DOE/BP/59774--T1

Bonneville Power Administration
Lower Columbia Region

Noxious Weed Management

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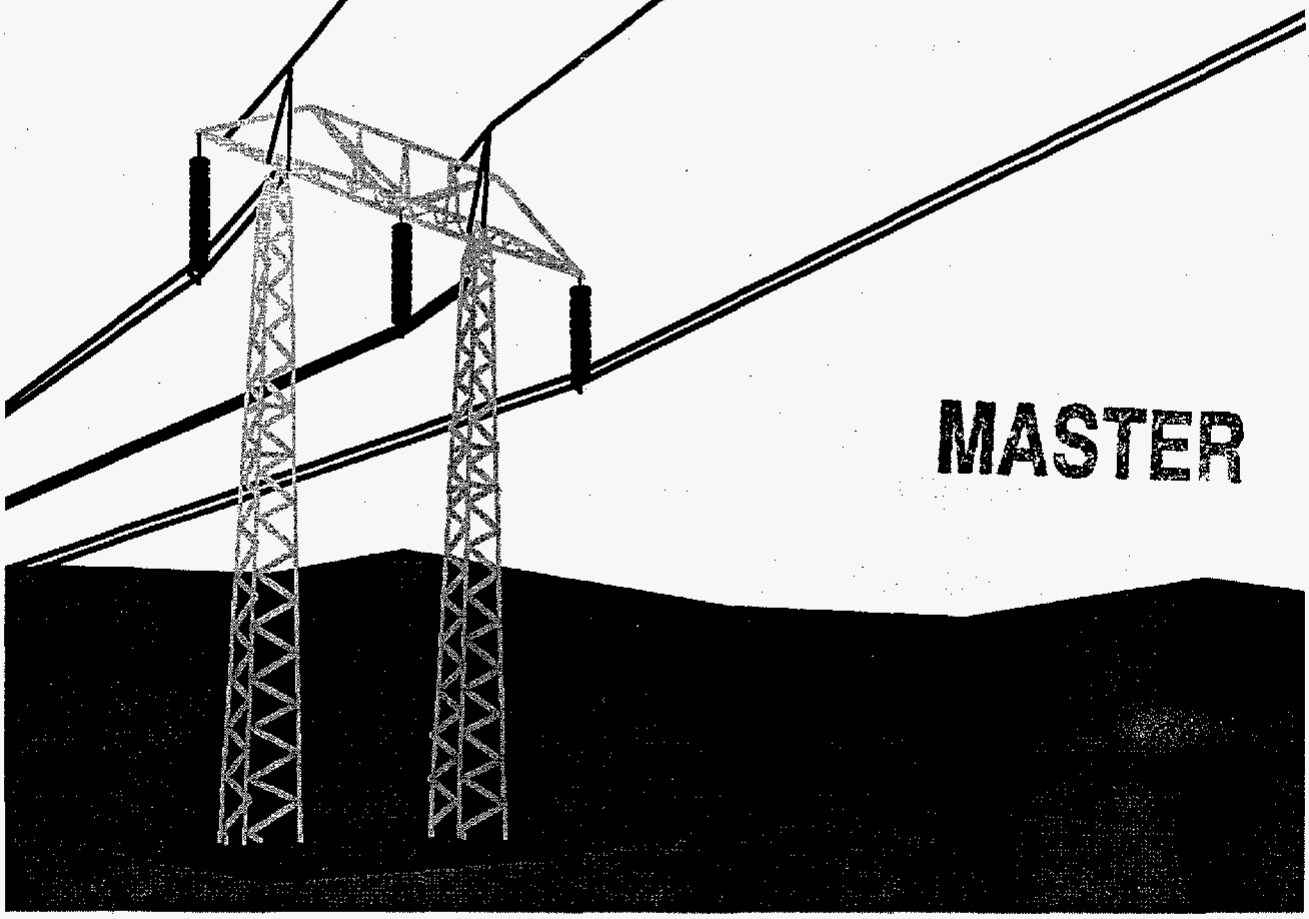

