MALHEUR RIVER SUBBASIN
Project #: 32018
Williams Ranch Fish and Wildlife Acquisition Project
Sponsor: Burns Paiute Tribe
Province: Middle Snake

ISRP Comment #1: ***There must be detailed monitoring and evaluation plans in the "Objectives, tasks, and methods" section***.

The Tribe's M&E protocols were written in such a way that they pertain to all mitigation sites and proposed acquisitions. It is repeated at the end of this document for your convenience. NOTE: The elk M&E study pertains only to the Malheur River Wildlife Mitigation Site (#200002700).

ISRP Comment #2: ***What are the plans for the use of the water rights associated with the property?***

The Williams Ranch meadows are very similar to those of the Malheur River Wildlife Mitigation Site in hydrology, plant community structure, and challenges and obstacles. Therefore management will closely resemble that of the other site in both water management and meadow manipulation.

ISRP Comment #3: *Can the water rights provide instream flow for the portion of the South Fork of the Malheur that is occasionally dewatered and through the Jones Property to the Snake River Reservoirs?*

The only water rights associated with the property come from the North Fork Malheur River. South Fork water rights in this immediate area belong to ODFW. Water could, however, be held instream to the Snake River reservoirs. This practice would gain little for fisheries, however, as the river would still dry up late in the season.

ISRP Comment #4: *Sponsors should investigate Oegon water law to determine if instream flow rights from the Logan Valley Project can be extended below Warm Springs Reservoir.*

According to District 10 Watermaster Mitch Lewis, the Logan instream rights would end at Warmsprings Reservoir and cannot be extended to lower reaches of the river.

M & E Protocol for Wildlife Mitigation Projects
Burns Paiute Tribe

Vegetation

Managing land for wildlife habitat requires knowledge of the various species of plants and animals on the site, as well as their special requirements for reproductive success. Unfortunately, gaining the knowledge necessary to manage vegetation toward a targeted habitat condition is more difficult than merely identifying the condition necessary to enhance wildlife.

Any strong habitat restoration plan is dependent on energy flows, nutrient cycles, and plant community dynamics. A combination of the three governs rangeland and meadow ecosystems (National Research Council 1994). Because these communities are dynamic, an intimate familiarity of plant demography (the study of plant population changes and their causes) is critical. Such knowledge can only be gained through careful observation in the field.

Plant Community Mapping.

Because plant communities play such a vital role in the present and future availability of desirable habitat for wildlife, they will serve as a basis for the Burns Paiute Tribe's monitoring and evaluation activities. These aggregations of plant populations will be identified, mapped, and classified in accordance with the Oregon Natural Heritage Program's *Manual of Oregon Actual Vegetation* (Attachment 1). Lines will be drawn along the borders of available topographic maps through the use of GPS technology and numbered with a map code for each specific community type. This information will then be entered into the Department's GIS system. For example, a low sagebrush/ bluebunch wheatgrass site would be classified as ARTARB/AGSP and given the map code 313.

General Vegetation Monitoring for Shrub-Steppe/Grassland Communities.

Four characteristics of vegetation will be observed and recorded for future use in analyses. The first is **frequency**, which is the percentage of a species that is present in a measured area (sample unit). This information is collected mainly for the purposes of monitoring vegetation change over time and comparing differences in adjacent plant communities. **Cover** and **density** data provides insight into demographical and ecological characteristics of the communities being observed. Lastly, **biomass** is used to estimate herbaceous production on the site.

Transect Procedures.

Once all the plant communities on the mitigation sites have been mapped, the Daubenmire method (Daubenmire 1959) will be used to monitor vegetation (Attachment

2). Only a few minor additions and adjustments will be made to this procedure and are listed below.

