Chapter 3 Affected Environment and Environmental Consequences

3.1 Affected Environment

The Affected Environment for this analysis are those watersheds and resources that are described in the Affected Environment of both Agency's Land Management Plans and EIS's to which this analysis is tiered. This encompasses about 2.5 million acres of public lands within the San Luis Valley and Upper Rio Grande Drainage. Implementation of conservation treatments would occur where needed across the RGNF and SLRA lands. Activities often would focus in priority watersheds.

Past activities have affected the soil, water and fisheries resources on certain public lands. The Revised Forest Plan EIS sections on Soil and Aquatic Health describe how watersheds and soil health have been impacted in some locations. Though management activities are carefully planned and monitored, some impacts to resources do occur from time to time. Those impacts are proposed for restoration using this EA and analysis. The FEIS for the San Luis Resource Area Land Management Plan also describes existing conditions on those affected lands.

3.2 Cumulative Actions Planned on the Forest and BLM Lands over the next Plan period

Treatments may or may not be implemented when other activities are planned in such watersheds. The list below is extracted from Forest Plans for each agency and shows past, present and reasonably expected future activities that could coincide with watershed treatments. For RGNF activities, FEIS Table S-2 was used to summarize activities based on the selected Alternative G. Table 3.2.1 shows Planned Activities for the Next 10-15 Years on Public Lands but the complete list is contained in Revised Forest Plan and FEIS, Table S-2 and is adopted by this analysis. For SLRA activities, data was extracted from the FEIS for the Resource Management Plan, September 1991 or is based on information provided by resource specialists.

Table 3.2.1
Planned Activities for the Next 10-15 Years on Public Lands

Planned Activities Summary for Next Plan Period (10-15 years)	Proposed on RGNF	Proposed on SLRA
Recreation (Persons at One Time Days)	750,000	100,000
Livestock Grazing (Head Months)	81,400	4,600
Timber Harvest (Acres Even and Uneven aged management)	15,938	340
Fire or Fuel Treatment (Acres of desired fuel treatments)	47,000	22,000
Actual Road Construction and Reconstruction	39	100

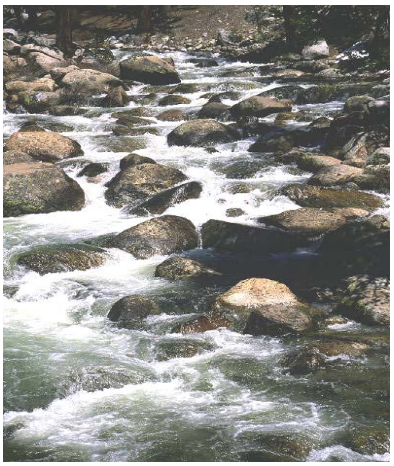
(Miles)		
Road Obliteration (Miles)	50	75
Trail Construction (miles)	30	35
Trail Reconstruction (Actual planned miles)	100	20
Mining and Oil and Gas Acres Affected	219	400

For RGNF lands, the Revised Forest Plan FEIS described past actions in detail. Please refer to the Aquatics section of the FEIS, 3-252 through 278 for a comprehensive discussion of past management actions affecting watersheds. In the BLM Resource Plan, Chapter 4 discusses trends and the implications from past actions. Both of those analyses are incorporated by reference.

Watershed and Fisheries Conservation Treatments could be implemented in watersheds that have or are currently being managed under the above-described activities. Overlap may occur spatially (in the same watershed) or temporally (at the same time) of other activities. Watershed and fisheries treatments can be delayed and managed so that conflicts would be minimized. For example, if intensive recreation use occurs in an area during summer months, then watershed projects may be delayed until fall. Because watershed actions encompass a few acres up to a few hundred, the relative impact, incrementally to any of the planned actions above would be small. The likelihood of all of these actions occurring in one watershed at a time is relatively low, and more likely, a few of the actions are expected at one time in a given watershed. In addition, impacts expected to watersheds from watershed treatments are expected to be beneficial to resource conditions. The Watershed Project Checklist (Appendix A) and the BLM DNA (Appendix B) both contain a category for the review of cumulative effects before a specific project can proceed.

3.3 Direct, Indirect, and Cumulative Effects on Watersheds, Riparian Areas, and Air Quality

Forest Plan standards and guidelines are designed to protect watershed, stream, riparian area and wetland health. The BLM's Standards for Public Land Health have similar protection standards (1997). The direction of both BLM and FS standards would be implemented to comply with Clean Water Act requirements to protect designated stream uses.



Alternative 1: Impacts to watersheds, streams and wetlands from implementing projects covered by this EA should be the same under alternatives 1 and 2. Direct impacts should be very minor as long as routine protection measures are followed. Negative indirect and cumulative impacts to watershed, stream and wetland health would be greater under this alternative, because fewer restoration and improvement projects would be completed.

The Forest is constrained by the time and money needed to do typical NEPA analysis. Project costs are higher under this alternative, because more specialist time is needed to complete NEPA analysis. Fewer projects would be accomplished, because it takes more time to do individual project NEPA analysis.

Alternative 2: Corps of Engineer 404 permits regulate activities that can impact stream channels, floodplains and wetlands. Only projects that comply with nationwide or regional 404 permits are included under this alternative.

One of the proposed treatments is to maintain or remove earthen catchment basins, commonly referred to as stock ponds, gully plugs or sediment catchments. Through time, agencies built numerous such structures; most built in the late 1950's through early 1970's. The purpose of these structures included stock-water catchments, reducing "head cutting" erosion, building erosion control plugs, wildlife habitat enhancement, sediment traps, etc. Additional catchments have come into federal ownership through land exchange and land acquisitions.

The associated dams, spillways, water elevation control valves, and containment pits are increasingly in need of maintenance, have failed (e.g. breached), or are soon to breach. Sometimes the dams redirect flows via the spillways and create erosion problems in newly formed side channels. Occasionally an ensuing release of stored sediments occurs and a new risk of "head-cut" can begin. In some instances, catchments actually inhibit down slope riparian values because they terminate low flows into previously captured/stored sands/sediments with little or no surface wetland values. In certain instances, ensuing water release could prove more beneficial if the catchment, if no longer deemed functional, were reclaimed.

