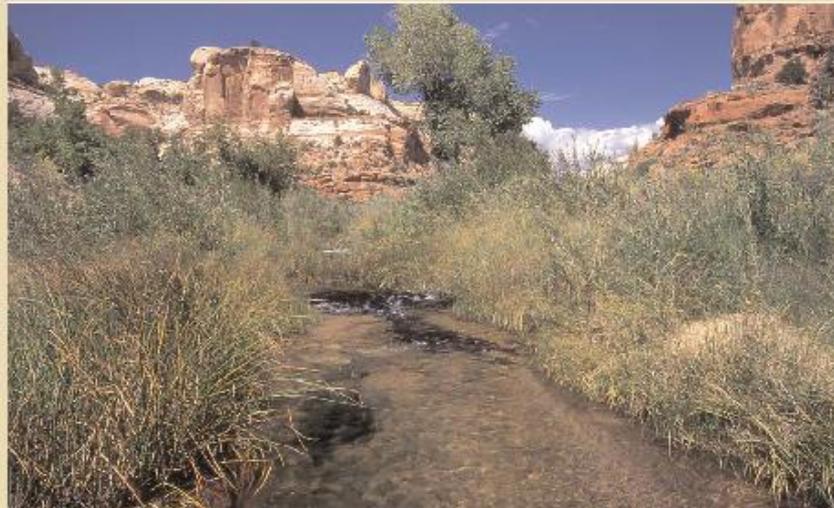# An Introduction to the Rapid Stream-Riparian Assessment Method (RSRA)

Peter Stacey

University of New Mexico

User's Guide for the Rapid Assessment of the Functional Condition of Stream-Riparian Ecosystems in the American Southwest

Peter B. Stacey, Allison L. Jones, Jim C. Catlin, Don A. Duff

Lawrence E. Stevens, and Chad Gourley

GOALS FOR AN EFFECTIVE RIPARIAN EVALUATION METHOD

Consider different components of the overall ecosystem

- Water quality
- Geomorphology
- Aquatic Habitat
- Terrestrial vegetation and productivity
- Wildlife habitat

GOALS FOR AN EFFECTIVE RIPARIAN EVALUATION METHOD

Consider different components of the overall ecosystem

Address the ability of the ecosystem to provide various desired functions

(water quality and quantity, flood prevention, erosion control, biodiversity, fish, wildlife and plant habitat, etc.)

GOALS FOR AN EFFECTIVE RIPARIAN EVALUATION METHOD

Consider different components of the overall ecosystem

Address the ability of the ecosystem to provide various desired functions

Provide specific guidance for future restoration, if necessary

GOALS FOR AN EFFECTIVE RIPARIAN EVALUATION METHOD

Consider different components of the overall ecosystem

Address the ability of the ecosystem to provide various desired functions

Provide guidance for future restoration, if necessary

Be repeatable, so method can be used to document changes through time (monitoring)

GOALS FOR AN EFFECTIVE RIPARIAN EVALUATION METHOD

Be repeatable, so method can also be used to compare conditions across an entire watershed during the same time period.

GOALS FOR AN EFFECTIVE RIPARIAN EVALUATION METHOD

Be repeatable, so method can be used to survey entire watersheds

Be repeatable, so method can be used to compare watersheds within a geographic region (e.g., useful for restoration prioritization)

GOALS FOR AN EFFECTIVE RIPARIAN EVALUATION METHOD

Rapid Assessment approach

- Provide an ecological and functional "checkup".

- Identify problems that may require additional analysis.

- Identify features that are functioning well.

Similar to physical exam for health checkup.

GOALS FOR AN EFFECTIVE RIPARIAN EVALUATION METHOD

Indicator or Variable Choice for Assessment

Use variables that can be measured rapidly in the field, and that do not require specialized equipment or knowledge

GOALS FOR AN EFFECTIVE RIPARIAN EVALUATION METHOD

Indicator or Variable Choice

Use variables that can be measured rapidly in the field, and that do not require specialized equipment or knowledge

Use variables that have a documented scientific basis

GOALS FOR AN EFFECTIVE RIPARIAN EVALUATION METHOD

Indicator or Variable Choice:

Use variables that provide direct information on ecological functioning, and that are interpretable to both the specialist and the layperson

GOALS FOR AN EFFECTIVE RIPARIAN EVALUATION METHOD

Indicator or Variable Choice:

Use variables that provide direct information on ecological functioning

Use variables where differences in scores indicate differences in ecological functioning (i.e, use a functional rather than descriptive approach: what does a high versus low score actually mean?)

GOALS FOR AN EFFECTIVE RIPARIAN EVALUATION METHOD

Indicator or Variable Choice:

Use variables that can provide specific guidance for future restoration actions if they are necessary

FOR METHOD TO BE REPEATABLE

Score condition using a 5 point scale:

ranges from completely non-functional for that variable (score of 1) to what would be expected in an unimpacted or reference system (score of 5)

FOR METHOD TO BE REPEATABLE

Use 5 point numeric scale

Use explicit and specific criteria for each level of score for each variable (to insure repeatability)

FOR METHOD TO BE REPEATABLE

Use 5 point numeric scale

Use specific scoring criteria

Use reference sites to determine score scaling

Is the system geomorphicly consistent and what would be observed in an unimpacted system?

1= non-functional   5= functioning as in

non-impacted system

FOR METHOD TO BE REPEATABLE

Scores are based upon what is ecologically and geomorphically "possible" in the reach, rather than what might be desired for that reach

FOR METHOD TO BE REPEATABLE

Scores are based upon what is ecologically "possible" in the reach system, rather than what might be desired

Scores are based upon current condition rather than expected future conditions (c.f. PFC)

DEVELOPMENT TEAM

Water Quality – Chad Gourley

Hydrology/Geomorphology – Chad Gourley

Fish/Aquatic Habitat – Don Duff

Riparian Vegetation – Larry Stevens

Wildlife Habitat – Pete Stacey

Organizers – Allison Jones and Jim Catlin

Wild Utah Project

Scientific Review – > 30 Specialists

WATER QUALITY (NON-CHEMICAL)

1. Filamentous Algae Growth and Cover
   - Nutrient loading
   - O_2 concentration
2. Shading of Channel by Vegetation, Solar Exposure
   - Thermal loading from sunlight
   - O_2 concentration

1. Filamentous Algae Cover

- 100 point samples along 200 meter in-stream transect. Samples taken 1 meter from bank, or center of stream if stream less than 2 meters wide. Presence or absence of filamentous algae noted at each sample point.

- Cover = number positive algae "hits" divided by 100.

WATER QUALITY (NON-CHEMICAL)

1. Filamentous Algae Growth and Cover (scoring criteria)

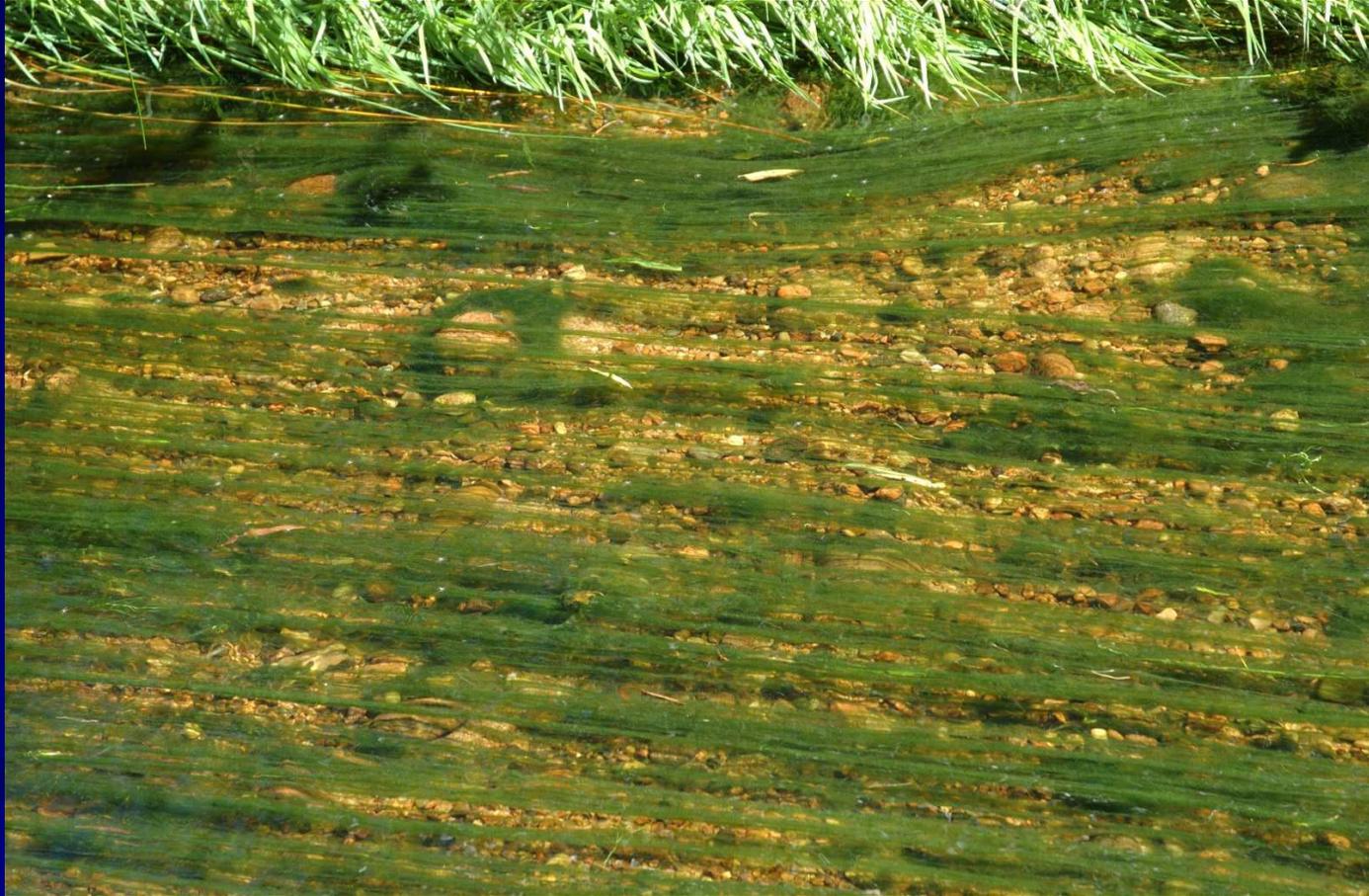1= >50% of stream bottom covered by filamentous algae

