Riparian Area Condition
Item 22

OBJECTIVE: Ensure compliance with Forest Plan standards for fisheries, water, and wildlife.

DATA SOURCE: Interdisciplinary team reviews and monitoring information from resource specialists.

FREQUENCY: One project per District per year.

REPORTING PERIOD: 1999.

VARIABILITY: Deviation from riparian area and fisheries objectives.

EVALUATION:

The Forest Plan's fish and wildlife goals are to provide habitat to support viable populations of native and desirable non-native wildlife and fish, provide for the recovery of threatened and endangered species, and maintain riparian flora, fauna, water quality, and recreation activities. This monitoring item discusses activities and monitoring associated with timber harvest, recreation, fire management, facilities management, and grazing in riparian areas, all of which can affect riparian function. Although fire is a natural process on the landscape, it can have temporary adverse effects on fish habitat. Currently the Forest Plan does not acknowledge the role of fire in riparian areas, or specify the effects of fires and fire suppression on fisheries and riparian areas. These issues need to be analyzed in the Forest Plan revision. We cover restoration of riparian areas in Item 19, Watershed Effects and Restoration. Fisheries monitoring may be found in Items 21 and 41.

Previous monitoring reports have documented the need to address various riparian issues, including describing desired conditions for riparian areas, determining how to measure livestock impacts, and establishing thresholds for impacts. The Bureau of Land Management developed a system of assessing riparian health, called "Proper Functioning Condition." The Forest Service is adopting this assessment system nationally, and we expect it to help us answer some questions regarding riparian management.

MONITORING RESULTS:

Timber Harvests

Fern Trap Timber Sale. In April 1999, the Forest monitored the 1.3 miles of temporary road in the Spoon Creek drainage that accesses Unit #8 of the Fern Trap Timber Sale. The road skirts some wetlands, and enters the 300 foot riparian habitat conservation area (RHCA) along Spoon Creek for several hundred feet. The road did not appear to be adding any sediment to Spoon Creek, but it was intercepting and rerouting the flow of water and sediment into the wetlands below the road. Spoon Creek is buffered by a very thick riparian zone on both sides and the RHCA, which is effectively filtering out any road-caused sediment before it can reach Spoon Creek. In early June 1999, we examined the fish habitat in Spoon Creek to look for signs of recent sediment input from the road. Some sediment did enter the non-fisheries wetlands along the road, but there was no evidence of road sediment getting into Spoon Creek. The terrain is flat and well-vegetated, and at low flows there were no live connections between the wetlands along the road and Spoon Creek. In late July 1999, the Forest established ten sediment monitoring transects in Spoon Creek adjacent to the Unit #8 temporary road. The ten sediment monitoring transects can be remeasured during or after the sale if there is reason to believe that sediment from the sale is entering Spoon Creek.

In early June we also monitored the reconstructed road along McCoy Creek. It had contributed a minor amount of sediment to fish habitat in McCoy Creek along a couple of short sections where the road fill-slope was within 20 feet of the high water mark. Most of McCoy Creek is protected from road sediment by a flat, thickly vegetated riparian buffer at least 30 feet wide. There are two other temporary roads in the McCoy Creek and Trapper Creek drainages associated with this timber sale. These short road segments are located on dry ridge tops and will not produce sediment which can reach any riparian area.

Lick Lost Salvage Timber Sale. In April 1999, we monitored the Lick Lost salvage timber sale. The sale was 85% completed, and had no visible effect to streams. See Monitoring Item 14 for more information on this.

Aspen Restoration in Riparian Areas. Aspen appears to be declining as a component of the landscape in the Bitterroot NF, primarily due to fire exclusion and the resulting conifer invasion. Most aspen stands are considered seral or early invaders that can be replaced entirely by conifers without periodic disturbance to kill the old stems and trigger regeneration of new shoots (Shepperd, 1996). Without this periodic disturbance, such as fire, aspen will generally be replaced by shade tolerant conifers that establish under the aspen and eventually overtake and crowd it out (Shepperd, 1996).

