FINAL REPORT

INTERAGENCY AGREEMENT
AGREEMENT #14-48-001-95664

# MOWITZ CREEK RIPARIAN FENCE PROJECT

## ABSTRACT

The Mowitz Creek project is located in the Clear Lake drainage within Modoc County, California. Lands included within the project are within the Modoc National Forest and include National Forest administered and privately owned lands.

Primary resource uses for the project area are grazing, wildlife habitat and potential fisheries habitat for Lost River and shortnose suckers, federally listed Threatened and Endangered species.

The purpose of the project was to control livestock grazing to allow for improvement of riparian habitats, through fencing and improve fish passage under the Clear Lake road by improving the culverts.

Projects completed under this agreement included; construction of 1.38 miles of livestock control fence, including installation of two cattleguards, planting willow rooted cuttings in the Mowitz Creek riparian zone, modifying the culverts in County Road 136 to improve fish passage, and drilling and developing one well to provide an alternate watering source for livestock that formerly utilized Mowitz Creek as a primary water source.

Results monitoring of the project has been initiated to determine changes to the riparian habitat as a result of the activities. Baseline information has been collected by the forest service and Tulelake High School biology classes and includes stream cross sections, water temperature, and plant and plant community composition. Transects and photo points have been used to document these conditions. As project improvements were completed in the fall of 1995 and summer of 1996, only before project conditions have been documented thus far. Followup transacts and photopiont photos will be retaken in 1997 and periodically on a three to five year cycle .

Rooted willow cuttings were planted in the fall of 1995. Cursory observations of plant survival indicate a very low survival rate. A complete survival survey will be completed in the summer of 1997. Success of the planting will be evaluated at that time and any Followup action necessary will be planned.

Initial observations of the response of the Mowitz Creek riparian area to livestock exclusion has been very positive. Riparian vegetation is expanding along the stream banks and out into the water. Standing vegetation should serve to trap silt from the spring runoff and build banks and narrow the stream channel. Over time, the plant community is expected to progress from a community currently dominated by rushes and spike rush to one dominated by sedges. A limited amount of willow and other riparian shrubs are expected to develop, primarily within the rock sections of the creek. Due to the fine, clay nature of the stream bed, the potential plant communities are expected to be herbaceous dominated communities.

## INTRODUCTION

The Mowitz Creek Riparian Fence Project has been undertaken as a habitat restoration project in cooperation with the Lava Beds Resource Conservation District, U.S. Forest Service, Tulelake High School and the U.S. Fish and Wildlife Service.

Lava Beds Resource Conservation District has served as the project proponent and worked with the forest service in developing the project proposal and grant application. The forest service has designed the project, procured materials and contracts, administered the contracts, furnished labor for some aspects of the project, accomplished certain monitoring functions, and worked with Tulelake High School in designing and providing training and supervision for certain monitoring activities carried out by the high school biology classes. Tulelake High School has contributed use of monitoring equipment, and student time for monitoring and evaluation of the project. Students also planted willows on the project. The U.S. Fish and Wildlife Service has administered the 319(h) grant used to fund this project.

The objective of this project is improvement of riparian habitat along Mowitz Creek and to improve fish passage through culverts in County Road 136 which are thought to be restrictions to fish fry as they travel down Mowitz Creek to rearing habitat. Mowitz Creek is a tributary to Clear Lake which provides habitat for the threatened and endangered Lost River and shortnose suckers. Mowitz Creek is potential spawning habitat for these species.

Cattle grazing has been heavy in and around Mowitz Creek since records have been kept on grazing utilization. This use has been thought to limit the improvement of the riparian habitat and maintain plant communities in less than potential condition. Fencing was proposed to control livestock utilization and encourage improvement in riparian condition.

Mowitz Creek flows through two large culverts where it crosses County Road 136. During minimum flows in late spring and summer much of the water coming down the creek had been subing under the culverts with the remaining water spread out between the two culverts. This created a flow condition of very shallow water in the culverts at this time. It has been thought that this flow was too low to allow sucker fry to migrate through the culverts from the upper portion of Mowitz Creek to Clear Lake where they reside while they are growing to maturity. Modifications were proposed to the culverts to seal the flow of water from beneath the culverts and to divert 100 percent of the flow through one culvert . This would increase the column of water available to carry sucker fry downstream into the lake.

Without access to Mowitz Creek, the water available to cattle would be diminished substantially, restricting the number of cattle and amount of time they could graze on the forest service allotment. As part of the project, alternate water sources were planned to offset this deficiency.

In order to evaluate the effectiveness of the project monitoring was designed to evaluate the response of the riparian habitat and associated habitat conditions . Selected monitoring parameters were changes in stream cross section, changes in riparian and upland plant composition and community type, changes in water temperature, and changes in herbaceous and woody plant cover. Various sampling techniques were selected to collect data on pre-project conditions. A program of replicating these samples in subsequent years in order to display change was planned.

## DESCRIPTION OF STUDY AREA

The study area is located in Modoc County, California, approximately one-half mile south of Clear Lake. Specific project sites are in T. 45 N., R. 6 E., Sections 16, 17 and 34.

The sites are located on the Modoc Plateau and is within the Basin and Range physiographic province. Vegetation consists of Juniper, sagebrush and bunchgrasses. Mowitz Creek is represented by riparian plant communities that are dominated by grasses, spikerushes and rushes. There is no current representation of a woody component in the riparian plant community. Silver sagebrush (Artemisia cana) is the dominant shrub within the plant community.

Elevation is approximately 4525 feet above sea level. The terrain is nearly flat. Surround soils are shallow, fine textured clay loams derived from basalt parent material.

Mowitz Creek has been classified according to Rosgen Stream Channel typing as being within a C5 stream channel type. This channel type is a low gradient channel of primarily silt and clay channel materials that displays moderate entrenchment and confinement. This channel type on Mowitz Creek has the potential to develop into a C6 type characterized by low gradient, sand and silt channel materials with some fine gravels and deeply entrenched with no confinement.

## METHODS AND MATERIALS

The project consists of two distinct areas: 1) construction of improvements, and 2) monitoring of results.

Monitoring consists of two phases; pre-project characterization and followup monitoring to determine changes following implementation of the improvements.

Pre-project characterization consisted of establishing five stream cross sections, characterizing the existing riparian plant communities utilizing Green Line method, measuring pre-project water temperatures of the stream at the upper end of the project and at the lower end of the project and establishing photo points at the stream cross sections and at the beginning of the green line transect. The stream cross sections and the Green Line transects were taken in August of 1995. Water temperature was monitored using "Hobo", continuous readout, temperature probes beginning in the summer of 1995. Additional data was gathered on plant cover and production by Tulelake High School biology classes in September of 1995 and again in September of 1996. Techniques for stream cross sections and Green Line transects are found in Appendix A.

Construction of improvements began in October of 1995 and consisted of modification of the County Road 136 culverts, fencing of Mowitz Creek from the existing exclosure above County Road 136 to the U.S. Fish and Wildlife Service boundary at Clear Lake, and drilling and development of a water well southeast of the enclosure.

Modification of the County Road 136 culverts consisted of building a concrete barrier from the bottom of the culverts to bedrock on the upper end of the culverts in order to stop subsurface low water flows beneath the culverts. Additionally, a six inch tall concrete barrier was built across the inlet of one of the culverts in order to divert the total low water flow through the other culvert. At the outlet end of the culverts, a concrete apron with energy dissipaters was built to

bridge the fall from the culvert outlet to the stream channel. Rock filled gabions were installed on the downstream side on both sides of the culverts to stabilize the roadbed and prevent excessive siltation during peak runoff periods when the stream typically overflows its banks and overtops the road

The creek was fenced using a standard four wire/steel post fence configuration. The fence was placed back away from the creek approximately 500 feet on the east side of the creek, and 1250 feet on the west side of the creek. Cattleguards were used on both sides of the creek where the fence crossed the road. The north end of the fence was tied into an existing exclosure north of County Road 136. The south end of the fence was tied into the Clear Lake Wildlife Refuge boundary fence. Fence construction and cattleguard installation took place in October 1995.

A water well was drilled in T. 46 N., R. 6 E., Section 34 to provide water for livestock and attract them away from the project area. The water is pumped with a DC submersible pump powered by a solar generator. The well was drilled and the pump and generator installed in September 1996.

## RESULTS AND DISCUSSION OF ACCOMPLISHMENTS

### Pre-Project Monitoring

#### Stream Cross Sections

See data, Appendix B

Mowitz Creek within the project area was found to be relatively wide and shallow. The average width to depth ratio is 31.3 feet indicating wide divergence from potential conditions within the C5 stream channel type.