2= 26-50% coverage

3= 11-25% coverage

4= 1-10% coverage

5= no filamentous algae on stream bottom

1. Filamentous Algae Cover

Example of a Score of 1

2. Channel Shading and Thermal Loading

Example of a Score of 1

2. Channel Shading and Thermal Loading

Example of a Score of 5

HYDROGEOMORPHOLOGY

3. Flood Plain Connection and Inundation

- Dynamic Equilibrium: Bankfull should equal flood plain height (difference = amount of incision)

- Flood water retention and control

- Healthy flood plain and aquatic vegetation (water and nutrient transfer in both directions)

4. Vertical Bank Stability

- Bank erosion

- Sediment loading

HYDROGEOMORPHOLOGY

5. Hydraulic Habitat Diversity
   - Edge Water, Back Water, Scour Pools, High Velocity or Gradient Riffles, etc.
   - Slows water flows (turbulence, friction)
   - Aquatic biological diversity
6. Riparian Area Soil Integrity
   - Indicator of bank and flood plain erosion
   - Affects riparian plant recruitment

HYDROGEOMORPHOLOGY

7. Beaver Activity
- Keystone species
- Flood and erosion control
- Water storage: dampens hydrograph
- Nursery habitat for fish, amphibians, plants
- Etc.

FISH/AQUATIC HABITAT

8. Riffle-Pool Distribution
   – Fish spawning habitat (Riffles)
   – Aquatic invertebrate habitat (Riffles)
   – Fish resting and feeding habitat (Pools)
9. Underbank Cover
   – Fish hiding habitat
   – Indicator of healthy bank vegetation, channel shape

FISH/AQUATIC HABITAT

10. Cobble Embeddedness

– Aquatic invertebrate habitat

– Indicator of sediment loading, local and upstream erosion

11. Aquatic Macro-invertebrate Diversity

– Food for fish

– Indicators of water pollution

FISH/AQUATIC HABITAT

12. Large Woody Debris
   – Fish hiding habitat
   – Stream morphology
   – Nutrient transfer

13. Overbank Cover and Terrestrial Invertebrate Habitat
   – Food (insect) input or drop for fish
   – Indicator of healthy bank vegetation

RIPARIAN VEGETATION

14. Riparian Zone Plant Community Structure and Cover

- – Measured at ground (grass and forb), Shrub, Middle Canopy and Upper Canopy layers
- – Amount of plant productivity in riparian zone

15. Shrub Demography and Recruitment

- – Evidence of loss of age classes (seedlings, saplings, mature, snags) of dominant native shrub

RIPARIAN VEGETATION

16. Tree Demography and Recruitment

- Evidence of loss of age classes (seedlings, saplings, mature, snags) of dominant native tree

17. Non-native Herbaceous Plant Species Cover

- Relative dominance of non-native species of grasses and forbs

RIPARIAN VEGETATION

18. Non-native Woody Plant Species Cover

– Relative dominance of non-native species of shrubs and trees

19. Mammalian Herbivory (Grazing) Impacts on Ground Cover

– Percentage of grasses and forbs that have been grazed by native and domestic ungulates (from point counts)

RIPARIAN VEGETATION

20. Mammalian Herbivory (Browsing) Impacts on Shrubs and Small Trees

– Percentage of woody plant individuals that show evidence of browsing by native and domestic ungulates

– High levels of browsing can impact woody plant recruitment

TERRESTRIAL WILDLIFE HABITAT

21. Shrub Patch Density and Connectivity
    – Provides cover, shading, resting and nesting/breeding habitat for wildlife
    – Some species require dense patches at specific canopy levels

22. Middle Canopy Patch Density

23. Upper Canopy Patch Density

TERRESTRIAL WILDLIFE HABITAT

24. Fluvial Habitat Diversity

- Flood Plain Geomorphology: Ponds, Oxbows, Wet Meadows, Stable Cut Banks, etc.

- Provides specialized habitats for different wildlife species

EXAMPLE OF SURVEY FORM

Lazy F/W Ranch, Mancos River, Colorado

SPECIFIC SITE SURVEYS

Mancos River, Colorado
Lazy F/W Ranch Reach, Upstream
12S0736366 E, 4133877 N
Elevation 2055m
11 July 2006

Appendix 2: Rapid Stream-Riparian Assessment Score Sheet rev March 2006

Stream _Mancos River_ Watershed _Mancos_ Reach _Lazy F/W Ranch_

Survey Date _11 July 2006_ Time _09:00_ Weather _Clear_

Background information available? ____ Observers _P.G. Stacey, R.A. Stacey, T.R. Jones_

Contact Info: Address _Dept of Biology, Univ. of UM_ Phone _505 277-0869_ Email _pstacey@unm.edu_

Reach (UTM) ~~down~~ Start _4133469_ N _1250736257_ E   Length Surveyed _____
up Stop _4133817_ N _1250736360_ E

UTM zone _____

Stream Transect ___ Start _4153849_ N _1250736373_ E
Upstream or (Down)? ____   USGS Quad Map Name:
Veg. Transect   Upstream or Down? ____
Reference Photos #1 _____ N _____ E _____
                    #2 _____ N _____ E   Reach Elevation _2055 up_
                                                             2041 down

OVERALL RATING: _2.3_ CONDITION _At risk_

Previous Ratings: DATE _____ Overall Score _____ Current Trend _____
Individual Previous Scores: WQ ____ HG ____ F/AH ____ RV ____ TWH _____

Score (1-5 or N/A)	Indicator Number	Indicator	Scoring Definitions and Directions. Scores of 5 indicate that the indicator is close to the potential of the geologically and biologically similar reference reach, and/or what would be expected to be found in a healthy ecosystem, a reference reach without anthropogenic disturbance. Scores of 1 indicate riparian or stream components that are not functioning properly. Use N/A if the indicator is not relevant or appropriate for this particular reach.	Notes on measurement methods
			WATER QUALITY	
1	1	Algal Growth	1 = >50% of stream bottom covered by filamentous algae 2 = 26-50% of bottom covered by filamentous algae 3 = 11-25% of bottom covered by filamentous algae 4 = 1-10% of bottom covered by filamentous algae 5 = no filamentous algae on stream bottom _71%_	Use ocular tube and field worksheet to score 0.5m from bank every 2m in 200m in-stream transect. Do not count the single cell algae on the surface of rocks
2	2	Channel Shading, Solar Exposure	1 = stream channel completely unshaded 2 = slight shading 3 = moderate shading 4 = substantial shading 5 = shading is geomorphically consistent _3%_	Look up and down stream in three different representative points in the overall stream reach. Look for geomorphic consistency
Water quality mean score: _1.5_		Notes:		

39

FISH/AQUATIC HABITAT

Qualifier: If the stream is no longer perennial, but used to be a fishery, the mean score entered for this section is a score of "1." (It is no longer functioning as fish/aquatic habitat>)				
3	8	Pool Distribution	1 = no pool habitat in 200m stream transect 2 = one to several pools 3 = limited to moderate pool and riffle distribution in reach 4 = moderate to abundant pool and riffle distribution 5 = pools abundant (>50% of transect has pools connected by riffles)　limited	Check along 200m in-stream transect. Look for geomorphic consistency (e.g. high gradient streams will have more pools than low gradient streams).
2	9	Underbank Cover	1 = no underbank cover in 200m stream transect　2% 2 = <10% transect has underbank cover 3 = 10 - 25% of transect has underbank cover 4 = 26 - 50% of transect has underbank cover 5 = >50% of transect has underbank cover	Check along both banks of 200m in-stream transect. Undercut must be at least 15cm (6 in) into the streambank.
2	10	Cobble Embedded-ness	1 = average of >50% of rock volume is imbedded in fine silt 2 = 41 - 50% of rock imbedded 3 = 26 - 40% of rock imbedded 4 = 20 - 25% of rock imbedded　41% 5 = <20% of rock imbedded	Determine the percent embeddedness of a simple of 6 rocks 3-8" in diameter from riffles in each of three different random points along the overall stream reach.
5	11	Aquatic Macro-invertebrate Diversity	1 = no aquatic (benthic) macroinvertebrates found 2 = 1 macroinvertebrate order present 3 = 2 macroinvertebrate orders present 4 = 3 macroinvertebrate orders present 5 = 4 or more orders present	Examine 5 rocks 15cm (6") or larger at the same sites used for Indicator 10. Use Appendix 2 or other guide to identify macroinvertebrate orders.
2	12	Large Woody Debris	1 = no large woody debris (LWD) in transect 2 = <3 LWD pieces in transect 3 = 3 - 5 LWD pieces in transect 4 = 6 - 10 LWD pieces in transect 5 = >10 LWD pieces in transect	Count woody debris pieces larger than 15cm (6") in diameter and 1m (3 f) long or longer in the channel in the 200m in-stream transect.
3	13	Overbank Cover and Terrestrial Invertebrate Habitat	1 = no grass, shrubs, trees overhang water 2 = <10% of bank has grass, trees, shrubs that overhang the water 3 = 10 - 25% of bank has overhanging veg. 4 = 26 - 50% of bank has overhanging veg. 5 = >50% of bank has overhanging veg.	Check along both banks of 200m in-stream transect. Look for geomorphic consistency. Do not include rocks or cliff faces.
Fish/Aquatic Habitat mean score:　2.8		**Notes:** Some large caddis flies, but overall not many macroinverts. Crayfish also present		