Watershed improvement activities covered under this action would be ability of the agencies, or stakeholders/permit holders, to either maintain a catchments original function (e.g. dredge, bulldoze, or otherwise remove accumulated sediments), repair those which have breached, or otherwise reclaim those no longer deemed useful; (e.g. surrounding uplands now healed, etc,) or in some instances, the removal to restore watershed function depending upon needs of affected interested parties.
By implementing required protection measures, direct impacts to watersheds, wetlands and streams should be minor and fairly localized, usually less than a few acres. There would be more positive indirect and cumulative impacts with this alternative, because the BLM and Forest Service could complete more restoration and improvement projects. Projects covered by this EA are designed to correct problems that are causing, or have the potential to cause, negative impacts to watersheds, wetland and stream systems.

The effects on air quality to the public lands of the San Luis Valley are expected to low from the proposed alternative. The FEIS for the Rio Grande Land Management Plan states that the air quality on the Forest rates among the best in the country and that management activities have never caused violations. The Forest currently meets National Ambient Air Quality standards. Watershed activities may affect local dust levels brought

about by traffic on native-surface roads but this is expected to be a minor impact. Similar minimal effects are expected from activities on BLM lands. No burning is proposed in this EA.

When wetland restoration or creation projects are proposed, they need to meet all federal and state regulatory requirements. Such requirements include the need to secure whatever water rights or substitute water supplies are deemed necessary by the Colorado Division of Water Resources.

3.4 Direct, Indirect and Cumulative Effects on Soil Health

Soil erosion, compaction, displacement, puddling, severely burned, nutrient depletions, and mass movement are soil health problems that would be addressed by the alternatives. These soil damages may be found on public lands in various locations and would be improved by the implementation of conservation treatments.

The effects on soils from Alternative 1 are that erosion, sedimentation and fisheries projects could have delayed implementation. This would result from conducting individual analyses for practices that are routinely needed. In addition, fewer on-the-ground acres would be improved due to redundant NEPA analyses for similar projects.

Alternative 2 would have beneficial effects to soils since quicker implementation of practices results in less erosion over time. In addition, more acres could be accomplished on the ground since a more efficient analysis process would be implemented.

Alternative 2 would allow bioremediation of small areas, which is the use of livestock to restore organic matter content in soils that are impoverished of organic materials. It would be used on mined and reclaimed areas and would improve soil and plant health.

Fabrics, mulches, hydromulches, tackifiers, fiber applications, sodding, wattles, plugging, and weed-free straw that are applied to the land are used to stabilize soils from erosion. Such materials protect the soil from detachment and transportation by rainwater impact. There are no harmful effects to the soils and ecosystems. All materials used would be weed-free. Results of these practices benefit soils by maintaining soil productivity, reducing sedimentation, and improving habitat.

Use of erosion control structures such as slash check dams (shown in photo) and rock check dams and similar structures reduce soil movement and help prevent the downcutting of channelized flows. The long-term objective of such structures is to establish natural vegetation on the soil (Heede, 1976). In many instances, gullies were once level soils (with no channels) and the goal is to build the soil so that downcutting

and headcutting are halted and the system can start building soil to stable levels. Such structures may require periodic maintenance to remain sound and effective.

The effectiveness of rock check dams is documented in a Rio Grande National Forest study by Olson, 1999. She inspected 581 structures on the Conejos Peak District. She found that rock check dams were 88% successful in reducing soil erosion and allowing vegetation to stabilize the system. Rock check dams, if properly constructed, can be effective for more than 40 years (Heede, 1966). Of the 12% that failed, livestock trampling, construction problems, and contour furrows contributed to the failures. Headcut structures were found to be largely ineffective at controlling soil erosion as were contour furrows. Improper construction may have caused the failure.

Sediment traps capture erosion and sediments in areas where there will be a continuous flow of sediment such as from main roadsides. These must be emptied periodically to remain effective.

Drainage structures, reclaiming culverts, improving drainage spacing, waterbarring, drainage dips, creating filter strips are practices designed to divert flows into places where erosion and sediments can be effectively filtered and stabilized. This would benefit soil health by keeping soils in place.

Erosion from off-road vehicle use..before treatment

Recontouring, seeding mulching, and barrier after treatment

Constructing physical barriers to restrict uses in areas needing restoration can be done through earth barriers, falling trees, gating or fencing. Such measures are important and effective in allowing areas to revegetate and recover from past impacts. Effects would benefit soil health by maintaining soil productivity. The before and after photos show reclamation efforts that were implemented to reduce soil, water and fisheries impacts from off-road vehicles. The after photo demonstrates land recontouring, seeding and mulching as well as tree falling for traffic control at a low water crossing through an important fishery.

Structures such as head-cut control structures can be used to reduce gully headcuts which result in a loss of soil productivity and lowering of water tables. Head-cut control structures would be used to protect the soils and fisheries as well. Periodic maintenance is expected so that the structure functions properly. Other structures include those necessary to divert streamflow to prevent channel erosion. Diverting flows would be beneficial in

keeping streambanks in good health. Structures such as vanes, jetties, and grade control structures are in-stream structures used to enhance stream habitat for fisheries or to protect banks from eroding. All of these structures have long-term benefits, though there could be small amounts of erosion and sedimentation during construction.

Use of erosion control practices such as mulching, fertilizing, applying fabrics, topsoiling, applying fiber wattles, applying lime, slashing with branches, and reseeding have all worked with success in various applications. Long-term goal is to re-establish natural vegetation to hold soil in place so that little maintenance is required. Soil erosion and sedimentation control measures are well documented in the literature. Erosion and sedimentation can be greatly reduced from forest roads and other systems through the use of mulches, surfacing, seeding, applying filter strips, hydromulching, fertilizing, and other conservation treatments (Burroughs and King, 1989). Their summation of studies found that erosion and sedimentation could be reduced by 36 to 88 percent depending on practices applied. They also found that about half of the sediment production from fillslopes occurs in the first summer after disturbance. They concluded that erosion control measures that can be put in place immediately after construction have the best potential to reduce sediment production.

