Seattle City Light

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SEATTLE CITY LIGHT
RIGHTS-OF-WAY MAINTENANCE PLAN
(1989 UPDATE / 1990 GOALS)

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1.0 INTRODUCTION

The Rights-of-Way (ROW) maintenance program at Seattle City Light (SCL) uses a variety of methods to control vegetation. This integrated approach to ROW vegetation maintenance was implemented to provide the utility with a safe, environmentally and economically sound program. The management strategies presented in this plan are directed by utility policy (see Section 2.1) which was developed to provide guidelines for the protection of the electrical system, the workers, and the environment. The goals and objectives of the maintenance program and the maintenance requirements for the transmission system are discussed in detail in Sections 2.2 and 2.3.

The following document also describes the routine maintenance work, primarily associated with vegetation control, carried out on SCL's ROWs. As this work is ongoing, annual milestones are projected for each task with general time frames (usually seasonal) provided whenever possible. Changes in trends of maintenance activities will be reflected in the total hours or total acreage estimated for the year (e.g., decrease in hours required per acre to clear trees as removal of larger trees on the ROW is replaced by cutting and lopping of smaller trees; or decrease of cut stump herbicide use over time as deciduous tree resprouting is controlled). This plan also details special projects (e.g., revegetation projects, consultant contracts, Capital Improvement Projects) and strategies for areas which require unique management considerations such as streamside management, aesthetics and scenic quality, with time lines and milestones identified where appropriate.

An annual update will be prepared each year which will summarize the work completed during the previous year and detail the work planned for the upcoming year. A discussion of the level of effort for each task will be provided. Detailed labor/cost analyses for maintenance activities are also presented in this document (see Section 9). Starting in 1990 the annual update will be prepared in November for the upcoming year. Therefore, the labor hours and costs presented for the routine maintenance activities are for the period of October 1 - September 30 instead of the calendar budget year used throughout the City. As the hours and acreages used are for a 12-month period and, generally, will be averaged over a two to three year basis, the use of an October - September time period should provide solid yearly estimates for budgetary and planning purposes.

The plan will be reviewed internally by the following divisions: Environmental Affairs (EAD), Property Management, Transmission & Distribution (T&D), Operations, and Safety & Health. The plan will be made available for review at the request of any interested party.

2.0 POLICIES AND OBJECTIVES

2.1 Maintenance Policy A Departmental Policy, DPP 500 P 506 (see Appendix A), for the maintenance of SCL transmission ROWs was established in 1983. The goals of ROW maintenance, as outlined in the DPP, are: 1) to maintain the integrity of the transmission system to ensure there are no outages due to interference with the conductors from vegetation or human-made objects; 2) to provide access, where reasonable, to all structures in the transmission system; 3) to utilize an integrated vegetation management approach to vegetation control; 4) to utilize maintenance methods which are legal, safe and economically acceptable to the utility industry, and generally acceptable to the public; 5) to encourage compatible multiple use of the ROW where feasible; and 6) to maintain the ROW in cooperation with governmental agencies having jurisdiction over adjacent property. Methods of control include manual, mechanical, chemical, biological and cultural techniques; however, the use of herbicides is minimized in favor of other techniques.

2.2 Maintenance Requirements The situations on the ROW that necessitate vegetation management are: 1) tall-growing trees below the circuits that will grow upwards into the conductors; 2) tall-growing "danger" trees encroaching from the ROW edge that may fall into the conductors as a result of windthrow, disease, decay or unstable root support; 3) vegetation blocking access to the transmission system; and 4) control of noxious weeds.

To prevent electrical grounding, trees on the ROW must not be permitted to grow close enough to endanger the conductors. A minimum standing clearance is specified to protect against arcing between conductors and trees and to prevent a side tree from falling into the conductors. Clearance standards used for trees on the ROW are the same as the construction clearance standards set for vertical clearance above buildings; 16.5 ft. clearance for 240 kV and 12.5 ft. for 120 kV. In actual practice, conductor clearance must accommodate worst-case conditions such as high wind conditions and maximum conductor sag and swag (conductor-to-ground distance will vary in time depending on air temperature and electrical load). Clearances should also provide a time margin before vegetation control is required again (2-3 year cycle - based on the growth rates of alder and cottonwood, which are the fastest growing species found on SCL's ROW system, unless there is a strong counterbalancing concern). See figure 1 for a depiction of allowable tree heights at midspan and tower structures for a 240 kV line. Taller vegetation can extend further into the ROW near structures (tower or pole), where they do not interfere with line sag and sway, than at

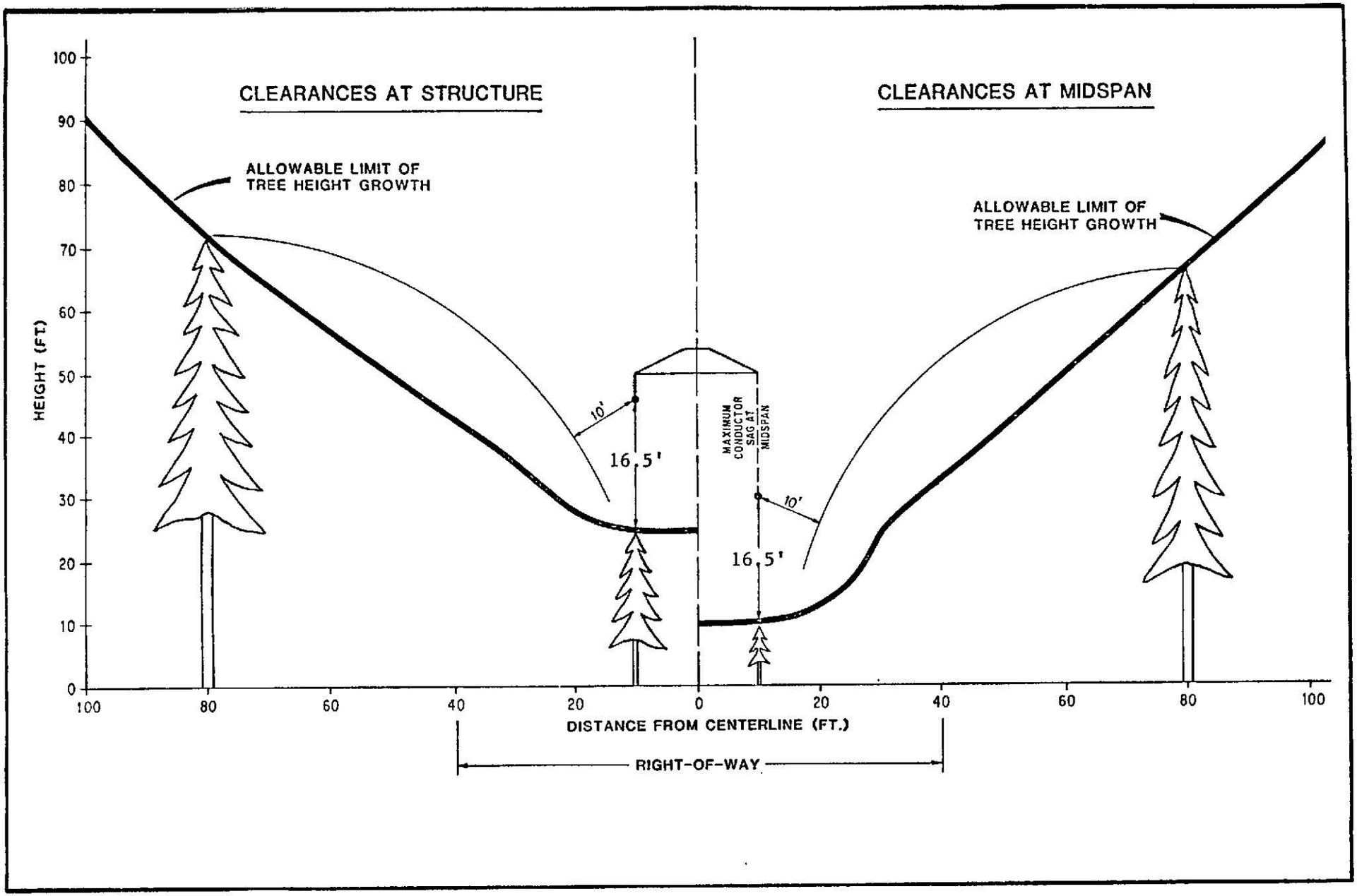


FIGURE 1. ALLOWABLE LIMITS OF TREE HEIGHT GROWTH ON A 240 kV TRANSMISSION CORRIDOR, ASSUMING A STANDING TREE CLEARANCE OF 20 FT. ON THE RIGHT-OF-WAY AND A FALLING TREE CLEARANCE OF 10 FT. OFF THE RIGHT-OF-WAY.(adapted from Gardner, 1980)

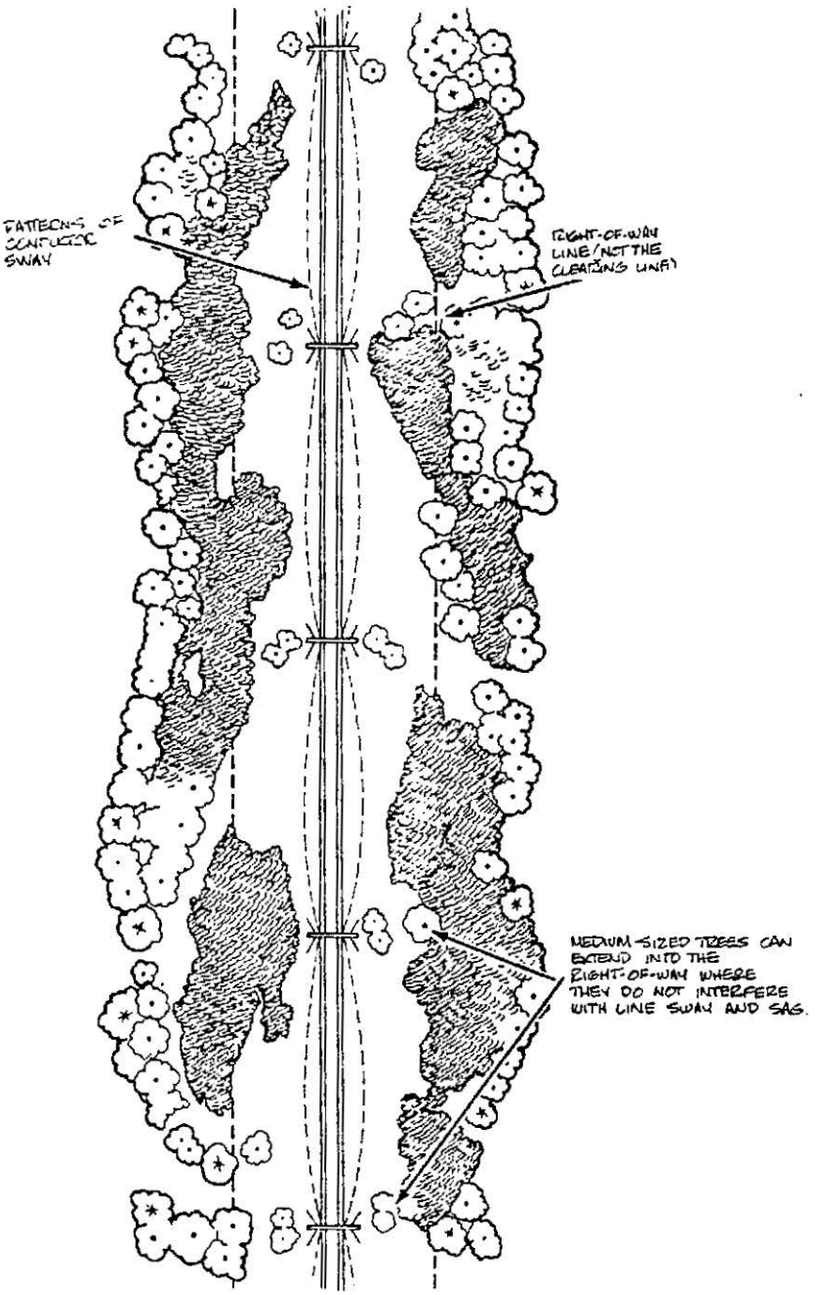
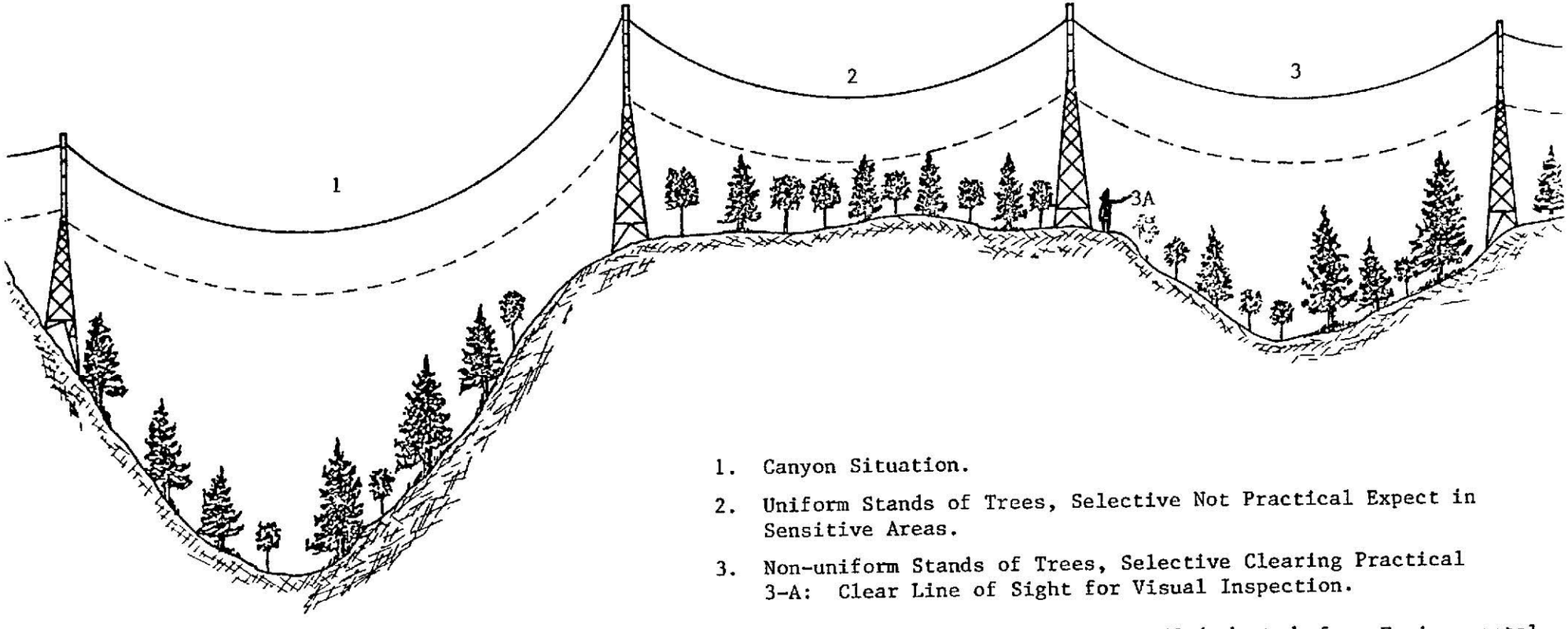


FIGURE 2. Influence of line sway and sag on ROW VEGETATION CLEARANCE. (adapted from National Forest Landscape Management, U.S. Department of Agriculture)



1. Canyon Situation.
2. Uniform Stands of Trees, Selective Not Practical Expect in Sensitive Areas.
3. Non-uniform Stands of Trees, Selective Clearing Practical
   3-A: Clear Line of Sight for Visual Inspection.

FIGURE 3. TYPICAL CLEARING CONDITIONS (adapted from Environmental Review of ROW Clearing, BPA).

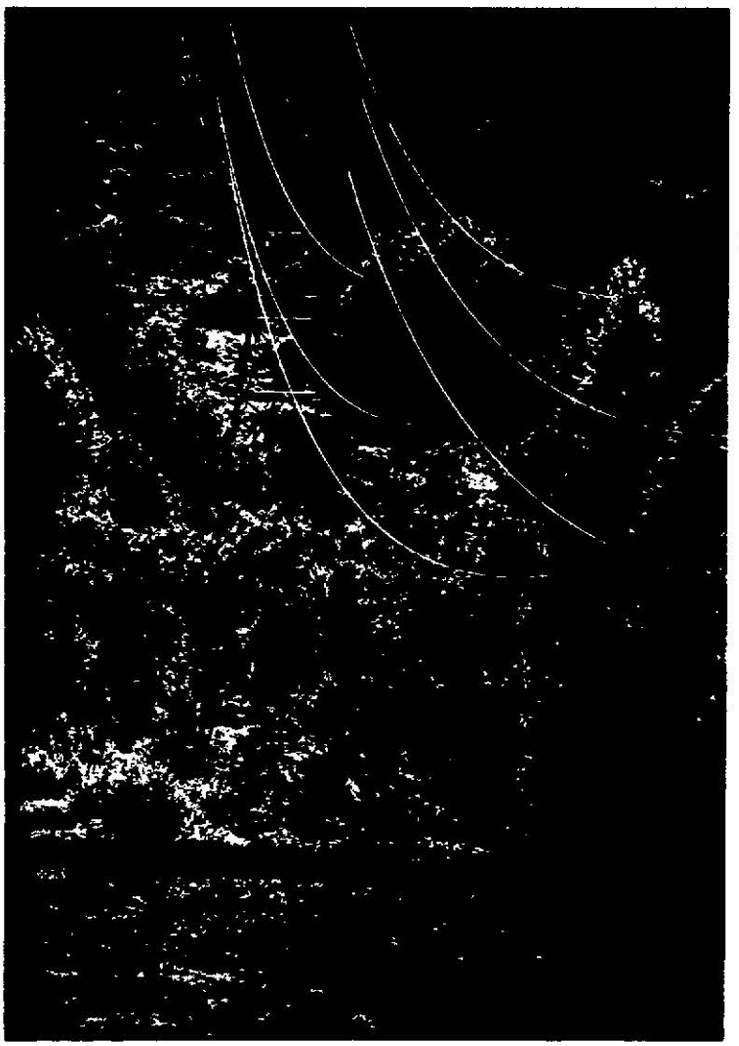
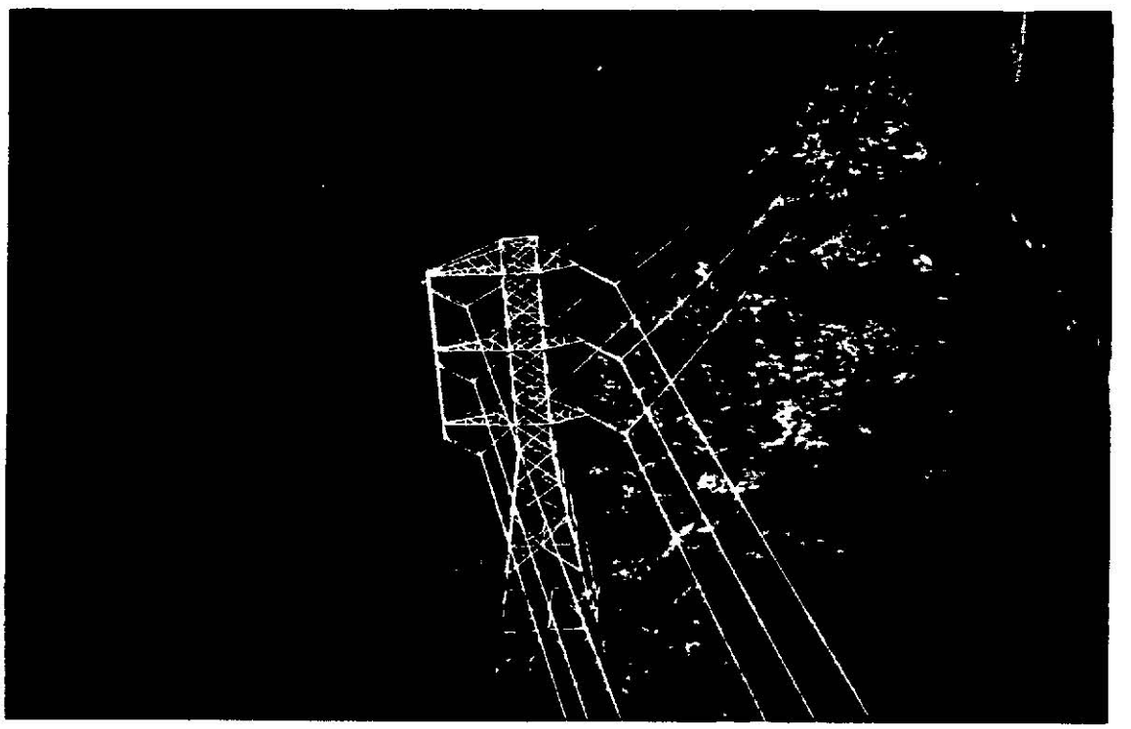


FIGURE 4. South Fork Stillaguamish River Crossing (left)

Side Clearance of D circuit, Skagit Line (below)



midspan (see figures 1 and 2). As experienced electrical workers patrol the transmission lines, proper clearance is also needed to provide a clear line of sight for visual inspection of conductor clearances.

