Fisheries

Introduction

Information for this analysis has been gathered from a variety of sources. Flathead National Forest and Montana Department of Fish, Wildlife and Park (MDFW&P) employees have conducted fish population inventories and habitat condition assessments since 1992 throughout the Porter Mount Project Analysis Area. This data, which is the basis for this analysis, is stored in files at the Swan Lake Ranger District Office. In addition, peer-reviewed scientific literature has been used as the primary source of information regarding the life histories and habitat requirements of the aquatic organisms and the effect of natural and human-caused disturbances upon those organisms.

Analysis Area Description

Spatial Bounds

The analysis area for Fisheries Resources covers three distinct watersheds, namely Rogers Lake, Smith Lake, and Upper Mount Creek. The analysis area is shown on Map 3-4.

Rogers Lake Watershed has several small inlet streams, but no outlet. Fisheries Resources in this lake basin are disjunct from any other watershed. Therefore, any cumulative effects to this basin would be only felt at Rogers Lake and does not extend to any other fish habitat. A notation should be provided about the actual name of this lake. The USGS maps and public maps identify the lake as “Lake Rogers” but since nearly everyone calls it “Rogers Lake,” this name shall be used in the analysis.

Smith Lake Watershed is a large, shallow in-channel wetland (lake) on the Ashley Creek drainage. Ashley Creek has several tributaries with fish habitat, some of which have activity proposed in this project. Fish can move around from stream to stream, and, therefore, any cumulative effects triggered by this project could have an impact on the overall Smith Lake Watershed. The upstream limit of fish migration is a large waterfall just below Monroe Lake, so therefore Monroe Lake, Lone Lake and Ashley Lake are not part of the analysis area. The downstream limit is Smith Lake itself. The outlet of Smith Lake is a warm-water stream that is a natural thermal barrier to fish migration. This effectively isolates Smith Lake from the rest of the Flathead Lake Fisheries Resource.

A man-made barrier to fish migration exists on Upper Mount Creek; therefore, the Upper Mount Creek Watershed is considered separately. Upper Mount Creek was historically connected to the Smith Lake Basin, but a private check dam installed decades ago blocks all upstream fish passage. This has isolated the Fisheries Resource of Upper Mount Creek, plus its tributaries. Any changes to fish habitat would likely only impact upper Mount Creek’s population.

Temporal Bounds

The temporal bounds are 10 years after the beginning of project implementation (approximately 2009 to 2019). Implementation is expected to begin in 2009 and should be completed by about 2012. Water yield modeling on vegetation management and associated road work suggests that water yields would return to existing conditions in an average of about 10 years after implementation. After 10 years, the effects of the project should no longer be felt, and therefore, a 10-year temporal bound was selected.

Affected Environment

Historic Condition

To the best available knowledge, Rogers Lake was historically fishless. This was due to the lake's natural isolation, since it has no connectivity or outlet stream.

Although Smith Lake is a shallow, warm water lake, Ashley Creek historically supported a large population of westslope cutthroat trout. The cutthroat trout spawned and reared in tributary streams and moved around the watershed to seek optimal temperature conditions to mature into adults. Cutthroat trout were able to ascend all the way into the Mount Creek Basin as well. The movement of cutthroat trout around the basin helped prevent inbreeding and allowed a stream to be re-colonized after a disturbance event like a fire or flood. Smith Lake and the lowermost 3 miles of Ashley Creek before its confluence with Smith Lake was probably too warm for cutthroat trout during the summer months. Native sucker species, as well as northern pikeminnow (squawfish), also occupied lower Ashley Creek and spawned at the confluence of tributaries like Mount Creek, Truman Creek, and others. These species prefer slightly warmer water temperatures for spawning and rearing than cutthroat trout. Thus, lower Ashley Creek and Smith Lake primarily hosted suckers and northern pikeminnow, while the cutthroat trout spent the majority of their life in the headwater tributaries.

Historically, bull trout were never present in the analysis area. Due to the warm water nature of Smith Lake and its outlet stream, bull trout never colonized the area (Montana Bull Trout Scientific Group 1995).

Existing Condition

A. Rogers Lake Watershed

Rogers Lake has been stocked since the 1928 with Artic grayling. In more recent years genetically pure westslope cutthroat trout have also been stocked to provide an additional recreational fishery. Grayling are not native to the Flathead Basin or anywhere west of the Continental Divide. Due to concern about rapidly dwindling native stocks in Southwestern Montana, Biologists stocked the grayling in Rogers Lake as an emergency reserve. Grayling cannot thrive with any other fish species, but they can tolerate cutthroat trout. Rogers Lake provided an ideal grayling refuge since it has no connectivity to any other water body, and it only has cutthroat trout. In the Flathead Basin, there are several other small lakes stocked with grayling, but Rogers Lake is the largest and the most important for the following reasons. Grayling eggs are annually harvested from this lake, raised in a hatchery, and then stocked in the other lakes. Rogers Lake essentially serves as a grayling brood stock that allows a system of refuges to help keep the species from going extinct. Over the years, MDFW&P has invested considerable money and time to maintain the brood stock. Cutthroat trout also cannot fully sustain themselves in this basin (the spawning stream is simply too short) and MDFW&P occasionally stocks cutthroat trout just to maintain a recreational fishery.

In 1957, it was discovered that redside shiners had become established in the lake, presumably from released baitfish. Since grayling could not compete with the shiners, MDFW&P chemically treated the lake with rotenone {a naturally derived piscicides (a substance poisonous to fish)} to kill the shiners, and then restock with grayling and cutthroat trout. This was not fully successful and the lake was treated again in 1967. This eliminated the shiners, but then yellow perch and brook trout were illegally introduced by anglers in the 1980's. The lake was treated again in 1993.

Although the lake has been repeatedly treated with piscicides, the chemical agents break down very quickly and do not remain in the environment. Water quality in Rogers Lake is periodically monitored by local homeowners, and it is considered very good (Project File Exhibit L-7). The lake is shallow

(approximately 19 feet maximum depth), but has not exhibited any signs of eutrophication. “Eutrophication” is a process where increased nutrients from agriculture or erosion trigger increased plant and algae growth. However, the lake does periodically experience warm water temperatures. In July 2007, extreme warm weather resulted in a substantial fish kill of adult grayling. At the time of this writing, the impact of this on the overall population is not yet known.