Wetland restoration, enhancement and creation can often be done through use of structures that elevate water tables. By elevating and restoring water tables, water-dependent vegetation is encouraged, providing better soil stability through dense root mats. Important wetland values are restored.

Soil aerators could be used for land treatments. This farm implement causes very little surface disturbance, while improving soil aeration and infiltration. The vegetation vigor and growth is often improved. There is no significant erosion from the treatment.

The use of a winged-subsoiler would be implemented on deeply compacted soils. The subsoiler is an implement that improves soil health (aeration, infiltration and vegetation response). It would be used to reclaim old roads, two-tracked areas, on old skid trails, dispersed camp areas and other applications. There is no significant erosion from this practice. Kolka and Smidt (2004) evaluated different systems of forest road amelioration and concluded that subsoiling may represent the most economically-viable road retirement method.

Maintenance or removal of water impoundment structures would be done through the Watershed Project Checklist. Maintenance or removal would likely involve earthwork done by a bulldozer. Reshaping or eliminating the structure would expose soil, which would then need to be seeded or mulched. Long-term effects would be a better facility that would be able to function properly. For those removed, stream health would be restored along that stretch. These impacts are often less than an acre in size.

The proposed action Alternative 2 would not affect large areas. Therefore the consequences are generally limited in scope to those locations where treatments are implemented. Indirect effects are that soil particles are less likely to reach water systems.

Cumulative effects are that soils over the entire Forest are restored to properly functioning soil health condition.

Many of the proposed treatments would reduce erosion. This will result in reduced sedimentation of streams and fisheries. To demonstrate this, the Water Erosion Prediction Program (WEPP Model) was used to show potential effects of some of the proposed treatments (see Table 3.4.1). For example, the following table shows the estimated reduction in erosion and sedimentation achieved by installing more closely spaced drainage dips (decreasing the spacing between cross drains, for example on a forest road). For this analysis, we will assume that the road is 12 feet wide, in clay loam, road gradient is 8 percent, the climate is taken from Hermit Lake (on the RGNF), buffer length is 33 feet and the buffer gradient is 10%.

Table 3.4.1
Effects on Erosion by Reducing Cross Drain Spacing

Cross Drain Spacing Feet	WEPP Average Annual Erosion/Sediment Yield in Pounds Delivered to end of buffer	Erosion Reduction
400	600	
200	120	5 fold reduction
100	17	35 fold reduction

The WEPP model shows reductions of erosion and sedimentation can occur by reducing the spacing between cross drains. Waterbars, rolling dips, culverts are all proposed treatments that would be used to achieve these reductions. Be aware that the model does not produce absolute values and should be used only to show comparative differences and effects.

The WEPP model can also be used to show the potential erosion reductions from seeding, mulching, erosion fabrics and fertilizing treatments.

In order to model these treatments, we assumed the following. We selected climatic stations from the Great Sand Dunes National Park to reflect conditions we would encounter on BLM lands. This zone is not dissimilar from BLM lands located around the foothills of the San Luis Valley. We selected Hermit Lakes, on the RGNF, to reflect forest conditions.

We assumed that 20 acres of lands in each case was sparsely vegetated before treatments and better vegetated after treatments (seeding, mulching, fertilizing, erosion fabrics). Slopes are 30%, texture is clay loam, and slope length 300 feet.

Data is presented in the Table 3.4.2 below and is based on 30 year projection of climatic data for the selected locations.

Table 3.4.2
Erosion Probabilities Reduced by Erosion Control Treatments

Climate Station	Treatment	Probabilities of Occurrence first year following disturbance based on 30 years of climate		
		Probability there is Runoff	Probability there is Erosion	Probability of Sediment Delivery
Great Sand Dunes	Before Seeding, Mulching, Erosion Fabric or/and Fertilization	77%	77%	77%
Great Sand Dunes	After Seeding, Mulching, Erosion Fabric or/and Fertilization	40%	33%	40%
Hermit Lakes area, RGNF	Before Seeding, Mulching, Erosion Fabric or/and Fertilization	90%	87%	87%
Hermit Lakes area, RGNF	After Seeding, Mulching, Erosion Fabric or/and Fertilization	50%	40%	40%

The results show that when we increase surface cover using seeding, mulches, fabrics, and fertilization, that the risk of runoff, soil erosion and sedimentation are reduced on both BLM and Rio Grande National Forest lands.

The cumulative effects of the activities listed in section 3.12 may occur simultaneously with watershed treatments, but generally the effects from watershed treatments are expected to be beneficial, and not add adversely to any other activities planned relative to soils. There may be some short term, small extent soil disturbances, but in the long term, soil health is expected to improve. Stabilization of soil erosion through watershed treatments will reduce erosion and sedimentation, thereby having beneficial effects on the entire watershed.

3.5 Direct, Indirect, and Cumulative Effects on Fisheries Resources

The alternatives address several fish habitat enhancement, protection and restoration treatments including installation of structures to protect or enhance pool, spawning and cover habitat; construction of fish migration barriers for native fish restoration projects; removal of migration barriers when free movement of aquatic life is desired; removal of structures when they are detrimental to fish habitat; vegetation plantings to restore

riparian condition; fencing to provide faster recovery of riparian condition/fish habitat; and sediment control devices to minimize sedimentation of fish habitat. Opportunities for fish habitat enhancement, restoration and protection occur across the Forest and on some BLM lands. Fish habitat would be improved by implementation of the conservation treatments of Alternative 2.

Fisheries treatments on the Conejos River

Fisheries treatments can be broken into several general groups for the purpose of considering direct and indirect effects: 1) installation or removal of instream structures, such as migration barriers and log or boulder structures; 2) erosion control structures that are not placed within the stream channel; 3) vegetation plantings; and 4) channel alteration.