#### Water Temperature

Data not available at this time

#### Vegetative and Plant Community Composition

See data, Appendix C

Green Line Transect data indicate that the riparian area within this section of Mowitz Creek is in early seral condition. Objectives for this site is for mid to late seral condition.

### Project Improvements

#### Culvert Modifications and Gabion Installation

Approximately 10 cubic yards of concrete were installed to complete the modification for low water flow. Work, including construction of concrete forms and concrete pouring and finishing was completed by the forest service construction and maintenance crew utilizing forest service equipment. Concrete was furnished by Jefferson State Concrete of Klamath Falls, OR.

#### Fence Construction and Cattleguard Installation

Approximately 1.38 miles of fence was constructed by contract. Contractor was Parker Engineering of MacArthur, CA.

Cattleguards were installed by the forest service construction and maintenance crew.

Well Drilling and Development

The water well was drilled by Enloe Well Drilling of Bieber, CA under contract. The well is 165 feet deep and produces approximately 25 gallons per minute.

The DC submersible pump was purchased from Photocomm, Inc. of Scottsdale, AZ who also designed and furnished the solar generator. The systems is working very well.

## SUMMARY AND CONCLUSIONS

All construction and improvement work for this project is complete at this time. All improvements are functioning as designed.

Baseline monitoring is complete with the exception of tabulation of water temperature data. Subsequent change monitoring is scheduled for 1997 and every three years following until the desired condition of the project area is achieved. Periodic monitoring will be done following that time to insure that the project is being maintained in the desired condition.

## SUMMARY OF EXPENSES

The following is a tabulation of the project expenses:

| | |
|---|---|
| Materials | |
| (fence material, water troughs, etc) | $ 1819.90 |
| Contracts | |
| fence construction | $ 2757.24 |
| well drilling | $ 3537.20 |
| Equipment | |
| DC Submersible pump and solar generator | $ 6470.00 |
| TOTAL | $14584.34 |

# APPENDIX

# APPENDIX A

# GREEN LINE VEGETATION COMPOSITION
## R2-2200-GL

## GENERAL DISCUSSION

Sampling community type composition along edges of live water can provide additional information over that collected by the cross-section process. Presence of permanent water in the plant rooting zone allows more rapid recovery of vegetation after disturbances. This permits a rangeland manager to make an earlier evaluation of management intended to improve riparian condition. Also, measurement of this portion of the riparian area provides an indication of short-term trend for the riparian area. This is where the forces of water, as influenced by total watershed condition, play their most prominent role.

Additionally, there is a strong relationship between amount and kind of vegetation along the water's edge and bank stability. Natural plant species in this permanently watered area have developed rooting systems which enhance bank stability. An evaluation of the vegetation in this area can thus provide a good indication of the general health of the watershed, as well as the stream..

*The green line is defined as that specific area where a more or less continuous cover of perennial, hydric vegetation is encountered when moving away from the perennial water source (Figure 5-3).*

At times, the green line may be at the water's edge. Or, it may be part way back on a gravel or sandbar. The green line may be only a foot or two wide, or may be many feet wide, depending on soil and water features. Native plant species forming the green line, such as beaked sedge or water sedge are generally good buffers of water forces. Disturbance activities, such as overgrazing or trampling by animals or people, result in changes to species such as Kentucky bluegrass or redtop, both of which have a reduced ability to buffer water forces.

In most riparian settings, there is a continual effort by nature to form this green line of vegetation, even where the adjacent community types are composed of the more shallow-rooted species. Well developed green line vegetation stabilizes channel banks and buffers water forces. This enhances channel stability, even for inherently unstable stream types. Therefore, an evaluation of the

community type composition of the green line can provide a good indication of the general health of the riparian area.

## TRAINING

The Green Line Vegetation Composition Method does not require intensive training for field application. Examiners must be able to recognize different communities and identify where the change between communities occurs. The most complicated aspect of this method is to record the number of feet per community for all communities on each cross-section.

Examiners should work closely with District or Forest hydrologists or fisheries biologists to learn to estimate percent composition of different stream substrates. In addition, examiners must be able to recognize characteristics of stable and unstable stream banks.

## PERSONNEL AND EQUIPMENT

One person can complete and record green line vegetation composition transects, however it is easier and more efficient for a second person to function as a recorder. The equipment required to complete this method are stakes to mark transect ends, a hand-held counter, and a camera.

## SAMPLING PROCEDURE

The green line transect begins on the right-hand side of the stream (looking upstream) at the point where the first cross-section composition transect intercepts the green line (Figure 5-3). In settings where the stream has multiple channels, use the current, most dominant channel. Sampling proceeds up the green line using a paced transect, as described in the cross-section composition measurement, instead of a stretched tape.

Enough steps should be taken to total 363 feet linear distance; the number of steps will vary from examiner to examiner. A temporary marker is placed at the end of the transect for location of subsequent shrub measurements. The examiner then crosses the stream and repeats the sampling process for 363 feet downstream. Use the Riparian Green Line Transect Data Form (R2-2200-GL) to record the number of steps for each transect and the Green Line Summary (R2-2200-GLSum) to summarize the community distribution for the entire riparian area.

Start and stop counts are recorded for every community type change. Subsequent measurements of the same area provide a measurement of trend for that complex. Indicating start and stop counts on the form will assist in evaluating trend later. In addition, they are important cross references with aquatic surveys.

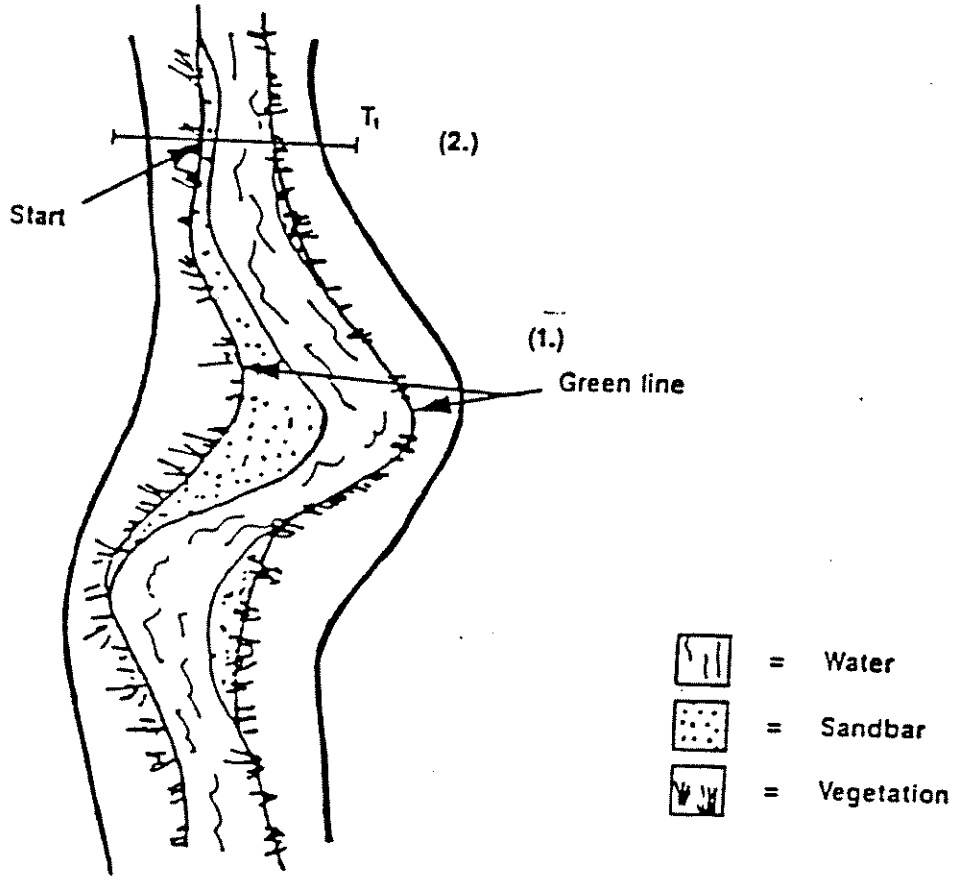
*NOTE: The stopping point may not coincide with the initial starting point on the other side of the stream due to difference in lengths of meanders on each side of the stream. It is important to sample both sides of the stream since activities (grazing pressures or water forces) may be different on each side.*

On certain streams, especially those with steep gradients, the number of feet of large anchored rocks or large logs should be tallied in addition to the vegetation. Rocks and logs must be large enough to withstand the forces of water and must appear stable in the setting being measured. The number of feet of rocks and logs would be counted as a natural stable percentage of the green line. Also tally the number of feet of disturbed or damaged stream bank. This gives an accurate measure of the amount of disturbance.