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A Cooperative Program between
Bonneville Power Administration
and
Oregon Department of Agriculture

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Abstract

During the 1996 season ODA executed the contract between BPA and ODA. Execution of this contract included the following activities. Survey for target noxious weeds, such as Gorse; collection and redistribution of biological control agents, for example, *Apion* seed weevils for Scotch broom, bioagents for diffuse and spotted knapweed, Gorse spider mite, and gall fly releases for control of Canada thistle and bull thistle; and control of isolated infestations of Gorse on BPA rights-of-way. Training was provided for line crews at the Chemawa, Alevy and North Bend districts.

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Introduction

The following is the 1996 Annual Report for noxious weed control activities on Bonneville Power Administration Rights-of-Way, Lower Columbia Region. This report covers the period from January 1996 to September 1996, for Contract Number DE-BI79-92BP59774. This is a cooperative project between Bonneville Power Administration (BPA) and Oregon Department of Agriculture Noxious Weed Control Program (ODA).

The purpose of this program is to assist BPA in the integrated prevention and control of noxious weed species on BPA Transmission Line Maintenance Right-of-Ways. This is accomplished by providing consulting and training on noxious weeds, developing and implementing control efforts, and by providing biological control of noxious weeds.

BPA and ODA entered into an agreement and developed a Memorandum of Understanding (MOU) and Contract for noxious weed prevention and control in 1992. This is a proactive program and BPA has taken the leadership role in its initial development. This contract has brought about a cooperative effort of noxious weed management between ODA and BPA.

This contract operates under the principles of Section 15 of the Federal Noxious Weed Act which directs federal agencies to enter into cooperative agreements with state agencies to coordinate the management of undesirable plant species on Federal Lands.

Integrated weed management activities for the 1996 season involved implementation of a gorse detection and control project, providing training for noxious weed identification, providing ODA program background to BPA districts, and collection and release of biocontrol agents. Other activities included program planning, meetings, and reporting to BPA with monthly reports and updates.

Project Area

The Project Area for the purposes of this program is the Lower Columbia Area of BPA jurisdiction. Geographically this represents the area west of the Cascade Mountain Range in the State of Oregon.

Noxious Weed Defined

For the purpose of this contract, noxious weeds are defined as those species designated by the Oregon State Weed Board (established by Oregon Law, ORS Chapter 570) as noxious. A noxious weed defined by the State of Oregon is an exotic nonnative species that is injurious to public health, agriculture, recreation, wildlife or any public or private property.

Noxious weeds are declared as noxious because of their invasive characteristics, physical structure and the threat they pose to vegetation management, resource management and natural diversity. Plants become noxious weeds when they are introduced into a region where they are able to prosper uninhibited by natural barriers that prevent the plants from exhibiting exploitative characteristics in their native distribution. Barriers include natural enemies, such as insects and pathogens, surrounding vegetation types, climate and other environmental factors.

The Purpose and Need for Noxious Weed Management

Noxious weeds pose a serious threat to state, federal and privately owned lands. When noxious weeds become established they cause negative impacts by increasing the cost of vegetation management, limiting access, increasing hazards, loss of productivity, and impacting ecosystems.

Prevention, monitoring, eradication, containment and control of noxious weed species is needed to lessen or prevent the impacts of noxious weed invasions. These techniques are used by the ODA Weed Control Program to prevent the introduction and establishment of new noxious weed species, to stop or slow the spread of established species, to maintain certain species below economically important levels and to protect uninfested areas.

ODA's Objectives

It is ODA's objective to manage noxious weeds with a regional approach. Statewide management of noxious weeds requires cooperation from state, federal and private land managers because weeds do not respect boundaries. ODA has prioritized and targeted specific noxious weeds to work with based on the State Weed Boards directives. Action is taken to prevent noxious weed introductions, eradicate them or contain them to specific geographic locations and to protect uninfested areas from noxious weed establishment. ODA has signed a memorandum of

understanding and developed cooperative agreements with ODOT, BPA, USFS, BLM, US Fish and Wildlife, Oregon counties and private landowners to facilitate a statewide program to manage noxious weeds.