There will be one macroplot per plant community, three 60 m transects per macroplot spaced 20 meters apart, and 20 quadrats per transect. Each quadrat will be 40 x 50 cm (Attachments 3 and 4). While mapping and monitoring plant community boundaries, Department staff will have the opportunity to locate and record existing and future satellite weed populations in both the meadow and upland sites. Shrub cover/density will also be recorded at this time.

Photo Monitoring.

Three photostations per transect will be established (0 m, 30 m, and 60 m) and photographs will be taken at 0, 90, 180, and 270 degrees at each station. The camera will be elevated exactly one meter above the ground using a tripod and camera type, aperture, date, time of day, transect/location, GPS coordinates, and photographer data will be collected and recorded in a photostation journal and on the data collection sheet for the transect. A one-meter measuring board will be set up 10 meters from the photographer in each picture.

Permanent Placement of Transects.

Rebar will be driven into the ground at 0 m and 60 m and will be spray painted and marked with a metal identification tag bearing the number of the transect.

Shrub Monitoring
(Bitterbrush and Willow spp)

The Tribe has been working closely with the Agricultural Research Service (ARS) on developing monitoring techniques for woody plant abundance. Ground-based photography and image analysis is currently being evaluated for quantifying stand development of riparian willow communities. Field methodology is based on the relationship between visual obstruction and plant production (Attachment 5).

Wildlife and Aquatic Resources

The techniques outlined in the *Monitoring and Evaluation Plan for the Albeni Falls Wildlife Mitigation Project* (Albeni Falls Interagency Work Group 2001) will be used to monitor for land birds, waterfowl, bald eagles, small mammals, and herptofauna. The Tribe will be working closely with the CBFWA Wildlife Committee in establishing standardized M&E strategies for sage grouse and wild ungulates.

A separate M&E project is currently being proposed by the Tribe for monitoring the interactions between deer, elk, and domestic livestock on the Malheur River Wildlife Mitigation Site and will be discussed at the end of this document.

Hydrological features will also be monitored over time. Forest Service Region Six Stream Inventory Level I and II (1999) and Rosgen Level I, II, and III assessments (1998) will be conducted on the mitigation properties every five years in cooperation with the Department's fisheries biologists.

Attachment 1

An Example from the Manual of Oregon Actual Vegetation (Kagan and Caicco 1992)

Mapcode: 303
Mapname: Artemisia tridentate/ Festuca idahoensis

Comnames: big sagebrush/ Idaho fescue

Acroname: ARTTRI/FESIDA
Crosswalk: ARTTRI/FESIDA, ARTTRIW/FESIDA, ARTTRIT/FESIDA

Vegstruct: Tall shrub community in which Wyoming and basin big sagebrush predominate. Patches of a low shrub community in which low sagebrush predominates may occur. Low, early, blooming bunchgrasses predominate between the shrubs.

Ecology: Occurs on deeper soiled flats, plateaus, and slopes. The highest elevation regular sagebrush type, occurring primarily in the mountains of the Basin and Range. In central and eastern Oregon, it occurs on north slopes at lower elevations, and at other moist sites.

Distribut: Common throughout the southern High Lava Plains and Basin and Range, in Lake, Harney, and Malheur Counties, and southern Deschutes and Crook Counties. Occurs as a major type in southeastern Oregon.

Diaggrass: Poa sandbergii dominates the understory, and is often the only grass. Agropyron spicatum, Sitanian hystrix, Stipa occidentalis, and S. thurberiana, and other Poa species (nevadensis, canbyi, or scabrella) can be locally important. Annual grasses are rarely important, but Bromus tectorum increases with cattle grazing.

Diagshrub: Artemisia tridentate dominates. Artemisia arbuscula communities occur in shallow soiled areas typical of this type. Chrysothamnus viscidiflorus, C. nauseosus, and Gutierrezia sarothrae occur in disturbed areas.

Diagtrees: None.

Othtrees: Juniperus occidentalis often occurs as individuals in this type. It also dominates narrow canyons which occur in this type, along with Cercocarpus ledifolius.