41

RIPARIAN VEGETATION

Handwritten notes (left margin):

G 67%
S 11%
MC 7%
TC 9%

r 79.9%
14%
17%
23%

2	14	Lower Riparian Zone Plant Community Structure and Cover	1 = <5% average plant cover in lower riparian zone (LRZ) 2 = 5 - 25% average plant cover in LRZ 3 = 26 - 50% average plant cover in LRZ 4 = 51 - 80% average plant cover in LRZ 5 = >80% average plant cover in LRZ $\bar{x} = 24\%$	Use the field worksheet and ocular tube to determine the cover for the ground, shrub, midcanopy and tall canopy layers along 200m transect in the lower riparian zone. Look for geomorphic consistency.
3	15	Upper Riparian Zone Plant Community Structure and Cover	1 = <5% average plant cover in upper riparian zone (URZ) 2 = 5 - 25% average plant cover in URZ 3 = 26 - 50% average plant cover in URZ 4 = 51 - 80% average plant cover in URZ 5 = >80% average plant cover in URZ $\bar{x} = 33\%$	Use the field worksheet and ocular tube to determine the cover for ground, shrub, mid-canopy and tall canopy layers along the 500m transect in the upper riparian zone. Look for geomorphic consistency.
4	16	Shrub Demography and Recruitment	1 = no native shrubs present in study reach 2 = one age class present 3 = two classes present, one class with seedlings or young shrubs 4 = three age classes present no saplings or immatures 5 = all age classes present	Determine during the overall walk through the number of age classes (seedlings, saplings, mature, standing dead) for the dominant (most common) native shrub species.
4	17	Tree Demography and Recruitment	1 = no native tree present in study reach 2 = one age class present 3 = two classes present, one class with seedlings or saplings 4 = three age classes present no saplings or immatures 5 = all age classes present	Determine during the overall walk through the number of age classes (seedlings, saplings, mature, standing dead) for the dominant (most common) deciduous native tree species.
2	18	Non-native Herbaceous Plant Species	1 = >50% of herbaceous plant cover are not native species 2 = 26 - 50% herbaceous not native 3 = 11 - 25% herbaceous not native ≈40% 4 = 5 - 10% herbaceous not native 5 = <5% of herbaceous cover not native	Estimate on the overall walk through.
5	19	Non-native Woody Plant Species	1 = >50% of woody plant cover are not native species 2 = 26 - 50% of woody cover not native 3 = 11 - 25% of woody cover not native 4 = 5 - 10% of woody cover not native 5 = <5% of woody cover not native <5%	Estimate on the overall walk through.
2	20	Mammal Herbivory (Grazing) Impacts on Ground Cover	1 = >50% of plants impacted by grazing, signs of ungulates common (scat, trampling and trails) 2 = 26 - 50% of plants impacted ungulate use signs are common 3 = 11 - 25% of plants impacted LRZ: 39% 4 = 5 - 10% of plants impacted URZ = 45% 5 = <5% of plants impacted $\bar{x} = 42\%$	Use the field worksheet and ocular tube to determine the number of "hits" showing herbivory on the ground covering plants (grasses and forbs) on the LRZ and URZ 200m transect. Use average of the two transects to score.

RIPARIAN VEGETATION, CONTINUED

1	21	Mammal Herbivory (Browsing) Impacts on Shrubs and Small Trees	1 = >50% of plants (shrubs and trees) impacted 2 = 26 - 50% of plants impacted 3 = 11 - 25% of plants impacted 4 = 5 - 10% of plants impacted 5 = <5% of plants impacted *nearly 100%*	Using the same transects as for Indicator 20, estimate the percentage of shrubs and small trees that have branch tips that have been clipped or eaten by large mammals.

Riparian Vegetation, mean score:

2.9

Notes:

The lack of exotic shrubs and trees is positive
Heavy cattle use limits survival of seedling willows and cottonwoods

TERRESTRIAL WILDLIFE HABITAT

2	22	Shrub Patch Density	1 = no shrub patches in stream reach 2 = few, isolated shrub patches 3 = isolated patches 4 = few large open areas between large patches 5 = almost continuous dense shrub cover	In overall walk through, examine patches and clusters of shrubs (<4m tall) and openings between those clusters. Look for geomorphic consistency.
2	23	Mid-Canopy Patch Density	1 = no mid-canopy shrub or tree patches in reach 2 = few isolated small patches in mid canopy 3 = isolated patches 4 = few large open areas between large patches 5 = almost continuous dense mid-canopy cover	In overall walkthrough, examine clusters of mid-canopy large shrubs and trees (4-10m tall) and openings between those clusters. Look for geomorphic consistency.
2	24	Upper Canopy Patch Density and Connectivity	1 = no large trees present in reach 2 = 1 - 25% of upper canopy patches connected 3 = 26-50% of upper canopy patches connected 4 = 51-75% of upper canopy patches connected 5 = >75% of upper canopy patches connected *15%*	In overall walk through, examine clusters of upper canopy trees (>10m tall) and openings between those clusters. Look for geomorphic consistency.
3	25	Fluvial Habitat Diversity	1 = no other fluvial habitat besides the stream channel 2 = one other type of fluvial habitat present 3 = two other types present 4 = three other types present 5 = four or more other types present	Examine during overall walk through. Fluvial habitat types include flood-plain ponds, oxbows, side channels, sand bars, wet meadows, beaver ponds, and stable cutbanks.

Terrestrial Wildlife Habitat, mean score:

2.3

Notes:

Most shrubs and trees are old – many are starting to die from old age.
Little recruitment of shrubs and trees limits wildlife habitat

Final Score - Rapid Stream Raparian Assessment

Mean Scores:

|	
Water Quality:	1.5
Hydro-geomorphology:	1.8
Fish/Aquatic Habitat:	2.8
Riparian Vegetation:	2.9
Wildlife Habitat:	2.3
Overall Score:	2.3

Overall Comments

Current condition shows the effects of long term grazing of riparian area. There are numerous cottonwood and willow seedlings that have germinated this year. This means the area could recover rapidly. The large lower riparian zone resulting from channel migration would be particularly productive.

Attach field worksheets (including the human impact worksheet) to this score sheet
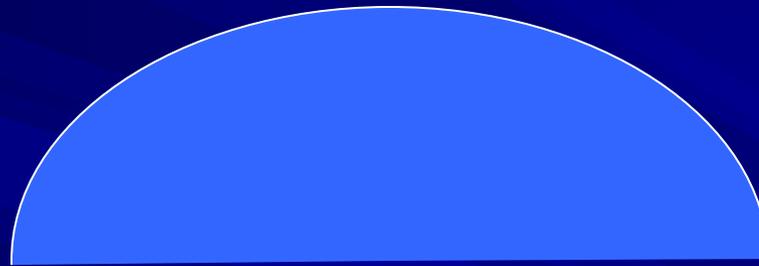
APPLICABILITY

Perennial Streams   Yes

Intermittent Streams   Yes

    (Fish/Aquatic habitat may be "N/A" for some
    sections of the reach)

Ephemeral Streams   Partial

    (Most applicable where there is year round
    underground water flow supporting well developed
    riparian vegetation; fish/aquatic habitat will be "N/A")

Dry Washes   No

APPLICABILITY

WATERSHED STUDIES

FUNCTIONAL ASSESSMENT OF THE MANCOS RIVER, COLORADO:

