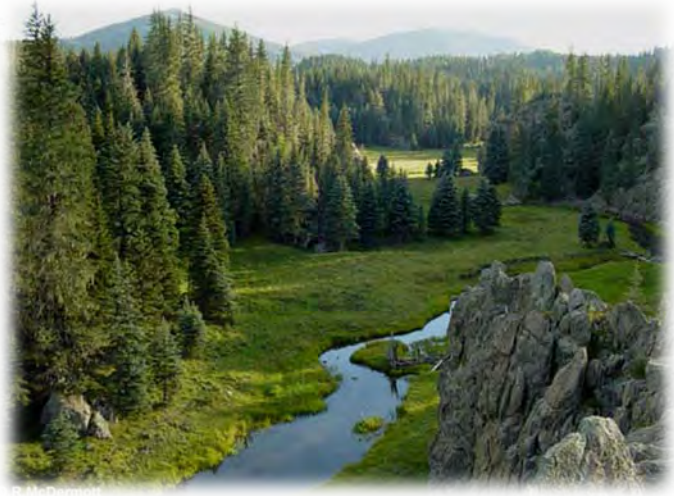
Southwestern Jemez Mountains Landscape (SWJML)

Out of Whack Summary



Grasslands and Waters

Montane Grasslands

Meadows, Wetlands & Riparian Areas

Streams

"Boundaries don't protect rivers, people do."
- Aristotle

The majority of the montane grasslands within the SWJML can be found in the expansive valles of the VCNP. A fine scale mapping project delineated 17,500 acres of upper and lower montane grasslands on the VCNP alone. Despite their seemingly high abundance on the VCNP, montane grasslands are relatively uncommon in New Mexico. Other than in the Jemez Mountains, they are found only at the highest elevations of the Sangre de Cristo Mountains along with scattered occurrences in the Sacramento Mountains and in the Gila. The montane grassland ecosystems include upper and lower montane grasslands.

The grasslands have adapted to frequent, low intensity fire (Fire Regime I). The exclusion of fire combined with climate, grazing, and road building has led to increasing encroachment by conifers as well as the establishment of non-native species, and noxious weeds. The loss of the valle grasslands has been somewhat limited by the extremely cold temperatures which reduce conifer encroachment. In the forests, the current extent of montane grasslands is probably only 30-50 percent of the historic extent. The losses are a cumulative effect of grazing, fire exclusion, conifer encroachment (a cause as well as effect), and changes in hydrology caused by density and condition of roads, with climate trends also a contributing factor.

Primary components of the upper montane grasslands are Parry's danthonia-Thurber's fescue and Thurber's fescue-Kentucky bluegrass (shown below left associated with the valles of the VCNP and below the summary table associated with high-elevation montane forests). Primary components of the lower montane grasslands (shown below, right) are Arizona fescue-pine dropseed and Arizona fescue -Kentucky bluegrass. Note: Kentucky bluegrass, a European pasture grass now considered naturalized, is a primary component throughout this system. Forest meadows are also present at various scales throughout the SWJML.

The out of whack assessment for the grasslands was based on field sampled data from nearly 700 plots including systematic repeat samples taken twice a year for six years at 41 ecological sites. Measures included species composition, cover by grass, litter and bare ground, grass production, water quality, and stream condition. The measures were compared to an estimated optimum condition. Forest meadows are mapped; however data on the condition, and more importantly, loss of these systems over the last century are not well documented. This important issue requires additional assessment and study to quantify and develop plans for restoration.

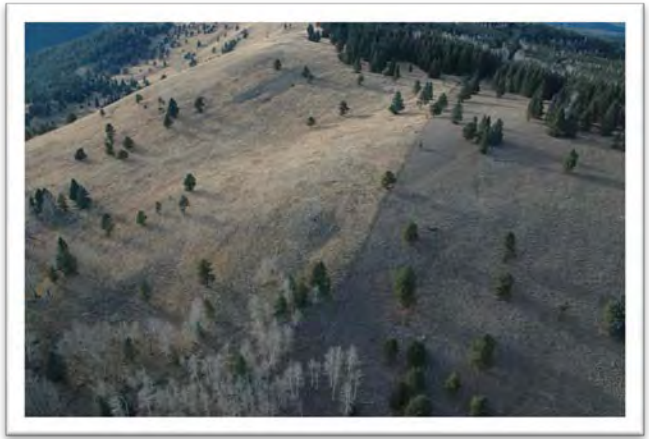
"The most variegated carpet of flowers I ever beheld lay unrolled before me – red, yellow, violet, blue, every color, every tint was there… The finest artificial garden in the world would sink into insignificance when compared with this parterre of nature's own planting."