Elevation: 4000-6000 feet.

Attachment 2

Daubenmire Method

1. *General Description*. The Daubenmire method consists of systematically placing a 20- x 50-cm quadrat frame along a tape on permanently lovated transects. The following vegetation attributes are monitored using the Daubenmire method:

    - Canopy cover
    - Frequency
    - Composition by canopy cover

    It is important to establish a photo plat and take both close-up and general view photographs. This allows the portrayal of resource values and conditions and furnishes visual evidence of vegetation and soil changes over time.

2. *Areas of Use.* This method is applicable to a wide variety of vegetation types as long as the plants do not exceed waist height.

3. *Advantages and Limitations*. This method is relatively simple and rapid to use. A limitation is that there can be large changes in canopy cover of herbaceous species between years because of climatic conditions, with no relationship to the effects of management. In general, quadrats are not recommended for estimating cover. This method cannot be used to calculate rooted frequency.

4. *Equipment.* The following equipment is needed:
    - Study Location and Documentation Data form
    - Daubenmire forms
    - Hammer
    - Permanent yellow or orange spray paint
    - Two stakes: ¾- or 1-inch angle iron not less than 16 inches long
    - Tape: 100- or 200-foot, delineated in tenths and hundredths, or a metric tape of the desired length
    - Steel pins for marking zero, mid and end points of the transect
    - Frame to delineate the 20- x 50-cm quadrats
    - Compass
    - Steel post and driver

5. *Training.* The accuracy of data depends on the training and ability of the examiners. Examiners must be able to identify the plant species. They must receive adequate and consistent training in laying out transects and making canopy coverage estimates using the frame.

6. *Establishing Studies.* Careful establishment of studies is a critical element in obtaining meaningful data.

a. **Site Selection.** The most important factor in obtaining usable data is selecting representative areas (critical or key areas) in which to runthe study. Study sites should be located within a single plant community within a single ecological site. Transects and sampling points need to be randomly located within the critical or key areas.

b. **Pilot Studies.** Collect data on several pilot studies to determine the number of samples (transects or observation points) and the number and size of quadrats needed to collect a statistically valid sample.

c. **Number of Studies.** Establish a minimum of one study on each study site; establish more if needed.

d. **Study Layout.** Data can be collected using the baseline, macroplot, or linear study designs. The linear technique is the one most often used.

(1) Align a tape (100- or 200-foot, or metric equivalent) in a straight line by stretching the transect location and the transect bearing stakes. Do not allow vegetation to deflect the alignment of the tape. A spring and pulley may be useful to maintain a straight line. The tape should be aligned as close to the ground as possible.

(2) Drive steel pins almost to the ground surface at the zero point on the tape and at the end of the transect. A pin may also be driven into the ground at the midpoint of the transect.

e. **Reference Post or Point.** Permanently mark the location of each study with a reference post and a study location stake.

f. **Study Identification.** Number studies for proper identification to ensure that the data collected can be positively associated with specific sites on the ground.

g. **Study Documentation.** Document pertinent information concerning the study on the Study Location and Document Data form.

7. *Taking Photographs.* The directions for establishing photo plots and for taking close-up and general view photographs are given in Section V.A.

8. *Sampling Process.* In addition to collecting the specific studies data, general observations should be made of the study sites.

a. **Cover Classes.** This method uses six separate cover classes:

Cover Class	Range of Coverage	Midpoint of Range
1	0 – 5%	2.5%
2	5 – 25%	15.0%
3	26 – 50%	37.5%
4	51 – 75%	62.5%
5	76 – 95%	85.0%
6	96 – 100%	97.5%

b. **Collecting Cover Data.** As the quadrat frame is placed along the tape at the specified intervals, estimate the canopy coverage of each plant species. Record the data by quadrat, by species, and by cover class on the Daubenmire form. Coanopy coverage estimates can be made for both perennial and annual plant species.