Both the cutthroat trout and grayling attempt to spawn in one inlet creek (the other inlet streams are too small to support any fish habitat). Some local homeowners call the stream “Grayling Creek,” and it enters Rogers Lake on the southeast portion of the lake (Map 3-4). It originates on Plum Creek Timber Company (PCTC) lands, then travels through National Forest Service (NFS) lands for about 0.75 of a mile, and finally travels through private land the last 0.25 miles before entering the lake. The majority of fish spawning takes place immediately upstream of the lake within the first 656 feet (200 m) of the stream. However some juvenile cutthroat trout have been observed as far as the lower boundary of NFS lands. Due to the high gradient and small water volume, it is assumed that fish habitat does not extend into NFS lands. Both grayling and cutthroat trout spawn on gravels in the spring. Grayling fry immediately wash down to the lake to mature (although some may stay a few months), but cutthroat trout tend to remain in the stream for one or two summers before moving into the lake.

Apparently, the grayling spawning in “Grayling Creek” was able to sustain the population for the first 40 years. But agency correspondence in 1973 suggests growing concern that the stream was not always capable of maintaining the Rogers Lake population. Over the next few decades, the spawning runs varied widely from over 1,000 mature grayling in some years to 0 in other years. The 2007 spawning run was the best in over 10 years. To supplement and stabilize the population in poor years, MDFW&P restocks Rogers Lake with progeny taken from mature fish of the lake.

Grayling ascending the inlet stream for spawning. (Photo taken 05/17/07)

There are several causes for the variable and unreliable wild reproduction success in “Grayling Creek.” The primary limitation is the small springtime runoff, especially during drought years. Beginning at some point in the early 1970’s, some spring runoffs were so short in duration that fish did not even move into the stream. MFW&P personnel note that the short runoff duration, rather than the low runoff volume, is the primary problem (Mark Deleray, Fisheries Biologist, personal communication). A second limitation is sedimentation in the spawning section. This area is the only low gradient section of the stream and a natural deposition area for any sediment transported from upstream. While sediment means anything from silt to boulders, the small-sized sediments {less than 0.25 inch (6.4 mm) diameter} concern Fisheries Biologists. The amount of fine sediments in a stream can profoundly affect the quality of fish habitat. Grayling and trout lay their eggs in between gravel substrate and if these eggs are covered with fine sediments, they suffocate. The third limitation was an undersized road culvert about 200 feet (60 m) upstream of the lake that existed in the 1960’s and 1970’s. This culvert blocked upstream fish passage to more than half of the available spawning habitat. The culvert was replaced with a bridge at some point in the 1980’s. There are no man-made fish barriers on “Grayling Creek” today.

While the small water volume is a natural feature (the watershed is only 1,200 acres), the situation has been aggravated by past land management activities. “Grayling Creek” was apparently able to support sufficient fish spawning habitat for 40 years up until the early 1970’s. However, beginning in the early 1970’s, the watershed had roads built and timber harvested on both PCTC and NFS lands. Roads can capture water that would have otherwise moved underground and bring it to the surface.

The ditches along a road, then, transport this water into a stream. Although this may seem trivial at each ditch, the cumulative effect is that the stream can experience higher-than-normal runoffs during the spring and then less-than-normal flows during the summer and winter. The existing density of roads in this watershed is 7.18 road miles per square mile, which is considered extreme when compared to healthy cutthroat trout and bull trout streams (USFWS 1998). While the majority of the roads are no longer eroding or collecting water, the stream crossing of Forest Development Road (FDR) #9669 is poorly designed and still eroding downstream. The condition of private roads is unknown.

Harvesting healthy trees can also have the same effect. Healthy trees capture precipitation, but if many trees are removed, the runoff moves quickly to the stream triggering a short and intense runoff period, similar to the road impact. Both PCTC and the Forest Service have conducted timber harvest in the “Grayling Creek” watershed. In 1995, the Forest Service determined the unnatural water yield on “Grayling Creek” was extreme, and the stream was considered in “disequilibrium.” The Forest Service initially proposed further vegetation treatment but then deferred it due to concern about fish habitat conditions (USDA Forest Service 1995). Eventually, as past harvested areas re-vegetate, the water yields return to normal. WATSED modeling indicates “Grayling Creek” is slowly recovering from a 1995 figure of 24 percent increase of peak flows over baseline conditions to 14 percent increase over baseline conditions currently.

The second limiting factor, sedimentation, has also been aggravated by past land management activities. Sedimentation comes from either indirect channel erosion or point-sources of erosion. Indirect channel erosion is a result of unnatural water yields as described above. The short, accelerated runoff forces the stream banks to widen and erode, but these banks would gradually heal. A 2001 assessment found about 80 percent of the bank lengths had stabilized.

During initial road construction, especially where the road crosses a stream, sediment is eroded into the stream. While the initial erosion stabilizes after a few years, there are several places in the “Grayling Creek” watershed that have poorly designed stream crossings and undersized culverts that are still eroding after every snowmelt or storm into the stream. Range cattle from the Potter Range Allotment have access to this watershed, although the riparian use by cattle has been primarily concentrated in a 300-foot length near the mouth of the stream (private land) and very little ever took place on NFS lands. Due to concerns that the stream banks were trampled by cattle, thus eroding into fish spawning habitat, a fence was built in the 1990’s to keep cattle out. This fence was partially effective, but did not completely block the cattle. Plum Creek Timber Company sold the land to the State of Montana in 2004, and cattle have not grazed in the area for the past few years. The Forest Service cattle allotment within the watershed has been closed and is not used for grazing. Thus, other than the lingering impact of poorly designed stream crossings, most of the sedimentation sources have healed in the past decade.

The lowermost portion of the stream (where spawning takes place) has been periodically monitored by the local homeowners with photographs, narratives, and Wolman pebble counts. Since 1993, the spawning habitat has generally had about 12 to 34 percent spawning gravels and 66 to 88 percent fine sediment, with no clear upward or downward trend. A stream with such large quantities of fine sediment typically indicates poor condition.

The stream was surveyed in 2001 upstream of the spawning area on NFS lands. The condition of upper “Grayling Creek” was compared to similar unmanaged streams to gauge stream health. This is a commonly accepted practice (Archer et al 2004) and the Project File (Exhibit L-6) contains information about unmanaged, reference streams. Upper “Grayling Creek” has plenty of large woody debris and pool habitat and healthy, stable stream banks. Water temperature in the stream is cold and not currently a concern (Mark Deleray, Fisheries Biologist, personnel communication). The stream has 34 percent fine sediment, which is on the high end of what would normally be expected. However the pools in upper “Grayling Creek” are shallow and lower quality than expected. The depth of pool habitat is considered one of the more sensitive indicators of land management impacts (Bauer

and Ralph 2001). Pool habitat quality can gradually decrease after road construction or logging, possibly taking decades to react to upland impacts and then decades to recover.