Due to successful fire suppression, the aspen stands in the Thunder, Salt Block, Salt, and Sheep Creek drainages in the Upper West Fork of the Bitterroot have been growing without a disturbance for 60 years. The ramifications as seen during the FY1999 examinations include: conifer encroachment, little to no age and size class distribution across the landscape, and little to no resprouting occurring. The majority of the clones selected for treatment are experiencing considerable conifer encroachment which is increasing the rate of mortality of individual stems, decreasing crown size, lowering the health and vigor, and reducing the amount of natural sprouting. Some of the clones are also diseased. We found one clone in particular to have approximately 90% of the stems infected with a stem rot called *Phelinus tremulae*. This is the worst unit of all those looked at and diagnosed. Several other units have black canker (*Ceratocystis fimbriata*).

In an attempt to restore some of these clones, we prescribed regeneration harvest for 10 stands. We treated four of these clones in FY1999. The prescriptions range from underburns to felling, but the objective was the same: remove competing conifers and encourage aspen sprouting. We will protect new sprouts from ungulates by fencing or leaving felled trees to make travel through the stand difficult. We have established photo points in each treatment unit and plan to monitor the regeneration success in FY2000, FY2001, and FY2003. The monitoring will include browsing pressure and its influence on root suckering, diseases such as cytospora and dothiora, snow damage, and how the stand is developing toward the desired stand condition. Long-term monitoring (approximately 14 years) is also important to learn more about the clonal dynamics and the influence parent root systems have on growth, spacing, and development of ramets. Much of the research suggests that biomass, leaf area, and crown stratification increases dramatically between 8 to 14 years after management and it is only during this time when we can determine if the stand is achieving the desired stand objectives.

Dispersed Recreation Monitoring

Skalkaho/Daly Dispersed Camp Sites. In April 1999, we monitored the condition of the dispersed camp sites along Daly Creek and lower Skalkaho Creek (a total of 19 sites). Most of the sites along Daly Creek are either having no effect on the riparian area or a minimal effect. Along lower Skalkaho Creek (Skalkaho Highway to Weasel Creek), however, some of the sites are having an adverse impact on stream banks and riparian areas. Full-size vehicles have created fords across Skalkaho Creek at two of the sites, and are driving across the stream onto user created roads on the west side of the stream. In addition to the stream bank damage, recreationists are cutting firewood within 150 feet of Skalkaho Creek at these camp sites. The Forest plans to restore the sites and control the vehicle use.

While monitoring the dispersed campsites, we also monitored the bull trout spawning reach in Daly Creek downstream of the FS Road #711 bridge. Sediment deposition (from the nearby Skalkaho Highway) over winter and early spring was considerable, and much more easily visible than in summer following high flows. The unpaved portions of the Skalkaho Highway are a significant contributor of sediment to bull trout and westslope cutthroat trout habitat in Daly Creek, especially the 2.7 mile long segment between the end of the pavement and the FS Road #711 intersection.

Fire Management

1998 North Rye Fire. We monitored the burned area of the 1998 North Rye Fire on several occasions during FY1999 to determine its impact on fisheries. Information on this monitoring is contained in the Fisheries monitoring section.

Prescribed management-ignited fires are generally designed to avoid riparian areas in order to prevent adverse effects on fisheries. It is becoming clear, however, that many of these areas burned historically. During Forest

Plan revision, the Bitterroot NF will consider using prescribed fire in riparian areas to restore natural disturbance patterns.