The conductor-to-ground distance can vary substantially with location depending on the terrain below the conductor, distance between structures, and amount of conductor sag. These varying conditions will dictate the clearing requirements. In areas with steep terrain, clearing is typically not required at the bottom of the slope since the structures are placed at the top of the slope allowing for a large conductor-to-ground clearance (see figure 3). An example of such an area is the South Fork Stillaguamish River crossing on the Skagit line (see figure 4) where only limited selective clearing is required on the valley floor. This also allows for protection of the streamside vegetation in this area. But areas which are difficult to access and where working conditions are dangerous may require a greater tree removal effort on the lower portions of steep slope areas, even though removal may not be needed for several years, in order to reduce risks to workers (i.e., some steep slope areas in the upper Skagit). Selective removal is possible in areas with non-uniform stands of slow and fast growing tree species (areas of mixed conifer and deciduous stands). In areas of moderate slope with relatively uniform stands of trees, selective clearing is not practical unless buffers are needed for visually or environmentally sensitive areas such as stream banks and other riparian areas.

2.3 Planning and Maintenance Objectives The natural regeneration of woody tree species must be controlled to maintain a safe ROW system. The basic philosophy of vegetation management on the ROW is to remove only the tall-growing woody species where necessary and encourage compatible low-growing species which compete with and inhibit the establishment or spread of tall-growing species. This can be accomplished by: 1) selectively removing tall-growing species with as little impact as possible to the indigenous low-growing species; 2) removing deciduous trees in such a manner as to prevent resprouting (e.g., time of year tree is cut, cut stump herbicide treatment, or mechanically shattering the root crown); 3) development of new communities by preparing a seedbed and seeding/planting with compatible species; 4) seeding and/or fertilization of existing or disturbed areas with compatible species; and/or 5) encouraging land use practices which exclude tree growth (e.g., pastures, gardens, etc.). The method chosen depends on the density of the problem species, the existing plant community, the terrain, environmental sensitivity, and ownership of the ROW.

Vegetation control efforts on SCL's ROWs are achieved primarily through manual (chainsaws) and mechanical (mowers/cutters for grass and brush) methods. Herbicides are used only as an additional tool to help control deciduous tree stump resprouting in selective areas and to control noxious weeds. As deciduous tree growth and resprouting is controlled on the ROW or alternative methods are found to control deciduous trees (e.g., mechanically shattering the roots crowns or selective seeding of existing ROW areas without seedbed preparation), the use of cut stump herbicide treatment will be reduced. Control of noxious weeds is not limited to herbicides, manual and biological controls are also being used and evaluated. If current experiments in biological control are successful, SCL will further reduce the use of herbicides to control weeds. Tent caterpillar control is limited to manual and biological control methods. Section 3 is a detailed description and discussion of routine ROW maintenance activities.

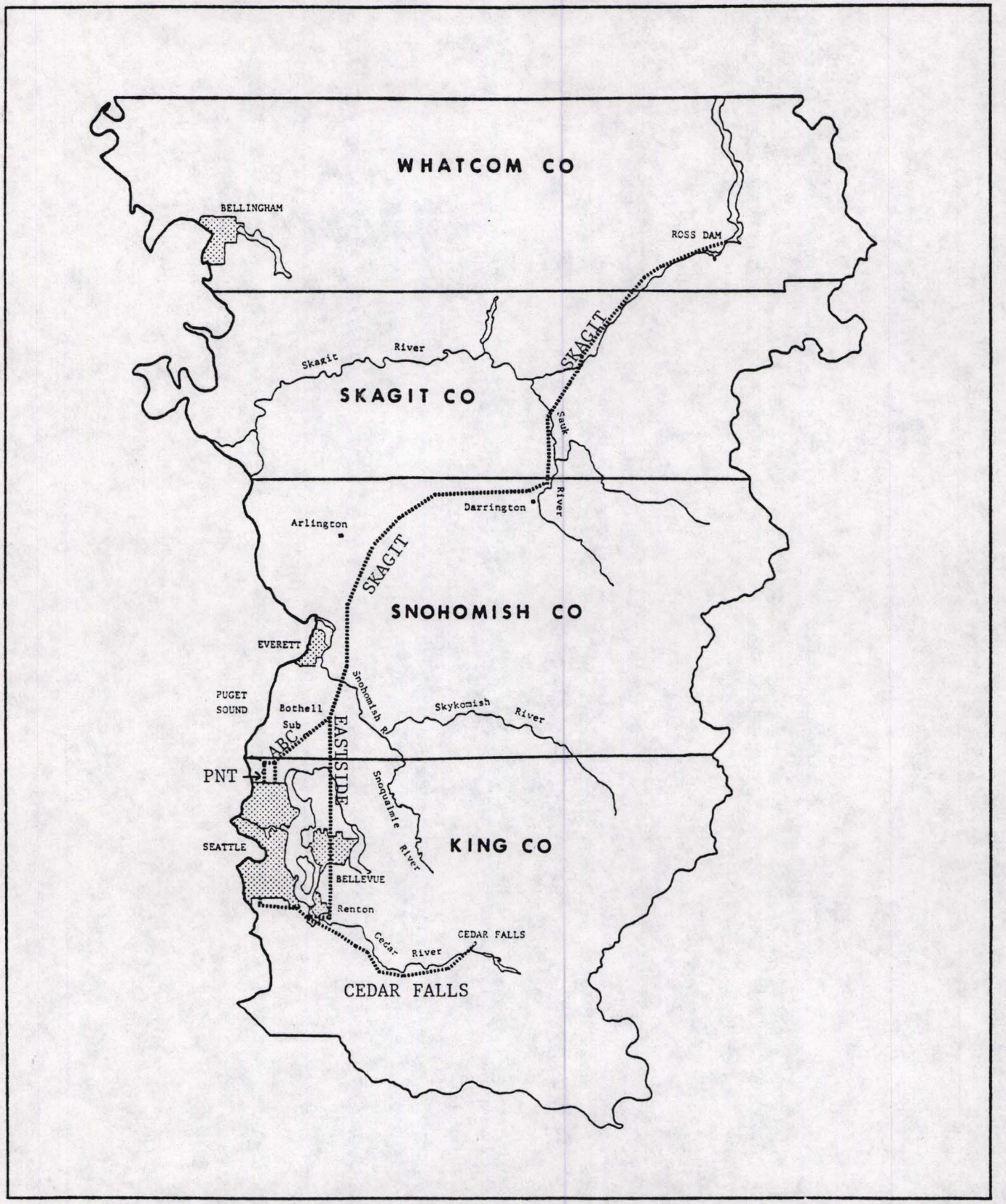
Improved streamside management techniques are presently being adopted by SCL. Selective removal of tall-growing species is the goal for streamside areas. These areas will need to be inspected more frequently and will probably need to be maintained on a 1 - 2 year cycle, instead of a 2 - 3 year cycle, to allow for less impact on the riparian vegetation and provide a more-or-less stable riparian vegetation zone for streamside areas.

Aesthetics are becoming an important management consideration in visually sensitive areas on the ROW. The major area of aesthetic concern is the Ross Lake National Recreation Area (NRA); other areas may be identified in the future. SCL is presently studying this issue within the NRA and investigating possible solutions to lessen the visual impact of ROW maintenance in the NRA (see Section 5.2). Aesthetic issues are also a major concern for maintenance efforts on SCL's urban ROWs.

SCL sponsored research and investigations (wetlands project and grasslands research) indicate that major efforts to reshape the landscape or vegetation is too costly for either the level of control needed or the amount of control gained from these efforts. Instead, it has been recommended that existing wetlands be carefully maintained to provide the tree control wetland communities on the ROW naturally provide, and that seeding efforts be focused on selected ROW areas without seedbed preparation (see Section 3.5 for a detailed discussion).

Another goal of ROW maintenance is to educate the public on the proper selection and placement of trees on the ROW. To meet this need SCL has produced a booklet, The Right Tree Book, to provide the public with information on the importance of proper tree selection, the steps involved in the selection process and a list of "small" trees. SCL is presently working with a citizens forum which is developing recommendations for a tree replacement policy/program for distribution lines. This program will influence replacement policies on the ROW.

Figure 5. Location of SCL's Transmission ROW Corridors.



SCL will continue to monitor the various control methods used. The issue demanding the greatest level of effort is deciduous tree control. Monitoring efforts will compare cut stump sprouting control between cut stump herbicide treatment, mechanical control (with and without cut stump treatment) and routine manual control. Efforts will also continue to investigate grass seeding efforts to control tree invasion on the ROW; seeding and fertilization of areas without extensive seedbed preparation will be the primary focus of future efforts.

2.4 SCL Transmission Corridor Descriptions SCL has approximately 180 miles of dedicated transmission corridors which range from 300 feet to less than 40 feet in width with one or more steel towers or cement, wood, or steel poles. These corridors differ in topography, vegetation, land use and political jurisdiction. See Figure 5 and Table 1 for the location of SCL ROW corridors and acreage summary by dominant landuse. Most of the urban corridors are City owned. The majority of SCL's other corridors are easement property; private landowners have granted SCL easement for construction, operation and maintenance of the transmission lines. Landowners retain the rights to engage in all activities that do not conflict with the transmission system.

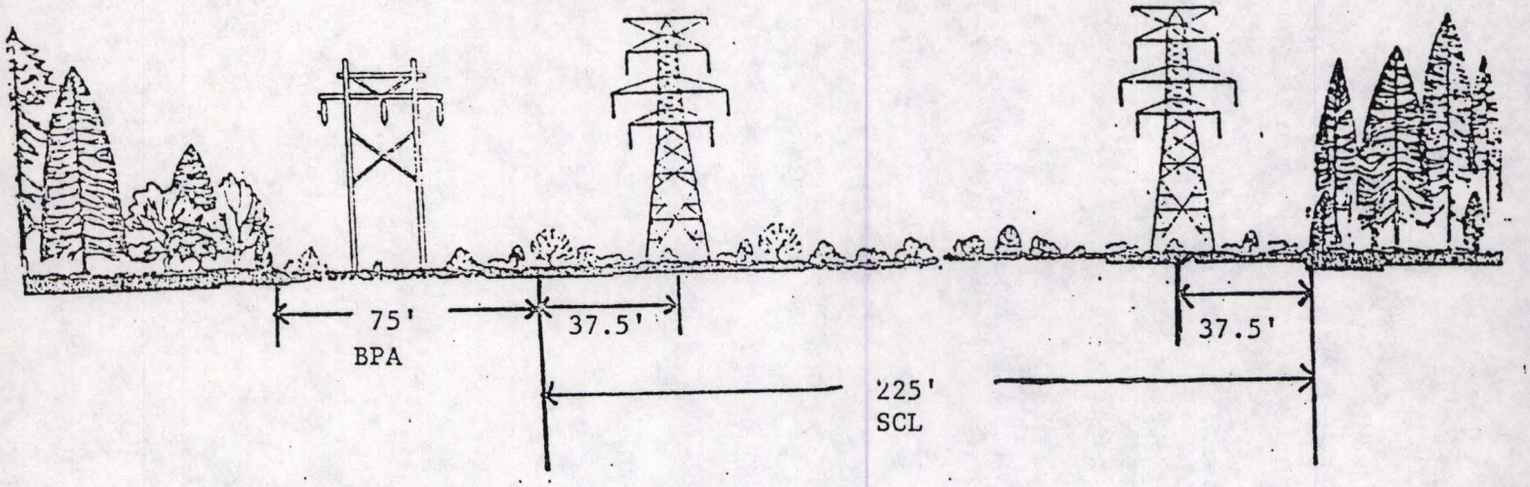
Table 1. Summary of acreages by dominant land use.

Transmission Corridor	Forest	Shrub	Agric	Urban	Total
Skagit	2,858	105	544	40	3,547
Cedar Falls	311	36	0	122	469
Suburban (Eastside/ABC)	370	15	67	256	736
Urban (Beacon Hill, PNT, Duwamish, Delridge)	90	29	5	349	473
Totals	3,629	185	616	767	5,225

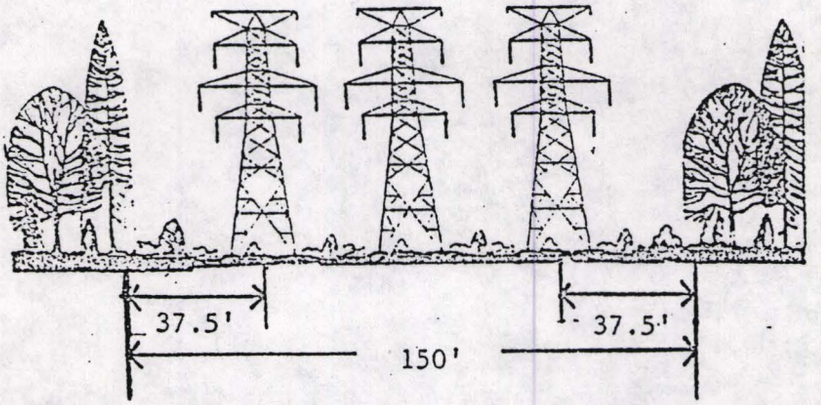
Skagit Corridor The Skagit corridor is 94 miles long, averaging 300 ft in width, and passes primarily through rural and forested areas, although there has been a dramatic increase in suburban development adjacent to the ROW in Snohomish County in recent years. Twenty miles lie within the Ross Lake NRA near the generating facilities on the upper Skagit (see section 5.2 for ROW management plans within the NRA). The ROW is often used for agricultural crops and pastures in rural residential areas. The primary control effort needed on the Skagit ROW is tree removal. Average distance from ROW edge to tower centerline is 37.5 ft

Figure 6. Typical Side Clearances by Corridor.

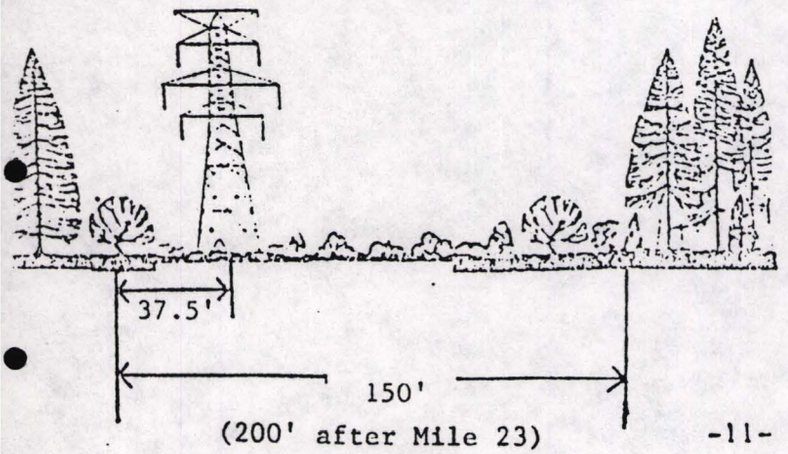
SKAGIT CORRIDOR (South of Skagit River)



ABC CORRIDOR

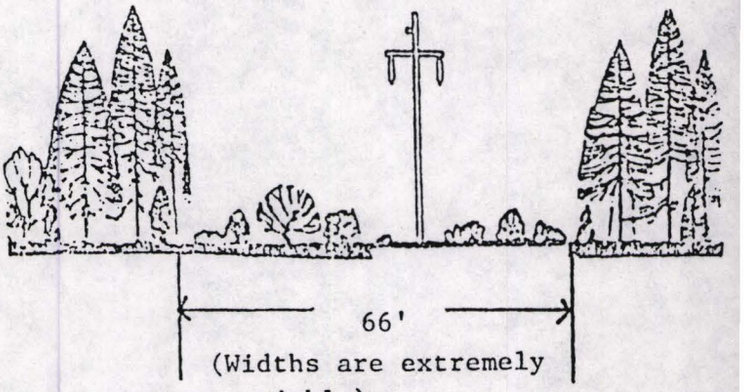


EASTSIDE CORRIDOR



(200' after Mile 23)

CEDAR FALLS CORRIDOR



(Widths are extremely variable)

for the D and B circuits. BPA controls an additional 75 ft. of the ROW from the B side of SCL's corridor. (see figure 6). On the ROW north of the Skagit River the tower centerlines are 75 ft. from ROW edge for both circuits. The limited side clearance for the D circuit south of the Skagit River restricts maximum allowable vegetation height near the ROW edge. For approximately 40 miles a double wood pole line (BPA or Snohomish County PUD) also lies within the outer 75 feet of the ROW adjacent to the B circuit; each utility is responsible for vegetation maintenance under and adjacent to their lines. In these areas the maximum allowable tree height is again severely restricted.

In the upper Skagit area the corridor clearance was extended out to the ROW easement edge during the past few years. The recent widening of the ROW has created a sharp contrast between the ROW and the adjacent mature forest which supports limited shrubby vegetation, this edge should soften as new growth is established in the recently cleared areas. Due to the narrow valley in the upper Skagit area, the transmission line splits into 2 corridors where it is not possible to place the two towers side by side within one corridor (approximately 11 miles); access and maintenance are generally more difficult in this area (e.g., some areas are accessable only via boat).

Cedar Falls Corridor

The Cedar Falls line also lies predominantly in rural and forested areas. Much of the corridor is within the boundaries of the Seattle watershed which is a closed watershed. This 30 mile single wood or cement pole line primarily has an east-west orientation. The corridor width varies on the nine miles from the powerhouse to Landsburg, and from Landsburg to Fairwood the width is 66 feet. There is very little direct sunlight on the ROW within the watershed even during the summer months due to the mature conifer forests immediately adjacent to the ROW. Outside of the watershed this corridor parallels the City's water pipeline until Lake Youngs.

Manual tree removal is also the major vegetation control technique utilized on the Cedar Falls corridor. Development is increasing rapidly in this area and much of the land adjacent to the line outside of the watershed will be residential areas in the near future.

Eastside and ABC Corridors

The ABC and Eastside lines lie primarily within suburban areas. Tree topping and trimming efforts are greater on these corridors as a large portion of these ROWs are adjacent to or pass through residential areas (landscaped backyard situations). Tree removal and replacement with compatible species is the preferred option to repeated trimming and topping efforts. The Eastside line crosses Bridle Trails State Park near Bellevue, clearance work in this area is done in cooperation with the Park Ranger. In suburban areas the ROW is used more often for athletic fields, gardens, horse stables, pastures, and lawns than less populated rural areas.

Three towers span the width of the ABC corridor, which averages 150 ft. Tower centerline to ROW edge is only 37.5 ft for both outside towers. The Eastside line, designed to accommodate two towers, is 150 ft wide from the Bothell Substation to Mile 23 and 200 feet wide after mile 23. Only one tower is presently on this corridor (tower centerline is 37.5 ft. from westerly edge of the ROW). A portion of the west circuit was recently energized (1988) by Puget Power; SCL continues maintenance responsibilities.