Direct effects from fisheries treatment 1) can include temporary disturbance of banks, possibly resulting in some sediment delivery to the channel. Indirect effects of sedimentation can reduce spawning habitat or smother existing eggs that have been deposited; reduction of invertebrate habitat. Mitigation to reduce these possible effects includes: timing these activities to avoid the period when eggs would be incubating; on-site sediment traps to catch sediment before delivery to the stream; revegetation of the disturbed area with weed-free seed immediately after completion of project to stabilize soils; use of soil stabilizing mats to further encourage revegetation; fencing the area to provide extra protection while the area recovers. Overall, however, the effects from this activity would be very beneficial to fish and fish habitat. The creation of new sources of cover in areas where cover is likely a limiting factor will provide critical habitat. Removal of structures where they are degrading habitat will eliminate the risk for further degradation, and allow recovery of those areas. Migration barriers are an extremely important tool for use in native fish restoration work. These structures provide the physical barrier necessary to separate native fish populations from non-native populations. Non-native species have the ability to outcompete, prey on, displace, or hybridize with the native fish.

Fisheries treatment 2) would have fewer potential negative effects to fish and fish habitat than fisheries treatment 1, because work takes place away from the stream channel. The positive effects from this work would be beneficial. Restricting sediment inputs to stream systems maintains important spawning habitats, invertebrate habitat, and stream health.

Planting vegetation (Fisheries treatment 3) would also have positive effects to fish and fish habitat.

Alternative 1 would result in less timely responses to fish habitat improvement opportunities. Individual analyses would be necessary, increasing cost and time for implementation. There may be instances where the slower response could result in

adverse effects to the fish population (for example, if a migration barrier fails, the risk of invasion increases as time increases).

Alternative 2 would be beneficial to fish and fish habitat, and allow for faster implementation of conservation treatments. Conservation treatments promote high quality fish habitat and healthy stream and riparian systems. Cover is provided by stable streambanks, deep pools, large woody debris (or other instream structure) and overhanging vegetation. Spawning habitat requires clean gravel substrates, free from excessive sediment deposition. Food resources are enhanced with sufficient riparian vegetation (invertebrates).

3.6 Direct, Indirect and Cumulative Effects on Plant Resources

Watershed treatments may cause short-term impacts to vegetative cover where the soil surface is disturbed by some treatments. However, long-term establishment of native species should have beneficial effects to the plants, animals and effects to soil, fisheries and watersheds. Noxious weeds and TE&S plants are appropriately discussed elsewhere in the EA. Forest and rangeland cover alteration is not being proposed by this action.

3.7 Direct, Indirect and Cumulative Effects on Wildlife, Management Indicator Species, Migratory Birds, and TES Species

Wildlife habitat quality is a function of soil, water and riparian health. This section discusses the relationship between these resources, the alternatives, wildlife and wildlife habitat.

Alternative 1: Alternative 1 will continue to result in watershed related projects being completed. However, it will result in many “emergency” projects being delayed in implementation due to project specific NEPA requirements needing to be met prior to implementation.

Treatments which improve soil health are necessary to help meet wildlife standards and guidelines in the Forest Plan. This alternative would allow these treatments to continue but project effectiveness and success would be decreased.

Delayed or restricted implementation could impact individual wildlife species and in some cases, populations. Many species dependent upon water and riparian quality (amphibians) typically are very susceptible to small changes in water characteristics (ph, turbidity, temperature). A sudden change in these characteristics could impact survival and recruitment of these species for several years. Delayed implementation of soil and watershed projects could potentially impact not only individual but population dynamics in the short term.

Alternative 2: This alternative best provides for wildlife by providing additional and improved site-specific options for applying soil and watershed techniques to damaged sites.

Under this alternative, there will be very little delay in implementing projects particularly in emergency situations. A quicker response to soil and watershed damage decreases the amount of time that water and riparian areas could be negatively impacted. Riparian species would benefit by a faster response and faster healing periods in riparian habitats.

The Watershed Project Checklist (Appendix A) would assure that implementation is consistent with Forest Plan goals and objectives and will ensure that TE&S wildlife and migratory birds will be considered when projects are proposed.

The proposed action should have little to no negative impacts upon wildlife habitat. There should be no conflicts between the proposed action and the objectives and policies of other Federal, State and local agencies who help manage wildlife habitat or populations.

Alternative 2 allows for wetland creation, restoration or enhancement. Wetlands are very important for wetland dependent species of plants, amphibians and wildlife. There would be no negative effects to critical wildlife habitat. Effects upon wildlife habitat would be beneficial and would not cause any adverse effects. Habitat conditions would be restored or enhanced by applying treatments to restore damaged soils and watersheds.

The proposed action does not involve any unknown risks to wildlife or wildlife habitat. Habitat enhancement and restoration would be the objectives of this proposal.

A Progammatic Biological Assessment (BA) and Biological Evaluation (BE) was completed for this project in 2003. The BE also incorporates Bureau of Land Management Sensitive species. It is maintained in the project record and is available upon request. The BA determined that the proposed actions will have No Effect upon Uncompahgre Fritillary Butterfly and May Effect, but are Not Likely to Adversely Affect Bald Eagle, Canada Lynx, Mexican Spotted Owl and the Southwestern Willow Flycatcher. The U.S. Fish and Wildlife Service (FWS) concurred with the BA's determinations on October 14, 2003. A copy of the BA is available in the project file.

The BE completed for plant species determined that the proposed actions should have No Impact upon three plant species and May Impact six plant species. However, site-specific surveys for sensitive plants will be completed prior to specific project implementation to mitigate any potential impacts. The wildlife BE determined that the proposal will have No Impact upon the majority of the Forest's Sensitive species and May Impact individuals of some species but are not likely to cause a trend towards Federal listing or result in loss of viability in the planning area. Species-specific information is included in the plant and wildlife BE's located within the project record. Also included in the project record available upon request but not included in this EA are Management Indicator Species Reports and a Wildlife Program Checklist as that would be completed by the Biologist for each specific watershed project.