A region wide approach to weed management requires numerous management practices and control techniques. ODA conducts its activities under an integrated pest management approach and operates under the principals of ORS 634.122 Chapter 943, the Integrated Pest Management Law.

Integrated Control Methods

The following is a listing of Integrated Weed Management (IWM) control techniques used by the ODA Noxious Weed Control Program. IWM is the use of multiple approaches to prevent, control and minimize the impacts of weeds. The following techniques are available for implementation during this cooperative agreement between BPA and ODA.

Prevention

Prevention is any technique that stops or reduces the distribution of reproductive parts to uninfested areas. Prevention activities include: minimizing soil disturbance, reseeding disturbed sites, use of certified weed free seed when reseeding, cleaning of equipment to minimize transport of weed propagules from infested areas and the use of good management practices to prevent noxious weed invasion.

Prevention also includes activities which aid in the detection of outlying weed infestations to bring them under management before they become major problems. Detection is enhanced by training sessions for BPA personnel to update them on the Weed Control Program objectives and target noxious weeds. The use of fact sheets, pamphlets, and video tapes can be used to provide noxious weed information to BPA personnel.

Survey

Survey is the process of looking for, mapping and recording noxious weed infestations. Surveying permits the inventory of weeds and provides baseline information so that management strategies can be identified and implemented based on distribution information. Surveys are used to detect new introductions of noxious weeds or to monitor and control the spread of weeds from core infestations. Quality survey information provides the information that is needed to locate, contain and eradicate noxious weeds.

Early Detection

Regular survey, providing noxious weed information, and working jointly with cooperators allows the early detection of noxious weeds. The early detection of weeds reduces losses and the cost of control. Failure to detect new weed invasions soon after introduction may eliminate the opportunity for eradication.

Biological Control

Biological control is the reassociation of a pest species and its natural enemies to reduce the population density of the target species below the economic injury level. Biocontrol of noxious weeds is a major emphasis of this IWM program. We are continuing active collection and redistribution of several biological control agents for target noxious weeds such as Tansy ragwort, Gorse, Knapweeds, Bull thistle, Canada thistle, Scotch broom, and St. Johnswort. Monitoring of weed populations and the introduction of biological control agents into appropriate areas is a primary objective of the ODA biocontrol program. Eric Coombs, ODA Biological Control Entomologist, is working with USDA-ARS and USDA-APHIS on a continuing basis for approval of new bioagents for release in Oregon. Emphasis for the 1995 season centered around the distribution of the gorse spider mite, *Tetranychus lintearius*, a new bioagent recently approved for release in the United States, collection and redistribution of *Apion* seed weevils for Scotch broom, collection and distribution of *Urophara cardui* and *Urophara stylata* for control of Canada thistle and bull thistle, and the introduction of bioagents to control isolated sites of Spotted and Diffuse knapweed.

Manual and Mechanical Control

Manual and Mechanical control is the use of hand pulling and tools to control weeds. These methods are important for use in an integrated control program. Manual and mechanical control can be used in sensitive areas were chemicals are not appropriate or on small infestations were biocontrol and chemical applications are not practical.

Chemical

Chemical control is an effective method of control, and will continue to be an important and useful tools as part of IWM. Chemicals have proven successful at eradicating new introductions of noxious weed species and containing larger or more wide spread infestations.

1996 Noxious Weed Control Activities

Gorse Control

Gorse has been targeted as a priority noxious weed on BPA rights-of-ways. It is a "T" rated noxious weed by the State of Oregon and is under intensive management by

the Weed Control Program. Gorse is a concern on BPA lines because the right-of-ways can act as corridors for dispersal of noxious weeds.