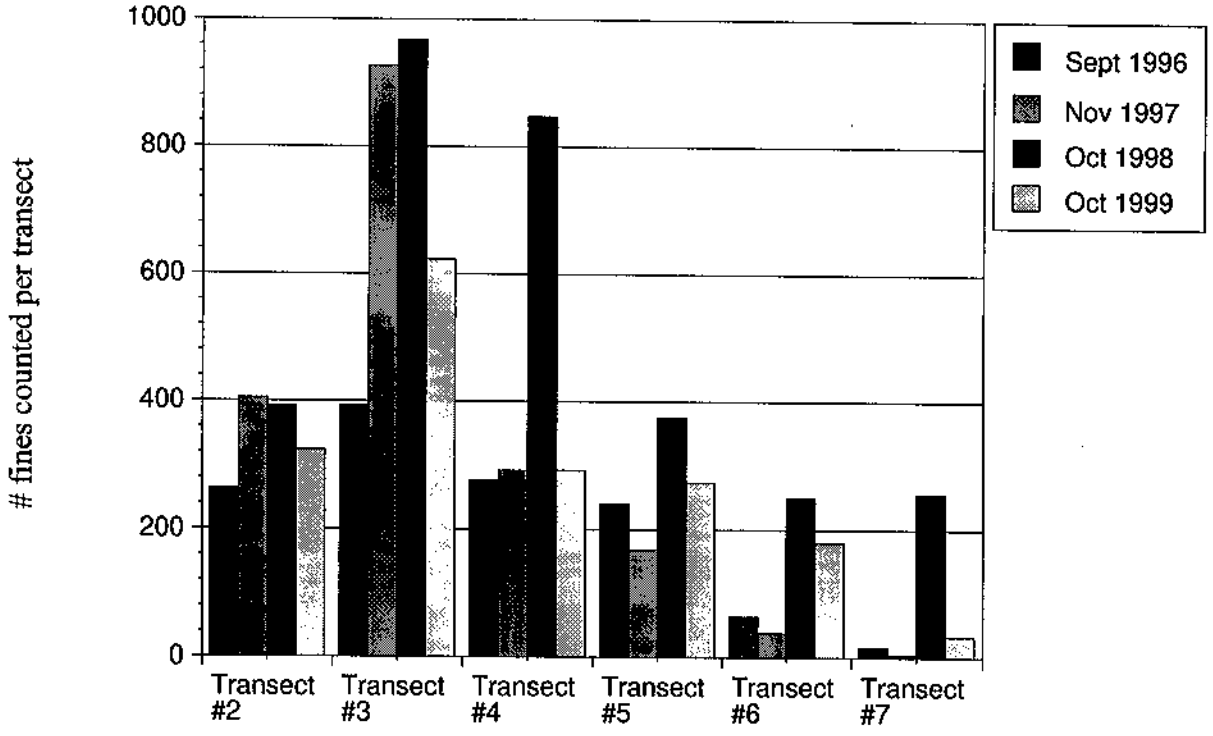
Facilities Management

In the spring of 1998, a significant leak was discovered in **Tin Cup Dam**. There was an effort to alleviate the immediate danger of dam failure by lowering the water level behind the dam. To do this, the spillway was lowered, first by using hand crews and later with an excavator. Finally, after the water level in Tin Cup Lake had dropped, the dam was partially breached. From the start, this project had potential to affect fish and stream conditions in Tin Cup Creek. Monitoring by Forest Service personnel occurred continually (24 hours per day) throughout the project.

We established seven sediment monitoring transects in Tin Cup Creek downstream of the dam in September 1996. We measured sediment levels at these transects in September 1996 to document the baseline condition prior to any work on the dam. The purpose of documenting the baseline condition was to measure and compare the effects of the dam repair activities. The seven transects are located in two areas. The upper four transects (#1-4) are located in the first 150 meters of Tin Cup Creek downstream from the dam outlet. The lower three (#5-7) transects are located about 1.5 miles downstream from the dam, at the first crossing of the Tin Cup Trail. We conducted this year's sediment monitoring on October 11, 1999. We did not monitor transect #1 in 1998 and 1999 because the riprap from the 1998 dam breach covers the transect.

Figure 7 displays the results of the monitoring from 1996 to 1999. The maximum number of fines that could occur on a transect is 980, which equates to 100 percent sediment. Fifty percent sediment equates to 490 fines. The 1999 data indicates that the affected sections of Tin Cup Creek are on an improving trend from the high sediment levels we observed after last year's major excavation at the dam. All of the transects contain less sediment than last year (October 1998), and appear to be moving towards the baseline condition measured in September 1996. We plan another year of sediment monitoring at the transects for autumn 2000.

FIGURE 7 - SEDIMENT LEVELS IN THE MONITORING TRANSECTS IN TIN CUP CREEK DOWNSTREAM FROM TIN CUP DAM



Bitterroot NF fisheries personnel monitored water temperatures in Tin Cup Creek with continuously recording HOBO-TEMP thermisters during the summers of 1998 and 1999. We monitored water temperatures at three sites: (1) the Tin Cup trailhead (stream milepost 5.0); (2) the first trail crossing downstream of Tin Cup Dam

(stream milepost 16.0); and (3) directly below the outlet of Tin Cup Dam (stream milepost 16.7). The monitoring period started on July 15th and continued until October 1st. Temperatures were recorded at each site every 4.5 hours.