An MIS Forest Plan Amendment was completed and determined that the proposed actions and their relationship to MIS species and the habitat types they represent, are not

expected to impact the viability of these species in the future nor will they cause a significant shift or change in population numbers within the planning area or Forest as a whole. The treatments are expected to result in improvements to MIS habitats, and will contribute to stable or improving MIS population trends.

Proposed watershed treatments may be implemented on Public Lands. Implementation of these treatments will be prioritized by watersheds of need, and will occur on sites in need of restoration. These treatments will be implemented consistent with Forest Plan Standards and Guidelines and are not expected to have significant impacts, individually or cumulatively. Each project will be reviewed through the use of the wildlife checklist to ensure necessary design criteria are in place so as to minimize site-specific impacts. Forest-level monitoring of TES and MIS species and their habitats should be sufficient to determine if undesirable cumulative effects are occurring.

A Wildlife Program Checklist has been developed to avoid or mitigate project-level effects to species and their associated habitat types. This Checklist includes MIS species, FS and BLM Sensitive species and species listed under the Endangered Species Act. The Checklist would be completed by biologists for each project in order to document a thorough project-level analysis and consistency with the programmatic documents. The Checklist serves as the signed documentation needed for project-specific analysis. The exception would be for Canada lynx, where a May Affect determination would require FWS consultation. The Wildlife Program Checklist is available upon request from the project record.

Direction concerning landbird conservation in Forest Service Region 2 is to interface with the State and Bird Conservation Region (BCR) working groups for actions and objectives to pursue concerning migratory bird conservation. Bird Conservation Regions consist of a hierarchical framework of nested ecological units that allow for the use of multiple scale-specific approaches to on-the-ground management.

There are 37 BCRs in North America with four of these occurring at least partially in Colorado. The Rio Grande National Forest occurs within the Southern Rockies Colorado Plateau Bird Conservation Region (BCR 16), which encompasses portions of Colorado, New Mexico, Arizona, Utah and Wyoming (USFWS, 2002). Information from BCR 16 was synthesized for use in Colorado through the development of the Colorado Landbird Conservation Plan (BCP).

The Colorado Landbird Conservation Plan (BCP, Version 1, 2000) identified priority species and habitats for each physiographic area in the state based on the Partners-In-Flight Species Prioritization Process. Priority habitats identified for the Southern Rocky Mountains Physiographic Area include alpine tundra, aspen, cliff/rock, high elevation riparian, lowland riparian, mixed-conifer, mountain shrubland, ponderosa pine, sagebrush shrubland, spruce-fir, and wetlands. All 11 of these habitat types also occur on the Rio Grande National Forest, with spruce-fir the most extensive and both sagebrush shrubland and lowland riparian the least common.

One hundred and fifty-eight of the 169 migratory birds that occur or could potentially occur on the Rio Grande National Forest were assessed through the MIS Amendment to the Forest Plan, based on information identified for the Southern Rocky Mountains (Physiographic Area 62) in the Colorado Landbird Conservation Plan. The assessment process used was based upon the priority habitats and species identified in the BCP and their relationship to the Forest Land Type Associations. The potential conservation issues identified in the BCP were compared to the issues and management activities identified for each LTA. All priority habitats identified in the BCP are, at a minimum, provided a coarse filter assessment that evaluates broad-scale habitat changes and ecosystem processes over time, and except for the aspen LTA, a fine filter assessment is applied to Forest LTAs so that there is an expected adequate level of monitoring provided for these avian species.

The Colorado Landbird Conservation Plan (BCP) identifies ten primary goals and objectives that must be met on a statewide basis in order to meet the overall conservation goals concerning migratory and resident birds in Colorado. Each of these goals was reviewed during the Forest Plan MIS Amendment process in order to evaluate the potential effects of the Plan implementation on migratory birds. The Forest Plan and its MIS Amendment incorporate and address these goals through standards and guidelines, Forest Plan monitoring and MIS monitoring.

The U. S. Fish and Wildlife Service (FWS) has developed a list of birds of conservation concern based on BCRs. Birds identified on that list were reviewed in conjunction with the Species Conservation Project (SCP) and the 2003 update to the Region 2 Forester's list of sensitive species. Those species identified in BCR 16 applicable to the Rio Grande National Forest are considered and conserved as part of Forest Plan Standards and Guidelines and Forest Plan monitoring for TES or MIS species.

Species that were assessed through the MIS Amendment to the Forest Plan are displayed in the Migratory Bird Supplemental Information Report (USDA 2003). Species not evaluated in that assessment, but included on the FWS list and evaluated as part of the Regional Forester's sensitive species review are displayed in Table3.7.1.

Table 3.7.1. FWS Species of Conservation Concern in BCR 16, specific to the RGNF.

Species	Regional Forester's Sensitive Species Review Disposition	RGNF Conservation Measures
Swainson's Hawk	Consider as an emphasis species, protect nest sites	Forest Plan Wildlife Standard 5 Forest Plan Wildlife Standard 21
Golden Eagle	Consider as an emphasis species, protect nest sites	Forest Plan Wildlife Standard 5 Forest Plan Wildlife Standard 21
Prairie Falcon	Consider as an emphasis species, protect nest sites	Forest Plan Wildlife Standard 5 Forest Plan Wildlife Standard 21
Pinyon Jay	Common breeder on R2 units	Forest Plan Wildlife Standard 21

Proposed watershed treatments may be implemented Forest-wide, across all Landtype Associations (LTAs). Implementation of these treatments will be prioritized for watersheds of need, and will occur on sites in need of restoration. These treatments will be implemented consistent with Forest Plan Standards and Guidelines and are not expected to have significant impacts, individually or cumulatively. Each project will be reviewed through the use of the wildlife checklist to ensure necessary design criteria are in place so as to minimize site-specific impacts. Forest-level monitoring of TES and MIS species and their habitats should be sufficient to determine if undesirable cumulative effects are occurring.