(1) Observe the quadrat frame from directly above and estimate the cover class for all individuals of a plant species in the quadrat as a unit. All other kinds of plants are ignored as each plant species is considered separately.
(2) Imagine a line drawn about the leaf tips of the undisturbed canopies (ignoring inflorescence) and project these polygonal images onto the ground. This projection is considered "canopy coverage." Decide which of the classes the canopy coverage of the species falls into and record on the form.
(3) Canopies extending over the quadrat are estimated even if the plants are not rooted in the quadrat.
(4) Collect the data at a time of maximum growth for key species.
(5) For tiny individuals, it is helpful to estimate the number of individuals that would be required to fill 5% of the frame. A quick estimate of the numbers of individuals in each frame will then provide an estimate as to whether the aggregate coverage falls in Class 1 or 2, etc.
(6) Overlapping canopy cover is included in the cover estimates by species; therefore, total cover may exceed 100 percent. Total cover may not reflect actual ground cover.

9. *Calculations.* Make the calculations and record the results in the appropriate columns on the Daubenmire form.

a. **Canopy Cover.** Calculate the percent canopy cover by species as follows:

(1) On the Daubenmire form count the number of quadrats in each of the six cover classes (by species) and record in the Number column on the Daubenmire Summary form.
(2) Multiply this value times the midpoint of the appropriate cover class.
(3) Total the products for all cover classes by species.

(4) Divide the sum by the total number of quadrats sampled in the transect.
(5) Record the percent cover by species on the form.

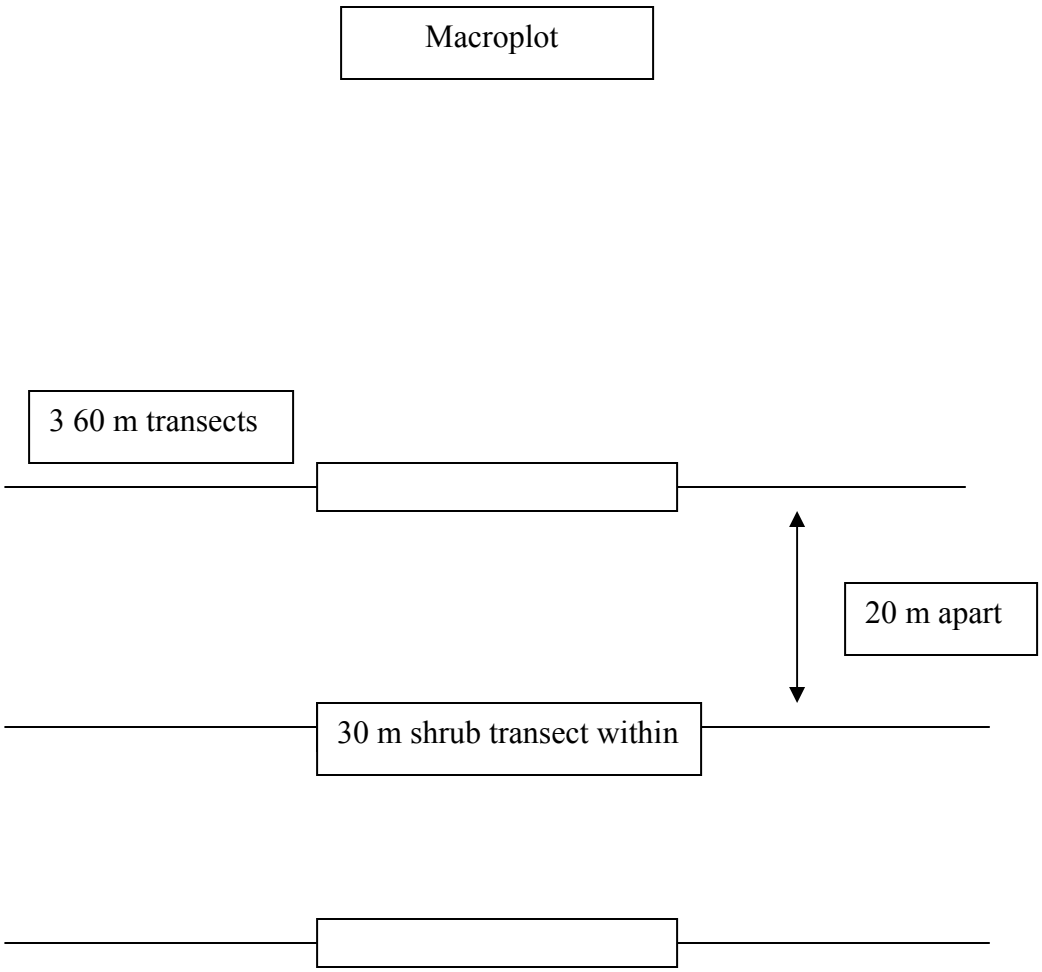
b. **Frequency.** Calculate the percent frequency for each plant species by dividing the number of occurrences of a plant species (the number of quadrats in which a plant species was observed) by the total number of quadrats sampled along the transect. Multiply the resulting value by 100. Record the percent frequency on the form.