Experience in all Regions has shown that stream bank stability is a critical characteristic for initial inventory and monitoring of grazing programs. Stream substrates are also important from fisheries and stream health perspectives. Fill out estimates of stream bank stability and stream substrates when doing the green line transect.

Figure 5-3. GREEN LINE VEGETATION COMPOSITION MEASUREMENT

Location of (1) the green line in relation to the water's edge and to sandbars and (2) location of the green line transect in relation to the cross-section composition transect.



## NUMBER OF TRANSECTS

The number of green line transects measured is dependent on the inventory intensity, and the complexity and size of the riparian ecosystem. As many as one green line transect may be established for each cross-section composition transect. At least one green line transect should be established for every grouping of cross-section composition transects.

## COMPUTATIONS

The total number of feet of each community type encountered along the green line is tallied and composition for each type computed as described in the cross-section composition measurement. For example:

$$\frac{\text{Total Feet of Each Type (Left + Right Side)}}{\text{726 Ft (363 Ft Minimum Each Side)}} = \text{CT Composition}$$

## PHOTOGRAPHS

A photograph can be taken at the starting point of the green line transect, looking upstream. Additional photos may be taken along the transect if desired. These photographs should include permanent landscape features wherever possible to assist in geo-referencing the transects so they can be re-established in the future.

Conduct a woody species regeneration survey on the same transect location using Form R2-2200-WS (page 5-23).

# APPENDIX B

Stream Channel Cross-Sections on Mowitz Cre August 11, 1995

| Foot Increments (X) | T1 (Y) | T2 (Y) | T3 (Y) | T4 (Y) | T5 (Y) |
|---|---|---|---|---|---|
| 0 | 3.81 | 2.75 | 1.08 | 1.84 | 1.96 |
| 1 | 3.76 | 2.63 | 1.26 | 2.06 | 1.95 |
| 2 | 3.65 | 2.63 | 1.38 | 2.30 | 1.89 |
| 3 | 3.49 | 2.95 | 1.38 | 2.51 | 1.90 |
| 4 | 3.35 | 3.22 | 1.44 | 2.24 | 1.62 |
| 5 | 3.31 | 3.23 | 1.49 | 2.09 | 1.54 |
| 6 | 3.45 | 3.20 | 1.56 | 1.96 | 1.45 |
| 7 | 3.52 | 3.00 | 1.55 | 2.23 | 2.99 |
| 8 | 3.63 | 3.15 | 1.42 | 2.61 | 3.37 |
| 9 | 3.76 | 3.36 | 1.34 | 2.72 | 3.35 |
| 10 | 3.76 | 3.27 | 1.38 | 2.84 | 3.35 |
| 11 | 3.48 | 3.45 | 1.54 | 3.14 | 3.14 |
| 12 | 3.47 | 3.86 | 1.60 | 3.42 | 3.20 |
| 13 | 3.65 | 3.83 | 1.80 | 3.78 | 3.29 |
| 14 | 3.84 | 3.71 | 1.92 | 3.98 | 3.41 |
| 15 | 4.03 | 3.68 | 2.09 | 4.28 | 3.77 |
| 16 | 4.27 | 3.64 | 2.24 | 4.40 | 3.84 |
| 17 | 4.50 | 3.76 | 2.46 | 4.53 | 3.93 |
| 18 | 4.62 | 3.66 | 2.58 | 4.50 | 4.01 |
| 19 | 4.72 | 3.52 | 2.60 | 4.63 | 4.20 |
| 20 | 4.84 | 3.46 | 2.79 | 4.79 | 4.36 |
| 21 | 4.78 | 3.48 | 2.97 | 4.78 | 4.40 |
| 22 | 4.62 | 3.46 | 3.24 | 4.99 | 4.41 |
| 23 | 4.58 | 3.52 | 3.29 | 4.81 | 4.44 |
| 24 | 4.76 | 3.32 | 3.27 | 4.62 | 4.35 |
| 25 | 4.93 | 3.41 | 3.33 | 4.94 | 4.27 |
| 26 | 5.00 | 3.46 | 3.59 | 5.19 | 3.91 |
| 27 | 4.96 | 3.48 | 3.29 | 5.13 | 3.82 |
| 28 | 5.01 | 3.45 | 3.70 | 5.15 | 3.84 |
| 29 | 4.98 | 3.43 | 3.75 | 5.11 | 3.89 |
| 30 | 4.93 | 3.35 | 4.16 | 5.09 | 3.89 |
| 31 | 5.22 | 3.32 | 4.15 | 5.72 | 3.94 |
| 32 | 5.18 | 3.39 | 4.25 | 5.64 | 3.96 |
| 33 | 5.22 | 3.50 | 3.70 | 5.59 | 3.99 |
| 34 | 5.29 | 3.72 | 3.62 | 5.34 | 4.04 |
| 35 | 5.34 | 4.01 | 3.59 | 5.40 | 4.08 |
| 36 | 5.41 | 4.36 | 3.62 | 5.13 | 4.05 |
| 37 | 5.44 | 4.27 | 3.62 | 4.88 | 4.13 |
| 38 | 5.53 | 4.36 | 3.39 | 5.15 | 4.24 |
| 39 | 5.80 | 4.50 | 3.58 | 4.84 | 4.72 |
| 40 | 5.99 | 4.54 | 3.68 | 4.70 | 4.69 |
| 41 | 6.06 | 4.71 | 3.76 | 4.60 | 5.13 |
| 42 | 6.02 | 4.62 | 4.00 | 4.55 | 5.25 |
| 43 | 6.11 | 4.87 | 4.70 | 4.60 | 5.33 |
| 44 | 6.29 | 5.01 | 3.87 | 4.73 | 5.49 |
| 45 | 6.19 | 5.33 | 4.35 | 4.61 | 5.69 |
| 46 | 7.03 | 5.35 | 4.33 | 4.42 | 5.57 |
| 47 | 7.15 | 5.37 | 4.62 | 4.38 | 5.29 |