The BLM would also analyze migratory birds as part of watershed project planning and review. The Migratory Bird Treaty Act (MBTA) of 1918 was passed to put an end to the commercial trade of birds and their feathers that, by the early years of the 20th century, had severely impacted the populations of many native birds. The MBTA protected all migratory birds and their parts (including eggs, nests, and feathers). The MBTA is a domestic law that enforces treaties between the US, Mexico and Canada, for the protection of a shared migratory bird resource. The primary concern for migratory birds from actions authorized by this EA is in regards to the loss or disturbance of occupied nests and of individual birds.

An Executive Order (EO 13186) enacted in 2001 requires federal agencies to consider the effect of projects on migratory birds, and it directs agencies to review the list of Birds of Conservation Concern (USFWS 2002) for species that may occur in the project area. For the San Luis Valley BLM, the BCR list includes 28 species that may occur in the planning area and is applicable for project analysis of migratory birds of concern.

Neotropical migrants are not covered in the BLM San Luis Resource Area Resource Management Plan or in the Determination of NEPA Adequacy checklist. Therefore, in accordance with the Migratory Bird Treaty Act, BLM must incorporate into the wildlife checklist the Bird Conservation Regions Checklist (BCR 16). The BCR 16 checklist includes the 22 species listed below. Non-presence of six birds excludes them from the list of birds affected by management actions including gray vireo, Grace's warbler,

chestnut collared longspur, Sprague's pipit, and Crissal thrasher. Two of the species, the Marbled Godwit and Solitary Sandpiper, have never been documented to breed in this area, but do migrate through this area (Andrews and Righter, 1996). A review of this list (Bird Conservation Region 16) found bird species that could breed in the analysis area and whose nests might be affected by the proposed action. These species include:

1) Northern Harrier
2) Swainson's Hawk
3) Ferruginous Hawk
4) Golden Eagle
5) Peregrine Falcon
6) Snowy Plover
7) Mountain Plover
8) Solitary Sandpiper
9) Marbled Godwit
10) Wilson's Phalarope
11) Yellow-billed Cuckoo
12) Flammulated Owl
13) Burrowing Owl
14) Short-eared Owl
15) Black Swift
16) Lewis's Woodpecker
17) Williamson's Sapsucker
18) Piñon Jay
19) Bendire's Thrasher
20) Virginia's Warbler
21) Sage Sparrow
22) Prairie Falcon

Each of these species will be addressed in the Wildlife Program Checklist to ensure that no 'take' will occur due to management treatments. By implementing the checklist the actions authorized by this Environmental Assessment (EA) are consistent with the MBTA and the conservation measures set forth in Section 3 of the Executive Order. The Wildlife Program Checklist is designed to serve as project level documentation for the migratory bird analysis. The MBTA regulates actions that directly effect individual migratory birds. When watershed projects are proposed, the biologist analyzes the effects to neotropical migrants through use of the Wildlife Program Checklist. This will ensure that proposed watershed treatments are consistent with MBTA and will not result in 'take' of neotropical migrants.

Routine watershed and fisheries treatments applied to needed areas on BLM lands include erosion and sediment control practices, reclamation or restoration practices, fisheries improvements, as well as streambank stabilization and aquatic habitat improvements. Many of these actions require mechanical equipment to restore habitat or begin the reclamation process. Mechanical treatments may affect migratory birds during the breeding and nesting season (May 15 to July 15) through disturbance and resource alteration. Disturbance to nesting birds includes physical ground changing disturbance, presence of humans, auditory disturbance, nest destruction, any action that results in nest abandonment, direct injuring or death of a bird. On-site investigations by a wildlife biologist would be used to determine whether a seasonal restriction is necessary before a watershed project may be implemented.

Alternative 1 would not have a streamlined approach to management activities so would have delayed or restricted implementation of improvement of habitat conditions. Alternative 1 requires individual analysis of each project done in a non-efficient piecemeal approach. Without treatment, degradation of habitat may continue and may result in poor quality habitat for nesting birds. This alternative will not result in 'take'

individuals or nests of migratory birds but poor habitat conditions will ultimately not be considered productive nesting and breeding habitat.

Under either alternative, treatments would still be applied. Individually these projects would have minimal effects. Cumulatively across public lands, the treatments are intended to improve habitat conditions which may provide nesting and breeding habitat for migratory birds over time. Better habitat conditions allow diversity of nesting sites which likely contributes to the viability of the species. With the design criteria (surveys and timing of implementation) in the Wildlife Program Checklist, the actions authorized by this EA are consistent with the MBTA and therefore no direct, indirect, or cumulative impacts are anticipated. Design criteria for species conservation are not discretionary, they are required to prevent 'take' of neotropical migrants.

Mitigation needs may vary dependent on whether mechanical treatment or hand treatments are proposed. The scope and timing of the treatment effects must be considered differently depending on treatment type. Mechanical treatments are of more concern than non-mechanical treatments due to the level of disturbance. The scope of the treatment is greater when mechanical treatment is required than when hand treatments are utilized.

Birds present in treatment areas during the non-breeding/ nesting season are generally able to move from the area (they are in migratory status) during the period of disturbance to other suitable habitat. Therefore, the action is less likely to result in 'take' of a migratory bird. For BLM lands, the Watershed Treatments EA will have reduced risk of 'take' of adult birds if implemented outside of the May 15 to July 15 nesting period. The chances of encountering a nesting site during the breeding season is low and a quick check of the project site before treatment can confirm the presence or absence of the twenty two neotropical migrant birds for this area.

3.8 Direct, Indirect and Cumulative Effects on Heritage Resources and American Indians

The heritage resource analysis and assessment focused on areas of lands throughout the Public Lands where soil, water, and fisheries improvements are needed. Past activities that have affected cultural resources on the Public Lands include intensive livestock grazing in the late 1800's and early 1900's. Resultant erosion from this past activity is seen across the Forest, especially in lower elevation areas. Jeep roads and other smaller roads that were not engineered, usually formed many years ago, also produce affects relating to erosion that may impact cultural resource sites.

