trout. (IDFG 2007e)

Designated Wildlife Areas

Idaho Birding Trails: Birding is expected to increase in the watershed as it has nationwide. **Diamond Creek Wildlife Viewing Area** is one of a growing list of sites throughout the U.S. Public visits to the watershed to view wildlife and native habitats, especially the fall colors are expected to increase. **Blackfoot Wildlife Management Area (WMA)** continues to meet its goals as outlined by Idaho Department of Fish and Game. **Blackfoot Reservoir Important Bird Area, *Identified*** is also expected to increase in public use. However, this reservoir can be drastically lowered for irrigation needs. This is especially a problem in drought or low water years. This impacts the fishery and possibly reduces the bird's food base. Low water can also leave the nesting island exposed to increased disturbance or predation. Fisheries managers are concerned about pelican and cormorant impacts on stocked rainbow trout, and on native Yellowstone cutthroat trout (a species of special concern in the state). Sportsmen are also concerned about bird impacts on recreational fishing in the reservoir. To address this issue, fisheries biologists conducted a two-year study on pelican and cormorant food habits on the reservoir. They found that these birds do have a significant impact on stocked fish, and have adjusted fish stocking timing to alleviate this problem. To reduce impact of pelicans on Yellowstone cutthroat trout, various methods of bird deterrence have been implemented during the sensitive trout migration period.

Fish Contaminate Levels
In 2007 IDEQ and IDFG conducted a limited state-wide sampling of fish from lakes and reservoirs to determine contaminant levels. From that data, which includes Bear Lake, selenium levels do not warrant fish advisories for the fish and water bodies sampled. We don't have data for the Blackfoot River. IDEQ and IDFG are planning to do a sampling of rivers (in 2008). If the Blackfoot is in their random sample of rivers then there should be data in 2009. (Vannoy Per. Comm. 2008).

5.6 Human Uses

Phosphate Mining

There are currently two proposed new mines within the watershed project area; the Blackfoot Bridge Mine and the Dairy Syncline Mine.

A Mine and Reclamation Plan for the Blackfoot Bridge Mine was submitted to the BLM in 2005, and an Environmental Impact Statement is currently under development. The proposed mine is comprised of 493 acres of private land, 112 acres of state land, and 102 acres of BLM land with a proposed total disturbance of 707 acres. Mining operations are anticipated to begin in 2011. (P4 Production, 2005).

The Dairy Syncline Mine and Reclamation Plan for Federal Leases I-28115 and I-2058 was submitted to the BLM in October 2008. Both leases total 2302.3 acres, all on Forest Service System lands. Simplot, the mine operator is proposing the acquisition of six

fringe leases or lease modifications that would total an additional 1101.34 acres, predominantly on Forest Service System lands (Simplot, 2008).

There are currently more than 50 phosphate leases within the Blackfoot River Watershed, 35 of which are entirely or have a portion on National Forest Lands (lease numbers are from an unverified GIS layer produced from the BLM's LR2000 database from December 2007). The portion of the known phosphate leases that represent reasonably foreseeable phosphate mines is not known because ownership of a lease does not guarantee ore recovery from that lease. The active leases within the project area represent approximately three times the amount of mineralized area that has already been mined (BLM, 2003).

Mining is an important economic resource for the state of Idaho, so it is anticipated that the historic trend for phosphate mining resource development within the watershed will continue into the future at a similar, albeit accelerated pace due to improvements in mining equipment and ore recovery optimization.

Other Minerals Resources

Because reference conditions were not established for geology and non-phosphate mineral resources, a comparison to existing conditions cannot be made. Ecological trends are not expected to change based on geology and non-phosphate mineral activity.

It is anticipated that the need for mineral materials for road surfacing purposes will continue at about current levels. If new sources become necessary, they will have to be looked for and evaluated. Sources of "landscape rock" could be looked for and evaluated as well, although it is not necessarily the responsibility of the Forest Service to meet current demands for this type of material for individual use.

Fossil sites suitable for public collecting could be looked for, but would be of such a small size as to not cause a significant disturbance/impact. Individuals will still desire to collect fossils.