Gorse is found in heavy concentrations on the south and central coast in Coos, Curry, Lane, and Douglas Counties and in limited amounts in outlying areas on the north coast and inland sites. Some of the sites are in association with BPA lines, and ODA is concerned with dispersal from these infestations to new areas. Survey, early detection and control of outlying infestations are methods being used to prevent the spread and establishment of new infestations. Gorse poses a risk to BPA facilities and lines due to its flammability and limiting access when it becomes established and forms impenetrable stands. ODA staff in cooperation with BPA surveyed for gorse detection, used herbicide application to control outlying sites and released gorse spider mites to reduce the spread of gorse from core infestations.

During 1996 aerial surveys were made on the Chemawa, Alvey, North Bend, and Ross Districts for gorse detection. Outlying gorse site were treated with herbicides and gorse spider mites were released on core infestations.

Chemawa District

The Santiam-Chemawa and Buckley-Marion lines were surveyed from the Salem substation past Detroit. The Pearl-Marion right-of-way was surveyed from the Marion sub-station to Oregon City. Gorse has been found on Fellows road in Clackamas County just off the Pearl-Marion line, but no additional plants were found on or adjacent to the BPA right-of-way during this survey.

Ross District

During a survey in 1994 gorse was found on the Allston-Clatsop line in Columbia County. The site is located near Allston-Clatsop line 1, mile 4, tower 4; This site is the only known gorse site in Columbia County and the site has been targeted for eradication. Early detection of gorse in northwest Oregon is a priority because of limited distributions.

The 1996 season is the third year of treatments for the Columbia County site. Due to the long seed life of gorse in the soil, this project will take repeated treatment to eliminate gorse from the site. Some changes took place for this site in the 1996 season. Management of the site has changed from the Evenson Timber Co. to Mr. Usher who has fenced and converted the site to horse pasture.

The Columbia County site was retreated in May of 1996. 135 plants were treated at the site with a backpack sprayer making spot treatments of individual plants. Most of the plants were seedlings germinating during the previous year. The treatment was made with Garlon 3A.

North Bend District

Core infestations of gorse lie within the North Bend District. ODA is managing gorse on the central and south coast by preventing the movement of gorse out of this area on BPA rights-of-ways, on ODOT road corridors, by working with private landowners, and by implementing a biocontrol program on core infestations.

Lines on the North Bend District were surveyed in April of 1996 to find areas to make mite releases in August. The lines east of Bandon (Fairview-Bandon and Fairview-Rogue) and between Bandon and Gold Beach (Bandon-Rogue and Fairview-Rogue) were flown. Several heavily infested sites were found and targeted for mite releases.

One outlying gorse site was treated chemically on the North Bend District. A one eighth acre site in Douglas County near the Fairview substation was retreated in April, 34 plants were treated.

Alvey District

The Alvey District was aerially surveyed for gorse in April of 1996. No new sites were found on the BPA right-of-ways during this survey. A large site was found during the survey on private land in the Pleasent Hill area during our return to the Alvey Substation. Listed below are the areas surveyed during 1996.

Harrisburg to Albany
Line surveyed: Albany-Eugene

Albany to Lebanon to Santiam and back to the Eugene Area.
Line surveyed: Albany-Lebanon, Santiam-Alvey, Marion-Alvey

Up the McKenzie a few miles
Cougar-Thutston

Eugene to Oakridge
Line surveyed: Lookout Point-Alvey, Hills Creek-Lookout Point

Three gorse sites were treated with Garlon on the BPA right-of-way of the Alvey-Fairview line. These sites were located on private land owned by Dozhier, Weber and Clausen.

Biological Control Activities

Gorse

A major emphases was made to distribute a large number of gorse spider mites on the North Bend District during the 1996 season. Monitoring of previous releases were made and it was found that mites were established at 98% of the previously

made BPA release sites. In conjunction with the BPA release activities a gorse mite distribution day was organized involving ODA, BPA, USFS, BLM, ODOT, OSU Extension Services and private landowners. Gorse mites were distributed to state, federal and private land managers.