-Charles Sealsfield, 1843

Montane Grasslands							
Key Attribute	Indicator	Current Rating	Trend	Causes	Effects	Potential Outcome	Threat
Structure	Ecological Departure	FAIR/POOR	FLAT	Past grazing, roads, recreation, seeding	Vulnerability to drought,	GOOD	MEDIUM
Extent	Conifer Encroachment	FAIR/POOR	DOWN	Grazing, fire exclusion, climate, conifer encroachment, road density	Transition from grassland to forest, loss of habitat, change in soil, increased sublimation.	FAIR/GOOD	HIGH
Composition	Ecological Departure	FAIR/POOR	FLAT	Past grazing, roads, recreation, seeding w/non natives	Encroachment of conifers, naturalized non-natives, presence of noxious weeds	GOOD	MEDIUM/HIGH
Disturbance	FRCC Rating	FAIR	FLAT/DOWN	Grazing, seeding, fire exclusion	Vulnerable to climate	FAIR	MEDIUM
Habitat	Gunnison prairie dog, ground nesting birds and mammels	FAIR	FLAT	Grazing, recreation	Loss of habitat	GOOD	MEDIUM

"In nature there are neither rewards nor punishments; there are consequences."

Robert Green Ingersoll

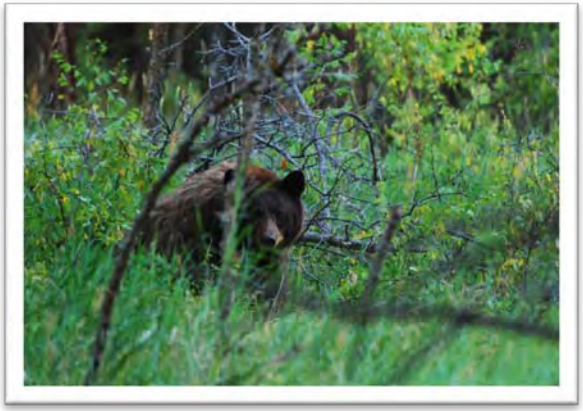


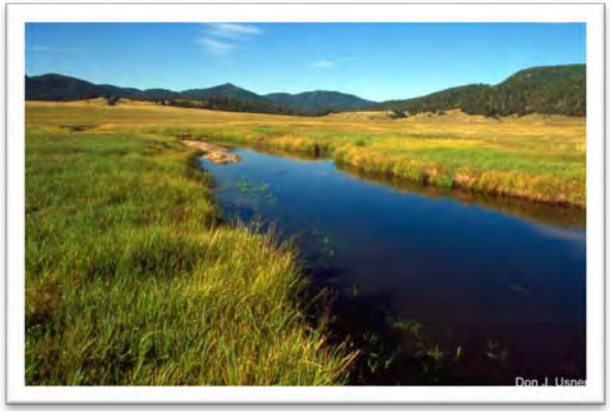
The riparian areas, wet meadows and wetlands associated with the rivers, streams, and creeks comprise ecosystems and habitats which support and connect all the systems, habitats, and life within the SWJML. The moisture associated with riparian areas promotes lower fire frequency compared with adjacent uplands, and rapid recovery from fire events. Wet meadow types seldom burn. Hydrological events are the major disturbance agent in these systems. In addition, beaver were historically important in many of these systems. Loss of beaver through trapping and habitat degradation is both a cause and effect to the level of departure in the current condition. These systems are especially vulnerable to clime trends and events.

Montane wet meadows support herbaceous vegetation dominated by a combination of facultative wetland as well as upland species. Stands most commonly occur on valley bottom surfaces that are not part of the active floodplain (terraces and lower alluvial slopes). They can extend up drainage ways and in springy areas of the surrounding valley alluvial piedmont slopes. Primary components include native and naturalized alliances including tufted hairgrass/woolly cinquefoil, Baltic rush-Kentucky bluegrass, Baltic rush-tufted hairgrass, and Kentucky bluegrass-common dandelion

Montane wetlands are dominated by obligate and facultative wetland species. They occur along valley bottom drainage ways that are part of the active floodplain. They can extend up drainage ways and into springy areas of the surrounding valley terraces alluvial piedmont slopes. These areas also include small inclusions of aquatic vegetation. The montane riparian system adjacent to streams consists of shrubland (shown left) and grassland (shown right) communities. Issues include roads, recreation and grazing.