Recreation Social and Resource Impacts

- During periods of high use resource damage can occur as people begin ride ATV's around camp spots creating small racetrack loops damaging forage vegetation and soil resources.
- Conflicts between livestock and dispersed campers can occur when cows rub against vacant trailers or cows are harassed by ATV riders and dogs. Increased recreational demands are intensifying these conflicts.
- Forage for livestock use can be impacted by multiple large camp spots forcing livestock to huddle unable to disperse and graze.

- Verbal visitor contacts while on patrol during the fall 2005 indicated that hunters and other recreation users have been soured by the elevated numbers of dispersed campers concentrated in the Diamond Creek area.
- Long term camping in popular areas can lead to disrespectful situations between occupants and groups wanting the same area.

Accomplishments
The accomplishments listed below are few of the efforts that have taken place to improve resource conditions while implementing Travel Management Projects in the Upper Blackfoot Watershed.

- Closed 6 unnecessary crossings with large rocks along Diamond Creek from the southern district boundary to the Blackfoot narrows.
- Completed in accordance with the Travel Management Plan the closure of poorly constructed old roads and illegal trails in the Diamond Creek drainage with KV money from 5 Timber sales and grant money.
- Implemented the Travel Management Plan by signing entrance portals to the Forest and all open trails with appropriate travel markers.
- Utilized a stewardship timber sale to place barrier rock, improve system roads with gravel and close multiple roads leading to the same area.

Range management

Existing Conditions and Concerns

Allotment	Conditions and Concerns
Rasmussen Valley	This was an excellent allotment in the past. Currently active mining has removed one complete unit from grazing use. On a good forage year the cattle can manage adequately on the remaining units. In 2007 the cattle came on about two weeks late and were required to leave early also to prevent excessive use. Revegetated mine dumps could be used to alleviate the problem if the cattle were allowed to use them.
Dry Valley	Mining has displaced cattle from areas where they previously grazed.
Diamond Cr.	Good allotment, but there are major conflicts between recreationists and livestock grazing. The allotment is long and narrow, running along Diamond Creek. The majority of the places where people like to camp are the same places where the cattle like to shade up.

The South Soda Sheep Environmental Analysis included all sheep allotments, on Forest Service land, within the Blackfoot Watershed. Based on this analysis all of these sheep allotments are at, or are moving toward the desired conditions. The following is quoted from the Decision Memo for the South Soda Sheep AMP revisions:

"For fiscal years 2005 through 2007, a decision made by the Secretary of Agriculture to authorize grazing on an allotment shall be categorically excluded from documentation in an environmental assessment or an environmental impact statement under the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.) if: (1) the decision continues current grazing management of the allotment; (2) monitoring indicates that current grazing management is meeting, or satisfactorily moving toward, objectives in the land and resource management plan, as determined by the Secretary; and (3) the decision is consistent with agency policy concerning extraordinary circumstances.

The twenty allotments of the South Soda Sheep AMP project area meet all three criteria and may, therefore, be categorically excluded from documentation in an environmental assessment or environmental impact statement.

Monitoring data indicates that current grazing management is meeting, or satisfactorily moving toward, objectives in the Forest Plan. Eight long-term upland sites and three long-term riparian sites within the project area have been monitored to determine long-term vegetative health and trend. Properly Functioning Condition assessments were conducted on perennial streams: Bacon Creek, Boulder Creek, Browns Canyon Creek, Burchertt Creek, Cabin Creek, Campbell Creek, Cold Spring Creek, Coyote Creek, Daves Creek, Draney Creek, Flat Valley Creek, Kendall Creek, Lanes Creek, North Fork of Lander Creek, Olsen Creek, Pole Canyon Creek, Sage Creek, Sheep Creek, South Fork Sage Creek, Slug Creek, Smoky Creek, Stump Creek, Timber Creek, Timothy Creek, Webster Creek, and Yellowjacket Creek. Riparian and upland forage utilization standards under the new Forest Plan Standards have been met within the project area."