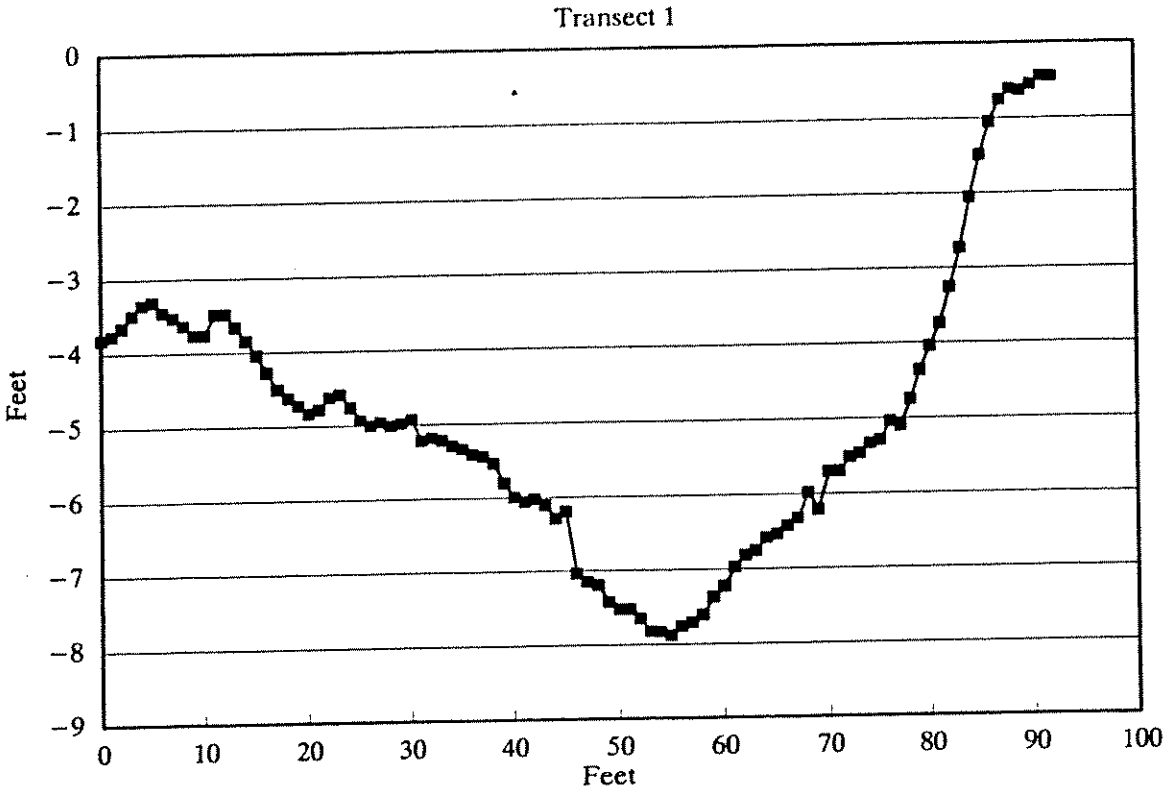
| | | | | | |
|---|---|---|---|---|---|
| 48 | 7.19 | 5.47 | 4.52 | 4.43 | 5.14 |
| 49 | 7.42 | 5.47 | 4.34 | 4.27 | 4.80 |
| 50 | 7.52 | 5.53 | 4.32 | 4.43 | 4.91 |
| 51 | 7.52 | 5.40 | 4.20 | 4.44 | 4.35 |
| 52 | 7.65 | 5.44 | 4.03 | 4.41 | 4.25 |
| 53 | 7.82 | 5.21 | 4.10 | 4.28 | 4.26 |
| 54 | 7.83 | 5.04 | 3.95 | 4.41 | 4.36 |
| 55 | 7.88 | 5.01 | 3.79 | 4.38 | 4.13 |
| 56 | 7.76 | 4.91 | 3.65 | 4.30 | 4.14 |
| 57 | 7.71 | 4.72 | 3.59 | 4.31 | 3.74 |
| 58 | 7.61 | 4.41 | 3.59 | 3.86 | 4.16 |
| 59 | 7.37 | 4.48 | 3.54 | 4.08 | 4.16 |
| 60 | 7.23 | 4.37 | 3.54 | 3.89 | 4.05 |
| 61 | 6.97 | 4.27 | 3.52 | 3.99 | 3.70 |
| 62 | 6.81 | 3.96 | 3.58 | 3.97 | 3.37 |
| 63 | 6.75 | 3.84 | 3.49 | 3.99 | 3.12 |
| 64 | 6.58 | 3.72 | 3.52 | 3.83 | 2.74 |
| 65 | 6.53 | 3.39 | 3.47 | 3.45 | 2.42 |
| 66 | 6.42 | 3.00 | 3.45 | 2.72 | 2.10 |
| 67 | 6.32 | 2.12 | 3.47 | 2.26 | 1.88 |
| 68 | 5.98 | 1.19 | 3.48 | 1.74 | 1.83 |
| 69 | 6.21 | 0.49 | 3.66 | 0.95 | 1.87 |
| 70 | 5.70 | 0.27 | 3.92 | 0.67 | 1.85 |
| 71 | 5.70 | 0.26 | 3.91 | 0.33 | 2.16 |
| 72 | 5.51 | 0.25 | 3.86 | 0.38 | 2.19 |
| 73 | 5.46 | 0.28 | 3.59 | 0.63 | 2.09 |
| 74 | 5.33 | 0.11 | 3.03 | 0.68 | 2.16 |
| 75 | 5.29 | 0.13 | 2.61 | | 1.89 |
| 76 | 5.04 | 0.22 | 1.98 | | |
| 77 | 5.10 | 0.19 | 1.05 | | |
| 78 | 4.75 | 0.12 | 0.49 | | |
| 79 | 4.36 | 0.10 | 0.08 | | |
| 80 | 4.04 | 0.19 | 0.04 | | |
| 81 | 3.74 | 0.25 | 0.20 | | |
| 82 | 3.26 | 0.23 | 0.16 | | |
| 83 | 2.73 | | 0.23 | | |
| 84 | 2.06 | | 0.31 | | |
| 85 | 1.49 | | | | |
| 86 | 1.05 | | | | |
| 87 | 0.75 | | | | |
| 88 | 0.61 | | | | |
| 89 | 0.63 | | | | |
| 90 | 0.55 | | | | |
| 91 | 0.44 | | | | |
| 92 | 0.45 | | | | |

August 11, 1995

| Foot Increments (X) | T1 (Y) | T2 (Y) | T3 (Y) | T4 (Y) | T5 (Y) |
|---|---|---|---|---|---|
| 0 | -3.81 | -2.75 | -1.08 | -1.84 | -1.96 |
| 1 | -3.76 | -2.63 | -1.26 | -2.06 | -1.95 |
| 2 | -3.65 | -2.63 | -1.38 | -2.30 | -1.89 |
| 3 | -3.49 | -2.95 | -1.38 | -2.51 | -1.90 |
| 4 | -3.35 | -3.22 | -1.44 | -2.24 | -1.62 |
| 5 | -3.31 | -3.23 | -1.49 | -2.09 | -1.54 |
| 6 | -3.45 | -3.20 | -1.56 | -1.96 | -1.45 |
| 7 | -3.52 | -3.00 | -1.55 | -2.23 | -2.99 |
| 8 | -3.63 | -3.15 | -1.42 | -2.61 | -3.37 |
| 9 | -3.76 | -3.36 | -1.34 | -2.72 | -3.35 |
| 10 | -3.76 | -3.27 | -1.38 | -2.84 | -3.35 |
| 11 | -3.48 | -3.45 | -1.54 | -3.14 | -3.14 |
| 12 | -3.47 | -3.86 | -1.60 | -3.42 | -3.20 |
| 13 | -3.65 | -3.83 | -1.80 | -3.78 | -3.29 |
| 14 | -3.84 | -3.71 | -1.92 | -3.98 | -3.41 |
| 15 | -4.03 | -3.68 | -2.09 | -4.28 | -3.77 |
| 16 | -4.27 | -3.64 | -2.24 | -4.40 | -3.84 |
| 17 | -4.50 | -3.76 | -2.46 | -4.53 | -3.93 |
| 18 | -4.62 | -3.66 | -2.58 | -4.50 | -4.01 |
| 19 | -4.72 | -3.52 | -2.60 | -4.63 | -4.20 |
| 20 | -4.84 | -3.46 | -2.79 | -4.79 | -4.36 |
| 21 | -4.78 | -3.48 | -2.97 | -4.78 | -4.40 |
| 22 | -4.62 | -3.46 | -3.24 | -4.99 | -4.41 |
| 23 | -4.58 | -3.52 | -3.29 | -4.81 | -4.44 |
| 24 | -4.76 | -3.32 | -3.27 | -4.62 | -4.35 |
| 25 | -4.93 | -3.41 | -3.33 | -4.94 | -4.27 |
| 26 | -5.00 | -3.46 | -3.59 | -5.19 | -3.91 |
| 27 | -4.96 | -3.48 | -3.29 | -5.13 | -3.82 |
| 28 | -5.01 | -3.45 | -3.70 | -5.15 | -3.84 |
| 29 | -4.98 | -3.43 | -3.75 | -5.11 | -3.89 |
| 30 | -4.93 | -3.35 | -4.16 | -5.09 | -3.89 |
| 31 | -5.22 | -3.32 | -4.15 | -5.72 | -3.94 |
| 32 | -5.18 | -3.39 | -4.25 | -5.64 | -3.96 |
| 33 | -5.22 | -3.50 | -3.70 | -5.59 | -3.99 |
| 34 | -5.29 | -3.72 | -3.62 | -5.34 | -4.04 |
| 35 | -5.34 | -4.01 | -3.59 | -5.40 | -4.08 |
| 36 | -5.41 | -4.36 | -3.62 | -5.13 | -4.05 |
| 37 | -5.44 | -4.27 | -3.62 | -4.88 | -4.13 |
| 38 | -5.53 | -4.36 | -3.39 | -5.15 | -4.24 |
| 39 | -5.80 | -4.50 | -3.58 | -4.84 | -4.72 |
| 40 | -5.99 | -4.54 | -3.68 | -4.70 | -4.69 |
| 41 | -6.06 | -4.71 | -3.76 | -4.60 | -5.13 |
| 42 | -6.02 | -4.62 | -4.00 | -4.55 | -5.25 |
| 43 | -6.11 | -4.87 | -4.70 | -4.60 | -5.33 |
| 44 | -6.29 | -5.01 | -3.87 | -4.73 | -5.49 |
| 45 | -6.19 | -5.33 | -4.35 | -4.61 | -5.69 |
| 46 | -7.03 | -5.35 | -4.33 | -4.42 | -5.57 |
| 47 | -7.15 | -5.37 | -4.62 | -4.38 | -5.29 |