B. Smith Lake Watershed

While Smith Lake once seasonally hosted cutthroat trout, the lake today is entirely dominated by introduced, warm-water fish such as northern pike and yellow perch. The lake is generally shallow and has considerable macrophyte growth (aquatic weed beds). It is unknown if the lake is becoming more "eutrophic" over time or if it has always been that way. One particular macrophyte (*Elodea Canadensis*) is extremely dense and periodically slows the inlet to Smith Lake so much it causes Ashley Creek to flood over its banks in the middle of the summer (Brant 1991).

Cutthroat trout have completely disappeared from Ashley Creek, Porter Creek, lower Mount Creek, Wild Bill Creek, and most of Truman and Emmons Creek. Only a tiny remnant population of cutthroat trout is left in the extreme headwaters of Truman Creek and Emmons Creek. The cutthroat trout in Truman Creek are found above a small series of waterfalls and these fish have been determined to be genetically pure westslope cutthroat trout. This population is very small, but has persisted because brook trout have not yet invaded past the waterfalls. The headwater of Emmons Creek also has cutthroat trout living sympatric (*occupying the same or overlapping geographic areas without interbreeding*) with brook trout, but their genetic purity and long-term prognosis is uncertain. Both Truman and Emmons Creek are outside of the project area but still within the cumulative effects analysis area.

Within the Smith Lake Analysis Area, non-native brook trout exclusively occupy all of the tributaries except above the barriers mentioned above. Brook trout were introduced to the Flathead Valley approximately 60 years ago and have become widespread, much like a noxious weed. Brook trout can quickly overwhelm a stream at the expense of native cutthroat trout. Juvenile brook trout out-compete juvenile cutthroat trout during the first winter, creating a population "bottleneck," which can ultimately deplete the cutthroat trout population. The greatest impact appears to be in lower elevations, low gradient, and slightly warmer streams (Benjamin, Dunham and Dare 2007) (Dunham et al 2002), such as Porter Creek, Mount Creek, Wild Bill Creek, and Truman Creek. Brook trout also may simply be more tolerant of degraded conditions, although this is difficult to determine since low elevation, low gradient systems tend to be the most disturbed. Researchers have noted that it appears brook trout are putting pressure on already depressed cutthroat trout populations, rather than outright replacing them (Dunham et al 2002).

All fish habitat on Porter Creek is on private lands; none on NFS lands. Fish habitat has not been formally surveyed, but the District Fisheries Biologist has observed it to be in poor condition due to considerable fine sediment covering any potential spawning gravels. The source of the sediment is probably from point sources, rather than in channel erosion. One point source was range cattle grazing from the Potter Range Allotment. Considerable bank damage took place on private land in the SW corner of T27N, R23W, Section 21 for many years, but a fence built in the late 1990's has greatly improved the stream condition. Occasional grazing on NFS lands headwaters of Porter Creek (at junction of FDR #2986 and FDR #9669) was also a problem, and this area was fenced off in the 1980's. The allotment has not been used since 2001, and it is unlikely to ever be used again. Another point source of erosion is from a few poorly designed roads and undersized culverts found in the headwaters. These are a continuous point-source of erosion. Unlike the point-sources of erosion, past vegetation management has not resulted in any indirect erosion or channel instability (USDA Forest Service 1994) (USDA Forest Service 2002). WATSED modeling indicates the current peak flows are 7 percent over baseline conditions. The headwaters of Porter Creek are stable.

An unnamed, perennial tributary to Ashley Creek is found between Porter Creek and Mount Creek. For simplicity sake, this analysis will refer to the stream as "Mossy Creek" (Map 3-4). A 2007 assessment found the stream to be naturally fishless. The "Mossy Creek" watershed has very few roads and very little timber harvest activity to date. The Potter Allotment which was within this area

has been closed since 2004. Even historically, no grazing took place in this forested watershed. The stream has cold water and stable channel conditions, thus it contributes good water quality to Ashley Creek.

Lower Mount Creek has been severely degraded from its historic condition. All fish habitat is on private lands, which has been used for both agriculture and residential uses. Mount Creek has three distinct segments. In the lowermost section, much of the riparian canopy has been cleared for agricultural use, and therefore the stream has little shade. Furthermore, several water diversions and ground-water pumping routinely leaves nearly two miles of Mount Creek dry every summer. In addition to diversions and ground-water pumping, timber harvest has undoubtedly contributed a role in the altered flow regime. The Mount Creek Watershed consists of 73 percent timber lands owned by the Forest Service, State of Montana, and PCTC. WATSED modeling indicates peak flows are currently 18 percent over baseline conditions. The combination of very low water and little shade results in considerable brook trout mortality every year. Several county roads and privately-owned roads cross the stream. While one consists of a bridge, the rest are made up of 2, 3, or even 4 culverts lined up in a row. The District Fisheries Biologist suspects that several of these culverts are too small and will gradually become barriers to fish migration.

Further upstream in the middle segment, Mount Creek enters a tight canyon with highly erosive soils. A county road was built near the stream and had steep, unstable cutslope and improper runoff on the road surface. A 1993 watershed analysis noted this 1.1 mile length of road as the single greatest source of sediment to Mount Creek (Sugden 1993). The Ashley Creek Watershed Group (a citizen's council associated with Flathead Basin Commission) was organized to mitigate this erosion point-source, as well as others in the Smith Lake Basin. In 2005, the road drainage was improved and the cut slope partially stabilized, thus reducing erosion in Mount Creek (Flathead Basin Commission 2007). The location of the road, however, is still very close to the stream, and it is not possible to completely stabilize the area. In recent years, a private development has cleared trees on the west side on the top of this canyon, triggering hillslope erosion, which deposited further sediment into Mount Creek.

Browns Meadow from Haskill Mountain

The upper segment of Lower Mount Creek consists of Browns Meadows. Around the early 1900's, Mount Creek (and its tributary Kessler Creek) was dredged and straightened to improve hay production. The stream was re-dredged again in the early 1960's and then again in 1991(Sugden 1993). This resulted in a "headcut" as the stream adjusted to a new, steeper gradient. The water table lowered and the stream became a gully. The old floodplain (now a hay field and grazing pasture) was left high and dry. Cattle grazing has left the stream banks very unstable and they continue to erode sediment into Mount Creek.