Urban Corridors
The primary vegetation control needed on the urban lines (Beacon Hill, PNT and Duwamish) is grass mowing. Residential, commercial, and industrial areas lie adjacent to the ROW and playgrounds, paths, gardens and parking lots may extend beneath the transmission lines. As these areas are more highly visible, a more groomed appearance is necessary on these corridors.

2.5 Herbicide Use Policy Spot application of approved herbicides is permitted by Departmental Policy and is the only application method utilized for herbicides on the ROW. Broadcast application of herbicides is permissable only upon approval of the Superintendent. Herbicides are presently used on a limited bases for control of deciduous stump sprouting and Tansy ragwort, a Class B noxious weed.

SCL is committed to using the safest effective herbicide(s) available and to monitoring herbicide use (see section 4.2 for a discussion of herbicide selection and review). The following precautions are taken for herbicide application: 1) all areas selected for application will be inspected prior to application by the plant ecologist to ensure no environmentally sensitive areas will be affected; 2) no herbicides will be used within 50 feet of any open water areas or within 20 feet of intermittent streams (50 ft buffer for noxious weed control); 3) no spraying will be done if wind speed is greater than 5 mph or if rain appears likely; 4) cut stump treatment will be done within one hour after cutting; 5) only target species will be sprayed; 6) local residents will be notified as appropriate; and 7) areas will be posted after herbicide application informing the public of the chemical used, the date and method of application, who to contact for further information, and a warning against use of the area or consumption of any plant material in the spray area (copy of the sign is provided in Appendix B).

All herbicides are stored properly in approved locations. Operations Division has a storage area at Newhalem. T&D uses the gardeners' chemical storage area at the University Substation for long term storage and a temporary storage area at the Bothell Substation during the spray season.

Empty containers are disposed of properly (containers are triple rinsed and punctured) and rinse water is used as spray. Newhalem has an authorized wash area which may be used.

Appropriate safety equipment is provided for herbicide application (coveralls, boots, goggles, gloves, aprons and respirators if required).

3.0 STANDARD ROW MAINTENANCE PRACTICES / VEGETATION MANAGEMENT TRACKING

Responsibilities

The Operations Division is responsible for ROW maintenance on the Skagit ROW north of the Sauk River (37 miles), T&D has the responsibility for the maintenance of the Skagit ROW from the Bothell Substation to the Sauk River (57 miles) and all other ROW corridors except Boundary in SCL's system. Transmission and Distribution's plant ecologist is responsible for planning of the entire ROW.

SCL has in-house ROW maintenance crews which are primarily responsible for: 1) vegetation control and 2) access, including road maintenance and water control. The workload typically increases during the summer months. Additional labor requirements are met by the use of temporary and permanent part-time employees as needed. A contractor is also utilized on a limited basis for mechanical clearing by T&D. Operations used contract crews until 1987 to assist in their clearing efforts in the upper Skagit area. Currently, all manual clearing efforts in the upper Skagit area are performed by in-house crews.

Tracking Maintenance Activities

A computer database, developed in house, is used to track maintenance activities, MAVIS - ROW Maintenance Activity and Vegetation Inventory System. MAVIS includes a vegetation and physical inventory and work activity records which track maintenance activity by span (see Appendix C for database information and list of reports generated by this system). This type of tracking provides detailed records of work activity by specific location, specific maintenance activity, and hours of maintenance required on a per acre, span or mile basis. The database is used for budgeting purposes, cost analysis, analyses of maintenance techniques and labor requirements, and for identification of trouble areas and environmentally sensitive areas.

Overview

The following information is compiled by an October 1 - September 30 time reference (although this is not the City's budget cycle). It is also possible to provide the information by line (e.g., Skagit, ABC, Eastside, etc.) if more specific information is required for planning purposes. Section 9.2 is a summary of labor hours and acres or spans maintained in 1987, 1988, and 1989.

The following maintenance techniques are the methods employed for vegetation control on SCL's ROWs; maintenance requirements will vary due to local conditions (e.g., terrain, corridor width, adjacent land use, sensitive areas, etc.).

3.1 Manual Vegetation Removal

Almost all clearing efforts on SCL ROWs are done manually with chainsaws. The cut stem is either chipped and the chips broadcast, or chipped and the chips hauled off site, or the stems are piled and burned. Larger diameter stems are limbed and typically cut into firewood lengths and left on the ROW. Work may be restricted or prohibited during the summer months due to fire precaution restrictions or shutdowns. King and Snohomish Counties also have open area burning restrictions in designated areas. SCL's burning policy will be reviewed for impacts on air quality.

With the increase of landscaped suburban and urban areas along the ROWs there has been an increase in the amount of tree topping and trimming that is done on the ROW. All trimming is done manually and the material is chipped and broadcast or removed from the site or cut into firewood lengths and left on the property.

Transmission & Distribution

Manual Removal	Acres	Hours	Hrs/Acre
1987 actual	1163	7178	6.2
1988 actual	1582	6476	4.1
1989 estimated	1400	6400	4.6
1989 actual	1159	5254	4.5
1990 estimated	1560	6800	4.4
1991 estimated	1560	6800	4.4

Other manual clearing efforts:	1987 hours	1988 hours	1989 hours
Rattlesnake Lake line	192	157	395
Cedar Falls Dam tie	163	0	0
Cedar Falls penstock	0	247	106

1990 manual clearing efforts will be concentrated in the following areas:

- Portion of ABC line not completed in 1989 - 80% manual removal, 20% trimming effort
- Eastside line - major clearing effort between miles 10 - 26
- Skagit line - major clearing effort between miles 0 - 7, mile 14, miles 27 - 32, miles 49 and 50
- Cedar Falls line - miles 0 - 4, danger tree removal
- Skyway area - major clearing effort between poles 109 - 317

Topping & Trimming	Spans	Hours	Hrs/Span
1987 actual	50	950	19.0
1988 actual	52	868	16.7
1989 estimated	50	1000	20.0
1989 actual	29	563	19.4
1990 estimated	35	600	17.1
1991 estimated	30	495	16.5

Topping and trimming efforts should decrease in 1990 after completion of Eastside line west circuit clearance and ABC line clearance.

Danger Tree Removal	Spans	Hours	Hrs/Span
1987 actual	60	556	9.3
1988 actual	38	307	8.1
1989 estimated	30	270	9.0
1989 actual	37	407	11.0
1990 estimated	25	225	9.0
1991 estimated	22	198	9.0

A danger tree is defined as a tree which in the current year has or will touch the conductor or, which if cut at the ROW edge could touch the conductor. The goal of the ROW maintenance program is to control vegetation in a routine maintenance cycle to avoid contact between conductors and trees. Danger tree removal efforts should decrease over time. Most of the danger trees removed on the system now are unstable trees found at the ROW edge.

Tower Clearing	# Towers	Hours	Hrs/Tower
1987 actual	82	100	1.2
1988 actual	165	682	4.1
1989 estimated	70	90	1.3
1989 actual	132	35	0.3
1990 estimated	70	90	1.3
1991 estimated	110	132	1.2

Increased tower clearing efforts are usually associated with tower painting. ROW crews cleared towers on the ABC line prior to painting in 1988. Both manual and mechanical clearing methods are used for tower clearing, although most clearing was done manually in 1987 and 1988.

Steel poles will be painted in 1990, and although exact areas are not yet known, areas presently under consideration on the Duwamish - Delridge line are already cleared of brushy vegetation.

Operations

Manual Removal	Acres	Spans	Hours	Hrs/A
1987 actual	754	129	11151	14.8
1988 actual	447	69	9506	21.2
1989 estimated	-	135	11880	-
1989 actual	894	-	7708	8.6
1990 estimated	400	-	8840	22.1
1991 estimated	600	-	8000	13.3

Operations has been tracking their work by acres and not by spans since 1989.

Other manual clearing efforts:

	Hours	
1987	1272	(26 kV line)
1988	1372	(26 kV line, & 7 kV line, Ross communication)
1989	none	

Projected areas for manual clearing 1990:

LOCATION	Projected Hrs
o Diablo Resort Peninsula	80
o B89/09N - B89/36N Buster Brown	320
o B86/32N - B87/08N D86/25N - D87/03N	384
o D75/18N - D76/03 Shovel Spur to Damnation	1280
o D86/13N - D86/25N	480
o D58/32N - D59/09N	1920
o Above Ross Tunnel - B90/48	320
o Lopping from Bacon Creek to DPH	2584
o 12A and 376 A Gorge Dam	192
o D84/31N Tunnel #2	640

Projected areas for manual clearing 1991:

LOCATION	Projected Hrs
o B89/09N - B89/50N Buster Brown	560
o B86/32N - B87/08N D86/13N - D87/03N Diablo "Y" to DPH	640
o Diablo Resort Peninsula	80
o B83/03N - B83/44N D83/00N - D83/38N Tunnel #1	960
o D70/35N - D70/47N B70/35N - B70/47N Spurlock	1024
o B74/22N - B74/42N Pinky's	640
o B75/18N - B75/38N Shovel Spur	640
o Lopping (Sauk River to Bacon Creek DPH to RPH	4520

3.2 Cut Stump Herbicide Application

Cut stump herbicide treatment is utilized on a limited basis to reduce stump sprouting of deciduous tree species, its use has thus far been limited to the Skagit corridor only during manual clearing efforts. Banvel CST, active ingredient dicamba, is presently (1989/1990) the herbicide in use on SCL ROWs for cut stump treatment. (Alternative herbicides for cut stump treatment are now under investigation, see Section 4.2 for a detailed discussion of herbicide selection and review.) Application of Banvel is limited to the drier months of May through September, depending on rainfall conditions, as dicamba is very water soluble and is not effective when applied during rainy seasons. (General precautions taken for herbicide application were previously discussed in Section 2.5.) Application rate is dependent on stem density but on the average it has been 1.2 to 1.7 gallons per acre. Application is done by or under the supervision of licensed pesticide applicators using Lumark backpacks equipped with a #9 controlled nozzle.

Transmission & Distribution

	Herbicide Application (Manual Clearing)			
Cut Stump Herbicide	Gal	Acres	Hrs	Gal/A
1987 actual	105	113	411	0.9
1988 actual	87	46	128	1.9
1989 estimated	180	150	500	1.2
1989 actual	98	76	117	1.3
1990 estimated	180	150	500	1.2
1991 estimated	180	150	500	1.2

Cut stump herbicide efforts were less in 1988 than in 1987 because Banvel CST supplies on hand were used before additional stock was delivered. This resulted in a three week period during the application season when Banvel supplies were not available.

1990 - 91 Goals

Areas targeted for cut stump treatment in 1990 are miles 27 - 30 and miles 34 - 39 on the Skagit corridor as time and weather permits from May - September. An effort equal to 1990 is predicted for 1991; based on the number of areas needing alder control, cut stump herbicide control efforts will not be decreasing in 1991.

Operations

Cut Stump Herbicide	Gallons	Acres	Spans	Hours	Gal/A
1987 actual	not available	599	80	1655	
1988 actual	73.5	120	25	235	0.61
1989 estimated	70	-	60	640	-
1989 actual	0	0	0	0	0
1990 estimated	40	60	60	480	0.66
1991 estimated	90	600	80	1600	0.15

Projected areas for cut stump treatment:

	LOCATION	Projected Hrs
1990:	Benches - DPH	480
	D72/07N - D87/03N	
	D72/08N - D87/08N	
1991:	Sauk River - Spurlock	1600
	D57/42N - D70/35N	
	B57/44N - B70/35N	

3.3 Mechanical Vegetation Removal

3.3.1 SCL Mechanical Clearing Operations

Mechanical clearing is utilized on a limited basis on SCL ROWs. Areas targeted for mechanical clearing are areas of high tree density with accessible terrain, and areas where the machine will not damage compatible vegetation or damage adjacent property with flying debris, although new equipment developments are reducing this hazard. Several types of brush clearing machines are presently used. T&D has a boom mower attached as a side-mount to a tractor. This machine is used primarily for roadside brush control but will occasionally, where terrain permits, be used for brush control on the ROW proper. A tractor pulled rotary mower (6 ft swath) is also used on the Cedar Falls ROW to cut brush alder where the terrain permits. Presently, Operations does not use mechanical clearing for maintenance of the upper Skagit ROW.

Transmission & Distribution

Mechanical Removal	Acres	Hours	Hrs/A
1987 actual	161	427	2.6
1988 actual	204	484	2.4
1989 estimated	180	500	2.8
1989 actual	308	557	1.8
1990 estimated	180	500	2.8
1991 estimated	180	500	2.8

The primary mechanical brush control efforts on the ROW proper by ROW crews is done on the Cedar Falls line to control dense alder brush areas. In 1989, this work was done in miles 0 and miles 3 through 9. Presently, T&D has no plans to increase the in-house mechanical clearing efforts. Areas under consideration for mechanical clearing in 1990:

- o Miles 0, 5, and 8 on the Cedar Falls line.

3.3.2 Contract Mechanical Clearing

T&D utilizes a contractor for mechanical clearing on a limited basis. In 1989, a new brush cutting machine was introduced onto SCL rights-of-way. This machine, the Spyder, is a smaller, more maneuverable machine with a unique design which allows each leg or wheel to move up or down, extend or retract, or move in or spread out. This allows the operator to adjust the working base of the machine to any slope. The cutting wheel on the Spyder is guarded, reducing the distance debris is thrown from the cutting blade. The cutting blade produces a fine mulch, reducing the hazard of heavy flying debris. The cutting disc on the Spyder has been designed to more effectively shred the stem of smaller diameter trees, thus causing more extensive root crown damage than the machines previously used by SCL. Spyders were utilized on the rights-of-way in 1989, and the resprouting of the deciduous trees in its path will be closely monitored in 1990 by the Plant Ecologist. Consideration is also being given to following the mechanical clearing efforts with cut stump herbicide application in selected areas. The Shur Shar 20 will continue to be utilized on selected rights-of-way; however, the Spyder may replace it in areas after resprouting has been assessed.

Areas under consideration for contract clearing in 1990 (early summer):

- o Miles 5 and 6 on the Eastside line.
- o Other areas are under consideration, but have not yet been selected. An area will be selected for a side-by-side comparison of resprouting control between an area cleared with the Spyder with and without a follow-up of cut stump herbicide application (weather permitting).

Contract Mechanical Clearing (T&D)

Mechanical Removal	Acres	Hours	Hrs/A
1987 actual	83	176	2.2
1988 actual	42	88	2.1
1989 estimated	100	210	2.1
1989 actual	35	180	5.1
1990 estimated	40	80	2.0
1991 estimated	40	80	2.0

3.4 Mowing

Routine mowing is done on approximately 270 acres of the Beacon Hill, Duwamish, and the PNT corridors to control grass, shrubs and weeds. Hand held brush cutters are used in areas where the tractor mowers are not able to access. Annual labor hours are dependent on growing conditions which control the number of cuttings per year.

Transmission & Distribution

Mowing	Acres	Hours	Hrs/A
1987 actual	247	1425	5.8
1988 actual	267	1494	5.6
1989 estimated	265	1500	5.7
1989 actual	322	1162	3.6
1990 estimated	265	1500	5.7
1991 estimated	265	1500	5.7

3.5 Manipulation

Manipulation is an effort to alter vegetation in areas with dense stands of problem vegetation or to revegetate severely disturbed areas (typically seeding/fertilization efforts). These efforts are made in an attempt to eliminate or reduce future maintenance efforts and thus, reduce long term costs for control. Seeding and fertilization of ROW areas without seedbed preparation is also under consideration for investigation (see discussion below).

Transmission & Distribution

Manipulation	Acres	Hours		Hrs/A
1987 actual	110	452	(PNT upgrade)	4.2
1988 actual	12	24		2.0
1989 estimated	60	300		5.0
1989 actual	12	23		1.9
1990 estimated	40	200		5.0
1991 estimated	40	200		5.0

1989 Update

Blackberry control on the PNT - area graded late summer 1988, seeded spring 1989.

Creston-Nelson Substation / seeding project completed in 1989.

Grasslands Project - Consultant Contract 1988 was the final year of monitoring the experimental grasslands plots by the consultant. Future monitoring will be conducted in house. The final consultant's report was submitted in March 1989. Tree seedling growth was somewhat suppressed for the first two years after the grassland plots were established, but the third and fourth years saw a significant invasion of alder seedlings at the "wet" site. It is suspected that the dry conditions after establishment of the grasslands plots were responsible for suppressed alder seedling invasion rather than competition from the seeded grasses and legumes or effects of the nitrogen fertilization. (See Appendix D for report summary.)

It is recommended that subsequent seeding efforts be attempted on the ROW with no seedbed preparation. Pacific Power & Light Company conducted a study on the effects of fertilizing established vegetation which indicated that fertilization of an established community can increase grass biomass and decrease alder seedling invasion for up to two years. The advantages of seeding and fertilizing without site preparation are: 1) lower initial cost, 2) elimination of the scarified stage during which alder invasion is likely and 3) fewer access and slope restrictions.

1990 Goals

Skagit ROW south of Frontier Village / seeding project - activities including the use of the brush machine, grading, seeding and fertilizing are scheduled for the summer of 1990.

Seeding/fertilization efforts of established ROW vegetation (no seedbed preparation) as a follow up of grasslands study. Specific areas will be selected during the summer of 1990 for fall implementation.

T&D is presently considering a burn and seed/fertilization effort in an area adjacent to Beverly Creek (D48/24N) in an attempt to control tansy ragwort. An unknown factor is how the tansy roots will respond to burning. The primary concerns are the ability to control the burn and the effects of burning on the biological control experiment. The insect population associated with the biological control experiment will be monitored this year before any decisions are made regarding burning to control tansy.

Additional manual efforts are planned on the blackberry control grading and seeding project on the PNT during the summer of 1990.

Evaluation of areas previously manipulated is planned in order to assess the effects of specific types of vegetation manipulation. This evaluation will be completed during the summer of 1990 by the Plant Ecologist.

3.6 Weed and Pest Control

3.6.1 Tent Caterpillars

Locations of tent caterpillar infestations on SCL owned ROW are recorded. These areas are then monitored for tent caterpillars starting in mid-April of each year. Treatment of these infected areas is done through a coordinated effort between SCL landscape and ROW crews. Infested limbs are removed manually or sprayed with Bacillus thuringiensis, BT, as needed. Also, tree species commonly infested with tent caterpillars or already infested are removed throughout the year, and this practice will continue in 1990.

Transmission & Distribution

Pest Control/Insect	Hours	Gallons Dipel/sticker	Cost/Gal Dipel/sticker
1987 actual / biological	0	--	--
manual	91		
1988 actual / biological	12	2 oz / 4 oz	$15 / $11
manual	15		
1989 estimated / biological	20	2 oz / 4 oz	$15 / $11
manual	20		
1989 actual / biological	0	--	--
manual	0		
1990 estimated / biological	20	4 oz / 8 oz	$15 / $11
manual	20		
1991 estimated / biological	20	4 oz / 8 oz	$15 / $11
manual	20		

No biological control efforts could be coordinated in 1987 for the heavy infestation at Mile 3 on the Eastside line, so infested limbs were manually removed. SCL responded to the request of homeowners in this area who were making a neighborhood effort to control tent caterpillars. BT was used for caterpillar control in this area in 1988. Caterpillar control on the PNT was done manually in both 1987 and 1988.

It is difficult to predict the severity of tent caterpillar infestations. For example, there were no caterpillar control efforts in 1989. An effort at a level equal to preceeding years will be anticipated, although biological control efforts will be easier to coordinate since the gardeners have joined Unit 502 and are licensed for BT application.

3.6.2 Noxious Weeds

Noxious weeds on the ROW are controlled as required by State Noxious Weed Control Regulations (see Appendix E for State Noxious Weed Law and Weed List). SCL is responsible for noxious weed control on property owned by SCL. Noxious weeds on easements are the responsibility of the infestation. If a Class A or Class B weed species is found on SCL property, a written agreement will be obtained from the County Noxious

Weed Control Board(s) that our efforts meet their legal weed control requirements.