c. **Species Composition.** With this method, species composition is based on canopy cover of the various species. It is determined by dividing the percent canopy cover of each plant species by the total canopy cover of all plant species. Record the percent composition on the form.

10. *Data Analysis.* Tests should be directed at detecting changes in cover of the species and/or in major ground cover classes. Tests for changes in minor species will have low power to detect change. If quadrats are spaced far enough apart on each transect so as to be considered independent, the quadrat can be analyzed as the sampling unit. Otherwise, the transects should be considered the sampling units. If the transects are treated as the sampling unit, and given that the transects are permanent, either the paired t-test or the nonparametric Wilcoxon signed rank test should be used to test for differences between 3 or more years. If the quadrats are treated as the sampling units, care must be taken to ensure they are positioned the same along each transect in each year of measurement. A paired t-test, Wilcoxon signed rank test, or ANOVA is then used as described above for transects.

Attachment 3

Macroplot Illustration



20 quadrats per transect.
Each quadrat is 40 x 50 cm in size.

Attachment 4

Field Vegetation Data Sheet

☐ cover/density

Page ___ of ____

Study Number:	Date:	Examiner:	Allotment Name and No:	Pasture:
Transect No. and Location:			Number of Quadrants:	

Plant Species	Quadrant 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

Shrub Spp	Density S	J	M	D	Hits

Photostation # _____

Slope: _____

Aspect:_____

Production estimate (#/acre):_____

Soil Notes:

General Notes (Population structure, boundary dynamics, stratification):

Attachment 5

Willow Monitoring Techniques

The following willow assessment techniques were developed by ARS scientists Dr. Chad Boyd and Dr. Tony Svejcar, who are stationed out of the Eastern Oregon Agricultural Research Center in Burns, OR.

Willow abundance will be assessed during the growing season. Monitoring stations will chosen to be representative (plant age and site conditions) of the willow communities present in targeted drainages. Monitoring will take place at both the community and individual clump levels.

For community monitoring, we will identify clumps of willow to be monitored and place permanent PVC markers at the outer boundaries of the clumps. A photopoint that would allow for photographing the area of interest will then chosen and marked, as will a location for a 1m tall photoboard. Communities are to be photographed in August with a 35mm camera. Camera height and lens focal length are recorded at each station and will remain the same for all repeat photographs. Images are then scanned to digital form and a minimum convex polygon was digitized around the boundaries of the clump using SigmaScan 5.0 software. Using the same software we will calculate maximum and minimum (largest diameter perpendicular to the maximum diameter) diameters and area of the polygons. Multiple polygon values at a site are summed together and the results in total.