| | | | | | |
|---|---|---|---|---|---|
| 48 | −7.19 | −5.47 | −4.52 | −4.43 | −5.14 |
| 49 | −7.42 | −5.47 | −4.34 | −4.27 | −4.80 |
| 50 | −7.52 | −5.53 | −4.32 | −4.43 | −4.91 |
| 51 | −7.52 | −5.40 | −4.20 | −4.44 | −4.35 |
| 52 | −7.65 | −5.44 | −4.03 | −4.41 | −4.25 |
| 53 | −7.82 | −5.21 | −4.10 | −4.28 | −4.26 |
| 54 | −7.83 | −5.04 | −3.95 | −4.41 | −4.36 |
| 55 | −7.88 | −5.01 | −3.79 | −4.38 | −4.13 |
| 56 | −7.76 | −4.91 | −3.65 | −4.30 | −4.14 |
| 57 | −7.71 | −4.72 | −3.59 | −4.31 | −3.74 |
| 58 | −7.61 | −4.41 | −3.59 | −3.86 | −4.16 |
| 59 | −7.37 | −4.48 | −3.54 | −4.08 | −4.16 |
| 60 | −7.23 | −4.37 | −3.54 | −3.89 | −4.05 |
| 61 | −6.97 | −4.27 | −3.52 | −3.99 | −3.70 |
| 62 | −6.81 | −3.96 | −3.58 | −3.97 | −3.37 |
| 63 | −6.75 | −3.84 | −3.49 | −3.99 | −3.12 |
| 64 | −6.58 | −3.72 | −3.52 | −3.83 | −2.74 |
| 65 | −6.53 | −3.39 | −3.47 | −3.45 | −2.42 |
| 66 | −6.42 | −3.00 | −3.45 | −2.72 | −2.10 |
| 67 | −6.32 | −2.12 | −3.47 | −2.26 | −1.88 |
| 68 | −5.98 | −1.19 | −3.48 | −1.74 | −1.83 |
| 69 | −6.21 | −0.49 | −3.66 | −0.95 | −1.87 |
| 70 | −5.70 | −0.27 | −3.92 | −0.67 | −1.85 |
| 71 | −5.70 | −0.26 | −3.91 | −0.33 | −2.16 |
| 72 | −5.51 | −0.25 | −3.86 | −0.38 | −2.19 |
| 73 | −5.46 | −0.28 | −3.59 | −0.63 | −2.09 |
| 74 | −5.33 | −0.11 | −3.03 | −0.68 | −2.16 |
| 75 | −5.29 | −0.13 | −2.61 | | −1.89 |
| 76 | −5.04 | −0.22 | −1.98 | | |
| 77 | −5.10 | −0.19 | −1.05 | | |
| 78 | −4.75 | −0.12 | −0.49 | | |
| 79 | −4.36 | −0.10 | −0.08 | | |
| 80 | −4.04 | −0.19 | −0.04 | | |
| 81 | −3.74 | −0.25 | −0.20 | | |
| 82 | −3.26 | −0.23 | −0.16 | | |
| 83 | −2.73 | | −0.23 | | |
| 84 | −2.06 | | −0.31 | | |
| 85 | −1.49 | | | | |
| 86 | −1.05 | | | | |
| 87 | −0.75 | | | | |
| 88 | −0.61 | | | | |
| 89 | −0.63 | | | | |
| 90 | −0.55 | | | | |
| 91 | −0.44 | | | | |
| 92 | −0.45 | | | | |