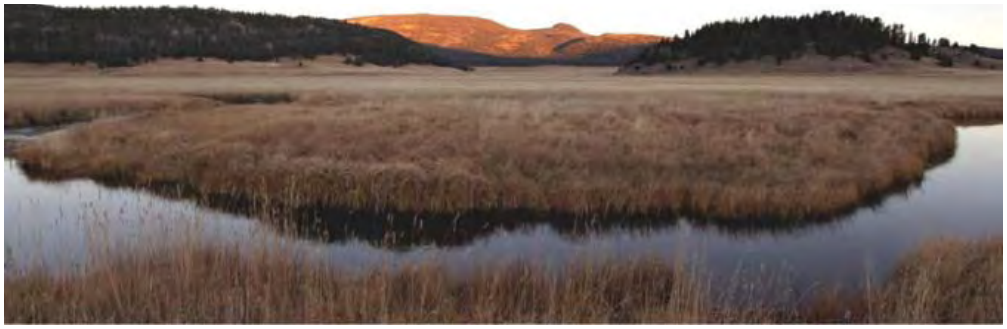
Montane shrublands occur along perennial mountain streams and fen margins. Elevations typically range from 8,300 to 9,400 ft. Streamside communities are dominated by thinleaf alder and occasional blue spruces. Understories are forb-rich and luxuriant, and typically have numerous obligate wetland species. On a regional basis these riparian shrublands occupy less than 1% of the Southern Rocky Mountain landscape. They are considered rare and globally threatened. The primary ecological management issues revolve around protection of water quality and quantity, and the enhancement of these sites for their intrinsic biodiversity values and importance to wildlife.





RIPARIAN *WETLANDS *WET MEADOWS – Out of Whack Summary Table							
Key Attribute	Indicator	Current Rating	Trend	Causes	Effects	Potential Outcome	Threat
Structure	Vegetation Succession	FAIR	UP	Grazing, earthen tanks, roads, recreation, non-native seeding, loss of beaver	Vulnerability to drought, impacts to stream function, loss of wetlands, loss of beaver.	GOOD	MEDIUM
Composition	Ecological Departure	FAIR/POOR	FLAT	Grazing, earthen tanks, loss of beaver, roads density/condition, recreation, seeding	Naturalized non-natives, loss of beaver, presence of noxious weeds, localized salt cedar	GOOD	HIGH
Disturbance	Beaver	FAIR	UP	Grazing, seeding, fire exclusion, loss of beaver	Loss of wetlands, loss of beaver	GOOD	MEDIUM
Habitat	NM Meadow Jumping Mouse, Northern leopard frog	FAIR	FLAT	Grazing, roads, recreation, seeding, earthen tanks, disease (frog)	Loss of habitat, absence of species	GOOD	HIGH

"Today the network of relationships linking the human race to itself and to the rest of the biosphere is so complex that all aspects affect all others to an extraordinary degree. Someone should be studying the whole system, however crudely that has to be done, because no gluing together of partial studies of a complex nonlinear system can give a good idea of the behavior of the whole." *-Murray Gell-Mann*



The SWJML is within the Jemez River Watershed. The waters within the SWJML eventually drain into the Jemez River. These streams flow through the landscape, sustaining both terrestrial and aquatic plant and animal life. They also sustain the people who live, visit, work, and play, for a short time or a lifetime in the Jemez. The quality and condition of these waters is a mirror, reflecting the quality and condition of the systems that surround it.

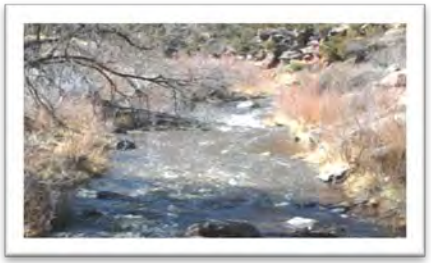
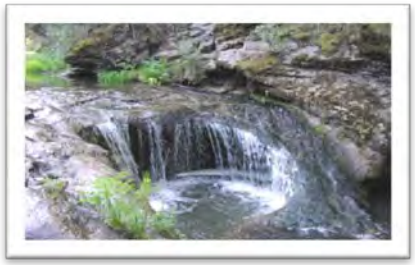
Key indicators in determining if these systems are out of whack are measures of water quality, stream condition, and the presence of native species. While water quantity is important a reference condition or systematic measure of the current condition are not available.