Previous heritage resource inventories, completed on approximately 150,000 acres in this area, have resulted in the recording of about 700 documented cultural resource sites. Most sites are within areas of past or proposed timber harvest, or within inventoried range allotments. The majority of lands administered by the USFS and BLM have not been inventoried for cultural resources.

Under Alternative 1, soil erosion, compaction, and displacement are soil health problems that have the potential to impact cultural resource sites throughout the area. Soil, water, and fisheries conservation treatment activities have the potential to impact cultural resources, if there is ground disturbance involved. Cultural resource inventory of specific project proposals, followed by mitigation pertaining to individual or groups of cultural resource sites, would protect National Register of Historic Places eligible cultural resources. Alternative 1 addresses these concerns, but projects may be delayed due to the present inefficient manner of project implementation.

Under Alternative 2, soil erosion, compaction, and displacement are soil health problems that have the potential to impact cultural resource sites throughout the Forest. These soil problems would be improved by the implementation of more efficient conservation treatments, thereby reducing the effects on both documented and as-yet undocumented cultural resources. Cultural resource inventory of lands involved with specific project proposals, if done in project planning stages, would identify any National Register of Historic Places eligible cultural resources. Mitigation or avoidance could then be used to protect National Register of Historic Places eligible cultural resources. The Watershed Project Checklist that would be used in this Alternative would require heritage resource clearance and mitigation prior to any ground-disturbing actions to restore soil, water and fisheries.

Past and future forest management projects can cause surface disturbance that affect the integrity of cultural resources. Cumulative effects that are the result of non-sanctioned management activities, such as vandalism or illegal excavation, also can occur. Natural weathering and erosion, fires and other types of ongoing processes contribute to cumulative effects to heritage resources.

Specific conservation treatment proposals, to be assembled and prioritized each year, will immediately be summarized and included in the Rio Grande National Forest Tribal Consultation Bulletin. The Tribal Consultation Bulletin presents initial information about proposed projects by describing proposed project activities, the geography of the area, and the nature of known cultural sites that may be important to American Indian People. Consultation Bulletin, February 2001, contained the information on the watershed analysis and invited comments. Arrangements for meetings or requested site-visits will be made, if requested.

3.9 Direct, Indirect and Cumulative Effects on Scenic Resources

Both alternatives will meet the Scenic Integrity Objectives and Recreation Opportunity spectrum for the areas. Improvements for watershed or fisheries will meet the scale and size of the appropriate Scenic Integrity Objective, borrowing from the form, line, color, and texture of the characteristic landscape. During the improvement of watershed or fisheries habitat, it is expected that viewers may see some temporary deviations to the landscape. These areas will have up to 2 years to come into compliance with scenic objectives. This is also specifically stated in the Forest Plan Forestwide Standard and

Guidelines III-30 #1. The Watershed Project Checklist (Appendix A) would include visual and recreation management considerations.

3.10 Direct, Indirect and Cumulative Effects on Socio-Economics

The economic benefits of the proposed action are difficult to quantify since the value of soil erosion and sediment prevented is difficult to apply valuation in monetary terms. The same would apply to fisheries resources.

There are intangible benefits that affect downstream water users. As watersheds are restored and enhanced, water quality and the quality of human life are enhanced. Fisheries can flourish, providing both consumptive and nonconsumptive values to the public.

Alternative 2 proposes to implement more efficient conservation treatments. These would be done through direct program funds, cooperative partnerships, and volunteers. The benefits from this proposed action are healthier resource conditions for soils, water, and fisheries on Public Lands.

This EA is tiered to the Revised Forest Plan EIS as amended to meet the Secretary of Agriculture's decision. It is also tiered to the BLM Resource Management Plan and EIS. Those two analyses describe the appropriate economic effects of resource management of the affected lands.

A Quick-Silver Program economic analysis was conducted on the two alternatives. Some of the basic assumptions of the model are as follows:

1) Unit costs of the treatments are categorized and cost the same in either alternative. We used $84 per acre for Structural Treatments; $320 per habitat treatment, $600/acre for land treatments and $2100 per fish structure. The types of activities covered in each class of treatments can be seen in Appendix D
2) The model can only show costs. The benefits of erosion prevented, fisheries enhanced or improved, and water quality and habitat improved are not easily quantified. As such, benefits can only be addressed in this section in narrative form.
3) We anticipate that Alternative 2 has reduced analysis costs due to more efficient NEPA process. As such, more targets (acres, structures etc) can be accomplished over time.

We analyzed the No Action and Proposed Action alternatives. We used an experienced budget constraint of about $132,500 and analyzed four categories of treatments: structures, habitat treatments, land treatments and fish structures. A major difference between alternatives is the amount of investment in NEPA analysis. In the No Action, annual NEPA cost is high because each District needs to do an environmental analysis annually. In the proposed action, each District completes a checklist annually which has lower cost than an EA document.

Results of the economic analysis for a 10 year period show the following costs and units.

Table 3.10
Present Value Costs by Alternative

Parameter	No Action	Proposed Action
Present Value Costs (10 years)	-$1,116,500	-$1,119,368
Units Accomplished	260	335

The Table shows that because of improved efficiency in NEPA analysis, more dollars in a constrained budget can go to on-the-ground improvements and accomplish 22% more acres/targets.

The social impacts of this proposal are minimal. Each Agency's LMPs and FEIS's describe social impacts from land management activities on a broad scale. Implementation of watershed treatments may create a small number of job opportunities through contracts or employment to accomplish watershed work.

3.11 Direct, Indirect and Cumulative Effects on Past, Present or Future Actions

Conservation treatments in both alternatives can correct past watershed problems. In the present and future, watershed projects under Alternative 2 would be carried out efficiently, when the treatments can have the most positive effect. Present and future conservation actions may take longer under Alternative 1 to implement since each project would have its own environmental analysis to conduct for routine watershed improvements.