Presently (1989), tansy ragwort (Senecio jacobaea) is the only Class A or Class B noxious weed found on SCL ROWs. Approximately 50 acres (spans D48/01N - D49/16N) near Darrington, Washington is the only area SCL is presently required to control tansy at this time. It is also found at two locations on the Cedar Falls corridor but the Seattle Water Department owns the land. Tansy ragwort is presently controlled through spot application of Banvel, except for areas within 50 feet of open water or intermittent streams where the tansy is handpulled, bagged and removed from the site. Flower heads are also clipped and bagged during the spraying operations. Flowering tansy is treated or pulled as needed between June 1 and September 30. The use of biological control is currently being evaluated through a SCL research & development project. See discussions below for a complete description of this biological control project. If this method proves effective, it will be used more extensively for control of tansy on the ROW.

There have recently (1988) been several reported findings of knapweed (Centuarea spp) in Whatcom County. Knapweed is a very invasive noxious weed and is listed as a Class A noxious weed in Western Washington. SCL will closely monitor the incidence of knapweed in this area.

Transmission & Distribution

Noxious Weed Control		Acres	Hours	Gallons of Herbicide	Cost/Gal
1987 actual	/ chemical	50	47	2	$22
	manual	12	53		
	biological	(none by ROW crew)			
1988 actual	/ chemical	50	80	1.5	$24
	manual	18	45		
	biological	6	14*		
1989 estimated	/ chemical	50	60	1	$24
	manual	18	40		
	biological	10	44*		
1989 actual	/ chemical	8	23	1	$24
	manual	29	56		
	biological	0	0		
1990 estimated	/ chemical	50	60	1	$24
	manual	18	40		
	biological	10	20*		
1991 estimated	/ chemical	50	50	1	$25
	manual	18	35		
	biological	10	20*		

* Biological control hours include hours for research, counting pla counting insects etc., and these hours will be reduced after biological control is operational.

1989 Update

Biological Control

A biological control program for tansy ragwort utilizing tansy flea beetles (Longitarsus jacobaeae) and cinnabar moths (Tyria jacobaeae) has been under investigation since 1986 by EAD at Mile 48 on the Skagit corridor. Both species of insects have been successfully established in the area. The insect populations did not provide significant control of the tansy in 1988. Three to four years are typically required for the populations to build up to levels which can significantly control tansy ragwort. Both insect species were reintroduced in 1988 and greater control of tansy by the insects was evident in 1989. The biological control site was also hand clipped in October 1988 and July 1989 within 1 - 2 meters of Beverly Creek; these seed heads were burned on site by the ROW crew.

Ragwort densities within the insect treatment area have exhibited a cyclic pattern of increase and decrease, with annual fluctuation in number of vegetative plants followed one year later by upflowering plants. Evidence of continued population growth made releases of cinnabar moth larvae and flea beetles unnecessary in 1989. Cinnabar larvae were still concentrated within the insect treatment area,although small numbers of caterpillars were found as far as 750 feet in either direction along the ROW corridor. Larval densities increased substantially from an estimated 25 percent of the plants infested in 1988 and 50 percent in 1989. Seedhead fly damage (seedhead flies were most likely brought to the site inadvertently with the cinnabar moth larvae) continued to be evident throughout the study area in 1989. 72 percent of the flowering plants had damaged seedheads, although most of the damage was relatively light. Significant growth was also evident in the local flea beetle population. Adult beetles were visible on ragwort plants from late September through early December, and the overall capture rate increased from 12.2 per minute in 1988 to 62.4 per minute in 1989.

Bob Brown, head of the Oregon Department of Agriculture's Weed Control Section, visited the site in 1989. His evaluation was that insect population levels should be high enough to control tansy ragwort in one to two years and that seeds entering Beverly Creek were unlikely to be a significant source of tansy ragwort off-property. If this experiment is successful, the need for herbicides to control tansy ragwort will be greatly reduced.

Manual and Chemical Control

On all areas outside of the biological control site no tansy ragwort was allowed to seed. After the initial July effort crews returned once in August for additional spot chemical control. Handpulling efforts were repeated three times during August and September by the T&D personnel conducting the herbicide monitoring program.

An area utilized as an additional insect overflow/release area in 1987 outside of the biological control plots was handpulled by the ROW crews in 1989 at the request of EAD.

1990 -1991 Goals

Below is a timeline outlining the milestones for 1990 and 1991 for the Alternative Control of Tansy Ragwort project.

Task	Timeline
o First inventory of experimental plots in 1990	May 1990
o Reintroduction of herbivorous insects (if necessary)	June and Sept. 1990
o Inventories of plots	June, July, and Sept. 1990
o Progress reports presenting results of ongoing inventories	Monthly
o Draft Report summarizing results for 1990	October 1990
o Final Report on 1990 results	November 1990
o First inventory of 1991	May 1991
o Inventories of plots	June, July, and Sept. 1991
o Draft report on 1991 results	October 1991
o Compile, evaluate, assess results	November 1991
o Final Report on project results	December 1991
o Projection of Project Completion Date	December 1991
o Presentations to R&D Committee	As requested

Additional efforts will be made in 1990 to control tansy seeding adjacent to the creek at the study site. These efforts will require additional labor hours from T&D crews. Seed heads will be be clipped within a 1 - 2 meter strip adjacent to the creek in the insect release area. This effort should begin in early July. T&D crews will clip the streamside area in early July when they are at the site for manual and chemical control.

T&D is presently considering a burn and seed/fertilization effort in an area adjacent to Beverly Creek (D48/24N) in an attempt to control tansy ragwort. (See Section 3.5)

Monitor flea beetle release site on Cedar Falls corridor (Mile 5) and release additional flea beetles in September if they are available.

3.7 Other Maintenance Activities

3.7.1 Road Work

Roads are maintained to allow 4x4 access to the transmission system for system maintenance. The various types of work involved with road maintenance include grading, spreading rock and gravel, water control (blanket HPA permits cover routine culvert maintenance and replacement,see Section 5.1), gate and barrier installation (necessary to limit access in certain areas) and mowing roadsides with a side-arm mower. Much of the rock for the ROW roads is taken from the pit at Mile 24 on the Skagit line, "Johnson's Pit". Road work hours include the grading efforts in the pit to remove the rock. The ROW crews are responsible for road work for T&D; labor crews maintain the ROW roads for Operations (these hours are not reported in this plan).

Transmission & Distribution

Roads	Hours
1987 actual	2323
1988 actual	1746
1989 estimated	1300
1989 actual	1870
1990 estimated	1800
1991 estimated	1800
Water Control	
1987 actual	37
1988 actual	272
1989 estimated	150
1989 actual	610
1990 estimated	600
1991 estimated	600

The increased water control efforts in 1988 and 1989 were due to beavers damming culverts and flooding roads on several areas of the Skagit ROW. The culverts need to be unplugged on a continuing basis.

1990 Goals

There may be additional road work needed in 1990 than the work outlined below to correct unforeseen drainage problems or damage resulting from severe flooding, or to limit access to control 4X4 damage, garbage dumping, etc.

Skagit: Road work at mile 37, Indian Ridge area as needed; gates at mile 5 and other areas as needed. Road work is needed in the Squire Creek area to re-open the road.

Eastside: Install gates and/or ecology blocks to control access, install two culverts pending approval by the city of Bothell.

ABC: Water control A00/001, water flow through the wetland area is threatening the tower base, culvert placement in the road will be altered to divert the flow away from the tower base, some ditching may also be required. This will result in only a slight alignment of flow through the wetland area.

3.7.2 Garbage Control / Vandalism

Efforts continue to limit access to the ROW in order to limit dirt bike and 4x4 use of the ROW which has been causing considerable erosion problems. Access is also barricaded to prevent garbage dumping on the ROW which has increased dramatically in the past few years. Many of the gates and barricades installed in the past few years to limit access have been vandalized by those who continue to attempt to gain access to the ROW for these purposes. Garbage dumping problems and disposal costs are expected to increase.

Transmission & Distribution

Garbage Control	Hours	Disposal Costs
1987 actual	618	$2000
1988 actual	534	$2300
1989 estimated	700	$5000
1989 actual	583	$2500
1990 estimated	700	$5000
1991 estimated	800	$6000

1990 Goals

One area of extreme concern is a dumping area found in a ravine at Mile 53 on the Skagit Line in November 1988. T&D will work with Skagit County to attempt to limit access to this area by installing a stronger gate. SCL will be required to remove some of the material dumped at this site because of potential health hazards.

Another area of concern is between towers B28/14S and B37/21S, with the target area from Mile 32 to Mile 36. Garbage dumping areas are increasing in this area as well as between North 95th St. and 185th St. on the PNT line. SCL will contact landowners adjacent to these areas and ask for assistance in order to identify and prosecute illegal garbage dumpers.

3.7.3 CIP Work

1989 Update

Moose Creek (Mile 42 Skagit line) and Olsen Creek (Mile 67, Skagit line) bridge procurement and installation was completed in 1989.

1990 Goals

The streambank stabilization project on French Creek (Mile 39, Skagit) is tentatively scheduled for the summer 1990. The Engineering Division is planning the project. It is presently estimated that the project will require 480 hours of T&D maintenance crew labor; costs of equipment rental and material have not yet been finalized. The planning and work efforts will be closely coordinated with the Agencies, site visits were made with the Departments of Wildlife and Fisheries during 1988. EAD will secure the necessary permits.

All culverts over thirty-six inches and all bridges are scheduled to be re-inventoried in 1990. The condition of each bridge or culvert will be assessed in order to identify long-term maintenance costs. This additional information is needed to determine the lifetime of each structure for the Capital Assessment Replacement Program (CARP).

3.7.4 Tower Designation

1990 Goals

Tower identification numbers will be replaced on towers 200A through 335 on the South Renton to Creston Line.

3.8 Travel Time And Equipment Transport

The hours reported for the above activities do not include travel time or equipment transport time for the activity described for T&D crews. The distance from the work headquarters to the job site, not the activity at the site, determines travel time. Although the type of activity will dictate the equipment needed at the job site, it is not included in the job time because the distance from the job site is again the major factor determining equipment transport time. Beginning in 1989, Operation's crews have included their travel time in the above activities, and future speculations on Operation's travel time are unnecessary since it is not recorded separately.

Transmission & Distribution

Travel/Equip. Transport	Hours
1987 actual	4020
1988 actual	4217
1989 estimated	4100
1989 actual	4435
1990 estimated	4400
1991 estimated	4400

Operations Division

Travel/Equip. Transport	Hours
1987 actual	1786
1988 actual	1853

4.0 SAFETY AND HEALTH STANDARDS

4.1 General Standards

All work on the ROW is performed in accordance to WAC 296-24-960, Washington General Safety and Health Standards, Proximity to Overhead Powerlines.

SCL provides the necessary safety equipment for chainsaw operators, equipment operators and herbicide applicators (chaps, safety glasses, hard hats, safety belts, ear plugs, coveralls, respirators, aprons, gloves, etc.).

All crew members carry current first aid and CPR cards; T&D crews also carry flagging cards.

Monthly safety meetings are held for the maintenance crews.

WIN books are located at all work reporting locations.

T&D and Safety & Health have developed an aerial rescue class and will conduct this training annually.

Maintenance standards have been developed for: 1) handling of hazardous substances on the ROW; 2) chain saw operation and maintenance; 3) methods and maintenance schedule for the PNT ROW, and 4) obtaining gasoline and oil for ROW vehicles and chain saws.

Most maintenance crew members and all crew leads applying herbicides are licensed public herbicide applicators. Unlicensed personnel applying herbicides must be under direct supervision of a licensed herbicide applicator. Approximately $50 (for training course) and 15 training hours are required yearly to license a crew member. Yearly license fees are $20 for public applicator licenses.

Clearance standards used for trees on the ROW are the same as the construction standards set for vertical clearance above buildings; 16.5 ft. clearance for 240 KV and 12.5 ft. for 120 KV.

See Appendix F for copies of the safety rules and standards.

4.2 Herbicide Selection and Review

Herbicides are used on a very limited basis on the ROW. SCL is committed to using the safest herbicides available when it is necessary to use herbicides for vegetation control. In order to carry out this commitment SCL must have the most current information regarding the toxicity of herbicides being used and other available herbicides .

Dost (1983) prepared a worst case analysis on several herbicides, including Banvel, for the Bureau of Land Management. Based on toxicological studies done by the manufacturer in 1981, there appears to be some reproductive sensitivity in rabbits resulting in early gestational loss at rates of 10/mg/kg/day (see Sept. 1985 memo Appendix B). SCL continues to recommend that female crew members not be in the area during or 24 hours after application of Banvel.

A professional consultant contract was used to assist in the review of herbicides available for cut stump treatment and noxious weed control on the ROW. The results will be reviewed by EAD staff and a recognition made of available safe alternatives.
The timeline for the herbicide review and report is as follows:

Task	Timeline
o Review of initial herbicide information and selection of herbicides for detailed review	April 1989
o Literature review and analyses of information	April - August 1989
o Preliminary report on selected herbicides	September 1989
o Final report	February 1990

1990 Goals

The final report from the consultant has been received. SCL will evaluate this report for implementation on the ROW.

5.0 SPECIAL MANAGEMENT AREAS / PROJECTS

5.1 Streamside Management

The management goal in riparian areas is to remove only danger trees, leaving remaining vegetation as undisturbed as possible. T&D and Operations have been selectively removing trees in stream areas as a standard maintenance practice for several years.

In recent years much work has been done on the ROW access roads to prevent road washing, including ditching and placement of culverts for proper hillside drainage. Such erosion control efforts reduce sediment runoff into streams. Culvert maintenance, primarily keeping the culverts clear of debris, is done as needed to allow unrestricted flow through the culverts.

Blanket Hydraulic Project Approvals (HPAs) which permit routine culvert maintenance and replacement between June 15 and October 31 have been or are being secured for all access road areas which cross fish supporting streams. Emergency repair and maintenance outside of this time frame or for larger structures will require emergency or separate permits from the Departments of Wildlife and/or Fisheries.

1989 Update

A blanket HPA was received for the area between Darrington and Newhalem on the Skagit line.

HPA's were received for (1) tower stabilization (B42/03N) adjacent to Moose Creek (rip rap near the tower base, which required removal of material from the opposite bank equal to the area filled by rip rap to prevent loss of channel area, and (2) Moose Creek bridge and (3) Olsen Creek bridge removal and replacement (CIP).

The stream stabilization project on French Creek to protect tower D39/29N which requires an HPA and close agency coordination was rescheduled for 1990. (These CIP projects were discussed in detail in Section 3.7.3.) EAD will obtain HPA permits.

1990 Goals

French Creek - The stream stabilization project on French Creek to protect tower D39/29N will require an HPA and close agency coordination.

Applications for blanket HPA's for the area between Bothell and Darrington on the Skagit line and for the Eastside corridor will be submitted in 1990.

Riparian areas between Mile 3 and Mile 81 on the Skagit Line will be examined during the summer of 1990 prior to formulating a vegetation management plan in 1991 for these areas.

5.2 Ross Lake National Recreation Area

5.2.1 Maintenance Scheduled for 1990 - 1991 in the Ross Lake NRA

The areas targeted for tree removal in 1990 are:

- o B75/18N - D76/03N
  Shovel Spur to Damnation Creek
- o D84/31N (Tunnel #2)
- o 12A - 376A (Gorge Dam)
- o D86/13N - D86/25N
- o B86/32N - B87/08N and D86/25N - D87/03N (Diablo "Y" to DPH)
- o B90/48N (Above Ross Tunnel)
- o Diablo Resort Peninsula
- o B89/09N - B89/36N (Buster Brown Area)

The areas targeted for tree removal in 1991 are:

- o B74/22N - B74/42N (Pinky's)
- o B83/03N - B83/44N and D83/00N - D83/38N ("Tunnel #1")
- o B75/18N - B75/38N (Shovel Spur)
- o B86/32N - B87/08N and D86/13N - D87/03N
- o Diablo Resort Peninsula
- o B89/09N - B89/50N (Buster Brown)
- o DPH to RPH
- o Ross Lake NRA Boundary to Bacon Creek

All vegetation control efforts will be done in close coordination with the National Park Service (NPS) and EAD to ensure that these efforts are in accordance with the Washington Park Wilderness Act of 1988 (see following section) and in compliance with Federal Energy Regulatory Commission (FERC) licensing requirements. Site specific management prescriptions will be necessary for some areas of the NRA.

5.2.2 Aesthetics and Scenic Quality Within Ross Lake NRA

Provisions in Washington Park Wilderness Act, 1988 (Section 205. Renewable Natural Resource Use in National Recreation Areas) require that to the extent practicable, the removal and disposal of trees within power line rights-of-way within Ross Lake NRA be conducted in such a manner as to protect scenic viewsheds. However, worker safety and system integrity are to take precedence over aesthetic concerns.

The basic philosophy of vegetation maintenance on SCL's ROW is to remove only incompatible vegetation where necessary, allowing lower-growing species to remain. Such a maintenance practice allows shrubs and small trees (e.g., vine maple), to grow on the ROW to soften the visual impact of the ROW corridor. In some cases, this will also allow coniferous and/or deciduous trees to grow to a larger size where they do not pose a risk to crews or the lines. Additional efforts are needed within the Ross Lake NRA for this purpose.

1989 Update

To address this need, SCL contracted a professional consultant in 1989 to identify and map potential areas for aesthetic improvement within Ross Lake NRA and to describe methods which could improve the visual quality of the ROW, as a model for protecting scenic values in the transmission corridor. Several areas identified as most critical were selected to implement and test these recommendations. Implementation of suitable recommended methods began in 1989 for target areas identified during the course of the study.

1990 Goals

Below is a list of sites targeted by the consultant for aesthetic improvement:

Bacon Creek
Diablo Y
Gorge Dam Viewpoint
Goodell Creek
Thornton Creek
Pinkies
Diablo Overlook

Work on these areas will be continued in 1990. The final license for the Skagit Project following the results of current negotiations may result in additional requirements to enhance aesthetics on the ROW.

5.2.3 Ross Lake NRA Threatened, Endangered and Sensitive Plant Survey

1989 Update

The results of the rare plant species survey requested by the National Park Service in conjunction with the FERC relicensing process for the Skagit Hydropower Project were that no rare plants were found that could be affected by ROW management activities. Therefore, it is not necessary to recommend modifications in vegetation management practices.

5.3 Public Outreach/Involvement

ROW maintenance staff is involved with the public on a daily basis primarily addressing specific concerns of individual property owners and SCL safety requirements.

Community meetings are held when necessary to address special community concerns.

The ROW maintenance policies and plan will be reviewed by the Toxics Advisory Group. ROW maintenance practices are also included in The Long Range Toxics Plan.

Local residents will be notified of impending herbicide use. Areas will be posted after herbicide applications informing the public of the chemical used, the date and method of application, who to contact for further information, and a warning against use of the area or consumption of any plant material in the spray area (copy of the sign is provided in Appendix B).

1989 Update

The Right Tree Book was published in March 1989. This booklet will educate and alert the public to the issues of tree clearance around utility lines.

SCL also formed a citizen's forum in 1988 to discuss and make recommendations for a tree replacement program for SCL. This group presented its recommendations to the City Council in April 1989.

T&D is presently coordinating with CRD to get information out to loggers about the dangers of logging activities in ROW areas. There have been several outages on the Skagit and Cedar Falls corridors caused by loggers falling trees into the line during the past several years (two separate incidences in one week during November 1988). Log landing and loading operations have also been found operating on the Skagit ROW frequently during the past few years. The equipment involved in these operations, yarders and loaders, are extremely hazardous to operate on the ROW. SCL is also concerned about narrow "buffer" strips left standing adjacent to the ROW which have a high blowdown potential. Community newspapers and logging contractors were targeted to get this information to the logging communities in Skagit, King and Snohomish Counties.