Water quality compares the designated uses, or the types of life and uses the water *should* support (based on state standards), against what can currently be supported. A rating of GOOD means the water is supporting all designated uses. A rating of FAIR is used when the stream is failing to support one designated use. A rating of POOR is used to indicate more than one designated use is not being supported. It should be noted that standards for water quality or either impaired or not impaired. We use the rating FAIR acknowledging that it is useful but not consistent with standards for evaluating water quality.

Stream condition compares national standards for measures of riffles, large woody debris, pool development, pool quality, and stream bank condition (width, depth, stability, vegetative cover and diversity, etc.) with current measures. These conditions are reported as Properly Function Condition (GOOD), Functioning at Risk (FAIR), or Not Properly Functioning (POOR). Upward trends are likely due to improving the management of grazing, recreation, and motorized access.

Native species rating indicates the presence or absence of native fish. A GOOD rating is given if all native species are present. A FAIR rating allows one native species to be missing from the species composition. A POOR rating is given when two or more native species are missing from the mix. Loss of beaver is both a cause and effect of the current departure.

The streams in the SWJML are diverse, from the Jemez River flowing through the piñon juniper woodlands in Jemez Springs (shown left), the Eastfork of the Jemez River flowing through the forests (shown center), or San Antonio Creek winding through the grasslands of the Valle San Antonio (shown right). It was not meaningful to summarize the condition of these creeks and streams across the landscape. Instead we have evaluated each creek and river individually, sometimes by reach or segment, to determine if it is out of whack.

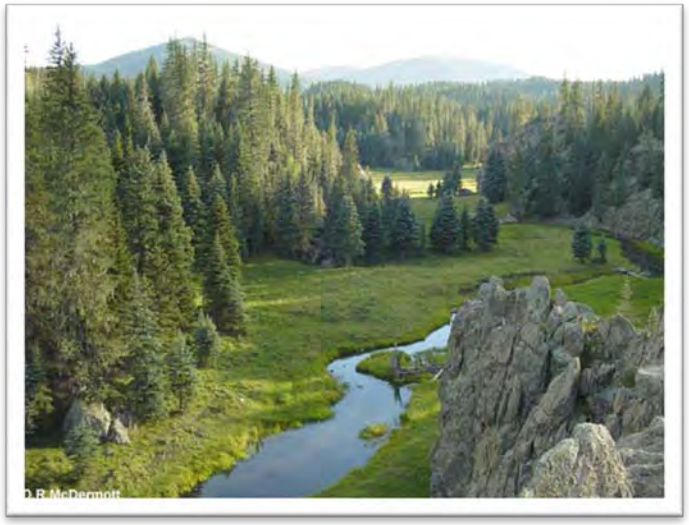




**The out of whack summary tables for streams are presented in order of stream length (longest to shortest)

San Antonio Creek 31.5 miles (2 reaches)							
Key Attribute	Indicator	Current Rating	Trend	Causes	Effects	Potential Outcome	Threat
Water Quality East Fork to VCNP Boundary	Supporting Designated Uses	FAIR	FLAT	Roads, loss of riparian habitat, natural sources, recreation, grazing, site clearance, stream bank destabilization	Not fully supporting high quality coldwater aquatic life	FAIR/GOOD	HIGH
Water Quality VCNP Boundary to Headwaters	Supporting Designated Uses	FAIR	FLAT	Roads, loss of riparian habitat, natural sources, grazing, site clearance, stream bank destabilization	Not fully supporting high quality coldwater aquatic life	FAIR/GOOD	HIGH
Condition East Fork to VCNP Boundary	Proper Functioning Condition	POOR	FLAT	Roads, natural sources, recreation, grazing, timber harvesting, stream bank destabilization	Loss of habitat, effects to water quality	FAIR/GOOD	HIGH
Condition VCNP Boundary to Headwaters	Proper Functioning Condition	FAIR	UP/FLAT	Roads, natural sources, recreation, grazing, timber harvesting, stream bank destabilization	Loss of habitat, effects to water quality	FAIR/GOOD	HIGH
Composition	Native Fish	POOR	FLAT	Water quality, condition, predation, competition from exotics	Absence of RGCT, Rio Grande chub & sucker	GOOD	MEDIUM

I see an America whose rivers and valleys and lakes – hills and streams and plains – the mountains over our land and nature's wealth deep under the earth -- are protected as the rightful heritage of all the people.
- Franklin D. Roosevelt