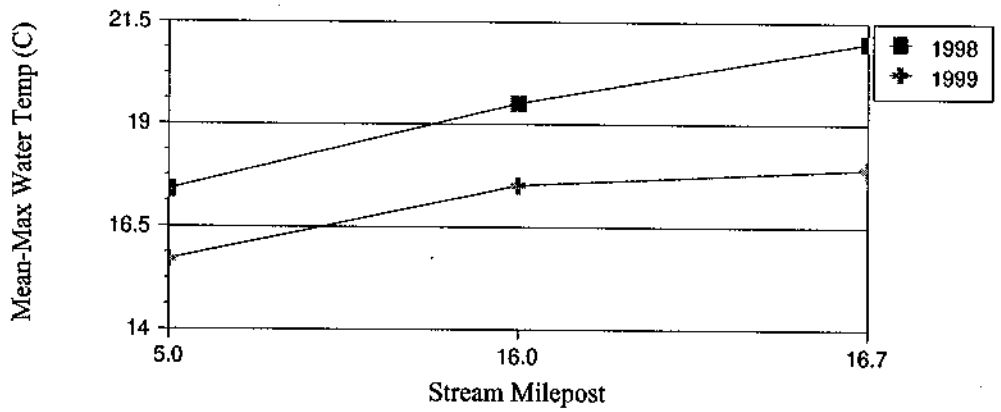
Figure 8 displays the mean maximum temperature over the warmest 7-day period for 1998 and 1999. These data indicate several things:

(1) From mid July through mid September, the release of surface waters from Tin Cup Reservoir appears to considerably warm the temperatures in Tin Cup Creek for a distance of at least several miles below the dam. We need to add another monitoring site immediately UPSTREAM from the reservoir inlet to confirm the magnitude of the warming effect of the reservoir. We plan to add this monitoring site during summer, 2000.

(2) In mid July, water temperatures are similar at the trailhead and dam outlet. However, throughout August and early September, temperatures at the trailhead are consistently 4 to 6° C colder than temperatures in the first several miles below the dam. Cooling is caused by the influx of several tributaries between the dam and trailhead. This difference continues until mid September, when the temperature of the water coming out of the dam is once again similar to that at the trailhead.

(3) Summer 1998 was considerably warmer than summer 1999, thus the warmer mean-maximum temperatures at all three sites. However, the important thing to note is that the spread between 1990 and 1999 was greatest at milepost 16.7, the dam outlet. One likely explanation for these warmer temperatures at the dam outlet was the FY1998 dam and spillway emergency project. In order to implement the FY1998 repair project, there was a rapid, early withdrawal of stored water from the reservoir. With less water in the reservoir, it warmed up more, and earlier in the season. This elevated the stream temperatures below the dam higher, at an earlier time of the year, and for a longer duration than during normal years of reservoir operation.

FIGURE 8 - A COMPARISON OF THE MEAN-MAXIMUM WATER TEMPERATURES IN SUMMER 1998 AND 1999 AT THREE SITES IN TIN CUP CREEK



On the Bitterroot NF, mid canyon reservoirs (at lower elevations) such as Tin Cup Reservoir and Fred Burr Reservoir, are likely to have more of an adverse warming effect on stream temperatures than reservoirs that are located at higher elevations in the upper headwaters (Bass Lake Reservoir, Big Creek Lake Reservoir, etc.). Both of our native trout species (bull trout and westslope cutthroat trout) are sensitive to water temperatures that exceed 15° C for prolonged durations. Westslope cutthroat trout are probably more tolerant of temperatures above 15° C than bull trout, but probably cannot tolerate temperatures that exceed 20° C for prolonged periods. The first symptom which usually manifests itself in both species is elevated physiological stress, which can indirectly cause increased mortality through a variety of factors, including reduced overwinter survival (poor condition going into winter), reduced egg production, and increased displacement by non-native competitors such as brook trout and brown trout. Both brook trout and brown trout are believed to have a competitive edge over bull trout in warmer waters. These species are present in the lower reaches of most of the west side canyon streams that contain irrigation reservoirs. When opportunities are available, the Forest Service should work together with reservoir operators to minimize potential water temperature effects on fisheries.