1990 Goals

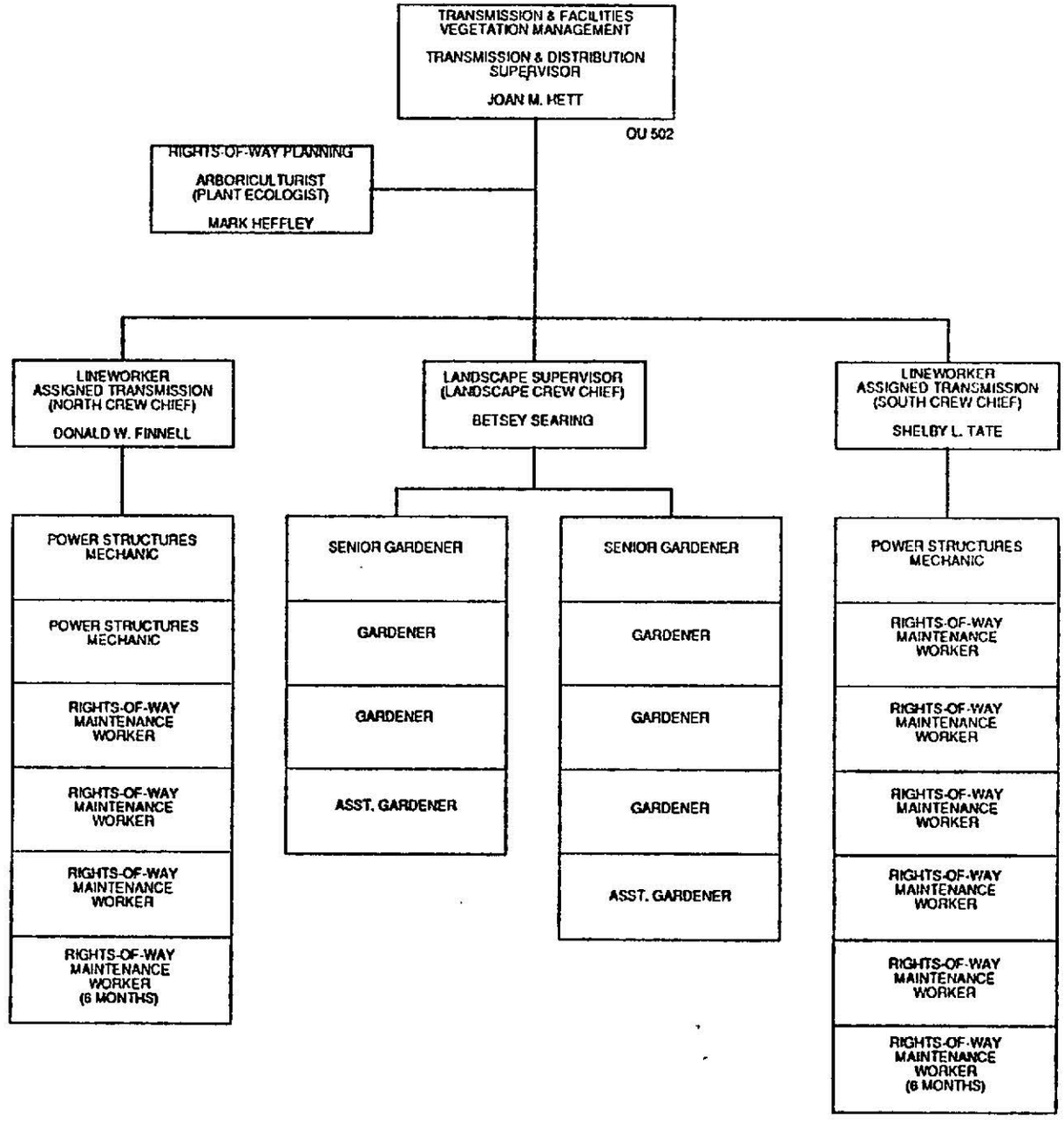
A committee composed of staff from Operations, CRD, EAD and T&D will be formed in 1990 to discuss the appropriate level of public involvement that is presently needed for ROW maintenance and planning, what future needs may be, and methods to accommodate any levels of public participation that may be identified.

6.0 BUDGET ALLOCATIONS FOR 1990

	T&D	OPERATIONS
MANAGEMENT/PLANNING		
2 FT Positions	$56,575	Skagit Operations
1 TES (1040 hrs)	10,465	/General
MAINTENANCE SUPERVISION		
3 Transmission Lineworkers (2 funded, 1 unfunded)	98,280	PSM/Crew Chief
MAINTENANCE WORKERS		
11 FT Positions	317,658	10 FT $223,000
1 TES (1040 hrs)	15,271	2 TES 20,000
2 (6 month)	28,878	
TRAINING	1,242	200
TRAVEL	1,204	300
MATERIALS & SUPPLIES	74,114	10,000
MISC (GARBAGE)	5,000	
EQUIPMENT RENTAL	15,150	
CONTRACT SERVICES		
o Mapping ROW access	30,000	
o misc. ROW (Right Tree Booklet printing, etc.)	10,000	
o Helicopter flights for outages	8,000	
o Brush cutting	36,925	
o Misc.	3,000	
**********		
EAD BUDGET / ROW RELATED		
CONTRACT SERVICES		
o Tansy biological control experiment/R&D	25,000	

7.0 EQUIPMENT ALLOCATION FOR 1990

Equipment	Unit 502	Unit 750
Chain Saws	11	5
Backpack Sprayers	3	4
Pickups/Crew Cabs/Vans	10	5
Dump Truck	5	4
Trailered Tank w/ Pump	-	1
Chipper	3	1
Trailers	5	1
Road Grader	1	1
Bulldozer	2	-
Loader	-	1
Backhoe	1	1
Low Boy	-	1
Tractor Mower/Backhoe	1	-
Tractor Mowers	3	-
Riding Lawn Mowers	2	-
Weedeaters	3	-
Tree-climbing Safety Belts	3	-
Pole clips Fiberglass 17 feet	2	-



OU 502 REPORTS TO SENIOR SUPERVISOR, TRANSMISSION AND DISTRIBUTION SERVICES

9.0 SUMMARY

9.1 1990 Goal Summary

CATEGORY	HRS	Acres	Index
MANUAL	15,640	1,960	
CUT STUMP HERBICIDE	980	210	220 Gal Herbicide
MECHANICAL	500	180	
CONTRACT MECHANICAL	80	40	
MOWING(GRASS)	1,500	265	
MANIPULATION	200	40	
PEST CONTROL/INSECT	40		4 oz BT
NOXIOUS WEED CONTROL	144	78	1 Gal Herbicide
ROADS	1,800		
MISC. MAINTENANCE	3,100		
TRAVEL/EQUIP> TRANSPORT	6,200		

SPECIAL PROJECTS

- o The Plant Ecologist will review herbicides available for cut stump treatment and noxious weed control; consultant contract, final report - February 1990, recommendations from EAD - May 1990.
- o Blanket HPA applications for Darrington to Newhalem on the Skagit line and the Eastside corridor will be submitted in 1990.
- o Aesthetics/scenic quality in the Ross Lake NRA. Identify potential areas for aesthetic improvement and a description of methods which could improve the visual quality of the ROW. Implementation of recommendations during study and following the final report, February 1990, consultant contract.
- o Committee to discuss level of public involvement for ROW maintenance and planning - committee recommendations by December 1990.
- o Tansy ragwort biological control experiment extended through 1990.
- o Mapping ROW access, consultant contract, project completed - November 1990.
- o Evaluation by the Plant Ecologist of areas previously manipulated needs to be undertaken in order to assess the effects of specific types of manipulation on vegetation - September 1990.
- o All culverts over 36 inches and all bridges will be re-inventoried by the Plant Ecologist to determine the lifetime of each structure for the Capital Assessment Replacement Program - October 1990.
- o Tower identification numbers will be replaced on towers 200A through 335 on the Creston Nelson-Maple Valley line.
- o Misc.
  - o Stream stabilization (CIP) French Creek, tower D39/29N - summer 1990.
  - o Monitor deciduous stump sprouting - ongoing.
  - o Limit access for garbage control at Mile 53 on Skagit line.
  - o Frontier Village seeding project - brush machine, grade, seed, and fertilize - ongoing training project.
  - o Examination of riparian areas on Skagit line between Mile 3 and Mile prior to formulating a vegetation management plan for these areas.
  - o Monitor flea beetle release site on Cedar Falls corridor (Mile 5).

9.2 1987 - 1989 LABOR HOUR AND COST ANALYSIS SUMMARY

TRANSMISSION & DISTRIBUTION (Unit 502)

Category	Hrs	Index	Hourly Analysis	Hr Rate	Cost Analysis	TL Cost
MANUAL						
Clear, chip, burn		Acres	Hrs/Acre		$$/Acre	
1987	7,178	1,163	6.17	$23	$142	$165,103
1988	6,476	1,582	4.09	$23	$ 94	$148,948
1989	5,254	1,159	4.53	$24	$109	$126,096
Tree Topping & Trimming		Spans	Hrs/Span		$$/Span	
1987	950	50	18.69	$23	$437	$ 21,838
1988	868	52	16.69	$23	$384	$ 19,964
1989	563	29	19.41	$24	$466	$ 13,512
Danger Tree Removal		Spans	Hrs/Span		$$/Span	
1987	556	60	9.27	$23	$213	$ 12,788
1988	307	38	8.09	$23	$186	$ 7,070
1989	407	37	10.99	$24	$264	$ 9,768
Tower Clearing		Tower	Hrs/Tower		$$/Tower	
1987	100	82	1.21	$23	$ 28	$ 2,290
1988	682	165	4.13	$23	$ 95	$ 15,686
1989	35	132	.27	$24	$ 6	$ 840
CUT STUMP HERBICIDE		Acres	Hrs/Acre		$$/Acre	
1987	411	113	3.62	$23	$ 83	$ 9,442
1988	128	46	2.81	$23	$ 65	$ 2,944
1989	117	76	1.54	$24	$ 37	$ 2,808
MECHANICAL						
502 Mechanical		Acres	Hrs/Acre		$$/Acre	
1987	427	162	2.64	$23	$ 61	$ 9,821
1988	484	204	2.37	$23	$ 55	$ 11,132
1989	557	308	1.81	$24	$ 43	$ 13,368
Contract Mechanical		Acres	Hrs/Acre		$$/Acre	
1987	176	83	2.12	$126	$268	$ 22,176
1988	88	42	2.10	$126	$265	$ 11,088
1989	180	35	5.14	$126	$648	$ 22,680
MOWING(GRASS)		Acres	Hrs/Acre		$$/Acre	
1987	1425	247	5.76	$23	$132	$ 32,775
1988	1494	267	5.59	$23	$129	$ 34,350
1989	1162	322	3.61	$24	$ 87	$ 27,888
MANIPULATION		Acres	Hrs/Acre		$$/Acre	
1987	452	110	4.12	$23	$ 95	$ 10,396
1988	24	12	2.01	$23	$ 46	$ 552
1989	23	12	1.92	$24	$ 46	$ 552

(continued)

TRANSMISSION & DISTRIBUTION (Unit 502)

Category	Hrs	Index	Hourly Analysis	Hr Rate	Cost Analysis	TL Cost
PEST CONTROL/INSECT		Spans	Hrs/Span		$$/Span	
1987						
Manual	91	4	22.75	$23	$523	$ 2,093
Biological	0					
1988						
Manual	15	2	7.5	$23	$173	$ 345
Biological	12	3	4.0	$23	$ 92	$ 276
1989						
Manual	0					
Biological	0					
NOXIOUS WEED CONTROL		Acres	Hrs/Acre		$$/Acre	
1987						
Chemical	47	50	0.94	$23	$ 22	$ 1,081
Manual	53	12	4.42	$23	$102	$ 1,219
Biological	0					
1988						
Chemical	80	50	1.60	$23	$ 37	$ 1,840
Manual	45	18	2.50	$23	$ 57	$ 1,035
Biological	14	6	2.31	$23	$ 53	$ 322
1989						
Chemical	23	8	2.88	$24	$ 69	$ 552
Manual	56	29	1.93	$24	$ 46	$ 1,344
Biological	0					

MISC. MAINTENANCE	Hours
Roads	
1987	2,323
1988	1,746
1989	1,870
Water Control	
1987	37
1988	272
1989	610
Garbage Control	
1987	618
1988	534
1989	583
Other Work (clearing, CIP, patrol, pole)	
1987	1,237
1988	1,699
1989	1,386

TRAVEL/EQUIP TRANSPORT	
1987	4,020
1988	4,217
1989	4,435

OPERATIONS (Unit 750)

Category	Hrs	Index	Hourly Analysis	Hr Rate	Cost Analysis	TL Cost
MANUAL						
Clear, burn, chip		Acres	Hrs/Acre		$$/Acre	
1987	11,151	754	14.79	$20	$296	$223,02
1988	9,506	447	21.27	$20	$425	$190,15
1989	7,708	894	8.62	$20	$172	$154,16
CUT STUMP HERBICIDE		Acres	Hrs/Acre		$$/Acre	
1987	1,655	599	2.47	$20	$ 49	$ 29,59
1988	235	120	1.96	$20	$ 39	$ 4,70
1989	0					

TRAVEL TIME	Hours
1987	1,786
1988	1,853
1989	??

OTHER WORK (clearing)	
1987	1,272
1988	1,372
1989	0

Environmental Affairs (Unit 120)

Category	
Tansy Biological Control	Total Cost
1987	
1988	
1989	

****

9.3 COST ANALYSIS FOR 1987 - 1989 CLEARING ACTIVITIES

DETAILED COST ANALYSIS FOR CLEARING ACTIVITIES ON SCL ROWS
(COMPARISON OF MANUAL, MECHANICAL AND CHEMICAL ACTIVITIES)

CATEGORY	TL HRS	INDEX	HOURLY ANALYSIS	HR RATE	COST ANALYSIS	TOTAL COST
A) Manual Clearing (cut, chip, burn)		Acres	hrs/Acre		$/Acre	
1987	13,251	1,250	10.6	$21	$223	$278,750
1988	14,875	1,863	8.0	$21	$168	$312,984
1989	12,537	1,963	6.4	$22	$141	$275,814
Manual Clearing with Cut Stump Application						
cut, chip, burn						
1987	5,079	667	7.6	$21	$160	$106,720
1988	1,108	165	6.7	$21	$141	$ 23,265
1989	407	76	5.4	$22	$118	$ 8,954
herbicide						
1987	2,065	712	2.9	$21	$ 61	$ 43,432
1988	363	165	2.2	$21	$ 46	$ 7,590
1989	524	76	6.9	$22	$152	$ 11,528
Total Cut Stump						
1987	7,144	712	10.0	$21	$210	$149,520
1988	1,471	165	8.9	$21	$187	$ 30,855
1989	524	76	6.9	$22	$152	$ 11,528
TOTAL MANUAL CLEARING						
1987	20,395	1,962	10.4	$21	$218	$427,716
1988	16,346	2,028	8.1	$21	$170	$344,760
1989	13,061	2,039	6.4	$22	$140	$287,342
C) Mechanical						
Unit 502						
1987	427	163	2.6	$23	$ 60	$ 9,780
1988	484	204	2.4	$23	$ 55	$ 11,220
1989	557	308	1.8	$24	$ 43	$ 13,368
Contract						
1987	176	83	2.1	$126	$265	$ 21,962
1988	88	42	2.1	$126	$265	$ 11,113
1989	180	35	5.1	$126	$648	$ 22,680

Table 2. Cost Analysis of Vegetation Control on SCL ROWs
Comparison by Corridor

OCTOBER 1986 - SEPTEMBER 1987

	SKAGIT (3,547 Acres)		CEDAR FALLS (469 Acres)		SUBURBAN (736 Acres)		URBAN (473 Acres)	
	ACRES	$/ACRE	ACRES	$/ACRE	ACRES	$/ACRE	ACRES	$/AC
Manual Clearing	1310	$ 257	143	$ 186	315	$ 288	149	$ 100
Mechanical Clearing								
Unit 502	0	-	87	$ 65	19	$ 95	55	$ 43
Contract	65	$ 202	0	_	18	$ 509	0	_
Tree Topping & Trimming	17	$ 8	8	$ 303	129	$ 143	15	$ 55
Danger Tree Removal	51	$ 22	34	$ 131	72	$ 87	15	$ 60
Noxious Weed Control	52	$ 44	0	_	0	_	0	-
Grass Mowing	0	-	0	-	0	-	247	$ 132

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OCTOBER 1987 - SEPTEMBER 1988

	SKAGIT (3,547 Acres)		CEDAR FALLS (469 Acres)		SUBURBAN (736 Acres)		URBAN (473 Acres)	
	ACRES	$/ACRE	ACRES	$/ACRE	ACRES	$/ACRE	ACRES	$/A
Manual Clearing	1531	$ 193	99	$ 127	300	$ 173	98	$ 151
Mechanical Clearing								
Unit 502	26	$ 16	65	$ 108	69	$ 32	42	$ 34
Contract	42	$ 265	0	-	0	-	0	-
Tree Topping & Trimming	15	$ 14	5	$ 223	160	$ 113	3	$ 139
Danger Tree Removal	87	$ 26	20	$ 154	32	$ 55	0	-
Noxious Weed Control	52	$ 33	0	-	0	-	0	-
Grass Mowing	0	-	0	-	0	-	267	$ 129

****

OCTOBER 1988 - SEPTEMBER 1989

	SKAGIT (3,547 Acres)		CEDAR FALLS (469 Acres)		SUBURBAN (736 Acres)		URBAN (473 Acres)	
	ACRES	$/ACRE	ACRES	$/ACRE	ACRES	$/ACRE	ACRES	$/A
Manual Clearing	1560	$ 155	89	$ 137	222	$ 189	169	$ 102
Mechanical Clearing								
Unit 502	31	$ 8	71	$ 82	169	$ 27	37	$ 74
Contract	21	$ 597	0	-	14	$ 709	0	-
Tree Topping & Trimming	14	$ 52	4	$ 103	65	$ 161	30	$ 38
Danger Tree Removal	108	$ 27	10	$ 270	32	$ 80	18	$ 32
Noxious Weed Control	17	$ 70	0	-	0	-	13	$ 13
Grass Mowing	0	-	0	-	7	$ 56	257	$ 101

APPROVED: _____

Randall W. Hardy, Superintendent

DATE: 5/14/90

APPENDICES

APPENDIX A. DEPARTMENTAL POLICY

Your City, Seattle

Department Policy & Procedure

Subject	Number
MAINTENANCE OF THE TRANSMISSION RIGHTS-OF-WAY	DPP 500 P I-506
	Effective: December 1, 1983
	Supersedes: N/A
Approved:	Department: City Light
	Page 1 of 5

1.0 PURPOSE

To establish Departmental Policy on the maintenance of the transmission Rights-of-Way (ROW).

2.0 ORGANIZATION AFFECTED

2.1 Distribution Division.

2.2 Operations Division.

2.3 Environmental Affairs Division.

2.4 Administrative Services Division.

2.5 Community Relations Division.

2.6 Engineering Division.

2.7 Human Resources Division.

3.0 REFERENCES

3.1 The Washington Pesticide Application Act - 17.22 RCW.

3.2 Rules and Regulations - County Noxious Weed Control Boards.

3.3 Federal Insecticide, Fungicide, and Rodenticide Act.

3.4 Washington General Safety and Health Standards, WAC 296-24-960, Proximity to Overhead Power Lines.

4.0 POLICY

4.1 The Department shall maintain the transmission ROW so as to prevent the interruption of electrical power transmission due to interference with the conductors from vegetation or human-made objects.

4.2 Maintenance methods shall be utilized which are legal, safe, economically acceptable within the electric utility industry, and generally acceptable to the public. These include, but shall not be limited to, manual, mechanical, chemical, ecological, and integrated control methods.