MANCOS VALLEY AND ADJACENT AREAS

PETER STACEY
UNIVERSITY OF NEW MEXICO

Stream-Riparian Ecosytem: Overall Mean Score
West Mancos and Mancos Rivers
(Above Jackson Gulch Resevoir Diversion to Mesa Verde NP/Ute Reservation Boundary)
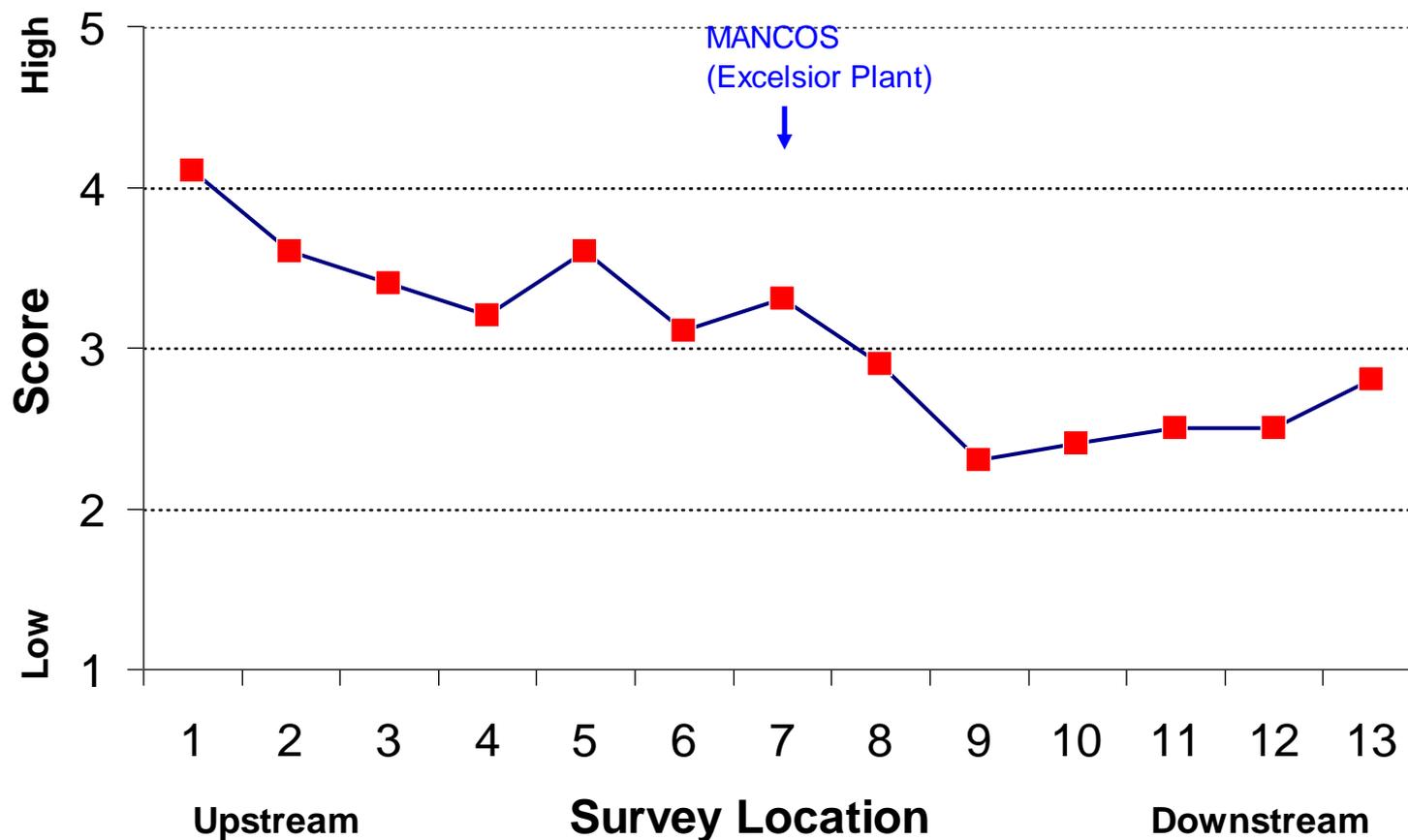
Fish Habitat: Cobble Ebeddedness (Sediment)
West Mancos and Mancos Rivers
(Above Jackson Gulch Resevoir Diversion to Mesa Verde NP/Ute Reservation Boundary)
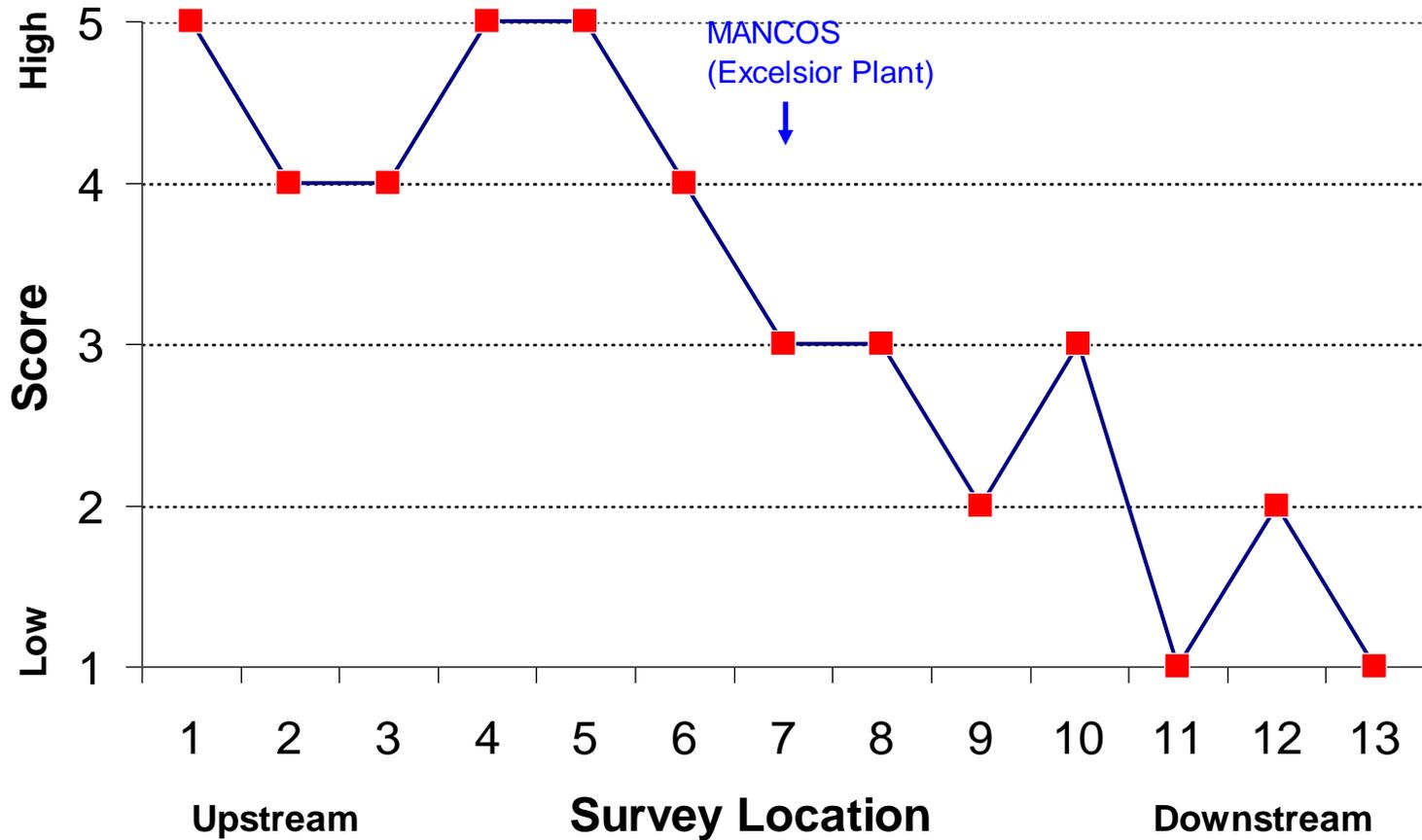
Fish Habitat: Large Woody Debris