Several small, nameless tributaries originate on NFS lands on either side of the Mount Creek Valley and discharge into the stream on private lands. Some of the streams are perennial, some intermittent, but none have fish habitat. These streams are located within the Browns Meadows and Wild Bill Range Allotments. Surveys in 1992 and 1995 did not find any riparian impacts from cattle in the Browns Meadow Allotment, which is on the east-facing tributaries to Mount Creek or Kessler Creek (Swan Lake Ranger District Office Files and Project File Exhibit Q-2). In the Wild Bill Allotment, a very

small amount of stream bank trampling and erosion was noted near roads / stream intersections on two west-facing tributaries. One tributary does not have surface water connectivity to Mount Creek, and the other is only intermittent. Thus, the current condition of the cattle allotments is having only a negligible impact to Mount Creek's fish habitat.

C. Upper Mount Creek Watershed

A flood-irrigation dam was installed decades ago along the line between sections 23 and 26 of T26N, R23W. Although the dam is on State of Montana lands, it is used for downstream agriculture purposes. The installation of the dam has left the fish population of Upper Mount Creek isolated from the rest of the Smith Lake watershed. Cutthroat trout are the only species in Upper Mount Creek and non-native fish have not invaded. A genetic sample of these fish taken in 2000 found them to be 99 percent pure westslope cutthroat trout (one percent rainbow trout introgression). Although they are slightly hybridized, they are still worthy of protection according to a species conservation strategy (MDFW&P 1999). In 2007, the entire fish population of the Upper Mount Creek area is estimated to be approximately 1,700 age 1+ cutthroat trout. Nearly all of these fish were subadult fish (less than 4" long) and it appears that only a very few survive to reproduce.

Upper Mount Creek's fish habitat exists on mixed ownership of PCTC and State of Montana lands. The first 0.33 mile above the dam experienced severe erosion when beaver dams were removed to improved range conditions. The Ashley Creek Watershed Group has planted shrubs and stabilized some raw banks in a limited area (Flathead Basin Commission 2007).

The remaining 3.3 miles of fish habitat of Upper Mount Creek is also in poor condition. A 1993 Plum Creek Timber Company report identified limiting factors due to sparse pool habitat and woody debris cover and the cause was primarily ascribed to historic timber harvesting in the riparian area and open range cattle grazing (Sugden 1993). Subsequent monitoring at three channel transects from 1993-1998 found conditions continued to worsen (become wider and more shallow), primarily due to cattle and erosion from roads in the watershed (Sugden and Breuer 1998). Unpublished monitoring data provided by Plum Creek Timber Company found conditions had stabilized since 1998, getting no better or worse. Fish habitat was evaluated in 2007 and the limiting factor was excessive sediment and very shallow pool habitat (Project File Exhibit L-6). This limits spawning success and also survival rates for sub-adult and adult fish that depend on deep, quality pools. The District Fisheries Biologist determines fish habitat conditions are likely due to a combination of changed peak flows (due to timber harvest in the watershed), historic riparian logging practice, erosion from roads, and cattle grazing.

Upper Mount Creek has one tributary within the project area. This unnamed tributary is called "Homestead Creek" (See Map 3-4). Cutthroat trout occupy the lower one mile in "Homestead Creek" on PCTC lands. The headwaters consist of two perennial streams on NFS lands but they are presumed too small in volume to support fish. "Homestead Creek" supports about 600 age 1+ fish (about 1/3 of the total population). Habitat monitoring trend data is not available. A 2007 habitat assessment found fish habitat is primarily limited by excessive sediment and very shallow pool habitat (Project File Exhibit L-6).

"Homestead Creek" is wide, shallow and silty but probably wasn't always that way. Cattle grazing in the riparian area are one probable cause for the change. This stream lies within the Welcome Springs Range Allotment. Surveys in 1992 and 1995 on NFS lands both found some stream bank trampling caused by cattle near the road / stream intersections. Cattle did not wander far upstream or downstream of the roads due to thick timber, and the total amount of sedimentation from NFS lands was judged to be fairly small. The allotment was in non-use from 1995 to 2002, but has since resumed. Downstream on PCTC lands (where the fish habitat is), the valley bottom has been partially harvested and provides plenty of forage for cattle near the stream. Cattle are routinely observed near the stream but it is uncertain if they are trespass cattle or cattle from the Welcome Springs Range Allotment. In addition to cattle grazing, it appears the stream channel has been impacted by unnatural

peak flow events. Even in hawthorn thickets where cattle cannot reach the stream, “Homestead Creek” has incised and collapsing stream banks that indicate changed flow regimes. In addition to timber harvest, peak flows may have been impacted by the very high road density of 7.43 miles per square mile of watershed. Within the one mile of fish habitat, “Homestead Creek” has three road crossings. One of these had a culvert wash out in 1992; the area has since been stabilized. Another culvert seems large enough but has created a large outlet pool, which indicated changed flow regimes. Ironically, the outlet pool is the largest and best pool habitat in the stream. Over time, this culvert will become a fish migration barrier.

A. Rogers Lake Watershed

Alternative A - No Action
Direct and Indirect Effects

Alternative A does not have any direct or indirect impact. This alternative includes no timber harvest or BMP work on roads in the Rogers Lake Watershed.

Alternative A - No Action
Cumulative Effects

The geology of the watersheds, past timber harvest and road construction projects, and natural events have created much of the existing riparian habitat conditions found within the analysis area.

Road Management: In consideration of past, present, and reasonably foreseeable actions, there are cumulative effects associated with Alternative A. The existing road network would remain as it is with periodic maintenance, but no BMP improvements. Nearly 14 miles of road would remain in the 1.9 square mile watershed of “Grayling Creek.” Forest Development Road #9669 would continue to erode into “Grayling Creek,” and it is probable that other drainage problems would develop as the roads age. However, no culverts have been found that are vulnerable to immediate failure or washout.

Vegetation Management: Some beneficial impacts would take place as the forest grows and matures. No reasonably foreseeable timber harvest is anticipated in the “Grayling Creek” watershed. WATSED modeling suggests the recovery rate would be slow, but at the end of the 10-year analysis timeframe, peak flows would subside to 11 percent over baseline (compared to 14 percent in current condition).

Range Management: Additionally, no further cattle grazing is anticipated in this watershed. Raw stream banks (if any remain) would heal quickly.

Wildfire: Stream banks would heal until a large disturbance such as a wildfire or beetle outbreak would occur. The potential for a large fire to occur specifically in this area is likely low. However there is more potential for large, stand replacing fire under Alternative A compared to the action alternatives. There is no means to estimate or predict when and where such an event would occur. The worst-case scenario type of fire is a stand-replacing fire across the entire basin, which would result in erosion and very erratic runoff conditions for 2 to 4 years. This would cause failed spawning success for a few years and MDFW&P would have to continue stocking. A more likely prognosis, however, is that any particular fire would be of small size or low intensity.

