

Appendix H:

Monitoring

Appendix H: Noxious Weed Treatment Monitoring

Introduction

An Annual Noxious Weed Treatment Work Plan will be developed identifying the specific weed treatment locations, treatment prescriptions and treatment monitoring protocols and locations proposed for the coming year. This Work Plan will be reviewed with affected interests including but not limited to Native American Tribes and livestock permittees, prior to its approval by the appropriate line officer(s).

Noxious weed treatment monitoring is divided into two phases: implementation monitoring and effectiveness monitoring. Implementation monitoring will document whether the individual treatments were implemented according to their individual prescriptions, including whether the Design Standards included in the prescriptions such as the implementation of Best Management Practices (BMPs), were successful in meeting their prescription objectives for protection or mitigation of environmental effects connected to treatment activities. Effectiveness monitoring will document whether the individual treatments accomplish the specific weed control and/or eradication purpose for which they were designed and implemented.

Separate from noxious weed treatment monitoring, as part of its Noxious Weed Management Strategy the Forest will have an ongoing inventory program to locate new or expanding populations of noxious weeds.

Implementation Monitoring

Implementation Monitoring includes a number of different aspects which will be coordinated and documented by the individual treatment project manager(s). These aspects include all:

- Required Design Standards, including BMPs, public notification signs, etc. were implemented
- Prescription requirements, such as timing, method, application, etc. were implemented
- Contracts or agreements were administered to standard
- Required water quality implementation monitoring was completed
- Unanticipated environmental effects connected to treatment activities are documented and appropriate reporting and/or mitigation of these effects is accomplished

Water Quality Implementation Monitoring Protocol for Herbicide Treatments

An implementation monitoring protocol for surface water quality related to noxious weed herbicide treatments has been developed for the Modoc National Forest Noxious Weed Treatment Project. The protocol will be used to assess compliance with State of California standards as described in the Regional Water Quality Control Boards' Basin Plans (Lahontan, Central Valley and North Coast Regions) and application of Best Management Practices. Annual surface water quality herbicide treatment monitoring based upon the protocol will be included in the Annual Noxious Weed Treatment Work Plan.

The protocol outlines surface water monitoring requirements for proposed application of herbicides. In general terms, the solubility of the herbicides in water and the ability for them to be transmitted into public waters drives this sampling protocol. The Forest Hydrologist or their designated representative will conduct the monitoring conducted under this protocol.

Annually, based on identification of proposed herbicide treatment areas, appropriate monitoring station(s) will be identified by the Forest Hydrologist or their designated representative, GPS'd on the ground, and assigned identifier number(s). The identifier numbers will be used on monitoring station maps and narrative descriptions. The monitoring stations will be identified in proximity to perennial stream courses or other water sources, and transmission routes to perennial streams or other water sources, based upon the locations of the proposed herbicide treatment areas.

Water samples will be taken so as to be representative of the total volume of water passing the monitoring stations at any moment. Samples will be collected at the lower end of a straight, riffle section of channel, preferably near the center of the stream. In past monitoring, composite sampling has not been shown to be more effective in detecting herbicide residues than the simpler grab water sampling. It is not believed at this time that the added expense, opportunities for contamination of samples and risk to personnel is justified for composite sampling. Therefore, all samples will be 1-liter grab samples.

A pre-application sample will be collected at all monitoring stations 24 to 72 hours prior to herbicide application. Pre-treatment samples will serve as control samples. Following herbicide application, water samples will be taken during storm runoff periods to determine the amount of herbicide that may have entered the water through surface runoff. Post-treatment samples will be taken within 24 hours following storm events that are likely to produce surface runoff. On the Modoc National Forest, the storm events that are likely to produce surface runoff are 2-year and 10-year storm events that occur during the summer season, or storm events that occur when soils are at field capacity during the fall and winter seasons. Samples taken during storm runoff periods will attempt

to catch the rising limb of the hydrograph. The exact dates will depend on weather conditions and monitoring station access.

For stations monitoring glyphosate movement, one sample will be taken during the first significant runoff-producing storm that occurs within 90 days of herbicide application. If no such event occurs, no sample will be collected.

If a herbicide residue is detected at a monitoring station following a storm event, the monitoring station will be re-sampled during the next significant runoff-producing storm that occurs after the results are received.

Extreme care will be taken to prevent sample contamination. The collector will not have any herbicide or other contaminant on his/her clothing, hands, or boots. Sample containers will not be transported or stored with herbicides or herbicide application equipment. The analyzing laboratory will provide the sample containers.

Samples will be delivered to the Forest Hydrologist or their designated representative, who will coordinate transport to the laboratory. A sample documentation form, which will serve as a "chain of custody" form, will accompany each sample. Each sample bottle will be clearly identified as follows:

- Monitoring station ID number;
- Date and time of sample collection;
- Name of person collecting sample;
- Type of sample;
- Herbicide to be analyzed.

This information, along with remarks on weather conditions and any other occurrence that might affect water analysis results; a listing of the treatment units within the drainage area of the sample point; and an estimate of stream discharge at the time of sampling will also be recorded on the sampling documentation form. Samples will be transported from field to laboratory in an ice cooler. The samples will be sent to a State certified laboratory within 48 hours of collection for analysis. For quality control, a blank and spiked sample will be sent to the lab with selected batches of samples approximately once per month while samples are being taken.

A water quality monitoring record for all herbicide treatment water quality monitoring will be kept on file in the Supervisor's Office. It will include the following information and documents for all monitoring locations:

- Maps of all treatment units and monitoring stations
- Sampling documentation forms

- Field notes
- Correspondence with labs
- Results of sampling analysis

If herbicide residue is detected at a monitoring location, the Forest Supervisor/District Ranger or Forest Ecosystem Staff Officer will be notified and advised if further monitoring of the location is recommended. That recommendation will be made by the Forest Hydrologist or their designated representative based on the magnitude of discovery and the individual attributes of the sample location.

An annual summary report will be prepared by the Forest Hydrologist or their designated representative that will contain a summary of the annual water quality monitoring results for herbicide treatments for the year. This report will be kept on file with the Forest Hydrologist and a copy of the report will be provided to the Forest Supervisor, District Rangers and the Ecosystem Staff Officer. In addition, a copy of this report will be made available to other interested parties.

Effectiveness Monitoring

Numerous methodologies can be used for detailed quantitative measurement of the changes in existing infestations of invasive species following noxious weed treatment, whether the treatment is a hand, herbicide or cultural treatment. Changes in distribution, relative density, and changes in the infestation size (extent) are important characteristics that will be used to measure treatment effectiveness. Pre treatment and post treatment distribution, relative density, and changes in the infestation size (extent) for representative treatment sites will be documented in tabular and spatial formats following the protocols described in the USDA-Forest Service publication Data Recording Protocols for Invasive Species Management (Treatment and Treatment Monitoring). An annual noxious weed treatment effectiveness summary will be prepared.

References

Mai, Christine and District Ranger, Eldorado National Forest. Water Quality Monitoring Plan, 1999
Herbicide Handbook of the Weed Society of America - 6th Edition. 1989.

USDA. Forest Service. Pesticide Background Statements

USDA-FS Region 5, A Review and Assessment of the Results of Water Monitoring for Herbicide Residues For the Years 1991 to 1999