West Mancos and Mancos Rivers

(Above Jackson Gulch Resevoir Diversion to Mesa Verde NP/Ute Reservation Boundary)
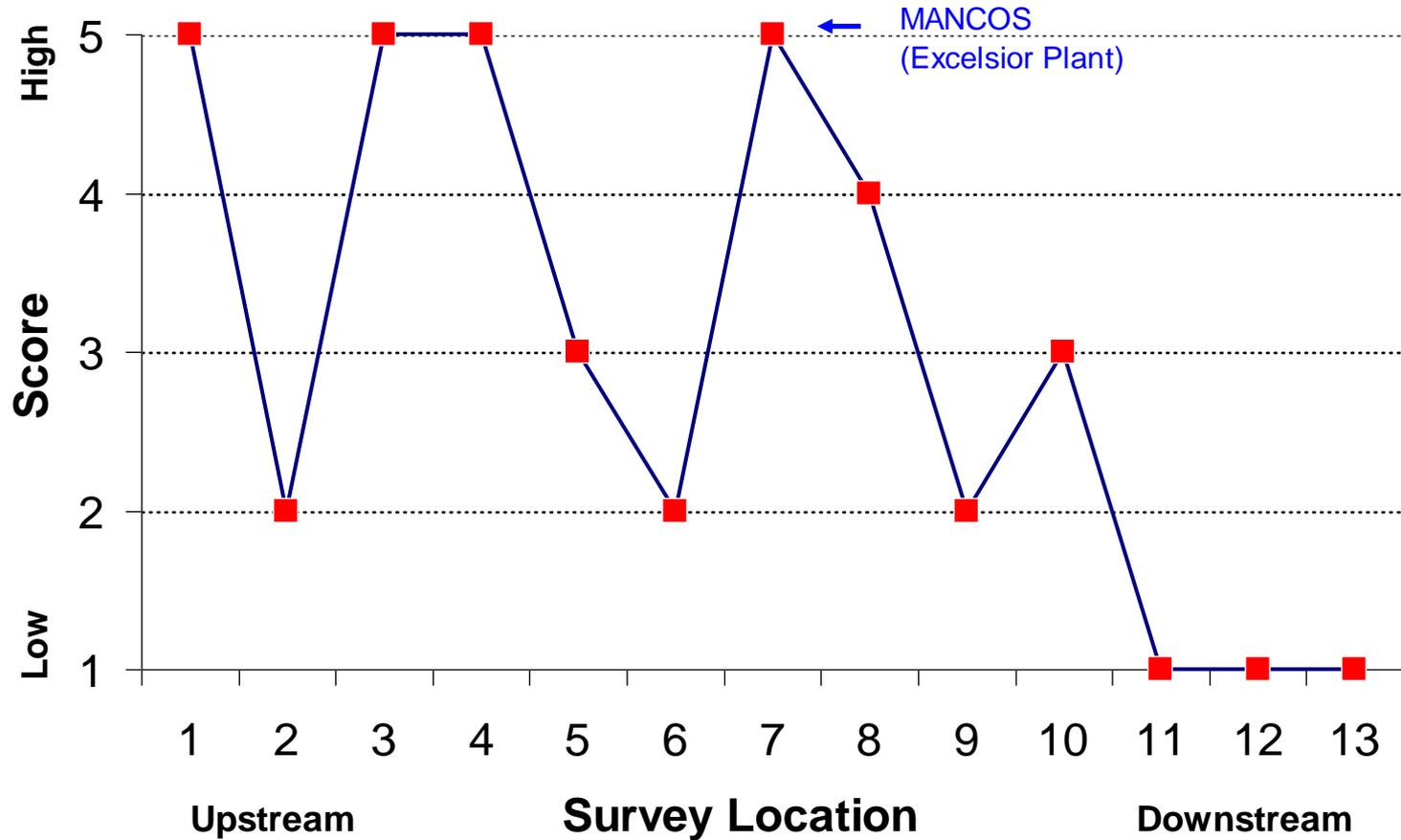
Wildlife Habitat: Upper Canopy Tree Density (>30')
West Mancos and Mancos Rivers
(Above Jackson Gulch Resevoir Diversion to Mesa Verde NP/Ute Reservation Boundary)
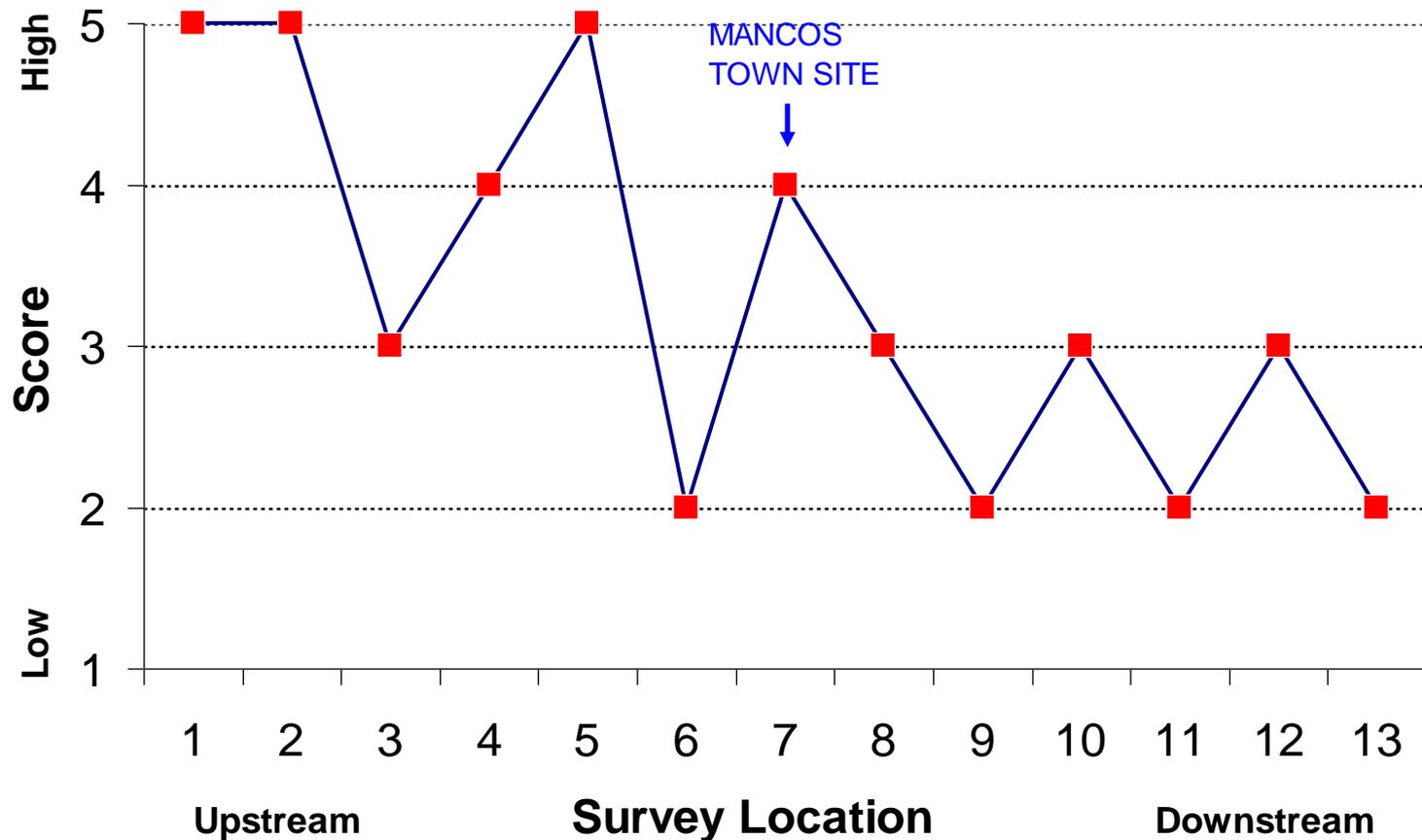
(Ex

Riparian Vegetation: Non-Native Shrubs and Trees
West Mancos and Mancos Rivers
(Above Jackson Gulch Resevoir Diversion to Mesa Verde NP/Ute Reservation Boundary)

MANCOS
(Excelsior Plant)
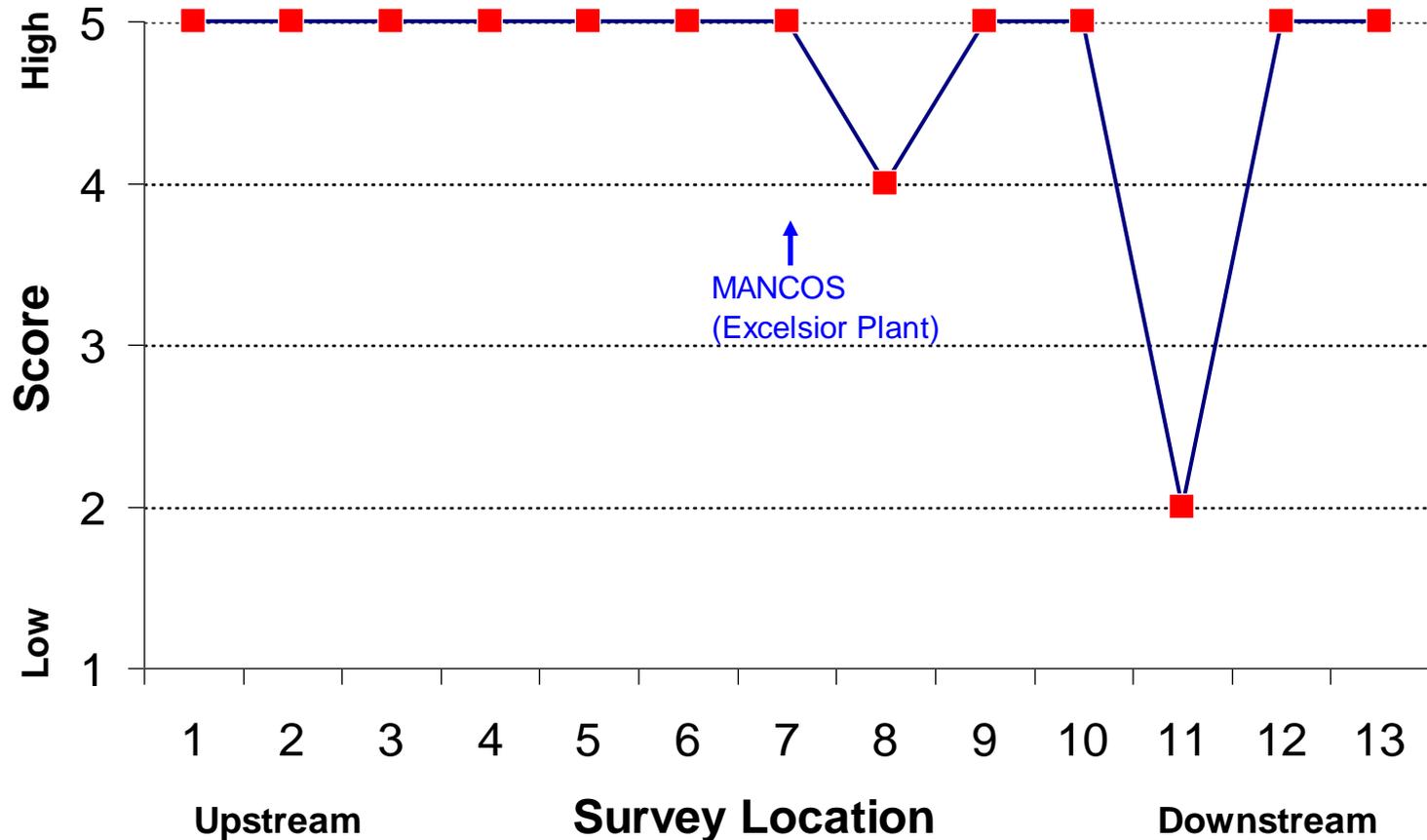
WEB ACCESSIBLE RSRA DATABASE

http://wildutahproject.org/programs/riparian/RSRA

WEB ACCESSIBLE RSRA DATABASE

- Goals
  - Provide a central repository of RSRA surveys conducted throughout the west
  - Make surveys accessible to everyone
  - Data are entered by survey team
  - Data structure is verified by RSRA team
  - Data base is searchable

WEB ACCESSIBLE RSRA DATABASE

■ Goals
  – Retrieve surveys by:
    ■ State
    ■ Watershed
    ■ River
    ■ Reach (eg., sort by date, for monitoring
      changes in reach)
    ■ Condition

WEB ACCESSIBLE RSRA DATABASE

- **Goals**
  - Develop geographically structured understanding of current condition of riparian areas in the southwest (and elsewhere)
  - Develop priorities for restoration, determine areas where change in management practices may be indicated, target specific reaches for species reintroductions, etc.