Assuming no large wildfire takes place, the consequence of the cumulative effects associated with Alternative A would be that the “Grayling Creek” fish habitat would remain about the same as the current condition. Pool habitat quality in the headwaters would remain poor and not recover until roads are removed or the forest is mature across the basin (all ownership). Spawning habitat near the mouth of “Grayling Creek” would probably remain about the same. While less sedimentation is expected due to the absence of cattle, the peak flow recovery is not substantial enough. Grayling

would not always have sufficient flow duration to spawn. Some years the grayling would be able to spawn but most years, like current conditions, the spawning run might never materialize. Cutthroat trout would remain in the stream but in very low numbers, similar to the current condition. The cutthroat trout population of the lake is primarily maintained by stocking, not by wild reproduction in "Grayling Creek".

Private Land Development: The water quality of Rogers Lake itself is not anticipated to change. There are no further private land developments foreseeable. The Rogers Lake Neighborhood Plan and Development Code, enacted in 1997, would adequately protect fisheries habitat (Project File Exhibit Q-10). Plum Creek Timber Company proposes to harvest timber, construct 0.5 miles of permanent road and construct 0.3 miles of temporary road in the NW part of the lake basin (not the "Grayling Creek" drainage), and this is anticipated to have no measurable impact on the lake. Despite the good water quality, Rogers Lake would probably need to be periodically stocked with grayling to help the population survive, in light of poor spawning conditions and periodic warm water temperatures in the lake.

B. Smith Lake Watershed

Alternative A - No Action
Direct and Indirect Effects

Alternative A does not have any direct or indirect impact. This alternative includes no timber harvest, ecosystem burning, temporary road construction, or BMP work on roads in the Smith Lake Watershed.

Alternative A - No Action
Cumulative Effects

In consideration of past, present, and reasonably foreseeable actions, there are cumulative effects associated with Alternative A. The existing road network would not receive any BMP improvements. While most of the Forest Service road system is in good shape, there are a few point sources of erosion in Porter Creek. The effect of No Action is continued, small amounts of erosion. No culverts have been found that are vulnerable to failure or washout.

While no change is expected in the Porter Creek Watershed, the overall road density of Mount Creek is expected to increase beyond its current density of 5.36 miles per square mile. The Forest Service proposes to construct several new OHV trails to connect existing roads into a loop system. The new OHV trail (road) construction would total an estimated 6 miles and would be located on the east side of the Mount Creek Watershed. Furthermore, PCTC proposes to sell approximately 1,360 acres to development in the Mount Creek and Ashley Creek watersheds. Developers are likely to construct several miles of new roads. The cumulative impact of these actions is more sediment in fish habitat.

Flathead County is likely to continue to blade the Mount Creek Road. In spite of recent improvement, this routine blading would inevitably contribute a significant amount of sediment into Mount Creek.

Some beneficial impacts would take place as the forest grows and matures. The only reasonably foreseeable timber harvest is the Blacktail Bill Project on NFS lands in Wild Bill and Truman Creek Watersheds. The project would have no impact on Porter Mount Project Area streams, but may have some impact on fish habitat of the Smith Lake Watershed. No other timber harvest is anticipated anywhere in the Smith Lake Watershed. WATSED modeling suggests the recovery rate would be slow, but at the end of the 10-year analysis timeframe, Mount Creek peak flows would reduce from 18 to 14 percent over baseline, and Porter Creek peak flows would drop from 7 to 6 percent. Future development on former PCTC lands (including the existing Haskill Mountain Ranch) are not likely to affect peak flows since most of the vegetation is already removed.

Cattle grazing is reasonably foreseeable on the Wild Bill and Browns Meadow Allotments. Furthermore, private land grazing and grazing allotments on PCTC land are likely to continue. The impact of this on NFS lands is very slight. Since this alternative would not increase forage, cattle would continue to mostly graze along existing roads and would not graze by the streams. The impacts of private land grazing on lower Mount Creek would likely remain very severe. The old Potter Allotment, which use to allow grazing on Porter Creek Basin, would remain inactive.

There is always a chance for a large, stand-replacing wildfire. The potential of a large fire is somewhat greater in Alternative A compared to the action alternatives. The actual potential for large, stand replacing fire is described in more detail in the Fire and Fuels Section of this chapter. As described for the Rogers Lake Watershed it is impossible to predict what the impacts of such a fire would be due to many natural variables, but the possibility of severe erosion and erratic runoff does exist. This is unlikely to result in a fish kill since the brook trout can escape to other streams and return later.

Assuming no large wildfires take place, the summary of cumulative effects associated with Alternative A would be that fish habitat conditions in lower Mount Creek would continue to remain very poor. While the water yield alteration due to forest management would slightly recover, the basin would still be affected by new roads, private land development, agricultural use, and an eroding county road. Conversely, fish habitat conditions on Porter Creek may very gradually improve since no additional pressures are identified.

The consequences of Alternative A's cumulative effects are that brook trout would continue to exist in Mount Creek and Porter Creek, although there are low numbers due to poor habitat. Cutthroat trout would not return. Even if fish habitat was completely restored, there are no known cases where cutthroat trout have been able to suppliant non-native brook trout. In the larger cumulative effects analysis area, brook trout would also continue to dominate Wild Bill Creek, Truman Creek, Emmons Creek, Ashley Creek, and other small unnamed tributaries of Smith Lake. There is no reasonably foreseeable action to recover cutthroat trout in the Smith Lake Watershed. The last remnants of cutthroat trout in the headwaters of Truman and Emmons Creek are not likely to persist due to their extremely small population size, under any of the alternatives, including Alternative A.

C. Upper Mount Creek Watershed

Alternative A - No Action
Direct, Indirect, and Cumulative Effects

Alternative A does not have any direct or indirect impact. This alternative includes no timber harvest or BMP work on roads in the Upper Mount Creek Watershed.

In consideration of past, present, and reasonably foreseeable actions, there are a few cumulative effects associated with Alternative A. The existing road network would remain as it is with periodic maintenance but no BMP improvements. Nearly 27 miles of road would remain in the 3.6 square mile watershed of "Homestead Creek." A few minor sediment sources were noted, but none significant. Of some concern is that undersized culverts may plug with debris and wash out a portion of the road. This took place in 1991 on a PCTC road, and several undersized culverts were noted on NFS lands. This is a possible event, but it cannot be forecasted with certainty. It is also possible that the road density would slightly increase due to the Forest Service's proposed new OHV trail system but this is probably too inconsequential to be able to detect in fish habitat.