East Fork of the Jemez River – 21.1 miles (2 reaches)							
Key Attribute	Indicator	Current Rating	Trend	Causes	Effects	Potential Outcome	Threat
Water Quality	Supporting Designated Uses	FAIR	FLAT	Roads, natural sources, recreation, grazing, timber harvesting, stream bank destabilization	Not fully supporting high quality coldwater aquatic life	FAIR	HIGH
Condition San Antonio to VCNP	Proper Functioning Condition	FAIR	Down	Roads, natural sources, recreation, grazing, timber harvesting, stream bank destabilization, loss of beaver	Loss of habitat, effects to water quality, loss of beaver	FAIR/GOOD	HIGH
Condition VCNP to Headwaters	Proper Functioning Condition	FAIR	UP	Roads, natural sources, recreation, grazing, timber harvesting, stream bank destabilization	Loss of habitat, effects to water quality	GOOD	HIGH
Composition	Native Fish	FAIR	FLAT	Water quality, condition, predation competition w/exotics	Absence of RGCT	GOOD	MEDIUM



"The survival of man in a world in which decency and dignity are possible, is the basic reason for bringing man's impact on his environment under informed and responsible control"

-Senator Henry Jackson, upon introducing Senate Bill 1075 (ultimately NEPA).

Jemez River – 16.9 miles (3 Reaches)							
Key Attribute	Indicator	Current Rating	Trend	Causes	Effects	Potential Outcome	Threat
Water Quality Jemez Pueblo to Rio Guadalupe	Supporting Designated Uses	POOR	FLAT	Flow alterations from water diversions, roads, waste disposal, natural sources, recreation, grazing, unknown sources	Not fully supporting high quality coldwater aquatic life and irrigation	FAIR	HIGH
Water Quality Rio Guadalupe to Soda Dam	Supporting Designated Uses	POOR	FLAT	Roads, loss of riparian habitat, natural sources, recreation, grazing, site clearance, stream bank destabilization	Not fully supporting high quality coldwater aquatic life and irrigation	FAIR	HIGH
Water Quality Soda Dam to East Fork	Supporting Designated Uses	POOR	FLAT	Roads, loss of riparian habitat, natural sources, recreation, grazing, site clearance, stream bank destabilization	Not fully supporting high quality coldwater aquatic life	FAIR	HIGH
Condition	Proper Functioning Condition	POOR	FLAT	Roads, natural sources, recreation, grazing, timber harvesting, stream bank destabilization, loss of beaver	Loss of habitat, effects to water quality, loss of beaver	FAIR	HIGH
Composition	Native Fish	POOR	FLAT	Water quality, condition, predation by exotics	Absence of native assemblege	FAIR	MEDIUM

Jaramillo Creek 12.1 miles

Key Attribute	Indicator	Current Rating	Trend	Causes	Effects	Potential Outcome	Threat
Water Quality	Supporting Designated Uses	FAIR	UP/FLAT	Roads, natural sources, grazing, stream bank destabilization, wildlife other than waterfowl (elk)	Not fully supporting high quality coldwater aquatic life	GOOD	HIGH
Condition	Proper Functioning Condition	GOOD	FLAT	Improvements due to exclusion of livestock, reduction in vehicles	Absence beaver	GOOD	HIGH
Composition	Native Species	FAIR	FLAT	Water quality, predation by, competition with exotics	Absence of RGCT	GOOD	MEDIUM

La Jara Creek 5.3 miles:

Key Attribute	Indicator	Current Rating	Trend	Causes	Effects	Potential Outcome	Risk/Priority
Water Quality	Supporting Designated Uses	FAIR	FLAT	Roads, natural sources	Not fully supporting high quality coldwater aquatic life	GOOD	HIGH
Condition	Proper Functioning Condition	Not Measured	-			-	-
Composition	Native Species	Not Measured	-			-	-

The waters of Virgin and San Juan Canyon are currently intermittent. These intermittent waters *may* have been perennial at one time and the current intermittent flow *may* be a result of logging, road building and changes in forest structure. We know that the mesa's surrounding the canyons were home to pueblos of 1000's of citizens for hundreds of years. It is reasonable to suppose that these communities were established in proximity to and sustained by, perennial streams and springs.