Gorse spider mites, *Tetranychus lintearius,* is a mite that feeds only on gorse foliage. It feeds on the hard tissues of the plant and sucks the clorplast contents from the stems and spines. Mite feeding impacts the gorse by injuring foliage and browning out plants. Monitoring of sites have shown that plants that have been attacked by mites have stunted growth and are not reproductive the following year. Once mite populations become widely established it is hoped that repeated mite attacks will weaken and kill plants.

Gorse spider mites were released at BPA sites in Coos and Curry Counties on the North Bend District. The mites were first released on BPA sites in 1994. The 1994 release sites were monitored in 1995 to determine establishment. All 1994 releases took well and produced healthy vigorous colonies. A large percentage of the 1995 releases were made to distribute the mites throughout the 1994 releases areas to develop nursery sites. The 1994 and 1995 releases were used as nursery colonies to collect releases for redistribution on BPA right-of-ways during the 1996 season. In August ODA staff collected and packaged mite releases for distribution from a BPA helicopter flight on the Fairview-Rogue line. Additional releases were made on the ground by driving or walking to release sites

The following are gorse spider mite releases were made on or adjacent to the Fiarview-Rogue right-of-way.

Lat	Long	Number Released	Township Range Section
N43,13.26	W124,22.32	(2 releases)	T27S-R14W-SEC. 21
N43,13.64	W124,22.49	(2 releases)	T27S-R14W-SEC. 16
N43,05.06	W124,23.82	(3 releases)	T29S-R14W-SEC. 5
N43,05.20	W124,23.87	(2 releases)	T29S-R14W-SEC. 6
N43,04.27	W124,24.04	(2 releases)	T29S-R14W-SEC. 7
N43,03.91	W124,24.01	(1 release)	T29S-R14W-SEC. 7
N43,02.15	W124,24.13	(2 releases)	T29S-R14W-SEC. 19
N42,59.78	W124,24.54	(2 releases)	T30S-R14W-SEC. 6
N42,58.89	W124,24.32	(2 releases)	T30S-R14W-SEC. 7
N42,48.93	W124,27.87	(2 releases)	T32S-R15W-SEC. 10
N42,47.84	W124,27.76	(2 releases)	T32S-R15W-SEC. 15
N42,47.59	W124,27.62	(2 releases)	T32S-R15W-SEC. 22
N42,46.99	W124,27.81	(2 releases)	T32S-R15W-SEC. 22
N42,46.74	W124,27.85	(2 releases)	T32S-R15W-SEC. 27
N42,45.72	W124,27.81	(2 releases)	T32S-R15W-SEC. 34

N42,45.71	W124,27.80	(2 releases)	T32S-R15W-SEC. 34
N42,45.46	W124,27.55	(2 releases)	T32S-R15W-SEC. 34
N42,45.29	W124,27.33	(2 releases)	T32S-R15W-SEC. 34
N42,44.89	W124,27.28	(2 releases)	T32S-R15W-SEC. 3
N42,44.77	W124,27.42	(2 releases)	T32S-R15W-SEC. 3
N42,45.15	W124,27.28	(2 releases)	T32S-R15W-SEC. 3
N42,45.35	W124,27.42	(2 releases)	T32S-R15W-SEC. 34
N42,45.66	W124,27.62	(2 releases)	T32S-R15W-SEC. 34
N42,45.79	W124,27.70	(2 releases)	T32S-R15W-SEC. 34
N42,46.07	W124,27.89	(2 releases)	T32S-R15W-SEC. 27
N42,46.64	W124,27.70	(4 releases)	T32S-R15W-SEC. 27
N42,46.58	W124,28.75	(4 releases)	T32S-R15W-SEC. 28
N42,46.89	W124,28.92	(2 releases)	T32S-R15W-SEC. 28

Spotted and Diffuse Knapweed

Biocontrol agents that attack Diffuse knapweed, *Centaurea diffusa* , and Spotted knapweed, *Centaurea maculosa*, were released and monitored in 1996 on BPA right-of-ways on the Ross District in the Portland area. Releases of *Sphenoptera jugoslvica*, a root boring beetle and *Lirinus minutus* , a seed head weevil, were made on the Rivergate -Keeler Line, and additional releases of *Agapeta zoegana*, a root boring moth, were made near the Rivergate-Keeler line 1, Mile 1, Tower 5. In July of 1996 the biocontrol release sites were monitored to determine if the previous years releases had established. During monitoring of the sites *Sphenoptera jugoslvica* was recovered and seems to have established. ODA is planning to make additional biocontrol releases and continue monitoring of this site to determine the effectiveness of biocontrol.