Visual obstruction (VO) will be measured for 1 willow clump at each monitoring station. VO provides an index to the mass of photosynthetically active tissue on a given willow clump. VO stations are located within the community photograph seen and placement of the visual obstruction board and camera are permanently marked with PVC stakes. Photographs are taken at a height of 117cm (equal to the center of the standing, fully assembled board), with a 50mm lens, and at a distance of 440cm from the photoboard. The photoboard itself is 150 x 180cm in size and is constructed of an aluminum frame overlain with white sheet plastic painted fluorescent orange. The photoboard is photographed fully assembled or disassembled to one half size for smaller plants. Film images are scanned to digital format, and the number of visible pixels determined using Adobe Photoshop 4.0 software.

ISRP Comment #3: *Brief resumes for the staff are needed.*

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EDUCATION: Master of Science, Rangeland Resources with an integrated minor emphasizing Public Land Policy.
-received in December 2000 from Oregon State University.
-GPA: 3.94

Bachelor of Science, Rangeland Resources, with minors in Crop and Soil Science and Biology.
-received in June 1998 from Oregon State University.
-*Cum Laude*

WORK EXPERIENCE: **Burns Paiute Tribe**
Rangeland Ecologist, December 2000-current

- ✓ Wrote management plans for Bonneville Power Administration (BPA) mitigation sites.
- ✓ Utilized GPS to conduct weed population analyses.
- ✓ Created public environmental education programs.
- ✓ Participated in Tribal land planning.
- ✓ Fulfilled position of ranch manager for 400 head operation with three full-time employees.
- ✓ Conducted vegetation trend analysis.
- ✓ Initiated a hydrology study in conjunction with Agricultural Research Service (ARS) scientists.
- ✓ Managed BPA wildlife projects for the Burns Paiute Tribe.

Eastern Oregon Agricultural Research Center
Research Assistant/ Graduate Student, June 1998-October 2000

- ✓ Conducted research in fulfillment of the thesis portion of my graduate program. My study examined the effects of early spring grazing on meadow foxtail (*Alopecurus pratensis*) dominated hay meadows in the Harney Basin of southeastern Oregon.

- ✓ Regularly weighed, doctored, and managed 110 replacement heifers during the two summers of my research project (1998-1999).
- ✓ Assisted other research efforts involving the effect of elevated atmospheric carbon dioxide on western rangeland vegetation and the impacts of western juniper competition (*Juniperus occidentalis*) on understory vegetation.
- ✓ Worked cows in the meadows and open range for the station herdsman.

Research Technician, summer of 1997

- ✓ Collected data from transects on a long-term cattle exclosure study at the Northern Great Basin Experimental Range, from a juniper study near Diamond, Oregon, and a burn study on Steens Mountain.

Portland State University
Consultant, spring 1999

- ✓ Investigated and reported on the current status and future risk of various plant community types including the sagebrush steppe, juniper woodlands, and oak woodlands. My reports were used in the writing of the Oregon State of the Environment Report, which was a state environmental assessment mandated by the Oregon legislature.

Malheur National Forest, Burns District
Forest fire-figher, summer of 1996

- ✓ Manned a heavy engine.
- ✓ Participated in timber thinning and brush disposal projects.

Biological Technician, summers of 1992-1995

- ✓ Range analysis and utilization surveys.
- ✓ Goshawk broadcasting and nest searches, organized and recorded.
- ✓ Raptor counts.
- ✓ Stream surveys.
- ✓ Stream rehabilitation and spring/seep condition evaluations.
- ✓ Stream electroshocking.
- ✓ Elk habitat surveys.

AWARDS AND HONORS:

2000: Outstanding Masters Student, Department of Rangeland Resources, Oregon State University

REFERENCES:

Dr. Paul Doescher. Professor of Rangeland Resources. Oregon State University. (541) 737-0504.

Dr. Tony Svejcar, Research Leader. Eastern Oregon Agricultural Research Service. Burns, Oregon. (541) 573-2064.