No timber harvest activity is reasonably foreseeable in either upper Mount or "Homestead" Watershed. As the forest grows, the WATSED modeling indicates that water yields of "Homestead Creek" would very slowly recover from 12 percent over baseline conditions to 9 percent over baseline conditions. This amount of change is not likely to be measurable when considering the extremely high

road density that would perpetuate unnatural water yields. The stream would likely remain wide and shallow throughout the timeframe analysis. There are no reasonably foreseeable private land developments or PCTC land sales.

Grazing on the Welcome Springs Range Allotment is reasonably foreseeable to continue. This would result in continued small amounts of stream bank trampling on NFS lands. Downstream on PCTC land, cattle grazing would continue to have a significant impact due to widespread riparian grazing resulting in sedimentation.

As described for the Rogers Lake and Smith Lake Watersheds, Alternative A does have some increased potential for a large, stand-replacing fire compared to Alternatives C and B. Detailed discussion of this potential is found in the Fire and Fuels Section of this chapter. If this should occur, the consequences would be very severe. The quality of fish habitat in upper Mount Creek and "Homestead Creek" may be too small to allow fish to survive a wildfire. The shallow pools provide very little refuge from heat and ash fallout during a fire. The cutthroat trout would not be able to escape downstream (due to a check dam in Mount Creek) and they would perish. This scenario is unlikely, but it is of great concern.

The consequences of Alternative A's cumulative effects are either stable or a slight downward trend of fish habitat quality in "Homestead Creek." No improving trend to fish habitat is likely. This is due to the continued unnatural water yields, continued sedimentation from grazing, and the road network. Cutthroat trout numbers in "Homestead Creek" and upper Mount Creek are already small and have no reasonable foreseeable habitat improvement or population enhancement project. To help determine the long-term population viability, a computer simulation called VORTEX (version 9.72) was ran 100 times for cumulative effects of Alternative A. The 100 scenarios allowed the possibility of random catastrophic events such as fire, flood or drought. In all 100 simulations, the Upper Mount Creek was ultimately extirpated. The median extirpation time was 15 years. Within the 10 year analysis timeframe, 81 scenarios had a surviving population and 11 resulted in extirpation. The VORTEX simulations and background assumptions that were utilized are in Project File Exhibit L-8. The District Fisheries Biologist interprets the poor viability prognosis is due to the current small population size and high mortality rates based on poor habitat conditions.

Alternative B – Proposed Action
Direct, Indirect, and Cumulative Effects

A. Rogers Lake Watershed

Alternative B includes about 51 acres of timber harvest, a designated skid route, and approximately one mile of BMP improvements in the "Grayling Creek" watershed on FDR #9669 and #9669A. No harvest activity would take place within Riparian Habitat Conservation Areas (RHCAs).

The direct effects of this include a one percent increase of peak flows for 3 years. This change is due to the proposed 14 acres of Seed Tree harvest and 37 acres of Commercial Thinning. Spring runoff would climb back to 14 percent over baseline conditions for 3 years before it returns to 13 percent as it was before the project implementation (2009).

Alternative B also has an indirect effect of BMP improvements on approximately one mile of road, which is roughly 66 percent of the existing NFS roads in the watershed. Considering that one road (FDR #9669) is a chronic source of sediment, this would help reduce sedimentation into "Grayling Creek." A 400-foot designated skid trail is needed to access Seed Tree Unit #16. This essentially causes the same impact as new road construction, although it is temporary and not near water. A temporary addition of 400 feet is too minor to increase the existing, high road density of "Grayling Creek." This skid route would be reclaimed following its use outsloping, scarifying, seeding, and recontouring.

The net impact of Alternative B is further habitat deterioration in “Grayling Creek.” Although the BMP improvement on one mile is a helpful mitigation, it is not sufficient to ameliorate the on-going impacts of 7.2 miles per square mile of roads and a 14 percent increase of peak flows over the baseline condition. Due to the already sensitive condition of the stream channel, it is anticipated that the slight increase of peak flows would result in a measurable deterioration of fish habitat conditions. As modeled, Alternative B could further reduce the very low flows during the grayling spawning period for a few years by changing the timing of peak flows. Eventually the impacts would subside and “Grayling Creek” would return to the existing, poor condition.

Alternative B is anticipated to make the potential of a large wildfire even more unlikely than the current condition. This helps prevent the possibility of significant erosion and very erratic runoff conditions that could otherwise take place with a fire. While a large fire could still take place, the cumulative effects of Alternative B are more likely to be a smaller increase of peak flows due to land management rather than a substantial increase due to wildfire.

The Cumulative Effects Worksheet (Project File Exhibit L-9) considers and describes proposed activities in addition to the past, current, and reasonably foreseeable activities listed in Chapter 3. Those activities that cumulatively contribute indiscernible effects on Fish are not included in this section but are discussed in the Fisheries Cumulative Effects Worksheet. Those activities that cumulatively affect Fisheries will be discussed below.

In conjunction with reasonably foreseeable actions, Alternative B cumulatively reduces the amount of stream sedimentation but also cumulatively increases the unnatural peak flows. The BMP improvements on an estimated one mile of road, along with the continued absence cattle grazing, would cumulatively result in less point-sources of sedimentation into “Grayling Creek”. However, the short-term increase of peak flows from Alternative B, along with the continuation of the high road density, would result in further elevated peak flows of short duration during the snowmelt, followed by lower flows when grayling attempt to spawn.

The consequence of the cumulative effects associated with Alternative B would be that the “Grayling Creek” fish habitat would deteriorate a small but measurable amount. The sensitive area is the last 656 feet (200 meters) of the stream before its confluence with Rogers Lake. Peak flows would become even higher during snowmelt and then dwindle to even lower amounts when grayling and cutthroat trout attempt to spawn. While the amount of point-source sedimentation is reduced, the in-channel erosion from peak flows would not allow improvement of spawning habitat. Most years, grayling would not be able to spawn and MFDW&P would have to continue to stock the lake. Upstream from the sensitive area, pool habitat quality would remain unchanged since a one percent increase is not substantial in this stable stream reach.

The water quality of Rogers Lake itself is not anticipated to change. As reviewed with Alternative A, no cumulative effects are anticipated to degrade water quality of the lake.

B. Smith Lake Watershed

Alternative B includes 1,116 acres of vegetation management in the lower Mount Creek and Porter Creek watersheds. This includes commercial timber harvest, non-commercial thinning, and one ecosystem burn. No activity is proposed in RHCA’s. Alternative B also includes 4.74 miles of temporary road construction, which includes crossing one intermittent stream. BMP improvements along an estimated 50 miles of roads in the Porter and Mount Creek watersheds are also proposed in Alternative B.