WEB ACCESSIBLE RSRA DATABASE

- Goals
  - Address climate change issues, such as potential corridors of high quality habitat, areas where carbon sequestration may be enhanced, or areas that may be particularly sensitive to climate change because of current conditions

WILD UTAH PROJECT

Programs

Grazing
ORV
Riparian
  RSRA
    Create
    Map
    Search
    Workshops
    and Trainings
Heart of the West
Partner support

Services

Developing new tools
GIS Mapping
Ecological Analysis

Rapid Stream Riparian Assessment Protocol

The Wild Utah Project and numerous partners have developed a tool that identifies streams that do, and do not, meet wildlife needs. The Rapid Stream Riparian Assessment protocol (RSRA), uses a series of simple but scientifically-based indicators to measure how much the stream system differs from what would be found in a reference stream. It incorporates an easy to understand scoring system that can be repeated in different locations by volunteers with some training. Wild Utah Project is now combining the forces of Citizen Activists, scientists and land management agency staff for the larger purpose of public and private land stream assessment and restoration in a way that has never been done before. Please consider joining us!

Create RSRA Score Sheet

Help

this is how you create...

This *RSRA Score Sheet* will be submitted for moderation and will not be accessible to other users until it has been approved.

Reach: *

Stream: *

Watershed: *

Survey Date/Time: *

Oct ▼ 2 ▼ 2009 ▼ 2 ▼ 13 ▼ : pm ▼

☐ Background information available?

Observers Contact Information

Observers: [   ]   E-mail: [   ]

Address: [   ]   Phone: [   ]

Upstream End of Study Reach

Zone: * 12 ▼   (UTM) E: [   ]   (UTM) N: [   ]   Elevation: [   ] meters

State: -- ▼

Upstream Photo Identification: [   ]

Downstream End of Study Reach

NAD: * 83 ▼   (UTM) E: [   ]   (UTM) N: [   ]   Elevation: [   ] meters

Downstream Photo Identification: [   ]

Stream Transect

RIPARIAN VEGETATION

Score	Indicator Number	Indicator
☐	**14**	**Riparian Zone Plant Community Structure and Cover**

G= [   ] %   S= [   ] %   MC= [   ] %   UC= [   ] %   avg= %

Score	Indicator Number	Indicator
☐	**15**	**Shrub Demography and Recruitment**
☐	**16**	**Tree Demography and Recruitment**
☐	**17**	**Non-native Herbaceous Plant Species**
☐	**18**	**Non-native Woody Plant Species**
☐	**19**	**Grazing Impacts on Ground Cover**

%= [   ]

Score	Indicator Number	Indicator
☐	**20**	**Browsing Impacts on Shrubs and Small Trees**

%= [   ]

OVERALL COMMENTS

Notes:

WORKSHEETS

Field worksheets and any additional supporting documents:

Browse_   Upload

Maximum Filesize: *8 MB*
Allowed Extensions: *txt doc pdf*

Add another item

PHOTOS

Field photos:

Browse_   Upload

Maximum Filesize: *8 MB*
Allowed Extensions: *gif jpg jpeg png*

Add another item

CAPTCHA

This question is for testing whether you are a human visitor and to prevent automated spam submissions.

sRM
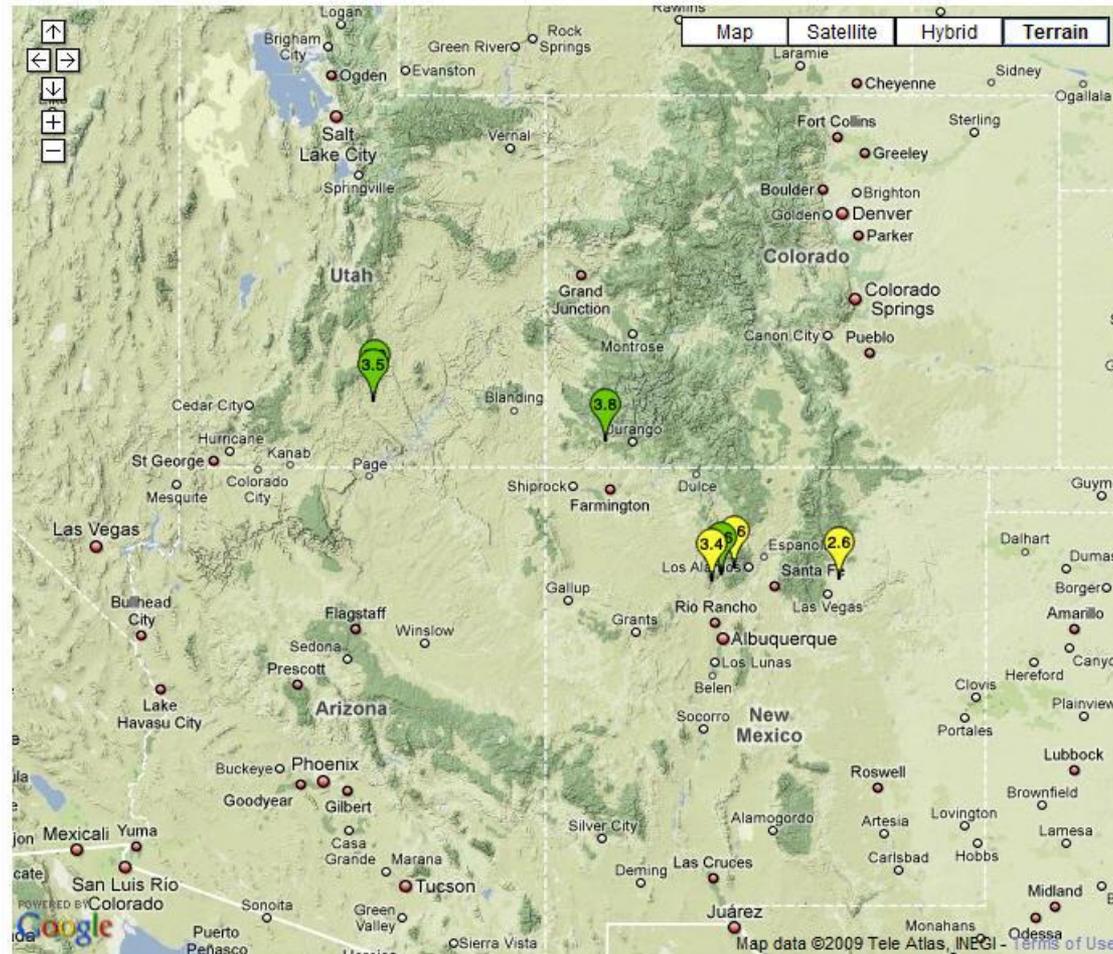
RSRA Map

This map illustrates the locations of the nodes on this website. Each marker indicates a node associated with a specific location.