# Mowitz Creek




Stream X-Section
August 11, 1995

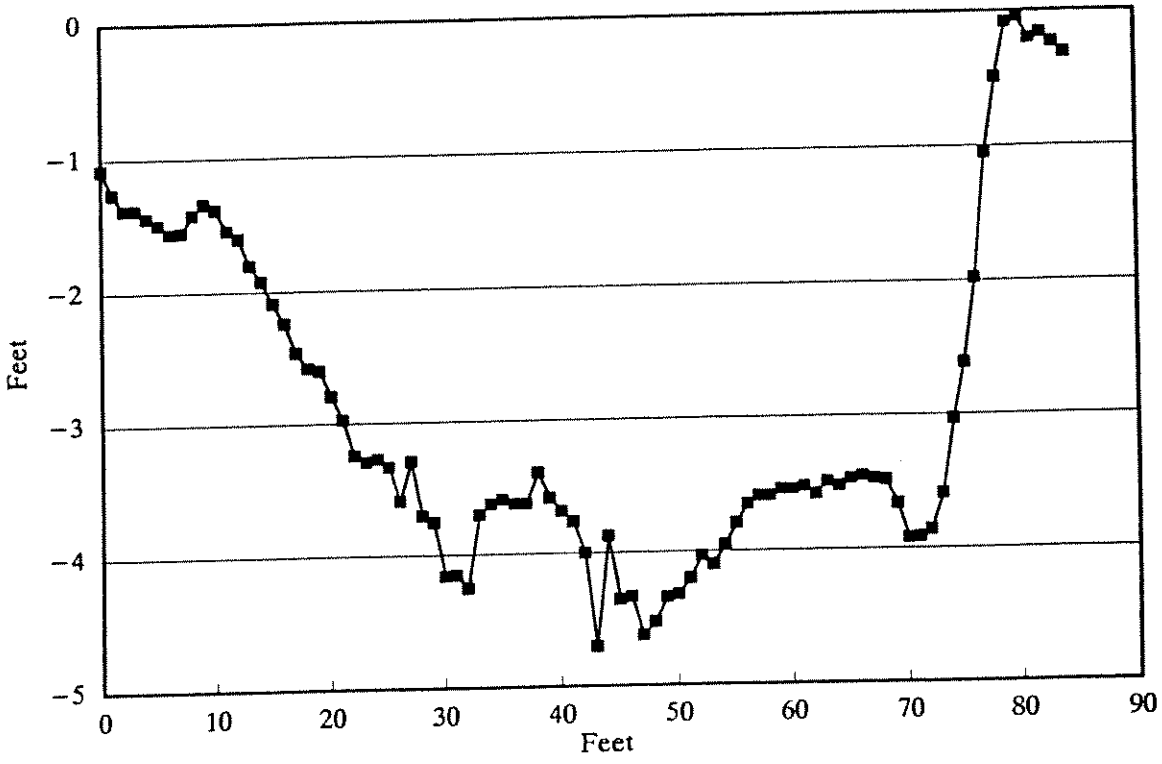
# Mowitz Creek

Transect 2


Stream X-Section
August 11, 1995

# Mowitz Creek

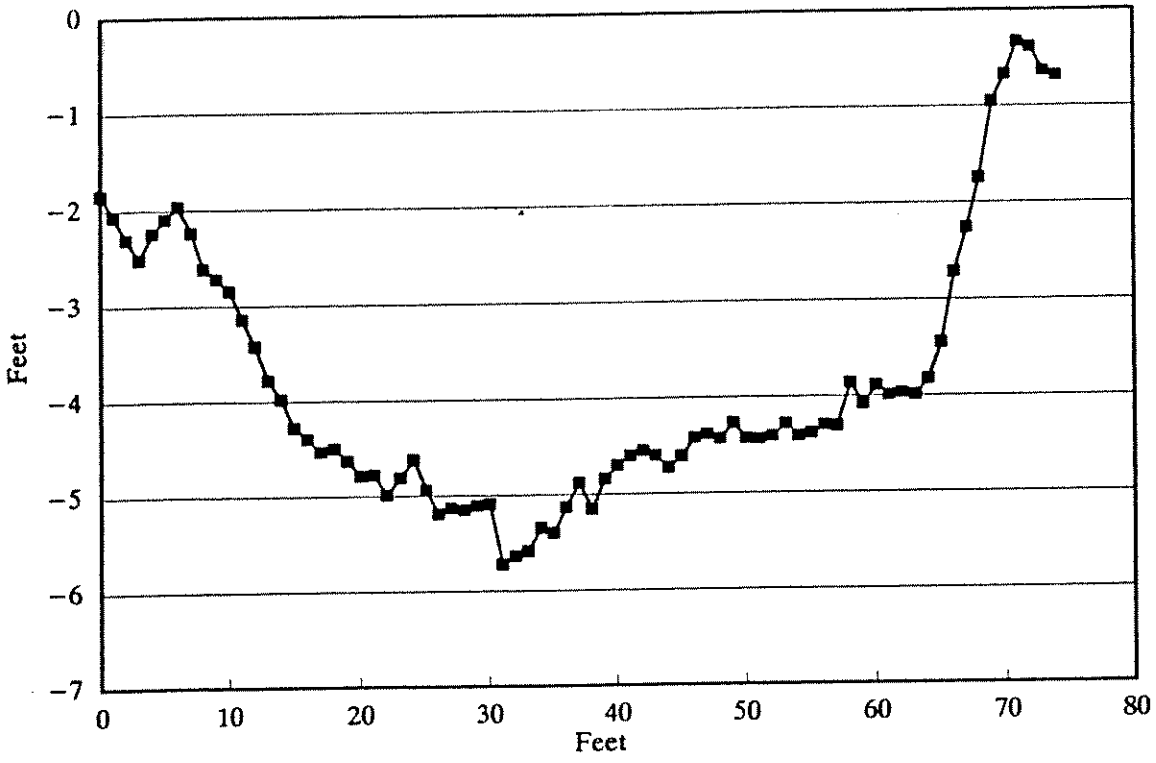
Transect 3




Stream X-Section
August 11, 1995

# Mowitz Creek

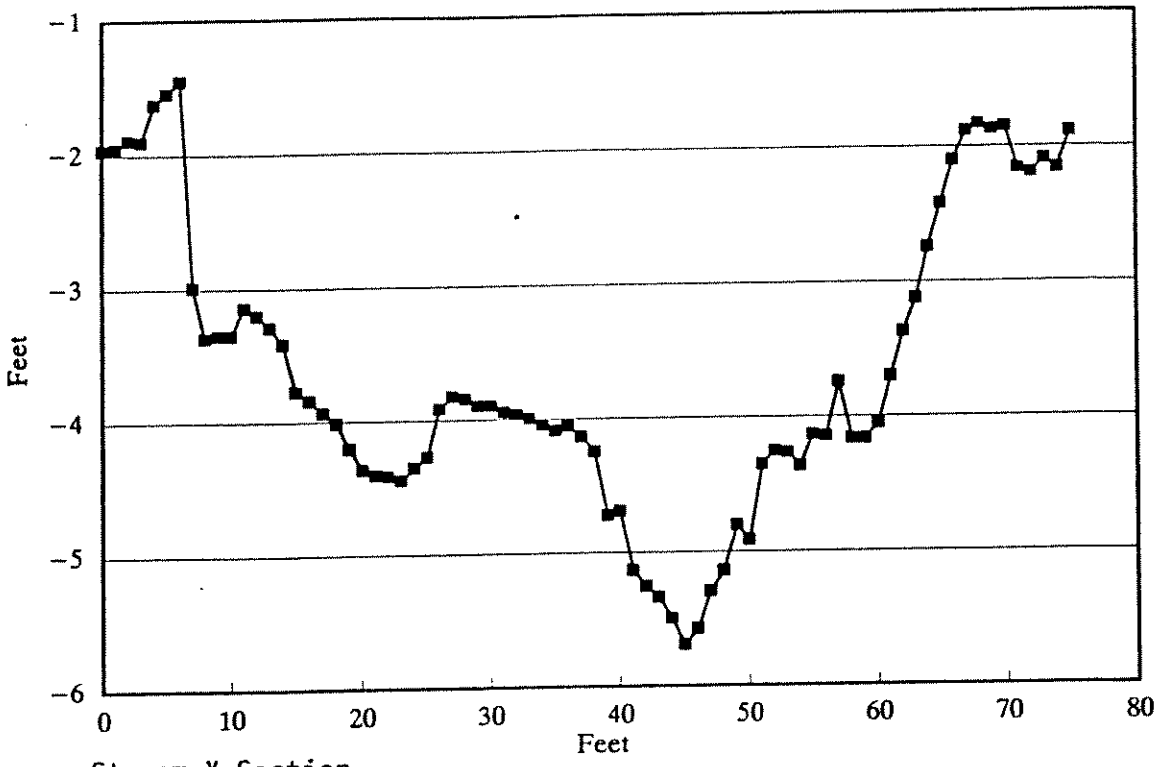
Transect 4




Stream X-Section
August 11, 1995

# Mowitz Creek

Transect 5




Stream X-Section
August 11, 1995

# APPENDIX C

# GREEN LINE ECOLOGICAL STATUS WORKSHEET

Complex Name (stream, lake,etc.; dominant soil family; stream type; dominant community type)

Mountz Clc

| Community Type | % Composition | ECOLOGICAL RATING | |
|---|---|---|---|
| | | Early | Late |
| Cane | 14.3 | | 14.3 |
| Juba | 14.3 | | 14.3 |
| Cane/Juba | 30.5 | | 30.5 |
| Eleocharis | 26.2 | 26.2 | |
| Bare Ground | 14.0 | 14.0 | |
| | | | |
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| | | | |
| | | | |
| TOTAL | 100% | 40.8 | 59.1 |

Percent Late Seral Types / Potential (see capability group value) $\frac{59.1}{95}$ = 62

ECOLOGICAL STATUS

| | |
|---|---|
| 0 - 15 | = very early seral |
| 16 - 40 | = early seral |
| 41 - 60 | = mid seral |
| 61 - 85 | = late seral |
| > 86 | = PNC |

Late

# GREEN LINE STABILITY RATING (CTs) WORKSHEET

Complex Name (stream, lake,etc.; dominant soil family; stream type; dominant community type)

Merwitz Creek

| Community Type | % Composition | STABILITY | |
|---|---|---|---|
| | | Class | Index |
| Cane | 14.3 | 9 | 1.29 |
| Juba | 14.3 | 9 | 1.29 |
| Cane/Juba | 30.5 | 9 | 2.74 |
| Eleocharis | 26.8 | 5 | 1.34 |
| Bare Soil | 14.0 | 0 | 0 |
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| | | | |
| TOTAL | 100% | | 6.66 |

## STABILITY RATING

| | | |
|---|---|---|
| | 0 - 2 | = very poor (very low) |
| | 3 - 4 | = poor (low) |
| X | 5 - 6 | = moderate |
| | 7 - 8 | = good (high) |
| | 9 - 10 | = excellent (very high) |

Moderate

# GREEN LINE SUMMARY

| Forest | District | Date Compiled |
|---|---|---|
| Modoc | Doublehead | 8/15/95 |
| Drainage: Mowitz Creek | | |
| Examiner(s): Reed/Villegas | | Photo Number(s) |
| Complex: Juba/Cane | | |
| Transect No.: T-1 | | |

| Community Type | $T_1$ (feet) | $T_2$ (feet) | $T_3$ (feet) | $T_4$ (feet) | $T_5$ (feet) | COMPOSITION | |
|---|---|---|---|---|---|---|---|
| | | | | | | Total Feet | Percent |
| Cane | 107.25 | | | | | 107.25 | 14.3 |
| Juba | 107.25 | | | | | 107.25 | 14.3 |
| Cane/Juba | 228.25 | | | | | 228.25 | 30.5 |
| Meadow | 200.75 | | | | | 200.75 | 26.8 |
| Bare Ground | 104.5 | | | | | 104.50 | 14.0 |
| | | | | | | | |
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BARS WITHIN ALL TRANSECTS (Optional)

| | FEET |
|---|---|
| GRAVEL | |
| SAND | |
| SILT/CLAY | 104.5 |

# RIPARIAN GREEN LINE TRANSECT DATA

| | | |
|---|---|---|
| Forest: Modoc | District: Doublehead | Date: 8/15/95 |
| Drainage: Mount Creek | | |
| Examiner(s): Reed / Vullegan | | Photo Number(s) |
| Complex: Julia / Cane | | |
| Location: Downstream from Co. Rd 136 | | |
| Transect No.: T-1 | Feet/Step: 2.75 ft/step | |

| Community Type | STEPS Left | STEPS Right | FEET (Steps x ft/Step) |
|---|---|---|---|
| Cane | 2,1,1,7,1 = 12 | 5,7,7,2,3,3 = 27 | 107.25 |
| Julia | 7,6,5,1,2,4,1,4 = 30 | 6,2,1, = 9 | 107.25 |
| Cane/Julia | 6,9 = | 9,5 = 14 | 226.25 |
| Elocaris | 4,6,3,2,9 = 24 | 3,3,9,15,12,2,5 = 49 | 200.75 |
| Bare Ground | 1 | 37 | |
| | | | |
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| | STEPS | FEET |
|---|---|---|
| GRAVEL | | |
| SAND | | |
| SILT/CLAY | 1 + 37 = | 104.5 |