4.3 The Department shall aggressively investigate, evaluate and, where feasible, implement integrated vegetation management practices.

4.3.1 Spot application of specifically approved herbicides shall be permitted, but only as one technique within an integrated vegetation management program.

4.3.2 Where feasible, use of herbicides shall be minimized in favor of other management methods.

4.3.3 Broadcast application of herbicides shall be permitted only with approval of the Superintendent.

4.4 The Department ROW shall be maintained in cooperation with the various governmental agencies having jurisidiction over the adjacent property.

4.5 Multiple or joint use of the ROW will be encouraged when such use does not interfere with maintenance or repair of the line, produces revenue, reduces maintenance costs, or is a public benefit.

4.6 ROW maintenance performed by contractors shall be in accordance with WAC 296-24-960 of the State of Washington General Safety and Health Standards.

5.0 DEFINITIONS

5.1 Integrated Vegetation Management. A method of vegetation management that combines available eradication methods, while emphasizing ecological approaches to inhibiting regrowth of potentially dangerous woody stems. Low-growing plant species are encouraged, which then act to inhibit the germination and growth of taller trees.

5.2 Transmission Rights-of-Way. Dedicated corridors for transmission lines of 120 kv and above.

5.3 Manual Methods. Use of manual labor and hand tools.

5.4 Mechanical Methods. Use of heavy machinery, such as large brush-cutting equipment, bulldozers, graders, etc.

5.5 Chemical Methods. Use of herbicides to kill or inhibit the growth of vegetation. Chemical methods may be selective (controls specific classes of plants) or nonselective.

5.6 Broadcast Application. Application of herbicides by spraying from a truck or aircraft. Used to cover large areas.

5.7 Spot Application. Application of herbicides to individual plants using portable herbicide applicator carried by one person.

5.8 Inventory. A tower-to-tower or other suitable management unit analysis conducted by a vegetation management specialist from the ground or with the aid of aerial photography of the ecological and edaphic factors that affect the growth of vegetation in the ROW. This analysis is conducted in sufficient detail to prepare an integrated vegetation management plan.

6.0 RESPONSIBILITIES

6.1 Distribution and Operations Division.

6.1.1 The Distribution Division shall have overall responsibility for all planning necessary to implement this document. In addition, the Distribution Division shall have maintenance responsibility for all City Light Rights-of-Way not assigned to the Operations Division.

6.1.2 The Distribution Division shall review, in consultation with other affected divisions, and recommend revisions, if necessary, to the present DPP in January of each year.

6.1.3 The Operations Division shall implement the Rights-of-Way vegetation management plan prepared by the Distribution Division for all Rights-of-Way upstream of the Sauk River crossing.

6.1.4 The Operations and Distribution Divisions shall report all cases of vandalism, theft, major damage and dumping on City Light ROW, under their respective jurisdictions, to the Security Manager.

6.2 Environmental Affairs Division (EAD). EAD shall be responsible for providing assistance and information on environmental matters affecting the ROW.

6.3 Human Resources Division, Safety Unit. Safety shall advise Operations and Distribution as to appropriate safety provisions on the ROW.

6.4 Administrative Services Division, Property Management Unit. The Property Management Unit shall be responsible for all formal contacts with property owners on and bordering the ROW and for providing pertinent information to the Operations and Distribution Divisions.

6.5 Community Relations Division (CRD). The CRD shall advise the Operations and Distribution Divisions, from the Community Relations standpoint, regarding maintenance of the ROW.

6.6 Engineering Division. The Engineering Division shall advise on Rights-of-Way standards.

6.7 Security. The Security Manager shall advise the Operations and Distribution Divisions on security matters.

7.0 PROCEDURE

7.1 Transmission ROW Maintenance Plan. Transmission ROW maintenance shall be performed (insofar as possible) according to a multi-year plan, updated annually by the Operations and Distribution Divisions. The plan shall precede the annual budget cycle; i.e., prior to April 1, and shall include, but shall not be limited to, the following elements:

7.1.1 Inventory. See definition 5.8.

7.1.2 Goals, Objectives, and Timetables. Specific goals, objectives, timetables, etc., for ROW maintenance over a multi-year period.

7.1.3 Organization. Organization charts showing the composition of the maintenance crews and their lines of authority and reporting. This section of the plan will also show which crew members must be licensed to handle and/or apply herbicides.

7.1.4 Labor Allocation. Planned allocation of labor-hours based on observed and/or predicted vegetation growth or other human-controlled changes within or adjacent to the ROW.

7.1.5 Budget Allocation. Approved and/or planned budgetary allocations for ROW maintenance.

7.1.6 Equipment Utilization Projections. Schedules of equipment required to maintain the ROW according to the Goals, Objectives, and Timetables. Projections shall also include scheduled equipment retirement and new equipment procurement.

7.1.7 Public Participation. Procedures for keeping the public informed with regard to ROW maintenance activities. Prepared in consultation with CRD.

7.1.8 Safety. Provisions for protection of employees and others from injury by various hazards unique to ROW maintenance.

7.1.9 Standards. Criteria for maintenance of the ROW, including clearances required, safety, roads, equipment operations, etc.

7.1.10 Herbicide Use Plan. The herbicide plan shall include, at a minimum, the following elements:

7.1.10.1 Herbicides selected for use.

7.1.10.2 Brands, formulations,and quantities desired.

7.1.10.3 Specific purpose for each herbicide.

7.1.10.4 Application technique proposed.

7.1.10.5 Safety and disposal practices.

7.1.10.6 Label requirements and other environmental safeguards to be employed.

7.1.11 Review and approval. Superintendent shall have final approval on the plan. Environmental Affairs, Safety, and Property Management shall review and comment on the plan prior to submittal to the Superintendent for approval. Plan will be forwarded to the Superintendent prior to March 15.

7.2 An adequate system of roads will be maintained to provide access to the transmission towers, lines, and corridors by authorized field crews.

7.3 All ROW will systematically be patrolled from the air and ground. Encroachments or threats to the integrity of the transmission system will be promptly corrected when, and if, detected.

7.4 The Department and any contractors employed will comply with all federal, state, and local laws, rules, and regulations pertaining to ROW maintenance activities.

8.0 APPENDIX

8.1 Distribution. All Department Policy and Procedure Manuals.

APPENDIX B. HERBICIDE INFORMATION

AN ANALYSIS OF HUMAN HEALTH HAZARDS ASSOCIATED WITH SOME HERBICIDES USED IN FORESTRY

by

DR. FRANK N. DOST

An Extension Specialist in Toxicology and Chemistry
Professor of Agricultural Chemistry

Accumulation in fish does not occur; exposure by ingestion of fish will deliver less fosamine than consumption of water after treatment. Rapid excretion results in limited residues in animal tissues.

Fosamine is among the least toxic of common chemicals. The lethal dose is about 2.5% of body weight. When fed as 1% of the total diet (10,000 ppm) fosamine had no effect in a one generation reproduction study, and this dose (about 600 mg/kg/day in the rat) was not teratogenic. A summary of results is available (Haskell Lab. 1979b), however, but data details are proprietary.

Because 10,000 ppm fosamine over a six-month period caused increased heart and stomach weight in dogs and slight kidney changes in rats the chronic no effect level is considered as 1000 ppm or about 60 mg/kg/day.

Ames type mutagenicty tests have shown no effect. Carcinogencity tests are now being completed for fosamine; they were not done earlier because as a chemical for which no food tolerances were requested, with no mutagenic activity, no cancer studies were indicated.

Applicator exposure may reach 0.1 mg/lg for mixer-loaders, and an exposure of 0.2 mg/kg from directly treated water can be imagined, however unlikely. These exposures can only be very short lived. When compared to the chronic no effect level of about 600 mg/kg, these expected doses are about 6000 and 3000 fold less.

DICAMBA

Dicamba (Banvel) has rather limited use in forestry. Typical use rate is about 1 lb/acre.

Occupational exposure.

Occupational exposure may occur in handling of the concentrated material, which is provided as about 4 lb of the dimethylamine salt per gallon of water.

Because dicamba will be applied on the ground by backpack sprayer, the applicators also have considerable expectation of exposure. The extensive data obtained from studies of 2,4-D exposure is directly applicable to dicamba, and the maximum daily intake by applicators will be no more than 0.1 mg/kg. No direct data on absorption through skin is available but dermal toxicity data suggest that transport across skin is less than that for 2,4-D. As a concervative estimate, however, the data applicable to 2,4-D will be used as a guide.

Environmental exposure.

There may be a somewhat higher probability of environmental contact with dicamba than with some other herbicides because it does not bind as tenaciously to organic and inorganic matter as do most other agents. It has a greater mobility

in soil than most other herbicides, but not to the extent that it has a significant tendency to migrate from use sites.

There is a somewhat greater tendency for any dicamba deposited adjacent to a stream to wash in with the first rain after an application because of the limited binding. Norris and Montgomery (1975) studied a watershed in western Oregon within which a dicamba-2,4-D treatment was adjacent to and at some points crossed small tributaries of a creek that discharged from the area at 57 liters/sec. A one lb/acre treatment resulted in a peak concentration at outlet of under 40 ppb, about five hours after application, without buffering the small tributories. The stream into which the feeder discharged peaked at 10 ppb shortly thereafter and at the end of one day the herbicide could no longer be detected. Under present day practices it is unlikely that even that level would be reached at any point in the system but an assumption of a single day peak of 10 ppb may be accepted for hazard assessment purposes. A two liter water consumption by a 50 kg person would result in a dose of 0.0012 mg/kg. Dicamba concentrates in fish to a level less by a factor of 8-10 than that of the surrounding water. (Yu et al. 1975). (Spray drift is not a major concern in the proposed use of dicamba because it will be applied from the ground and it is likely that no residues will reach streams by direct application or drift.)

Toxicological considerations.

The bulk of data on the toxicology of dicamba has been generated by the manufactures or its contractors as requirements for registration of the herbicide. Summaries of the data are available (Velsicol, 1981), but details are proprietary and not available for public use.

As a general case, dicamba seems to be among the least toxic of the herbicides. However there appears to be some reproductive sensitivity because in rabbits there was some early gestational loss at a dose rate of 10 mg/kg/day. At 3 mg/kg/day no such changes appeared. The no effect dose for teratologic change was 10 mg/kg/day.

Dicamba has no apparent genetic activity in a dominant lethal assay in animals given 1000 mg/kg orally. Microbial assays, including host mediated tests were also negative.

Carcinogenicity has been evaluated in mice at 100 and 1000 ppm in the diet, and rats at 500 ppm, and dogs at 50 ppm. No evidence of tumor induction was found. The mouse study was shortened from 24 months to 19.5 months for unspecified reasons.

If a no effect level of 3 mg/kg for reproductive deficits is accepted it would seem advisable to restrict female applicators from working with this chemical. Other general effects occurred only at very high doses and represent no hazard to applicators.

The use of ground application obviates spray drift as an environmental hazard. If water were consumed from an immediately adjacent stream containing 10 ppb

dicamba, the two-liter dose to a 50 kg person would be .0004 mg/kg. This is not a repeatable dose, and is excreted within 6-10 hours.

There is a difference of 7500 fold between the reproductive no effect level and that intake, which represents no hazard.

DIURON

Diuron is used as a road and right-of-way maintenance herbicide, but is not used in reforestation. It is active after reaching the ground and interacting with water. Because of this use pattern there is minimal deposition on foliage, little drift, little or no opportunity for movement to streams or for intake by game.

Occupational Exposure

Occupational exposure to the powder formulation may occur during mixing, and the principal concern is protection against inhalation of the dust, which is somewhat irritant. As the dry powder, absorption across the skin is negligible. Exposure to the mixed slurry as it is applied is available with proper procedure and garments, but a backpack applicator may have some contact. A maximum dose of 0.05 mg/kg will be assumed. The nature of the chemical and the mix is such that absorption will be much less than the maximum of 0.1 mg/kg assumed to result from contact with phenoxy herbicides.

Environmental Exposure

Potential for environmental exposure is markedly different than that expected to result from use of reforestation herbicides. Diuron is used only on roadsides and similar areas. The application area is very long and narrow, within rights-of-way. The chemical is applied almost entirely to areas that have been built up with fill on scarified. Because it is deposited from ground level drift is minimal. Droplet shattering and some movement of small particles is to be expected, however, for perhaps 10 feet from the spray zone.

Diuron is quite persistent in soil (Maska and Lacey, 1977, Miller et al, 1978), and in gravel and subsoil around roads should remain intact longer than on agricultural land. It has little tendency to migrate in soil, however (Willis et al. 1975). Because of the lack of mobility and the virtual absence of exposure of water courses that would supply potable water exposure of drinking supplies is not a factor in hazard assessment.

The only route of admission to streams would be by improper application at a point where a road crosses a flowing stream. The area drained will be very small, with no potential for application along a significant length of stream bank. The resultant intake by fish would be negligible. Accumulation, if taken in by fish should be limited, judging from the character of the chemical, but specific data on tissue binders is not available.

ATTENTION

Herbicide Treatment Area

Treatment Method

Herbicide Used

Treatment Date

AVOID USING THIS AREA
Avoid Eating Berries, or Other Plant Material From This Area.

FOR FURTHER INFORMATION CALL
Seattle City Light

_____

Your Seattle City Light

Memorandum

DATE : September 25, 1985

TO : Tim Croll

FROM : K. H. Hu[illegible], W. R. Sickler

SUBJECT: Procedures for Using the Herbicide Banvel (Dicamba) in Operations and Distribution Divisions

It has come to our attention that the Bureau of Land Management (BLM) in their May 1985 Draft EIS on Noxious Weed Control is recommending that the application of Dicamba (Banvel) be restricted to males. To determine the basis for this recommendation, our staffs and the safety supervisor have reviewed the available literature and have found that one article (see attached) and possibly the toxicology report on Banvel prepared by the manufacturer (Velsicol Chemical Corp.) are the primary references. We have yet to receive the requested manufacturers material.

Dost (1983) prepared a worst case analysis on several herbicides for BLM. In this article, Dost develops his comments on Dicamba from summaries of toxicological effects published by Velsicol in 1981. The details of their studies are proprietary and not available to the public. Although Dicamba appears to be among the least toxic of the herbicides Dost reviewed, he states "... there appears to be some reproductive sensitivity because in rabbits there was early gestational loss at a dose rate of 10 mg/kg/day. At 3 mg/kg/day no changes appeared." It is this 3 mg/kg/day which is used as the No Observable Effect Level (NOEL).

Using studies on 2-4-D, it has been determined that maximum daily intake for backpack applicators is no more than 0.1 mg/kg of body weight for a 50 kg (110 pound) person. The same intake rate has also been determined for mixer/loaders. Dost feels these values are directly applicable to Dicamba when you assume a use rate of 1 pound per acre.

We use Dicamba in two formulations. Banvel CST is used in our stump spraying program and Banvel is used for Noxious Weed Control. Comparing our use to the typical use reported by Dost indicates we apply Banvel CST at a rate 2 to 3 pounds per acre and Banvel at less than half a pound per acre.

Based on these figures, we estimate the maximum daily intake by a 110 pound person applying Banvel CST is less than .3 mg/kg/day which is 1/10th the NOEL rate of 3 mg/kg of body weight for a 50 kg person. We feel, there is an extremely low potential intake while spraying Noxious Weeds as we apply small amounts over very short time periods.

As we are fully committed to workers safety and their right-to-know about herbicide in their work environment, we have instituted the following procedures:

(1) We will continue to use Banvel and Banvel CST in our herbicide program.

(2) We will explain to all members of our rights-of-way maintenance crews the above findings and explain that the potential effect of the herbicide is only to the fetus.

(3) We will recommend to and allow all women crew members the opportunity to work ahead of the herbicide applications so they will not have to go through the area for 24 hours or be in the area while spraying is underway.

If there are any questions, please call Joan Hett, x3808 or Felix deMello, x4316.

JH:gjr

cc: Macdonald
Hunich
Sickler
Rutherford
Church
deMello
Hett
Colberg
Lewing
Stanchfield
File
02.1.5P2

SANDOZ CROP PROTECTION

Date Issued: April 1, 1987
Supersedes: January 5, 1987

3715

MATERIAL SAFETY DATA SHEET

BANVEL® CST HERBICIDE

Product/Material: BANVEL® CST HERBICIDE
Manufacturer: SANDOZ CROP PROTECTION CORPORATION
Address: 341 East Ohio Street, Chicago, Illinois 60611
Emergency Phone: 312/670-4500

I. PRODUCT INFORMATION

Trade Name	BANVEL® CST
Synonyms	None known
Active Ingredient	Dimethylamine (DMA) salt of dicamba and DMA salt of dicamba related acids
Chemical Family	Substituted Benzoic Acid
Chemical Formula	Mixture
CAS Registry Number	2300-66-5 (Active Ingredient)
EPA Reg. No.	55947-32
DOT Hazard Class	Not regulated

II. HEALTH HAZARD DATA

WARNING **HARMFUL IF SWALLOWED. AVOID BREATHING SPRAY MIST. AVOID CONTACT WITH SKIN, EYES OR CLOTHING.**

III. FIRST AID PROCEDURES

Eye	Flush eyes with tap water for at least 15 minutes. Consult an ophthalmologist.
Skin	Wash with mild soap and water. Rinse with copious amounts of water. Launder clothing thoroughly before reuse.
Ingestion	Drink 1 or 2 glasses of water. Induce vomiting by touching back of throat with finger or blunt object. Do not induce vomiting or give anything by mouth to an unconscious person. Consult a physician.
Inhalation	Remove person to fresh air. Apply artificial respiration if necessary. Consult a physician.

IN ALL CASES OF EMERGENCY, CONTACT A PHYSICIAN.

V. NOTE TO PHYSICIAN

Treatment is symptomatic. For ingestion, lavage stomach with tap water. Instill 30 gm activated charcoal in 3-4 oz. of water. Catharsis with 15 gm sodium sulfate in 6-8 oz. of water.

The principal toxic effect of ingesting BANVEL® CST will be kidney damage due to the ethylene glycol content. Early administration of ethanol may block the formation of nephrotoxic metabolites of ethylene glycol in the liver. Ethanol should be given intravenously as a 5% solution in sodium bicarbonate (dosage rate of about 10 ml of ethanol per hour). Hemodialysis may be required.

VI. FIRE AND EXPLOSION INFORMATION

NFPA Rating	**Health: 1, Fire: 0, Reactivity: 0**
Explosive Limits	Lower: Not applicable Upper: Not applicable
Flammability	Non-flammable
Flash Point	Greater than 212°F
Extinguishing Media	Water spray, foam, dry chemical, carbon dioxide
Special Protective Equipment	In case of severe fire involving BANVEL® CST solution, full protective clothing and self-contained breathing apparatus should be worn.
Special Fire Fighting Procedures	Use water to keep fire exposed containers cool. At first opportunity, remove from fire.
Products of Combustion	May yield steam, dicamba amine salt, HCl, organochloride products, oxides of nitrogen, carbon monoxide.
Unusual Fire and Explosion Hazards	Drums may burst as a result of steam being generated.

VII. SPILL CONTROL

Steps to be Taken	Contain spill and absorb with clay granules, sawdust or equivalent. Collect and place in suitable container for disposal. Area can be washed down with water and detergent to remove remaining herbicides. DO NOT ALLOW WASHINGS IN SEWER.
Absorbents	Clay granules, sawdust or equivalent
Counteractants	Not applicable
Incompatibles	None known
Reportable Quantity	1000 lbs. of dicamba

VII. PRODUCT/WASTE DISPOSAL

Incinerate product/waste at a U.S. EPA permitted waste incinerator.

VIII. SPECIAL PRECAUTIONS

Storage Keep in an area suitable for pesticide storage. Store in a cool, ventilated area away from seed, fertilizers, insecticides or fungicides. Keep away from children, wildlife, domestic animals and pets.