RSRA Map
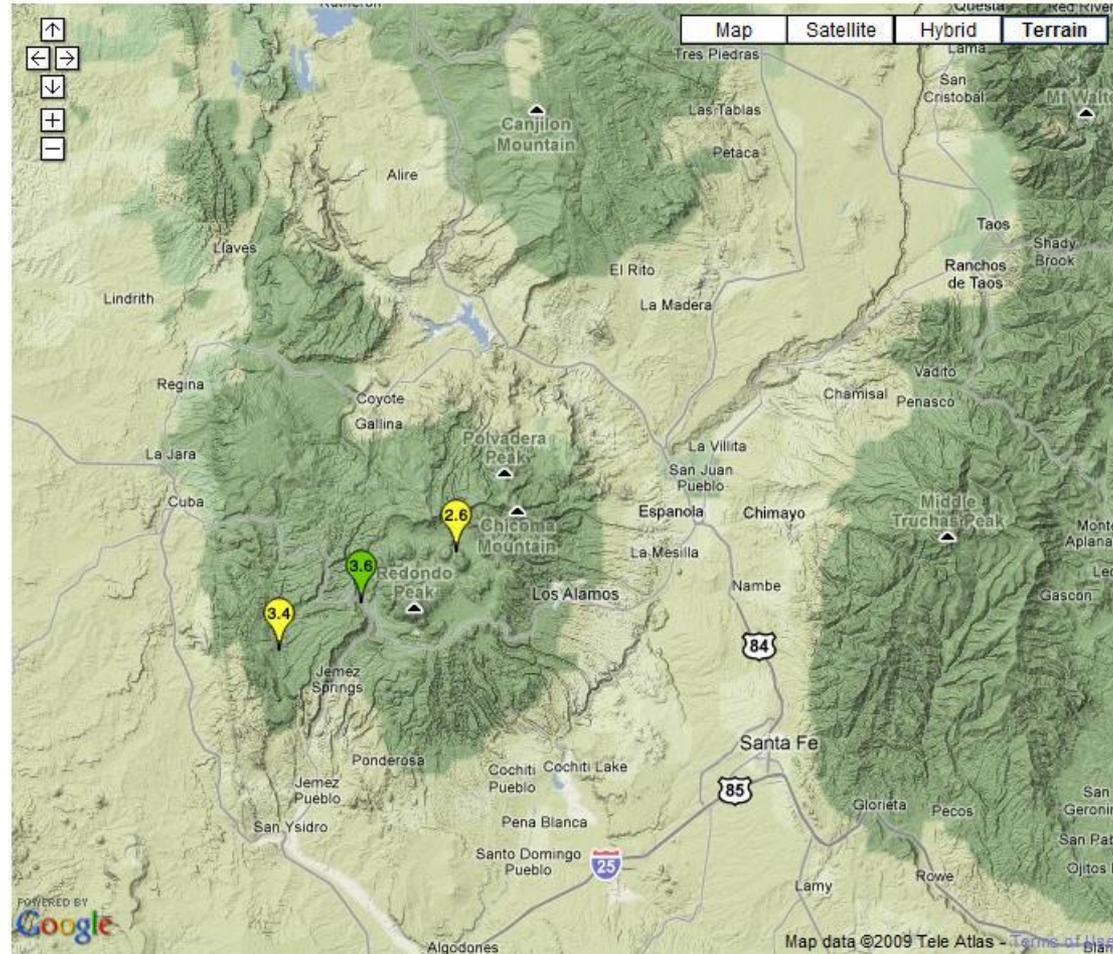
This map illustrates the locations of the nodes on this website. Each marker indicates a node associated with a specific location.
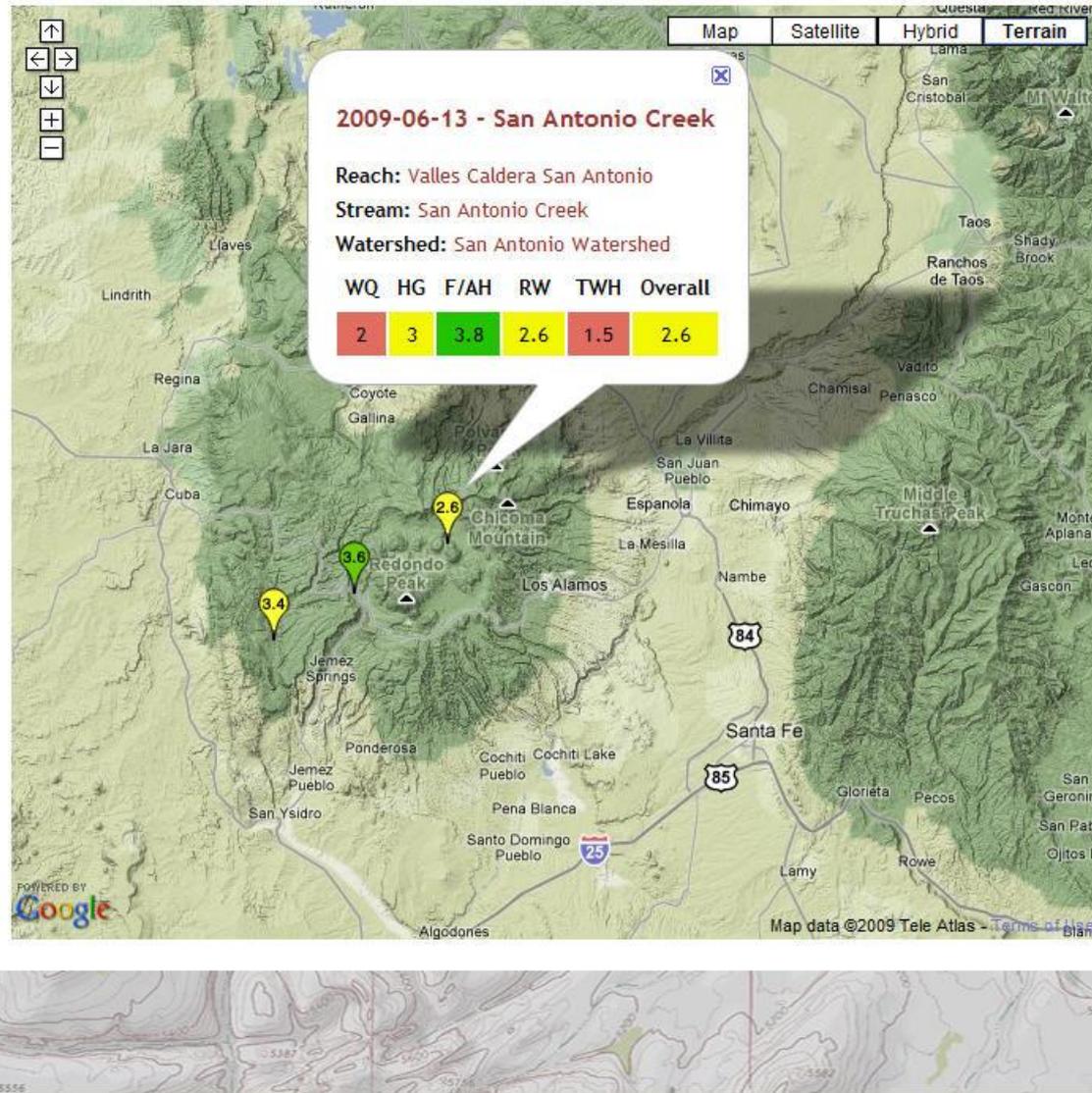
2009-06-13 - San Antonio Creek

Reach: Valles Caldera San Antonio   **Stream:** San Antonio Creek   **Watershed:** San Antonio Watershed

Survey Date: Sat, 06/13/2009 - 10:30am

Observers: Allison Jones, Peter Stacey   **E-mail:** allison@wildutahproject.org

Address: 68 South Main St, Ste 400 SLC, UT 84101   **Phone:** 801.328.3550

(UTM) Zone: 13   **Upstream (UTM):** 0365833E   **Upstream (UTM):** 3980590N   **Elevation:** 2621 meters

NAD: 83   **Downstream (UTM):** 0365662E   **Downstream (UTM):** 3980590N

(UTM) Start: 0365826E   **(UTM) Start:** 3980614N   **Upstream or down?** Upstream

Scores: WQ 2   **HG** 3   **F/AH** 3.8   **RV** 2.6   **TWH** 1.5   **Overall** 2.6

WATER QUALITY

Score	Indicator Number	Indicator
3	1	Algal Growth
%=13		
3	2	Channel Shading
%=1		
2		Mean Score

Notes: try planting willows

HYDROGEOMORPHOLOGY

Score	Indicator Number	Indicator
1	3	Floodplain Connection

RSRA Map

This map illustrates the locations of the nodes on this website. Each marker indicates a node associated with a specific location.
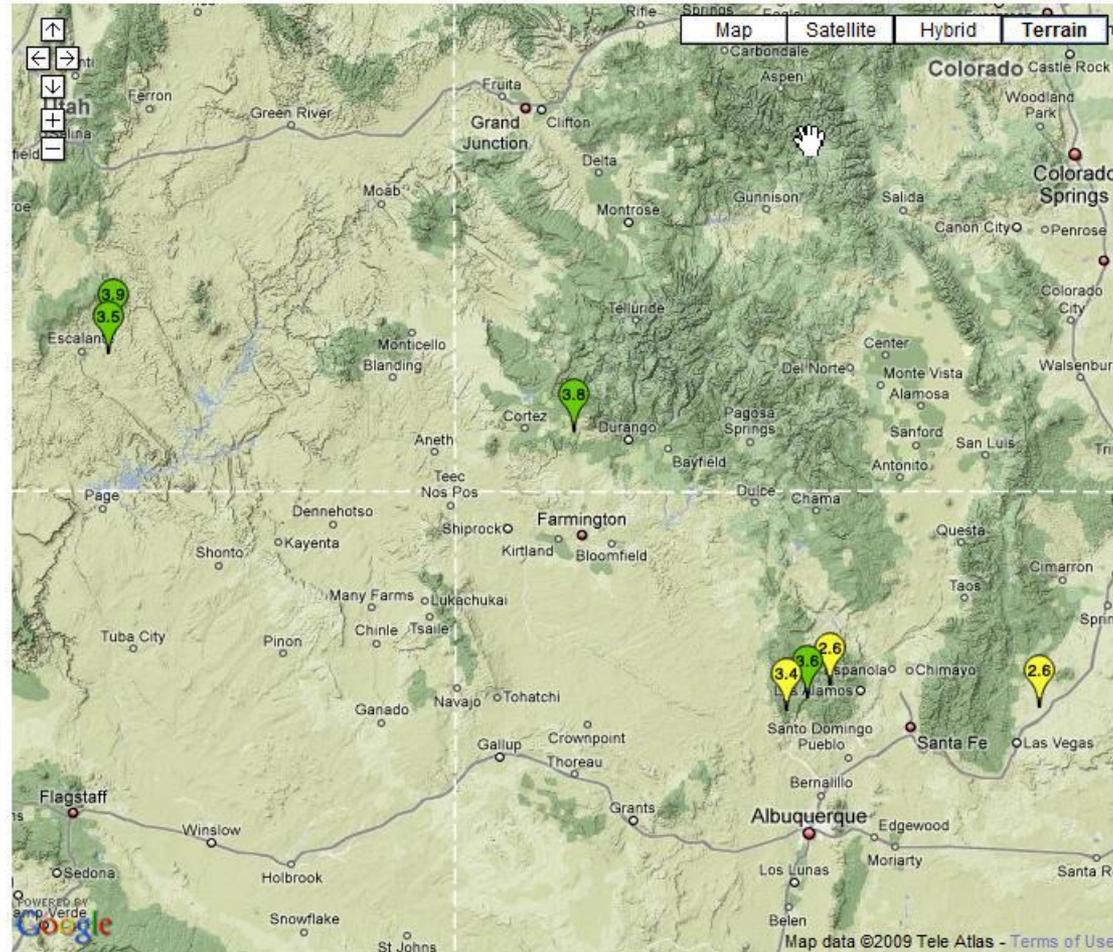
2006-06-17 - East Mancos River