Bull Thistle

Biocontrol agents for the control bull thistle, *Cirsium vulgare*, were collected in October and released in April by ODA. Two 50 gall releases of *stylata* were made on the Perl-Marion line at mile 38 in Marion County on the Chemawa District. *Urophora stylata* is a seed head gall fly that reduces seed dispersal of infected Bull thistle by forming galls in the seed heads.

Tansy Ragwort

Tansy ragwort flea beetles, *Longitarsus jacobaeae*, were released on the Big Eddy-Marcola Line, Mile 79 near tower one, Ross District in November of 1996. This release was made on private property near the town of Redland owned by Bottorff.

Training and Consulting

Noxious weed training was provided to district foremen and line maintenance crews at Alvey, Chemawa and North Bend Districts. ODA personal provided noxious weed identification training and ODA program objective and background information.

Technical Assistance
ODA provided technical assistance to BPA during the 1996 season. Questions relating to weed control were answered and weed management material was provided. Visits were made to easement landowners requesting technical assistance for weed management and to evaluate sites for biocontrol releases.

Planning and Program Development
1996 was the last year of a four year contract between BPA and ODA for noxious weed control in the Lower Columbia Region. During 1996, Joe Johnson, Bonnie Bellknapp and Tim Butler developed and finalized a new contract to start in October of 1996.

1997 Program Objectives

The following are proposed noxious weed control activities for implementation during 1997:

1. Prevention and Survey In 1997, ongoing surveys will be done to detect new invader weed species, delimit established infestations and find outlying infestations so management strategies can be developed and implemented.

2. Control Efforts Objectives of this agreement will be coordinated with ODA statewide noxious weed control activities. Collection and redistribution of biological control agents and chemical control of critical sites will be implemented during the 1997 season on and adjacent to BPA rights-of-way. Priorities for 1997 include redistribution of Scotch broom and Gorse bioagents, and herbicide application to control targeted outlying Gorse sites.

3. Training/Consulting ODA will provide training in integrated noxious weed management (IWM) to BPA personnel upon request. ODA will also act as a consultant and provide technical information on IWM to BPA personnel.

4. Reporting and Communications As part of this agreement ODA will document all activities in monthly progress reports and in an annual summary report.

1996 Noxious Weed Control - BPA
#DE-B179-92BP59774
1/1/96 - 9/30/96

	Jan - March 1996	April 1996	May 1996	June 1996	July 1996	August* 1996
Actual Expenses:						
Salaries & OPE	616.00	1,017.00	1,528.00	121.00	4,470.00	163.00
Travel & Per Diem	0	0	0	336.00	52.00	104.00
Nonexpendable Equip. & Material	0	0	0	0	0	0
Expendable Equip. & Material	0	0	0	33.00	127.00	32.00
Operations & Maintenance	0	0	0	0	0	0
Weed Control Chemicals	0	0	0	0	0	0
Total Expenditures	616.00	1,017.00	1,528.00	490.00	4,649.00	299.00
Indirect Costs (14.75%)	91.00	150.00	226.00	72.00	713.00	46.00
Total Costs for Month	707.00	1,167.00	1,754.00	562.00	5,362.00	345.00
Total Costs Previously Requested		707.00	1,874.00	3,628.00	4,190.00	9,552.00
Total Costs Requested to Date		1,874.00	3,628.00	4,190.00	9,552.00	9,897.00

* August was the final invoice on this contract.