IX. HEALTH HAZARD INFORMATION

Primary Route(s) of Entry
Oral: No
Inhalation: Yes
Dermal/Eye: Yes

Carcinogen as determined by
NTP: No
IARC: No
OSHA: No

Signs and Symptoms of Acute Overexposure Nonspecific. Symptoms may include exhaustion, muscular spasms, urinary incontinence, dyspnea and cyanosis. Skin and eye irritation may occur.

Acute Toxicity: Oral The acute oral toxicity (LD_{50}) in rats has been reported to be greater than 5000 mg/kg.

Dermal The acute dermal toxicity (LD_{50}) in rabbits has been reported to be greater than 2000 mg/kg.

Inhalation The acute inhalation toxicity (LC_{50}) in rats has been reported to be greater than 5.14 mg/liter, 4 hour exposure.

Other Toxicological Information
Skin Irritation: Mildly irritating to the skin of rabbits but not a primary skin irritant.

Eye Irritation: Not an eye irritant in rabbits.

Other Dicamba, the active ingredient in BANVEL® CST, has been studied extensively to determine potential health effects. Animal experimentation with dicamba has not demonstrated any carcinogenic, teratogenic or other reproductive effects with the exception of slightly reduced fetal body weights and post-implantation losses reported at the Maximum Tolerated Dose level. The preponderance of experimental data suggests dicamba is not a mutagen.

XII RECOMMENDED GENERAL PRECAUTIONS

Personal Protective Equipment Under normal conditions of use, respiratory protection is not required. In cases where inhalation is likely, a MSHA/NIOSH approved respirator for pesticides is recommended. In cases where eye and skin contact are likely, use of chemical safety goggles, impermeable gloves and clean, body-covering clothing are recommended.

X PRODUCT INFORMATION HAZARDOUS INGREDIENTS

Special Properties None

Exposure Limits **OSHA PEL:** Not established
ACGIH TLV: Not established
NIOSH Limit: Not established

Hazardous Ingredients (As defined by OSHA) Dimethylamine salt of dicamba (3,6-dichloro-o-anisic acid), 13.3%; TLV: Not established

DMA salt of dicamba related acids, 3.3%; TLV: Not established

Ethylene glycol, 30%; TLV: Ceiling 50 ppm

XI PHYSICAL AND CHEMICAL INFORMATION

Appearance and Odor Blue-green solution, mild amine odor
Molecular Weight Not applicable
Boiling Point 212°F (water)
Melting Point Not known
Vapor Pressure Greater than 14 mm Hg as water @ 68°
Vapor Density Greater than 1.0 (Air = 1)
Specific Gravity 1.087 @ 21°C (H_2O = 1)
Solubility Miscible in water
Evaporation Rate Not known
Stability Stable
Reactivity Not applicable
Decomposition Products None

XIII REGULATORY STATUS

Regulated by EPA under FIFRA, Clean Water Act and CERCLA (Superfund).

The information presented herein, while not guaranteed, was prepared by technically knowledgeable personnel and to the best of our knowledge is true and accurate. It is not intended to be all inclusive and the manner and conditions of use and handling may involve other or additional considerations.

Information on this form is furnished solely for the purpose of compliance with the Occupational Safety and Health Act of 1970 and shall not be used for any other purpose. Use or dissemination of all or any part of this information for any other purpose or purposes is illegal.

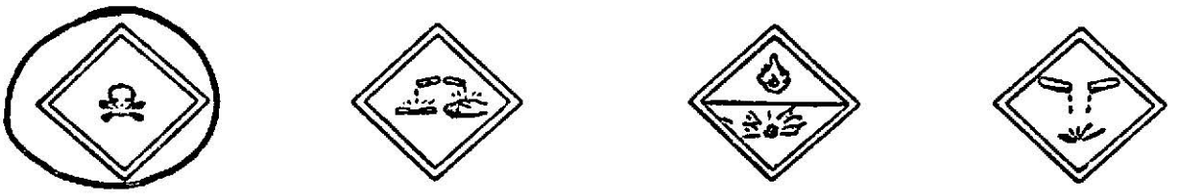
T I P S H E E T # 10F

WORKER RIGHT-TO-KNOW

CHEMICAL CLASS: PESTICIDES

HAZARD HIGHLIGHTS:

Health Effects | Corrosive/Caustic | Flammable/Explosive | Reactive



[X] inhalation [X] ingestion [X] skin (absorption/burning) [X] eyes

Special Precautions: Eye irritant. Slightly hazardous by inhalation. Hazardous by ingestion-POISON. City Light recommends application of Banvel be restricted to males, Banvel may have detrimental effects on the unborn fetus. Women crew menbers will not be asked to be in the area during application or within 24 hours after application.

REQUIRED PROTECTIVE EQUIPMENT:

[xx]	gloves rubber (type)	[x]	respirator chemical (type)
[ ]	safety glasses	[x]	coveralls provided by crew chief (type)
[xx]	goggles	[x]	apron rubber
[ ]	face shield	[x]	boots rubber

Note: Goggles and rubber apron are necessary when transfering the chemical from container to applicator but are not required for application. Use of a respirator is not mandatory.

SAFE USE PRACTICES: When handling hercides, throughly wash with soap and water before smoking, eating or drinking. Wear protective clothing. If exposed to the herbicide, wash affected area with soap and water, with eye contact flush with water for at least 15 minutes. Do not discharge into any body of water.

STORAGE and DISPOSAL: Triple rinse containers. Pour rinse solutions into tl spray tank and use. Properly rinsed containers can be placed with garbage to be taken to a sanitary landfill. Contain spills with dry-sorb, bag, tag and send to salvage for disposal. Store in a posted, fire resistant container approved for chemical storge. Store in a coc dry area out of sunlight. Store away from food items, seeds, fertili: insecticides and animals.

PRODUCTS COVERED BY THIS TIP SHEET:

Banvel CST		
Banvel		

Date: 5/14/87 FOR ADDITIONAL INFORMATION REFER TO MATERIAL SAFETY DATA SHEET(s)

Banvel®
HERBICIDE

FOR TURF AND LAWNS

SPECIMEN LABEL

ACTIVE INGREDIENTS:

Dimethylamine salt of dicamba (3,6-dichloro-o-anisic acid)*	48.2%
Dimethylamine salts of related acids	12.0%
INERT INGREDIENTS:	39.8%
TOTAL ...	100.0%

* This product contains 40.0% 3,6-dichloro-o-anisic acid (dicamba) or 4 pounds per gallon.

EPA Reg. No. 55947-1
EPA Est. No. 55947-TX-1

KEEP OUT OF REACH OF CHILDREN

WARNING

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS WARNING

Causes eye irritation. Do not get in eyes, on skin, or on clothing. Harmful if swallowed. Avoid breathing spray mist. Wash thoroughly after handling. In case of contact, wash skin with soap and water; for eyes, flush with water for 15 minutes and get medical attention.

ENVIRONMENTAL HAZARDS

Keep out of lakes, streams or ponds. Do not contaminate water by cleaning of equipment or disposal of wastes. Apply this product only as directed on label. Refer to page 7 for use restrictions to protect ENDANGERED SPECIES.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

Do not apply this product through any type of irrigation system.

For additional copies of the Specimen Label, write to the manufacturer.

BEFORE USING BANVEL HERBICIDE READ AND FOLLOW THE PRECAUTIONS

IMPORTANT

The following directions apply to all uses of BANVEL® Herbicide. Additional precautions and restrictions will be found in each specific use section.

Do not contaminate irrigation ditches or water used for domestic purposes.

SENSITIVE CROP PRECAUTIONS: BANVEL Herbicide may cause injury to desirable trees and plants, particularly beans, cotton, flowers, fruit trees, grapes, ornamentals, peas, potatoes, soybeans, sunflowers, tobacco, tomatoes and other broadleaf plants when contacting their roots, stems or foliage. These plants are most sensitive to BANVEL Herbicide during their development or growing stage. FOLLOW THE PRECAUTIONS LISTED BELOW WHEN USING BANVEL HERBICIDE.

- Do not treat areas where either possible downward movement into the soil or surface washing may cause contact of BANVEL Herbicide with the roots of desirable plants such as trees and shrubs.
- Avoid making applications when spray particles may be carried by air currents to areas where sensitive crops and plants are growing. Do not spray near sensitive plants if wind is gusty or in excess of 5 mph and moving in the direction of nearby sensitive crops. However, always make applications when there is some air movement to determine the direction and distance of possible spray drift. Leave an adequate buffer zone between area to be treated and sensitive plants. Coarse

Continued on next page...

sprays are less likely to drift out of the target area than fine sprays. Agriculturally approved drift-reducing additives may be used.

- Do not apply BANVEL Herbicide in the vicinity of sensitive crops when the temperature on the day of application is expected to exceed 85° F as drift is more likely to occur.
- Do not use aerial equipment to apply BANVEL Herbicide when sensitive crops and plants are growing in the vicinity of area to be treated.
- To avoid injury to desirable plants, equipment used to apply BANVEL Herbicide should be thoroughly cleaned (see PROCEDURE FOR CLEANING SPRAY EQUIPMENT on page 2) before reusing to apply any other chemicals.

All crop uses of BANVEL Herbicide are intended for a normal growing interval between planting and harvest. No crop rotation restrictions exist if normal harvest of treated crop has occurred. If this interval is shortened, such as in cover crops that will be plowed under, do not follow up with the planting of a sensitive crop.

Crops growing under stress conditions such as drought, poor fertility, or foliar damage due to hail, wind or insects, can exhibit various injury symptoms that may be more pronounced if herbicides are applied.

Consult your local or state authorities for possible application restrictions and advice concerning these and other special local use situations. Tank mix recommendations are for use only in states where the tank mix product and application site are registered.

PROCEDURE FOR CLEANING SPRAY EQUIPMENT

The steps listed below are suggested for thorough cleaning of spray equipment following applications of BANVEL Herbicide or tank mixes of BANVEL Herbicide plus 2,4-D amine.

1) Hose down thoroughly the inside as well as outside surfaces of equipment while filling the spray tank half full of water. Flush by operating sprayer until the system is purged of the rinse water.
2) Fill tank with water while adding 1 quart of household ammonia for every 25 gallons of water. Operate the pump to circulate the ammonia solution through the sprayer system for 15 to 20 minutes and discharge a small amount of the ammonia solution through the boom and nozzles. Let the solution stand for several hours, preferably overnight.
3) Flush the solution out of the spray tank through the boom.
4) Remove the nozzles and screens and flush the system with two full tanks of water.

The steps listed below are suggested for thorough cleaning of spray equipment used to apply BANVEL Herbicide as a tank mix with wettable powders (WP), emulsifiable concentrates (EC), or other types of water-dispersible formulations. BANVEL Herbicide tank mixes with water-dispersible formulations require the use of a water/detergent rinse.

5) Complete step 1.
6) Fill tank with water while adding 2 lbs. of detergent for every 40 gallons of water. Operate the pump to circulate the detergent solution through the sprayer system for 5 to 10 minutes and discharge a small amount of the solution through the boom and nozzles. Let the solution stand for several hours, preferably overnight.
7) Flush the detergent solution out of the spray tank through the boom.
8) Repeat step 1, and follow with steps 2, 3, and 4.

MIXING AND APPLICATION

UNLESS OTHERWISE SPECIFIED UNDER THE INDIVIDUAL USE HEADINGS OF THIS BOOKLET, THE FOLLOWING DIRECTIONS APPLY TO ALL CROP AND NON-CROP USES OF BANVEL HERBICIDE. REFER TO INDIVIDUAL USE SECTIONS FOR ADDITIONAL PRECAUTIONS, RESTRICTIONS, APPLICATION RATES AND TIMINGS.

BANVEL Herbicide is a water-soluble formulation that can be applied using water or sprayable fluid fertilizer as the carrier. If a fluid fertilizer is to be used, a compatibility test (see COMPATIBILITY TEST on pages 2-3) should be made prior to tank mixing.

Ground or aerial application equipment which will give good spray coverage of weed foliage should be used. HOWEVER, DO NOT USE AERIAL APPLICATION EQUIPMENT IF SENSITIVE CROPS ARE GROWING IN THE VICINITY OF THE AREA TO BE TREATED.

Apply 5 to 50 gallons of diluted spray per treated acre when using ground application equipment, or 3 to 10 gallons of diluted spray per treated acre when using aerial application equipment. Use the higher level of the listed spray volumes when treating dense or tall vegetation. Use coarse sprays.

Select nozzles designed to produce minimal amounts of fine spray particles. Spray with nozzles as close to the weeds as is practical for good weed coverage.

BANVEL Herbicide should not be applied during periods of gusty wind or when wind is in excess of 15 mph as uneven spray coverage may occur.

Avoid disturbing (e.g. cultivating or mowing) treated areas for at least 7 days following application.

BAND TREATMENTS

BANVEL Herbicide may be applied as a band treatment. Use the formulas below to determine the appropriate rate and volume per treated acre.

$$\frac{\text{Band width in inches}}{\text{Row width in inches}} \times \begin{matrix}\text{Broadcast RATE} \\ \text{per treated acre}\end{matrix} = \begin{matrix}\text{Band RATE} \\ \text{per treated acre}\end{matrix}$$

$$\frac{\text{Band width in inches}}{\text{Row width in inches}} \times \begin{matrix}\text{Broadcast VOLUME} \\ \text{per treated acre}\end{matrix} = \begin{matrix}\text{Band VOLUME} \\ \text{per treated acre}\end{matrix}$$

COMPATIBILITY TEST

Before mixing in the spray tank, it is advisable to test compatibility by mixing all components in a small container in proportionate quantities (see following table).

Amount of Herbicide to Add to One Pint of Spray Carrier
(Assuming Volume is 25 Gallons per Acre)

HERBICIDE FORMULATIONS	RATE PER ACRE	LEVEL TEASPOONS
Dry	1 lb	1½
Liquid	1 pt.	½

If herbicide(s) do not ball-up or form flakes, sludge, gels, oily films or layers, or other precipitates, then the tested spray mix is compatible. Usually, incompatibility in any of the above described forms will occur within 5 minutes after mixing.

If components are incompatible, the use of a compatibility agent is recommended. Rerun the above COMPATIBILITY TEST with a suitable compatibility agent (1/4 teaspoon is equivalent to 2 pints per 100 gallons of fluid fertilizer).

GENERAL WEED LIST

This is a general list of weeds which may be treated with BANVEL Herbicide in accordance with this label as recommended under the rates and timing sections of the Individual Use Headings. Proper usage of this product will give control or growth suppression of many ANNUAL, BIENNIAL, and PERENNIAL broadleaf weeds, and many WOODY brush and vine species including:

ANNUALS

Amaranth, Spiny (Spiny Pigweed)
Aster, Slender
Bedstraw
Beggarweed, Florida
Broomweed, Common
Buckwheat, Wild
Buffalobur
Burclover, California
Burcucumber
Buttercup, Roughseed
Carpetweed
Catchfly, Nightflowering
Chamomile, Corn
Chickweed, Common
Clovers (Annual)
Cockle, Corn
Cockle, Cow
Cocklebur, Common
Croton, Tropic
Croton, Woolly
Cucumber, Wild
Daisy, English
Eveningprimrose, Cutleaf
Fleabane, Annual
Goosefoot, Nettleleaf
Henbit
Jimsonweed
Knotweed
Kochia
Ladysthumb
Lambsquarters, Common
Lambsquarters (triazine resistant)
Lettuce, Prickly
Mallow, Common
Mallow, Venice
Mayweed
Morningglory, Ivyleaf
Morningglory, Tall
Mustard, Tansy
Mustard, Wild
Mustard (Yellowtops)
Nightshade, Black
Pennycress, Field (Fanweed, Frenchweed, Stinkweed)
Pepperweed, Virginia (Peppergrass)
Pigweed, Prostrate
Pigweed, Redroot (Carlessweed)
Pigweed, Rough
Pigweed, Smooth
Pigweed (triazine resistant)
Pigweed, Trumble
Poorjoe
Puncturevine
Purslane, Common
Pusley, Florida
Radish, Wild
Ragweed, Common
Ragweed, Giant Buffaloweed)
Rubberweed, Bitter (Bitterweed)
Sesbania, Hemp
Shepherdspurse
Sicklepod

ANNUALS *(Cont'd.)*

Sida, Prickly (Teaweed)
Smartweed, Green
Smartweed, Pennsylvania
Sneezeweed, Bitter
Sowthistle, Annual
Sowthistle, Spiny
Spikeweed, Common
Spurge, Prostrate
Spurry, Corn
Starbur, Bristly
Sumpweed, Rough
Sunflower, Common (Wild)
Sunflower, Volunteer
Thistle, Russian
Velvetleaf
Waterhemp
Waterprimrose, Winged
Wormwood, Annual

BIENNIALS

Burdock, Common
Carrot, Wild (Queen Anne's Lace)
Cockle, White
Eveningprimrose, Common
Geranium, Carolina
Gromwell
Knapweed, Diffuse
Knapweed, Spotted
Mallow, Dwarf
Plantain, Bracted
Ragwort, Tansy
Starthistle, Yellow
Sweetclover
Teasel
Thistle, Bull
Thistle, Milk
Thistle, Musk
Thistle, Plumeless

PERENNIALS

*Alfalfa
Artichoke, Jerusalem
Aster, Spiny
Aster, Whiteheath
Bedstraw, Smooth
Bindweed, Field
Bindweed, Hedge
Blueweed, Texas
*Bursage (Bur Ragweed) (Lakewed) (Povertyweed)
Bursage, Woolyleaf (Lakeweed)
*Buttercup, Tall
Campion Bladder
Chickweed, Field
Chickweed, Mouseear
Chicory
*Clover, Hop
*Dandelion, Common
*Dock, Broadleaf (Butterdock
Dock, Curly
Dogbane, Hemp
*Dogfennel (Cypressweed)
Fern, Bracken
Garlic, Wild
Goldenrod, Canada
Goldenrod, Missouri
Goldenweed, Common
Hawkweed
Horsenettle, Carolina
Ironweed
Knapweed, Black
Knapweed, Russian
Mare's Tail (Horseweed)
Milkweed, Climbing
Milkweed, Common
Milkweed, Honeyvine
Milkweed, Western Whorled
Nettle, Stinging
Nightshade, Silverleaf (White Horsenettle)
Onion, Wild
*Plantain, Broadleaf
*Plantain, Buckhorn
Pokeweed
Ragweed, Western
Redvine
Smartweed, Swamp
Snakeweed, Broom
*Sorrel, Red (Sheep Sorrel)
Sowthistle
Sowthistle, Perennial
Spurge, Leafy
Sundrop, Halfshrub (Eveningprimrose)
Thistle, Canada
Toadflax, Dalmatian
Trumpetcreeper (Buckvine)
Vetch
Waterhemlock
Waterprimrose, Creeping
*Woodsorrel, Common Yellow
Wormwood, Common
Wormwood, Louisiana
*Yankeeweed
Yarrow, Common

* Noted perennials may be controlled using BANVEL Herbicide at rate lower than those recommended for other listed perennial weeds. (See application rates and timing on page 6).

WOODY

Alder
Ash
Aspen
Basswood
Beech
Birch
Blackberry
Blackgum
Cedar
Cherry
Chinquapin
Cottonwood
Creosotebush
Cucumbertree
Dewberry
Dogwood
Elm
Grape
Hawthorn (Thornapple)
Hemlock
Hickory
Honeylocust
Honeysuckle
Hornbeam
Huckleberry
Huisache
Ivy, Poison
Kudzu
Locust, Black
Maple
Mesquite
Oak
Oak, Poison
Olive, Russian
Persimmon, Eastern
Pine
Plum, Sand (Wild Plum)
Poplar
Rabbitbrush
Redcedar, Eastern
Rose, McCartney
Rose, Multiflora
Sagebrush, Fringed
Sassafras
Serviceberry
Spicebush
Spruce
Sumac
Sweetgum
Sycamore
Tarbush
Willow
Witchhazel
Yaupon
Yucca

TURF AND LAWNS

Including Golf Course Fairways, Aprons, Tees and Rough.