Reach: Reddert Ranch Reach   **Stream:** East Mancos River   **Watershed:** Mancos River

Survey Date: Sat, 06/17/2006 - 8:51am   Background information available.

Observers: Peter Stacey   **E-mail:** pstacey@unm.edu

Address: Dept. Biology, University of New Mexico, Albuquerque, NM 87131   **Phone:** 505-277-0869

(UTM) Zone: 12   **Upstream (UTM):** 0745007E   **Upstream (UTM):** 4139352N   **Elevation:** 2402 meters

NAD: 83   **Downstream (UTM):** 0744884E   **Downstream (UTM):** 4139412N

(UTM) Start: E   **(UTM) Start:** N   **Upstream or down?** Upstream

Scores: WQ 4   HG 3.8   F/AH 4.3   RV 3.8   TWH 3.3   Overall 3.8

WATER QUALITY

Score	Indicator Number	Indicator
3	1	Algal Growth
3	2	Channel Shading
4		Mean Score

Notes:

HYDROGEOMORPHOLOGY

Score	Indicator Number	Indicator
2	3	Floodplain Connection
5	4	Vertical Bank Stability
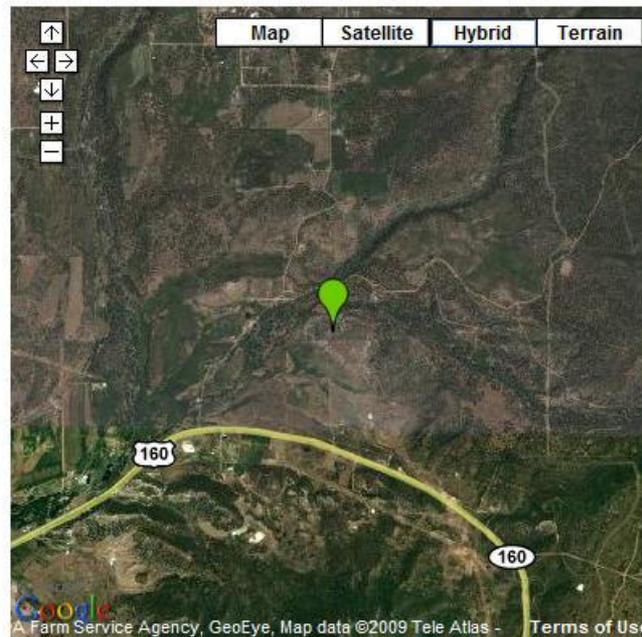
East Mancos River, Colorado
Reddert Ranch Reach
Upstream
12S0745007 E, 4139352 N
Elevation 2402m
17 June 2006
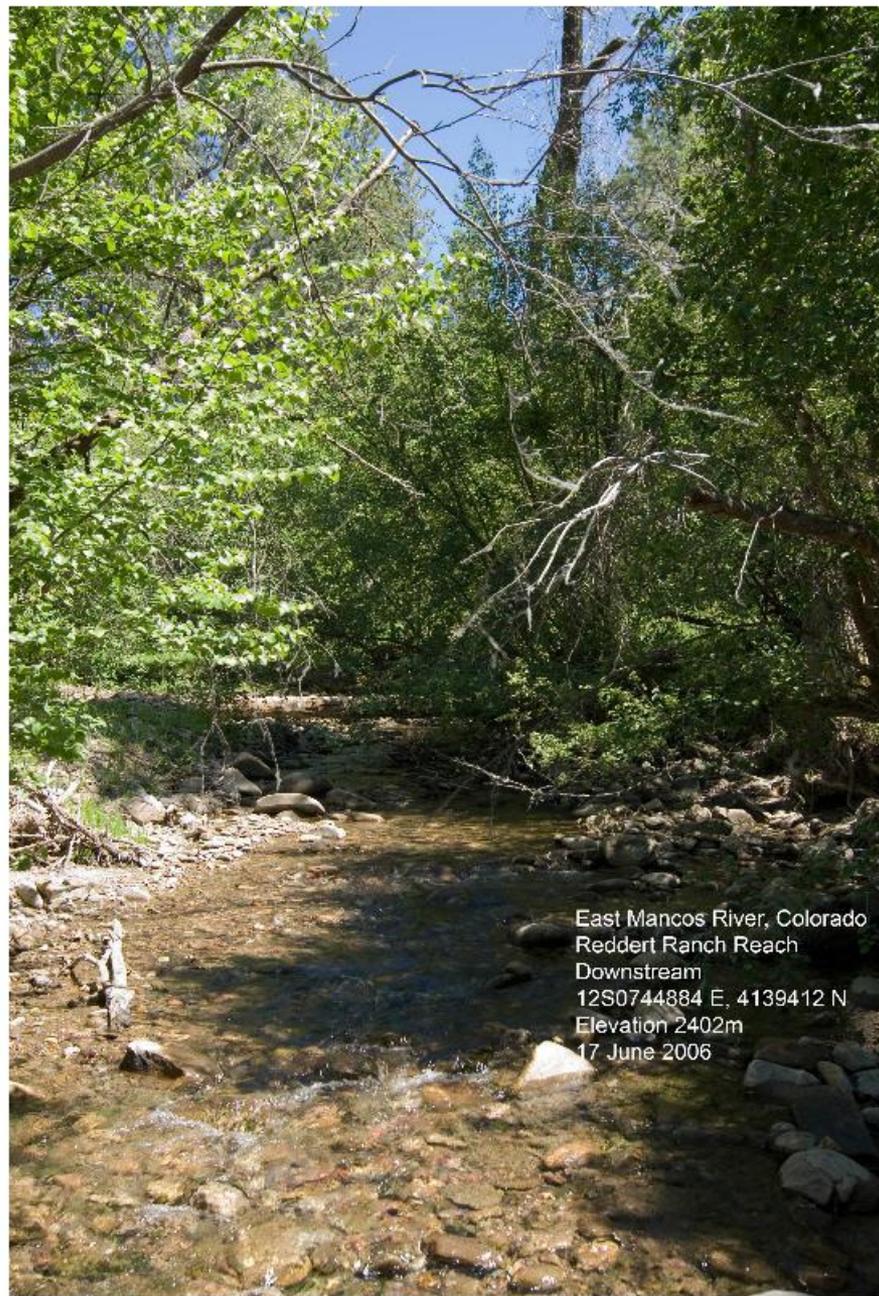
East Mancos River, Colorado
Reddert Ranch Reach
Downstream
12S0744884 E, 4139412 N
Elevation 2402m
17 June 2006

2008-06-08 - Calf Creek

Reach: Calf Creek above campground   **Stream:** Calf Creek   **Watershed:** Escalante River

Survey Date: Sun, 06/08/2008 - 11:00am   Background information available.

Observers: Allison Jones, Peter Stacey   **E-mail:** allison@wildutahproject.org

Address: 68 South Main St, Ste 400 SLC, UT 84101   **Phone:** 801.328.3550

(UTM) Zone: 12   **Upstream (UTM):** 0463922E   **Upstream (UTM):** 4183746N

NAD: 83   **Downstream (UTM):** 0463602E   **Downstream (UTM):** 4183258N   **Elevation:** 1604 meters

(UTM) Start: 0463016E   **(UTM) Start:** 4183608N   **Upstream or down?** Upstream

Scores: WQ 3   HG 3.6   F/AH 3.5   RV 4.4   TWH 3   Overall 3.5

WATER QUALITY

Score	Indicator Number	Indicator
4	1	Algal Growth
4	2	Channel Shading
3		Mean Score

%=6

Notes:

HYDROGEOMORPHOLOGY

Score	Indicator Number	Indicator
1	3	Floodplain Connection
5	4	Vertical Bank Stability

%=?

FURTHER INFORMATION

User's Guides are available from:

Peter Stacey (PDF File):

http://unm.edu/biology/stacey

Allison Jones (Hard Copy):

allison@wildutahproject.org

Database at:

http://wildutahproject.org/programs/riparian/RSRA