Virgin Canyon 14.8

Key Attribute	Indicator	Current Rating	Trend	Causes	Effects	Potential Outcome	Threat
Water Quality	Supporting Designated Uses	Not Measured	-	Not defined, likely forest structure, climate	Intermittent flow, loss of riparian structure and composition,	UNKNOWN	MEDIUM
Condition	Proper Functioning Condition	Not Measured	-			-	-
Composition	Native Species	Not Measured	-			-	-

San Juan Canyon 14.2

Key Attribute	Indicator	Current Rating	Trend	Causes	Effects	Potential Outcome	Threat
Water Quality	Supporting Designated Uses	Not Measured	-	Not defined, likely forest structure, climate	Intermittent flow, loss of riparian structure and composition	UNKNOWN	MEDIUM
Condition	Proper Functioning Condition	Not Measured	-			-	-
Composition	Native Species	Not Measured	-			-	-

When you drink the water, remember the spring.
- *Chinese Proverb*

Rio Guadalupe 12.7miles							
Key Attribute	Indicator	Current Rating	Trend	Causes	Effects	Potential Outcome	Threat
Water Quality Jemez River to Rio Cebolla	Supporting Designated Uses	FAIR	UP/FLAT	Loss of riparian habitat, natural sources, grazing	Not fully supporting high quality coldwater aquatic life	GOOD	HIGH
Condition	Proper Functioning Condition	Not Measured	-			-	-
Composition	Native Species	TBD	TBD				

Vallecitos 12.2 miles :							
Key Attribute	Indicator	Current Rating	Trend	Causes	Effects	Potential Outcome	Threat
Water Quality Ponderosa Diversion to Headwaters	Supporting Designated Uses	FAIR	FLAT	Natural causes	Not fully supporting high quality coldwater aquatic life	GOOD	MEDIUM
Condition	Proper Functioning Condition	Not Measured	-			-	-
Composition	Native Species	Not Measured	-			-	-

Clean water is not an expenditure of Federal funds; clean water is an investment in the future of our country.
- Bob Shuster, U.S. Representative, quoted in Washington Post, 9 January 1987

The care of rivers is not a question of rivers, but of the human heart.
- Tanako Shozo

Rio Cebolla							
Key Attribute	Indicator	Current Rating	Trend	Causes	Effects	Potential Outcome	Threat
Water Quality Rio las Vacas to Guadalupe	Supporting Designated Uses	GOOD	UP/FLAT	Recent restoration activities including road improvements, changes in management (recreation and grazing)	Fully supporting all designated uses	GOOD	HIGH
Condition	Proper Functioning Condition	GOOD	UP	Road maintenance, management of cattle and recreation all contributing to improvements	Continued absence of beaver	GOOD	HIGH
Composition	Native Fish	FAIR	FLAT	Predation by, competition with exotics	Absence of RGCT	GOOD	MEDIUM

Redondo Creek 6.1 miles:							
Key Attribute	Indicator	Current Rating	Trend	Causes	Effects	Potential Outcome	Threat
Water Quality	Supporting Designated Uses	FAIR	UP/FLAT	Roads, loss of riparian habitat, natural sources, grazing	Not fully supporting high quality coldwater aquatic life	GOOD	HIGH
Condition	Proper Functioning Condition	GOOD	UP			GOOD	HIGH
Composition	Native Fish	FAIR	FLAT	Predation by exotics	Absence of RGCT	GOOD	MEDIUM

Water is the formless potential out of which creation emerged. It is the ocean of unconsciousness enveloping the islands of consciousness. Water bathes us at birth and again at death, and in between it washes away sin. It is by turns the elixir of life or the renewing rain or the devastating flood. Praised be Thou,

O Lord, for sister water, who is very useful, humble, precious, and chaste.
-St. Francis of Assisi,

Rito de los Indios 4.5 miles:							
Key Attribute	Indicator	Current Rating	Trend	Causes	Effects	Potential Outcome	Threat
Water Quality	Supporting Designated Uses	FAIR	UP/FLAT	Natural sources	Not fully supporting high quality coldwater aquatic life	GOOD	HIGH
Condition	Proper Functioning Condition	FAIR	UP/FLAT	Roads, loss of beaver	Road crossing stream, loss of beaver	GOOD	HIGH
Composition	Native Fish	FAIR	FLAT	Water quality, condition, predation by competition with exotics	Absence of RGCT	GOOD	MEDIUM

The rivers are our brothers. They quench our thirst. The rivers carry our canoes, and feed our children. If we sell you our land, you must remember, and teach your children, that the rivers are our brothers and yours, and you must henceforth give the rivers the kindness you would give any brother.
Chief Seattle – 1854