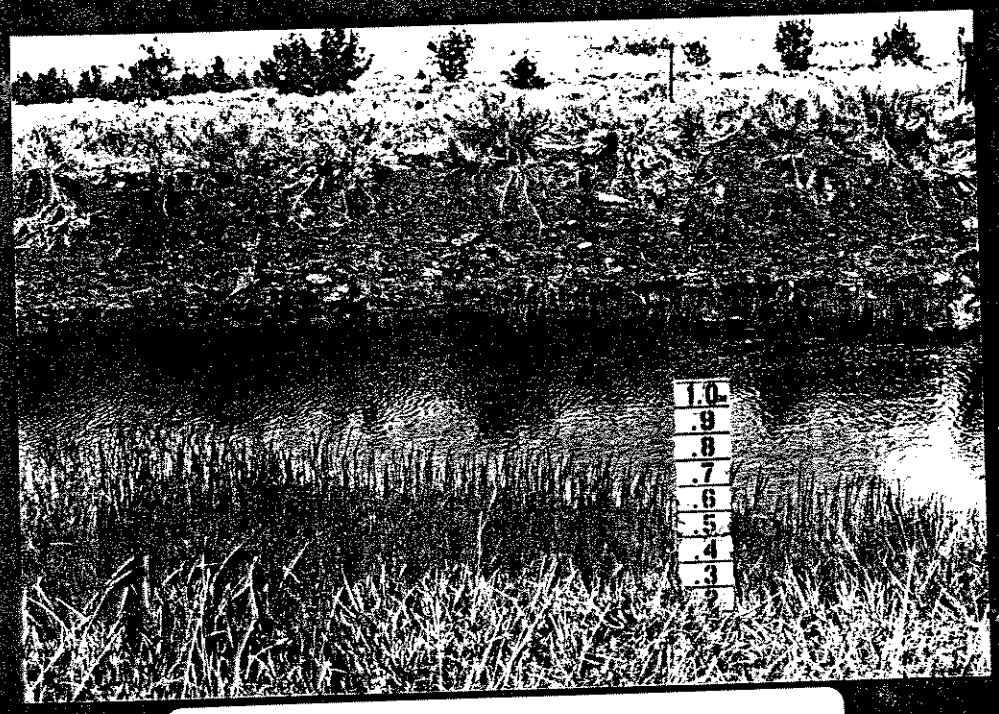
748'