The direct and indirect effects of Alternative B on Porter Creek would be a minor, short-term increase of sediment, followed by a minor, long-term reduction. Unit #2 would require an estimated one mile of temporary road. This temporary road would cross a tributary to Porter Creek (called “Slate Creek” in

this document), and this would result in some inevitable erosion as a new culvert is installed. Design Criteria would consist of installing this culvert during the dry season. However, exposed soils near "Slate Creek" would erode during the following spring runoff. Following the removal of the culvert, it would take a few years for the site to stabilize, and nearly a decade before the road completely disappears.

Alternative B also includes BMP work which would likely result in very small amounts of erosion during the implementation period (such as cleaning ditches or replacing culverts). Over the long-term, the amount of erosion from the roads would be reduced from its current condition. The indirect effects of Alternative B would not likely result in any channel instability. The existing condition of Porter Creek's fish habitat is impacted from sedimentation but not channel instability. Within the Porter Creek watershed, the effect of Alternative B's vegetation management would increase peak flows from 7 percent over baseline conditions to 12 percent over baseline conditions. However, due to the rocky, stable condition of headwater streams, the District Hydrologist does not anticipate this would affect downstream fish habitat.

In conjunction with reasonably foreseeable actions, the effects of Alternative B would be a short-term increase of sedimentation followed by a cumulatively, long-term decrease of sedimentation into Porter Creek. Alternative B incorporates BMP improvements on roads, which would reduce what little erosion is currently taking place. With the cessation of the Potter Range Allotment, this would also reduce point-sources of erosion. No other reasonably foreseeable actions would impact fish habitat in Porter Creek. Therefore, the cumulative effects of Alternative B in Porter Creek are a slight decline followed by a gradual improvement of fish habitat over the existing condition.

Almost no land management activity is proposed in the "Mossy Creek" Watershed. There are no direct or indirect effects, and this stream would continue to provide good water quality to Ashley Creek.

Within lower Mount Creek, the direct and indirect effects of Alternative B are very small and probably not measurable. The temporary roads would not cross any stream channels. BMP improvement on roads would probably result in very small amounts of erosion during implementation and then have small, long-term improvements. None of the Forest Service roads in the Mount Creek Watershed are currently known to be substantial problems. WATSED modeling for the Mount Creek Watershed (which included Upper Mount Creek's proposed activities) projected no further increase of peak flows. The impact of Alternative B is that peak flows would remain at 18 percent over baseline conditions for another 2 years (compared to Alternative A) before slowly recovering. The proposed harvest units would increase forage for cattle, but they are not located in areas of concern to Fisheries Resources. None of the proposed units in the lower Mount Creek Watershed would be expected to increase livestock use of streams. Therefore, the direct and indirect effects of Alternative B by itself are inconsequential to downstream fish habitat in lower Mount Creek.

Alternative B, in concert with other reasonably foreseeable actions, would cumulatively increase the amount of roads in the lower Mount Creek Watershed. It is reasonably foreseeable that the Forest Service's new OHV roads and trails and private land development would permanently increase the amount of roads. Alternative B also proposes an estimated 3.7 miles of new temporary road in the Mount Creek Watershed. Temporary roads would be reclaimed once harvest activities are completed within the harvest unit after project completion (usually within 3 years) but it would take all 10 years of the analysis timeframe before the vegetation returns and the impacts of the road begin to heal. This means that the road density of Mount Creek would increase beyond its current amount of 5.36 miles per square mile, but only a small amount is due to the Porter Mount Project.

The cumulative impacts of the reasonably foreseeable actions and Alternative B are increased sedimentation in Mount Creek. The majority of sedimentation would continue due to Flathead County maintenance on the Mount Creek Road, private land development, agricultural practices, and (to a small degree) the Wild Bill Range Allotment. As reviewed in Alternative A, these actions would result

in a substantial amount of sediment, while the effects of Alternative B are too inconsequential to add to cumulative effects.

There is always a chance for a large, stand-replacing wildfire. The potential of a large fire is discussed in the Fire and Fuels Section of this chapter. The potential for large, stand replacing fire is somewhat reduced with implementation of Alternative B as compared to the existing situation. As described for the Rogers Lake Watershed, it is impossible to predict what the impacts of such a fire would be due to many natural variables, but the possibility of severe erosion and erratic runoff does exist. Implementation of Alternative B would reduce the possibility of this scenario.

Assuming no large wildfire takes place, the summary of cumulative effects associated with Alternative B would be that fish habitat conditions in lower Mount Creek would continue to remain very poor. The cumulative effects of lower Mount Creek are essentially the same between Alternatives A and B. On Porter Creek, the cumulative effects of Alternative B would result in a short-term increase of sedimentation, primarily due to the temporary road that must cross “Slate Creek.” Over the long-term, the cumulative effects of Alternative B are expected to improve fish habitat conditions in Porter Creek.

The consequence on fish populations from Alternative B is essentially the same as Alternative A. Brook trout would continue to dominate Porter and Mount Creeks. Brook trout numbers would likely increase gradually on Porter Creek, but remain at low numbers in Mount Creek. Cutthroat trout would not return, even if Porter Creek has better habitat conditions. Furthermore, the potential increase of brook trout in Porter Creek would not impact the remnant cutthroat trout left in upper Truman or Emmons Creeks. Truman and Emmons Creeks already have numerous brook trout and any immigrating fish from Porter Creek would not increase the competition pressure in Truman or Emmons.

C. Upper Mount Creek Watershed

Alternative B includes 395 acres of commercial and non-commercial harvest activities, two short designated skid roads (but no temporary roads), and about 10.25 miles of BMP improvement on existing roads.

The direct and indirect effects of Alternative B are a gradual decline of fish habitat quality for a few years until it stabilizes at the end of the analysis period. WATSED modeling indicates that Alternative B would increase peak flows from 12 percent over baseline conditions to 15 percent. Peak flows would remain higher than Alternative A until the 10th year of the analysis, when it returns to 12 percent over baseline conditions. This is anticipated to result in some channel instability and areas of bank erosion. This has the consequence of reducing pool habitat quality. Deep pools are formed in stable channels while unstable channels have shallow, poor quality pools. Channel instability and bank erosion also increases sedimentation and reduces spawning habitat quality. The increased peak flows would also likely accelerate the rate of which the culverts on PCTC land would become barriers to fish migration. Additional water rushing through the culvert in the springtime, results in greater scour depth of the outlet waterfall (thus a taller and taller waterfall for fish to jump).