Section 3.2 describes the past, present and reasonably forseeable future actions that occur on public lands. Watershed treatments may have short term impacts, but in the long-term, there would be a reduction in cumulative effects to watersheds and an improvement in watershed and fisheries conditions.

3.12 Direct, Indirect and Cumulative Effects on Noxious Weeds

Noxious weeds occur on both FS and BLM lands in the San Luis Valley. Noxious weeds are a concern because of potential impacts to biodiversity and productivity. Their establishment and spread is largely a result of ground-disturbing activities. Treatments proposed in alternative 2 such as drainage structures, waterbars, dips, and barriers, adding some soil amendments, aerating or ripping increase the likelihood that noxious weeds become established as those actions cause soil disturbance. To prevent noxious weed infestation, disturbed areas would be treated with native weed free seed and mulches. All materials used on BLM or Forest lands would be Certified weed-free.

Noxious weeds may be reduced by these conservation treatments in that establishment of native ground cover by the proposed treatments would reduce the sites available for noxious weed encroachment. It should be noted that the treatments proposed in this EA often attempt to correct soil and water problems created by other management activities such as logging, grazing, recreation and mining. The best actions to prevent noxious weeds are the careful prevention of them getting onto a site.

3.13 Direct, Indirect and Cumulative Effects on Other Resources

The proposed action should have no consequence to other Federal and State Agencies. There should be no conflicts between the proposed action and the objectives, policies and land use plans of Federal, Regional, local, State, and Reservations since the proposed action focuses on Forest Service and BLM watershed needs. There are no policies of other agencies that would conflict with watershed and fisheries restoration treatments.

The proposed action causes no irretrievable or irreversible commitment of resources. This is because the actions being proposed would help impaired resources recover to healthy status.

There would be minor impact to air quality resulting from the use of heavy equipment (bulldozers, backhoes, etc) on some projects. Dust may be created by some treatments as well. A slight amount of short-term noise may be generated when heavy equipment is used as a conservation treatment.

The proposal and alternatives will not have a disproportionately high and adverse human health or environmental effect on minority or low income populations. Some of the watershed treatments may create opportunities to minority contractors.

There would be no affect to public health or safety. The actions proposed do not pose any kind of public risk. There would be no effects to prime farmlands since none of the BLM or FS lands in the San Luis Valley meet the Colorado state criteria. The effects to floodplains or wetlands would be beneficial and would not cause any adverse effects. Projects would comply with nationwide or regional Corps of Engineers 404 permits and would not require application for individual permits. This would limit size of projects and impacts to those that are readily acceptable by State and Federal regulations.

There would be no adverse impacts to ecologically-critical areas. The potential use of these conservation treatments would be beneficial to ecologically-critical areas. The proposed action would not adversely affect Wild and Scenic rivers and may actually improve those conditions by restoring soils, watershed and fisheries. The proposed action is not highly controversial. These treatments are generally routine in nature. The proposed action does not involve unique or unknown risks. Most of these treatments are well established and have had documented success. The proposed action does not set any new precedents. Watershed and fisheries work is not unexpected on the Forest. The proposed action does not create significant cumulative effects. The proposed action would help to reduce cumulative effects of existing resource problems. Threatened,

Endangered, and Sensitive Species effects are described earlier in this EA. The proposed action would not violate Federal, State or local laws protecting the environment. The intensity of impacts, based on the discussion above, is low.

Some of the watershed and fisheries treatments may be suitable for Wild and Scenic Rivers, Wilderness Areas or Areas of Critical Environmental Concern (ACEC) areas. The treatments would have to be compatible with the management requirements of those management areas. For example, any treatment involving motorized equipment would generally not be allowed. Any disturbance from the proposed treatments is expected to be short-term in nature and will improve and enhance Wild and Scenic, Wilderness and ACEC resource values.

There are no hazardous wastes or solids produced by any of the treatments.

List of Preparers

Kelly Ortiz – Landscape Architect
Les Dobson – Hydrologist
Dean H. Erhard – Ecologist
Dale Gomez – Wildlife Biologist
Mark Marshall –Recreation Staff
Steve Sanchez - Natural Resource Specialist
Melissa Garcia – Wildlife Biologist
John J. Rawinski – Soil Scientist, Interdisciplinary Team Leader
Vince Spero – Forest Archaeologist
Sue Swift-Miller – Wildlife Biologist
Laurel Kagan-Wiley –Wildlife Biologist
Barry Wiley- Fisheries Biologist
Dave Gilbert – Fisheries Biologist

Literature Cited

Agnew, William, 2001. Practical Approaches for Effective Erosion and Sediment Control. International Erosion Control Association publication, Steamboat Springs, Colorado.

Andrews and Righter, 1992. Colorado Birds. Denver Museum of Natural History, 442 pages.

Burroughs, E. R. and J. G. King, 1989. Reduction of Soil Erosion on Forest Roads. USDA. Forest Service. Intermountain Research Station, General Technical Report INT-264.

Heede, B. H. 1966. Design, Construction, and Cost of Rock Check Dams. RM Forest and Range Exp Stn. Res. Paper RM20.

Heede, B. H. 1976. Gully Development and Control. The status of our knowledge. US FS Res Stn Research paper 169.

Kolka, R.K. and M. F. Smidt, 2004. In: Forest and Ecology management 202 (2004) 313-323. Effects of forest road amelioration techniques on soil bulk density, surface runoff, sediment transport, soil moisture and seedling growth. USDA Forest Service, North central Experiment Station, Grand rapids, MN.

USDA, 1996. Revised Land and Resource Management Plan and Environmental Impact Statement, Rio Grande National Forest.

USDI, Proposed Resource Management Plan for the San Luis Resource Area, BLM and Record of Decision 1991 (BLM RMP)

USDI, Colorado BLM Standards for Public Land Health, 1997.