Grazing

Meadow-Tolan Allotment. During the Environmental Analysis for Meadow Tolan Allotment, allowable trampling levels were identified for various streamside zones. In June 1999, we measured the baseline riparian conditions at the thirteen riparian grazing monitoring sites established in the 1998 Meadow Tolan/Bunch Gulch/Shirley Allotment Management Plan. We remeasured these sites in October 1999, after the grazing season. We found trampling levels above the desired amount on five of the thirteen sites, as described below.

Bugle Creek #7 was over the desired bank trampling amount. We expect to fence this sensitive area in FY2000 to exclude livestock access. Restricting livestock access will allow the vegetation to recover. The construction of a stock watering tank will be needed when this fence is completed.

Another reach of concern was Meadow Creek #5, located in an old clearcut, where bank trampling was slightly over the desired level. This is a stream with low banks composed of alluvial material, and higher levels of trampling could easily alter stream channel condition. The interdisciplinary team (IDT) will monitor regeneration of conifers and other woody vegetation on this site in FY2000 and make a determination as to the need for a fence based on the monitoring results.

The north fork of Springer Creek is also located in an old clearcut. This area is very wet and has many springs that flow in the spring. In the fall, the area is mostly dry. The EA proposed fencing this draw, but the Forest is looking into other options for restricting the livestock at this site. The fencing of this site is of lower priority than fencing of Bugle Creek or the Meadow Creek sites, discussed above, because it contributes little water to Springer Creek during most of the year and the stream is healthy downstream. More benefits would be realized by fencing the other sites if money and time are limited. This issue will be revisited in FY2000.

Site 13, an un-named tributary to Meadow Creek was also slightly above the desired trampling level. The IDT discussed fencing to restrict access but they determined that livestock use here, in an area that has no input to Meadow Creek, was causing less impact than fencing and forcing livestock into the meadow of Meadow Creek. The team will review this area in FY2000 to determine if other management options are available and feasible.

Site 1, located below the exclosure fence on Meadow Creek, was slightly above the trampling limit set in the AMP. Because this site is located in a stable reach, the IDT believes the slight increase is not great enough to warrant fencing or other management changes at this time. This issue will be revisited in FY2000.

Each of these sites will be monitored again in FY2000 and the Forest will evaluate the impacts.

Bass Creek Allotment. On August 20, the Forest monitored the Larry Creek portion of the Bass Creek grazing allotment. We checked the Larry Creek Research Burn units and the 1997 Larry Creek fish habitat improvement project. There were no signs of cows along Larry Creek or in the burn units during the 1999 grazing season. The 500 foot long drift fence the Forest range crew constructed along the north side of Larry Creek in May 1999 was effective in keeping cows out of the riparian area. Shrub recovery along Larry Creek is proceeding very well in the small openings created by the burn project. The Arno timber harvest units currently have some mullein in the upper half, and a patch of knapweed in the lower NE corner, but a dense understory of snowberry and other shrubs is coming on strong. The shrubs could replace a lot of the weeds in the next one to two years.

Gold Creek Allotment. For information on this project see the INFISH project discussion on page 111.

Main Sleeping Child Allotment. For information on this project see the INFISH project discussion on page 111.

Waugh Creek Exclosure Fence. In late August 1999, we inspected the livestock exclosure fence surrounding a 0.25 mile long section of Waugh Creek. The fence, constructed in 1997, is in good condition and functioning effectively. Livestock have not been able to get inside the fence. The riparian area and stream banks inside the fence are healthy and in good condition. There was a minor amount of stream bank trampling upstream and downstream of the fence. Most of the stream bank impacts were located within 300 feet of either end of the fence. This fence is currently protecting the majority of westslope cutthroat trout habitat in Waugh Creek from livestock impacts.

Waugh Creek Grazing Allotment. In September 1999, the Forest monitored all of the fish-bearing stream reaches in the Waugh Gulch grazing allotment to assess grazing impacts to fish habitat. Stream bank grazing damage (channel widening and sediment input) is occurring throughout the lower mile of the West Fork of Camp Creek, and in spots along Waugh Creek and the West Fork tributaries. We have mapped and documented problem areas and we will address them in the up coming Waugh Gulch Grazing Allotment EA.

REFERENCES:

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