Alternative B would also have a small amount of short-term sediment due to BMP activity on 10.25 miles of road. Although no significant point-sources of sediment have been identified, it is likely that a few headwater culverts would need to be replaced because they are undersized. This would result in a short-term amount of sediment, although much less than the temporary road on “Slate Creek” since the road prism is already compacted. Over the long-term, the BMP improvements would reduce the sedimentation point-sources. It is not likely to be sufficient enough mitigate the increased peak flows and channel erosion. Thus, even with BMP improvements, the direct and indirect effects of the alternative are likely increased sedimentation.

Alternative B would reduce the potential of a large, stand-replacing fire to a lower level than existing levels. This is helpful to protect the vulnerable cutthroat trout population in upper Mount Creek and

"Homestead Creek." Alternative B essentially reduces habitat quality, but it is not as significant as what would happen resulting from a fire.

In consideration of past, present and reasonably foreseeable actions, Alternative B adds to the cumulative effects felt by "Homestead Creek." The increased peak flows would result in additional channel instability. The reasonably foreseeable new roads constructed by the Forest Service proposed OHV trail would also trend to more channel instability. In addition, the Welcome Springs Grazing Allotment is reasonably foreseeable. Units 42, 45, 46, 49 and 50 are located near sensitive areas where cattle are currently grazing. The retention of 100-foot RHCA buffers would help mitigate but it would not completely prevent cattle from accessing the stream for water. Additional lineal feet of stream banks are likely to be trampled as an effect of Alternative B. Furthermore, downstream on PCTC lands, cattle grazing would continue to have a significant impact due to widespread riparian grazing and resulting sedimentation.

The consequences of Alternative B's cumulative effects are a downward trend of fish habitat quality in "Homestead Creek." This is due to the cumulative effects of elevated water yields, which results in channel instability and sedimentation from grazing. These effects would lead to reduced spawning habitat, reduced pool volume, and possibly reduced habitat connectivity in "Homestead Creek." Fish habitat conditions in "Homestead Creek" are currently limited by sedimentation and shallow pools, and the cumulative effects will further aggravate the problem.

"Homestead Creek" is estimated to contain about 30% of the upper Mount Creek watershed cutthroat trout population. In order to estimate what the impacts of reduced habitat quality of "Homestead Creek" might have on the overall upper Mount Creek population, the VORTEX population simulation model was ran 100 times. This analysis assumed slightly increased mortality rates for eggs and adults, based on the reduce habitat quality described above. It also assumed reduced overall carrying capacity but also reduced likelihood of a catastrophic wildfire. These modifications to the VORTEX model were kept small in consideration that "Homestead Creek" is only about 30% of the overall upper Mount Creek population. After 100 computer simulations, the impacts of Alternative B lead to 100% likelihood of extirpation. This is just like the Alternative A except the median extirpation time decreased from 15 years to 9 years. However in the 10 year analysis timeframe, 81 scenarios had a surviving population and 19 found extirpation. This is identical to the Alternative A. Therefore, it is determined that Alternative B does reduce the cutthroat trout population but the difference is not significant to viability. The assumptions and results of the viability modeling are found in Project File Exhibit L-8.

Alternative C
Direct, Indirect, and Cumulative Effects

A. Rogers Lake Watershed

In the Rogers Lake Basin, Alternative C is identical to Alternative B, and therefore the effects are the same.

B. Smith Lake Watershed

Alternative C differs from Alternative B in that it minimizes the amount of temporary road construction (relies more on helicopter logging systems) and reduces the size of the Seed Tree units. Alternative C has 910 acres of commercial and non-commercial timber harvest in the Smith Lake watershed. A total of 0.89 miles of temporary road is required for several short spur roads, none of which cross any streams. Similar to Alternative B, this alternative would complete BMP improvements on an estimated 50 miles of road.

The direct and indirect effects of Alternative C are less sedimentation to Porter Creek, even more than with Alternative B. By not constructing the temporary road across "Slate Creek" to access Unit 2,

this alternative avoids the short-term sedimentation into the Porter Creek watershed. During BMP implementation on the 50 miles of roads, a very small amount of sediment is likely. This impact is short-term and following the BMP work, the overall amount of sediment from the roads would be less than the existing condition. In consideration of the reasonably foreseeable actions described earlier, the cumulative effects of Alternative C are slightly improved fish habitat conditions in Porter Creek, even more so than Alternative B.

The direct and indirect effects of Alternative C on lower Mount Creek are essentially the same as Alternative B. The only difference is that Alternative C would construct 0.89 miles of temporary road in the Mount Creek Basin Watershed instead of 3.7 miles. This would result in less short-term road density increase, but it is too minor to cumulatively impact the overall road density. Lower Mount Creek's fish habitat is expected to remain in poor condition with Alternative C, just like the other alternatives.

C. Upper Mount Creek Watershed

Alternative C is identical to Alternative B in the Upper Mount Creek watershed except that it has 19 acres less of Seed Tree harvest. This is too small of a change to have any impacts on projected peak flows. It does not affect grazing patterns (the 19 acres were not in an area of concern). Alternative C has identical cumulative impacts as Alternative B.

Regulatory Framework and Consistency

All alternatives comply with the majority of directions and goals set forth in the Forest Plan and the INFISH amendment. The alternatives do not have any activity in INFISH RHCAs, and they do not retard the attainment of riparian management objectives. All alternatives comply with Forest Plan Amendment #3, which was added in 1990. Amendment #3 set certain standards for 22 specific bull trout streams and streams known to contain westslope cutthroat trout on the Flathead National Forest. The alternative prohibits "unacceptable fish losses" from habitat modifications. The anticipated impacts on "Grayling Creek" would not result in unacceptable losses of cutthroat trout since the Rogers Lake population is artificially maintained with stocking. Likewise, the anticipated habitat loss on "Homestead Creek" is not significant enough to impact viability.

Bull trout are listed as a Federally threatened species. None of the streams in the project area have bull trout. There is no critical habitat in the analysis area. A BA is required for significant Federal actions that may impact bull trout. A BA for the action alternatives was completed and determined "no effect" for bull trout (Project File Exhibit L-1).

The Forest Service has listed westslope cutthroat trout as a sensitive species to prevent population declines that would lead to listing as a Federally threatened or endangered species. A BE has been prepared for the action alternatives. The BE determined that the action alternatives **"may impact individuals or habitat, but will not likely result in a trend toward federal listing or reduced viability for the population or species"** (Project File Exhibit L-10). This is because of the potential adverse impacts to cutthroat trout of "Homestead Creek" but the impacts are not substantial enough to affect viability. The Forest Service has also signed a Memorandum of Understanding with various agencies that outlines a conservation strategy that protects all known pure and nearly pure westslope cutthroat trout populations. The action alternatives comply with this Memorandum since they do not impact the viability of cutthroat trout.