RECEIVED

By

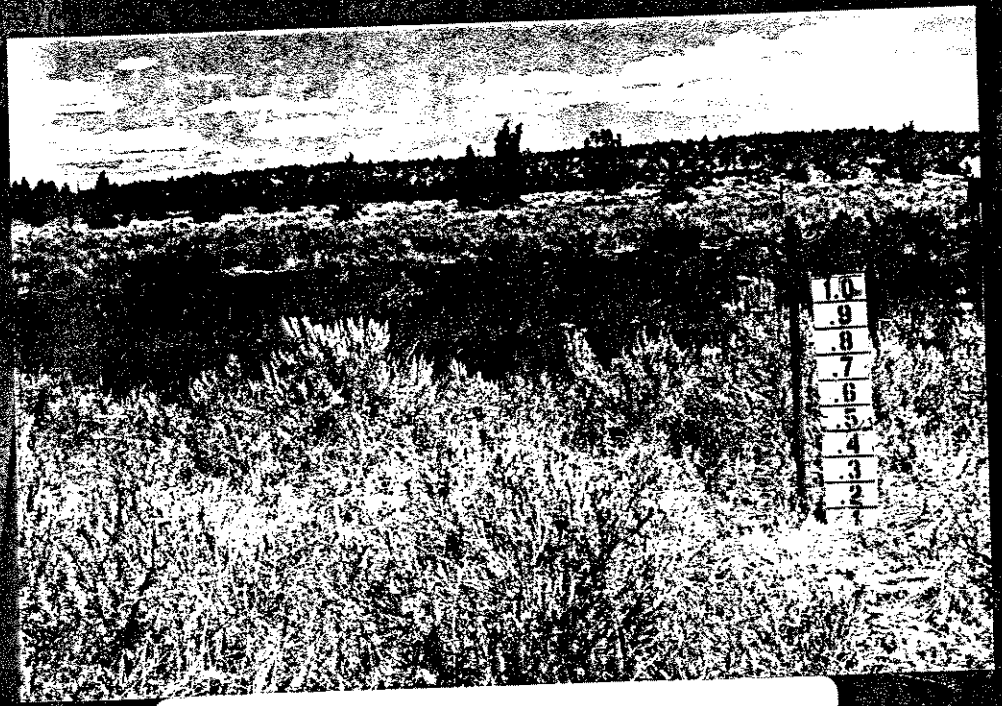
MOWITZ CREEK

STREAM CROSS SECTION




TRANSECT 1 LEFT BANK

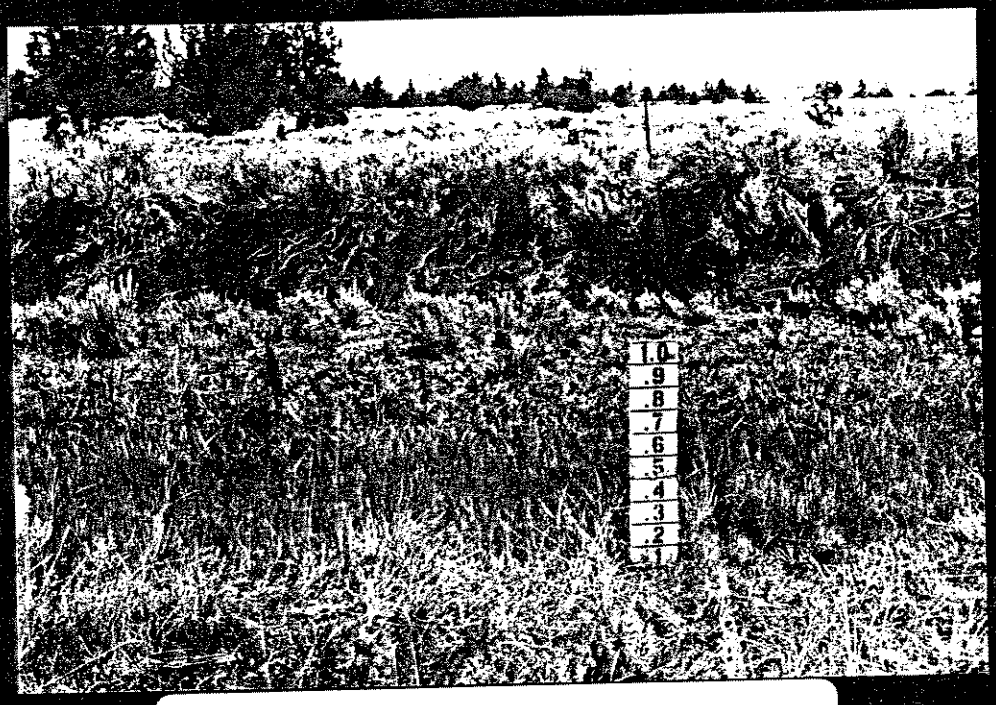
WATERS EDGE



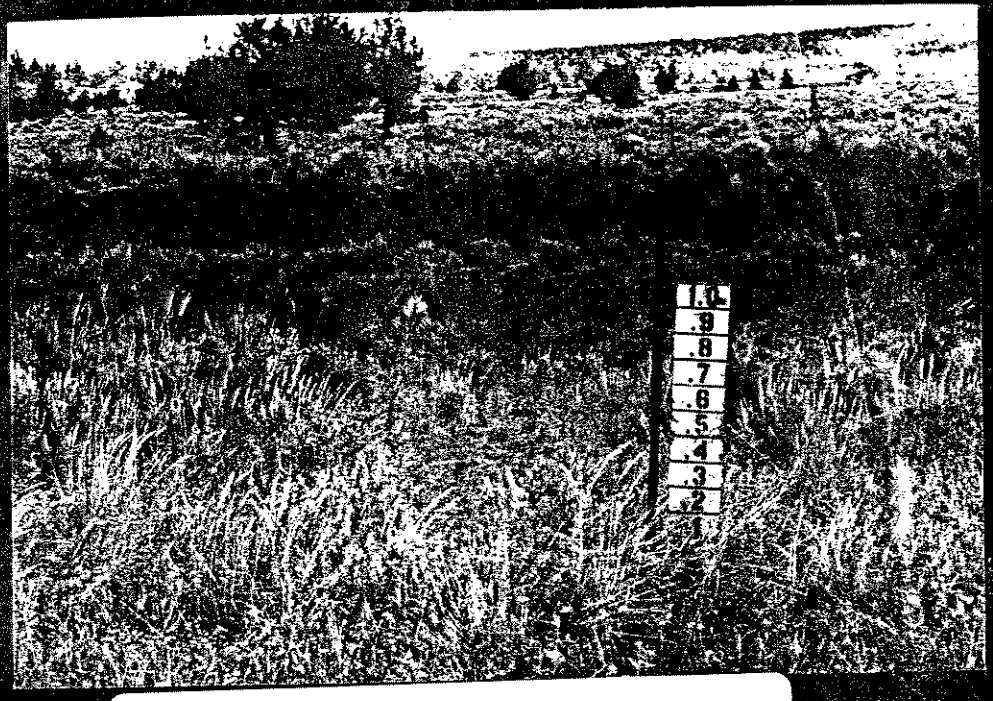

TRANSECT 1 LEFT BANK

TRANSECT START POINT

STREAM CROSS SECTION

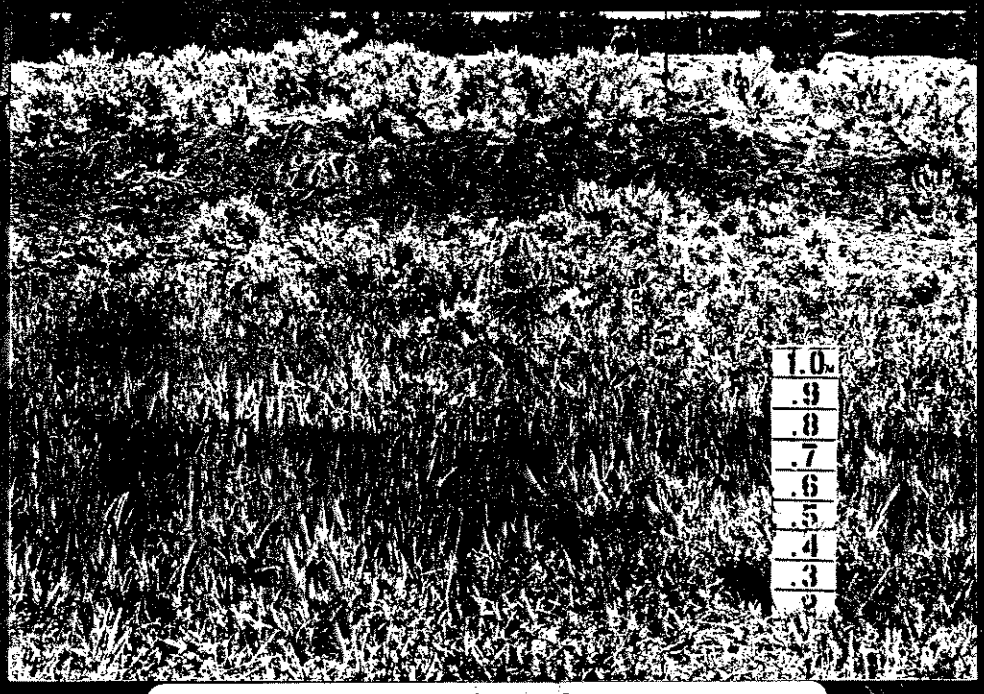



TRANSECT 2 LEFT BANK
WATERS EDGE




TRANSECT 2 LEFT BANK
TRANSECT START POINT

MOWITZ CREEK
STREAM CROSS SECTION

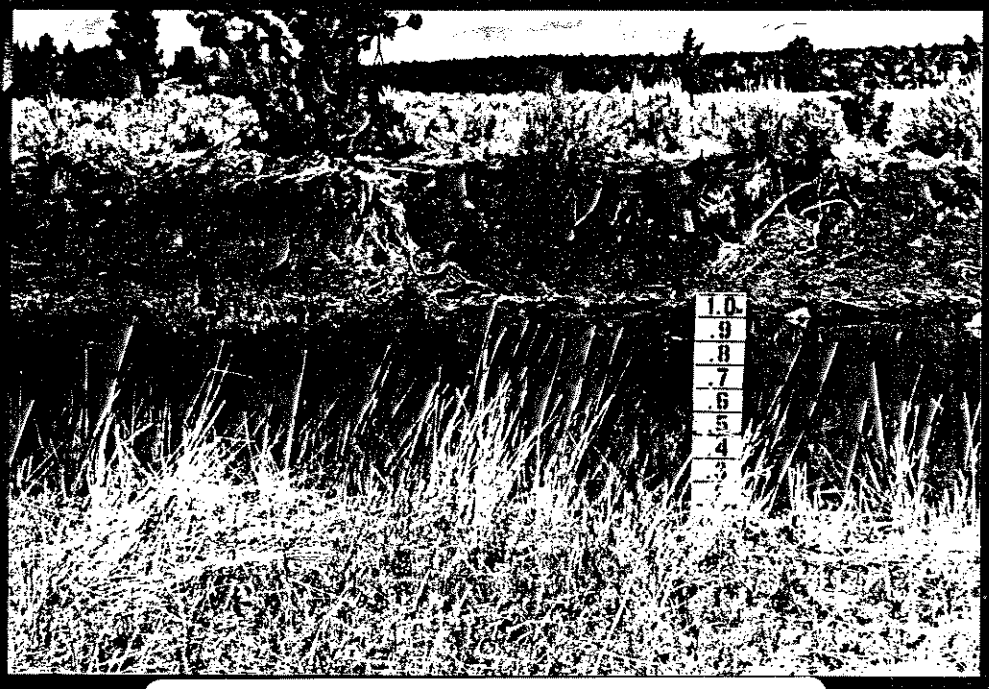



TRANSECT 3 LEFT BANK
WATERS EDGE

TRANSECT 3 LEFT BANK
TRANSECT START POINT

HOWITZ CREEK

STREAM CROSS SECTION




TRANSECT 4 LEFT BANK

WATERS EDGE


TRANSECT 4 LEFT BANK

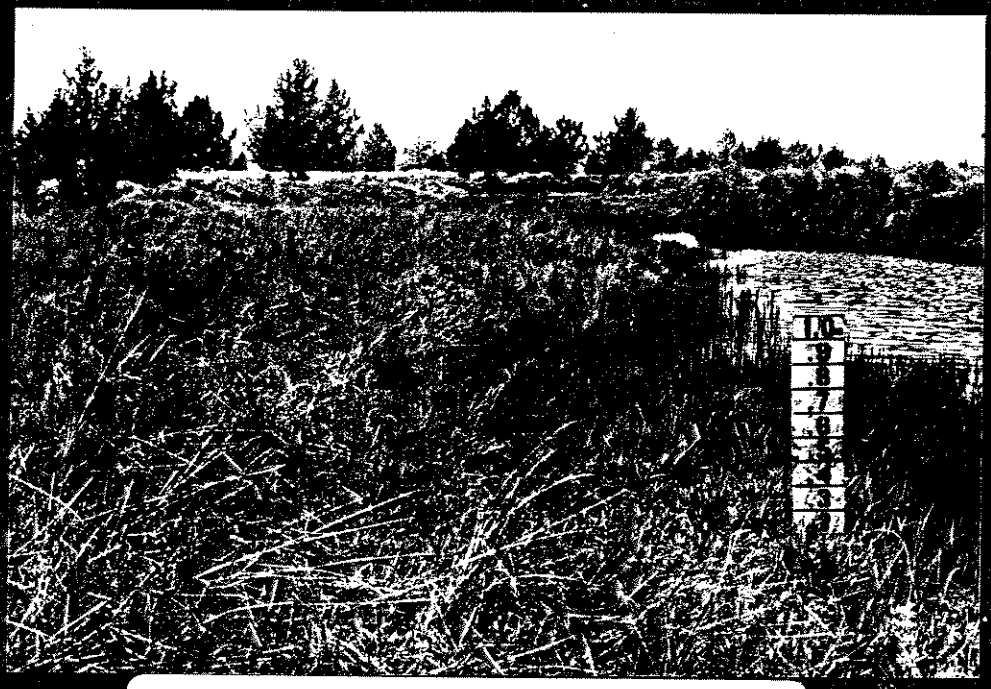
TRANSECT START POINT

STREAM CROSS SECTION

TRANSECT 5 LEFT BANK
WATERS EDGE

TRANSECT 5 LEFT BANK
TRANSECT START POINT

MOWITZ CREEK
GREEN LINE TRANSECT



GREEN LINE TRANSECT
START POINT