IMPORTANT

Observe all precautions on pages 1-2. Read and follow mixing and application instructions on page 2.

To avoid injury to newly seeded grasses, application of BANVEL Herbicide should be delayed until after the second mowing. Furthermore, application rates in excess of 1 pint (½ lb. a.i.) per treated acre may cause noticeable stunting or discoloration of sensitive grass species such as bentgrass, carpetgrass, buffalograss, and St. Augustine grass.

In areas where roots of sensitive plants extend, do not apply in excess of ¼ pint (⅛ lb. a.i.) of BANVEL Herbicide per treated acre on coarse textured (sandy-type) soils, or in excess of ½ pint (¼ lb. a.i.) per treated acre on fine textured (clayey-type) soils. Do not make repeat applications in these areas for 30 days and until previous applications of BANVEL Herbicide have been activated in the soil by rain or irrigation.

WEEDS CONTROLLED

BANVEL Herbicide, when applied at recommended rates, will give control of many ANNUAL, BIENNIAL, and noted (*) PERENNIAL broadleaf weeds commonly found in turf. BANVEL Herbicide will also give growth suppression of many other listed PERENNIAL broadleaf weeds and WOODY brush and vine species. (Refer to GENERAL WEED LIST on pages 3-4).

MIXING AND APPLICATION

Apply 30 to 200 gallons of diluted spray per treated acre (3 qts. to 4¼ gals. per 1,000 sq. ft.), depending on density or height of weeds treated and on the type of equipment used.

RATES AND TIMINGS

Use the higher level of listed rate ranges when treating dense vegetative growth.

Weed Stage & Type	BANVEL Herbicide: pints per treated acre	lbs. a.i. per treated acre	teaspoons per 1000 sq. ft.
Annual			
Small, actively growing	½-1	¼-½	1-2¼
Established weed growth	1-1½	½-¾	2¼-3¼
Biennial			
Rosette diameter			
Less than 3 inches	½-1	¼-½	1-2¼
3 inches or more	1-2	½-1	2¼-4½
Perennials and Woody			
Brush and Vines	1-2	½-1	2¼-4½

For best performance, apply when weeds are emerged and actively growing.

Retreatments may be made as needed; however, do not exceed a total of 2 pints (1 lb. a.i.) BANVEL Herbicide per treated acre during a growing season.

TANK MIX TREATMENTS

READ AND FOLLOW THE LABEL OF EACH TANK MIX PRODUCT USED FOR PRECAUTIONARY STATEMENTS, DIRECTIONS FOR USE, APPLICATION RATES AND TIMINGS AND OTHER RESTRICTIONS.

Tank mix treatments of BANVEL Herbicide may be made with 2,4-D, MCPA, MCPP, or bromoxynil for control of additional weeds listed on the tank mix product label.

Apply ⅕ to ½ pint (1/10-¼ lb. a.i.) of BANVEL Herbicide per treated acre with ½ to 1½ lbs. acid equivalent of 2,4-D, MCPA, or MCPP, or with ⅜ to ½ lb. a.i. of bromoxynil. Use the higher level of the listed rate ranges when treating established weeds. Repeat treatments may be made as needed; however, do not exceed 2 pints (1 lb. a.i.) of BANVEL Herbicide per treated acre during the growing season.

CUT SURFACE TREE TREATMENTS

BANVEL Herbicide may be applied as a cut surface treatment for control of unwanted trees and prevention of sprouts of cut trees. A mix of 1 part BANVEL Herbicide with 1 to 3 parts water should be used in application. Use the lower dilution when treating difficult-to-control species.

• FRILL OR GIRDLE TREATMENTS*: Make a continuous cut or a series of overlapping cuts using an axe to girdle tree trunk. Spray or paint cut surface with the BANVEL Herbicide/water mix.

• STUMP TREATMENTS: Spray or paint freshly cut surface with the BANVEL Herbicide/water mix. The area adjacent to the bark should be thoroughly wet.

* **Note:** For more rapid foliar effects, 2,4-D may be added to the BANVEL Herbicide/water mix.

DORMANT APPLICATIONS FOR CONTROL OF MULTIFLORA ROSE

BANVEL Herbicide can be applied when plants are dormant as an undiluted SPOT-CONCENTRATE directly to the soil or as a LO-OIL BASAL BARK treatment using an oil-water emulsion solution.

MIXING AND APPLICATION

SPOT-CONCENTRATE applications of BANVEL Herbicide should be applied directly to the soil as close as possible to the root crown but within 6-8 inches of the crown. On sloping terrain, application should be made to the uphill side of the crown. Do not make application when snow or water prevents applying BANVEL Herbicide directly to the soil.

LO-OIL BASAL BARK applications of BANVEL Herbicide should be applied to the basal stem region from the ground line up to a height of 12-18 inches. Spray until runoff, with special emphasis on covering the root crown. For best results, make application when plants are dormant. Do not make application after bud break or when plants are showing signs of active growth. Do not make application when snow or water prevents applying BANVEL Herbicide to the ground line.

Note: To prepare oil-in-water emulsions, half fill spray tank with water plus appropriate amount of herbicide. With continuous agitation, slowly add a premix of oil plus a suitable emulsifier to the spray tank. Complete filling of spray tank with water. Maintain vigorous agitation during spray operation to prevent oil and water from forming separate layers.

RATES AND TIMINGS

Application rates of BANVEL Herbicide are given below:

SPOT CONCENTRATE TREATMENT

Canopy diameter (feet)	BANVEL Herbicide (ounces)
5	¼
10	1
15	2¼

Do not exceed a total of 2 gallons (8 lbs. a.i.) of BANVEL Herbicide per acre per year.

LO-OIL BASAL BARK TREATMENT

Mix the appropriate amount of BANVEL Herbicide with the appropriate amount of water, emulsifier and No. 2 diesel fuel to obtain the volume of spray desired. See table below. Refer to MIXING and APPLICATION section before mixing.Do not exceed 30 gallons of spray solution per acre per year.

	Ounces			
Volume of spray solution desired (gal.)	Water	Emulsifier	BANVEL Herbicide	No. 2 Diesel Fuel
1	100* (3 qts.)	½	8	20
2	200 (6 qts.)	1	16	40
5	500 (3.75 gals.)	2½	40	100
10	1000 (7.5 gals.)	5	80	200

*Conversion: 100 ounces = 3 quarts

IMPORTANT

Observe all precautions on pages 1-2. Read and follow mixing and application instructions on page 2.

If spray contacts emerged spears, crooking (twisting) of some spears may result. If such crooking occurs, discard affected spears.

Do not harvest prior to 24 hours after treatment.

Make only one application per season.

RATES AND TIMINGS

Apply BANVEL Herbicide to emerged and actively growing weeds in 40 to 60 gallons of diluted spray per treated acre immediately after cutting the field, but at least 24 hours before the next cutting.

Weeds	Rate Per Treated Acre
Mustard, Black Pigweed, Redroot (carelessweed) Sowthistle, Annual *Thistle, Canada Thistle, Russian	½ to 1 pt. (¼-½ lb. a.i.)
*Bindweed, Field Chickweed, Common Goosefoot, Nettleleaf Radish, Wild Thistle, Milk	1 pt. (½ lb. a.i.)

BANVEL Herbicide plus 2,4-D herbicide tank mixture may be used for improved control of noted (*) weeds. READ AND FOLLOW 2,4-D PRODUCT LABELING FOR PRECAUTIONARY STATEMENTS, DIRECTIONS FOR USE, APPLICATION RATES AND TIMINGS, AND OTHER RESTRICTIONS.

PASTURE, RANGELAND AND NON-CROPLAND AREAS

BANVEL Herbicide is recommended for use on pasture rangeland, general farmstead weed and brush control and for use on non-cropland areas such as fence rows, roadways, rights-of-way (utility, railroad, highway, pipeline), non-selective forest brush control (including site preparation), wasteland and other non-cropland areas.

IMPORTANT

Observe all precautions on pages 1-2. Read and follow mixing and application instructions on page 2.

BANVEL Herbicide uses described in this section also pertain to small grains such as barley, oats, rye or wheat grown for pasture use only.

NEWLY SEEDED AREAS, including small grains such as barley, oats, rye or wheat grown for pasture, may be severely injured if rates of BANVEL Herbicide are applied in excess of those listed for control of ANNUAL weeds.

ESTABLISHED GRASS CROPS growing under stress can exhibit various injury symptoms that may be more pronounced if herbicides are applied. Furthermore, rates of BANVEL Herbicide in excess of 2 quarts (2 lbs. a.i.) per treated acre may cause temporary injury to many grass species.

Bentgrass, carpetgrass, buffalograss and St. Augustine grass may be injured at rates exceeding 1 pint BANVEL Herbicide (½ lb. a.i.) per treated acre. Usually colonial bentgrasses are more tolerant than creeping types. Velvetgrasses are most easily injured. Treatments will kill or injure alfalfa, clovers, lespedeza, wild winter peas, vetch and other legumes.

REMOVE MEAT ANIMALS FROM TREATED AREAS 30 DAYS PRIOR TO SLAUGHTER.

THERE IS NO WAITING PERIOD BETWEEN TREATMENT AND GRAZING FOR NON-LACTATING ANIMALS.

Refer to page 7 for restrictions concerning ENDANGERED SPECIES

TIMING RESTRICTIONS FOR LACTATING DAIRY ANIMALS FOLLOWING TREATMENT

BANVEL Herbicide Rate per Treated Acre	Days Before Grazing	Days Before Hay Harvest
Up to 1 pint (½ lb. a.i.)	7 days	37 days
Up to 1 quart (1 lb. a.i.)	21 days	51 days
Up to 2 quarts (2 lbs. a.i.)	40 days	70 days
Up to 8 quarts (8 lbs. a.i.)	60 days	90 days

Note: Observe all precautions and restrictions on labels of products used in tank mixtures.

MIXING AND APPLICATION

BANVEL Herbicide can be applied using water, oil in water emulsions (including invert systems), or sprayable fluid fertilizer as a carrier. A COMPATIBILITY TEST (pages 2-3 of this booklet) should be made prior to tank mixing.

To prepare oil in water emulsions, half-fill spray tank with water plus appropriate amount of herbicide. With continuous agitation, slowly add a premix of oil (such as diesel oil or fuel oil) plus a suitable emulsifier to spray tank. Complete filling of spray tank with water. Maintain vigorous agitation during spray operation to prevent oil and water from forming separate layers.

BANVEL Herbicide may be applied broadcast using either ground or aerial application equipment. When using ground equipment, apply 5 to 600 gallons of diluted spray per treated acre. Volume of spray applied will depend on the height, density, and type of weeds or brush being treated and on the type of equipment being used. When using aerial equipment apply 3 to 40 gallons of diluted spray per treated acre.

BANVEL Herbicide may be applied to individual clumps or small areas (SPOT TREATMENT) of undesirable vegetation using handgun or similar types of application equipment. Apply diluted sprays to allow complete wetting (up to run-off) of foliage and stems.

ACCUTROL® Herbicide adjuvant or other spray additives (emulsifiers, surfactants, wetting agents, drift control agents, or penetrants) may be used for wetting, penetration, or drift control. Spray additives must be agriculturally approved when used in pasture applications. If spray additives are used, read and follow all use recommendations and precautions on product label.

WEEDS CONTROLLED

BANVEL Herbicide, when applied at recommended rates, will give control of many ANNUAL, BIENNIAL, and PERENNIAL broadleaf weeds, and many WOODY brush and vine species commonly found in pasture, rangeland and non-cropland areas. (Refer to GENERAL WEED LIST on pages 3-4). Noted (*) PERENNIAL weeds may be controlled with lower rates of either BANVEL Herbicide or BANVEL Herbicide plus 2,4-D. See RATES AND TIMINGS below.

RATES AND TIMINGS

Application rates and timing of BANVEL Herbicide are given below. Use the higher level of listed rate ranges when treating dense or tall vegetative growth.

	Broadcast rate per treated acre	
Weed Stage & Type	product amount	lbs. a.i.
Annual		
Small, actively growing	½-1 pt.	¼-½
Established weed growth	1-1½ pts.	½-¾
†Biennial		
Rosette diameter		
Less than 3 inches	½-1 pt.	¼-½
3 inches or more	1-2 pts.	½-1
Bolting	2-3 pts.	1-1½
Perennial		
Suppression or top growth control	½-1 qt.	½-1
Noted (*) Perennials	1-2 qts.	1-2
Other perennials	2-4 qts.	2-4
Dense stands	4-6 qts.	4-6
Woody Brush & Vines		
Foliage Suppression	½-1 qt.	½-1
Stems	1-2 qts.	1-2
Stems and Stem Sprouts	½-1 gal	2-4
Stems and Root Sprouts	1-2 gals.	4-8

†For best performance, make application when BIENNIAL WEEDS are in the rosette stage.

Retreatments may be made as needed; however, do not exceed a total of 2 gallons (8 lbs. a.i.) of BANVEL Herbicide per treated acre during a growing season.

TANK MIX TREATMENTS

READ AND FOLLOW THE LABEL OF EACH TANK MIX PRODUCT USED FOR PRECAUTIONARY STATEMENTS, DIRECTIONS FOR USE, APPLICATION RATES AND OTHER RESTRICTIONS. BANVEL Herbicide may be tank mixed with one or more of the following herbicides for control of grasses, additional broadleaf weeds, and woody brush and vines.

Herbicide	Rates per treated acre (lbs. a.i.)
Pasture, rangeland, and non-cropland use:	
atrazine	½ to 2
diuron (Karmex®)	4 to 48
glyphosate (Roundup®)	¾ to 3¾
simazine (Princep®)	5 to 40
paraquat	½ to 1
triclopyr (Garlon®)	¾ to 9
2,4-D	¼ to 6
Rangeland and non-cropland use only:	
picloram (Tordon®)	¼ to 3
2,4,5-T	¼ to 6
Non-cropland use only:	
amitrole	2 to 8
atratol (Atratol®)	4⅓ to 40
bromacil (Hyvar®)	1½ to 24
dalapon (Dalapon®)	4¼ to 12¾
diquat	½
fosamine ammonium (Krenite®)	6 to 12
hexazinone (Velpar®)	2 to 12
MSMA	2
prometon (Pramitol®)	10 to 60
sulfometuron methyl (Oust™)	0.14 to 0.56
tebuthiuron (Spike®)	1 to 16
2,4-DP (Weedone®)	½ to 11

Due to the variations that may occur in formulated products and specific use ingredients (e.g. water supplies), a COMPATIBILITY TEST as described on pages 2-3 is recommended prior to actual tank mixing.

WIPER APPLICATION USES

IMPORTANT

Observe all precautions on pages 1-2.

BANVEL Herbicide may be applied through wiper application equipment to control or suppress actively growing broadleaf weeds, brush and vines. Use a solution containing 1 part BANVEL Herbicide to 1 part water. Do not contact desirable vegetation with herbicide solution. Wiper application should only be made to crops (including pastures) and non-cropland areas described in this label with the exception of Grain Sorghum (Milo).

ENDANGERED SPECIES RESTRICTIONS

Before using this pesticide on range and/or pastureland in the counties listed below, you must obtain the PESTICIDE USE BULLETIN FOR PROTECTION OF ENDANGERED SPECIES for the county in which the product is to be used. The bulletin is available from your County Extension Agent, State Fish and Game Office, or your pesticide dealer. Use of this product in a manner inconsistent with the PESTICIDE USE BULLETIN FOR PROTECTION OF ENDANGERED SPECIES is a violation of Federal laws.

Alabama
Cherokee, De Kalb, Etowah, Jackson and Marshall

Arizona
Cochise, Coconino, Gila, Graham, Maricopa, Mohave, Navajo, Pima, Pinal, and Yavapai

California
Alameda, Butte, Colusa, Contra Costa, Fresno, Glenn, Inyo, Lake, Los Angeles, Mendocino, Merced, Nevada, Orange, Sacramento, San Benito,San Bernardino, San Clemente Island, San Diego, San Francisco, San Joaquin, San Luis Obispo, San Mateo, Santa Barbara, Santa Barbara Island, Solano, Sutter, Tehema, Ventura and Yolo

Colorado
Delta, Jackson, La Plata, Mesa, Montezuma and Montrose

Florida
Charlotte, Franklin, Jefferson, Lee, Liberty and Orange

Georgia
Brantley, Towns and Wayne

Hawaii
Islands of Hawaii and Maui and the District of Lahaina

Idaho
Idaho

Illinois
DuPage, Lee, McHenry, Ogle and Winnebago

Iowa
Butler, Clarke, Dickinson, Emmet, Howard, Kossuth, Lucas, Oscocola, Story and Winneshiek

Kentucky
Fleming, Nicholas and Robertson

Minnesota
Cottonwood, Goodhue, Jackson and Renville

Missouri
Christian, Dade and Greene

Nebraska
Cherry, Garden and Hooker

Nevada
Nye

New Mexico
Catron, Chaves, Dona Ana, Eddy, Lincoln, McKinley, Otero, San Juan and Sierra

North Carolina
Henderson

Oregon
Harney and Wallowa

South Carolina
Greenville and McCormick

Tennessee
Davidson, Rutherford and Wilson

Texas
Bandera, Brazos, Brewster, Burleson, Culberson, Edwards, El Paso, Grimes, Harris, Hays, Hudspeth, Jim Wells, Kerr, Kimble, Kleburg, Nueces, Pecos, Presidio, Real, Refugio, Robertson, Runnels, San Augustine, Starr, Terrell, Uvalde, Val Verde and Zapata

Utah
Beaver, Cache, Carbon, Duchesne, Emery, Garfield, Grand, Iron, Kane, Piute, San Juan, Sanpete, Sevier, Uintah, Utah, Washington and Wayne

Wisconsin
Dane, Pierce, Rock and Sauk

STORAGE AND DISPOSAL

PROHIBITIONS

Do not contaminate water, food or feed by storage or disposal.

STORAGE

Store in original container in a well-ventilated area separately from fertilizer, feed and foodstuffs. Avoid cross-contamination with other pesticides. Spillage or leakage should be contained and absorbed with clay granules, sawdust, or equivalent material for disposal.

PESTICIDE DISPOSAL

Triple rinse pesticide from containers and use rinsates in the pesticide application. Wastes which cannot be used according to label instructions may be disposed of on site or at an approved waste disposal facility.

CONTAINER DISPOSAL

Plastic or Metal: After triple rinsing (or equivalent), offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities, such as burning of plastic containers. If burned, stay out of smoke.

LIMITED WARRANTY AND LIABILITY

NOTICE: Read this Limited Warranty and Liability before buying or using this product. If the terms are not acceptable, return it at once, unopened.

It is critical that this product be used and mixed only as specified on the label. The laws of a State may make some or all of this paragraph inapplicable or may give you rights in addition to your rights hereunder. Except to the extent prohibited by applicable law, the exclusive remedy of the user or buyer and the limit of liability of this Company or any other Seller for any and all losses, personal injuries or damages resulting from the use of this product, shall be the purchase price paid by the user or buyer for the quantity of product involved. Except to the extent prohibited by State Law, there is no warranty, and this Company and other Sellers disclaim all liability for losses, personal injury or damages: (i) arising from any use of this product in a manner or for a purpose not recommended in its label directions or from mixing this product before use with any substance except as recommended by the product's label; (ii) arising from handling or storage in violation of label instructions; (iii) for all indirect, special or consequential damages; (iv) when not reported to this Company within one year of discovery; and (v) arising from product not used within the label-designated shelf life or four years from the date of purchase, whichever first occurs. THERE ARE NO IMPLIED WARRANTIES AND NO WARRANTIES OF MERCHANTABILITY OR FITNESS.

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SP-341A

November 1987
Des Plaines, IL

APPENDIX C. DATABASE ORGANIZATION

C-1 Daily Work Activity Tracking

C-2 Reports and Table Information

0.3 MAVIS ORGANIZATION

MAVIS is organized into five basic functions :

1) The Daily Time Report Activity - which is used to record, edit and verify Daily Crew Time Report maintenance activity.

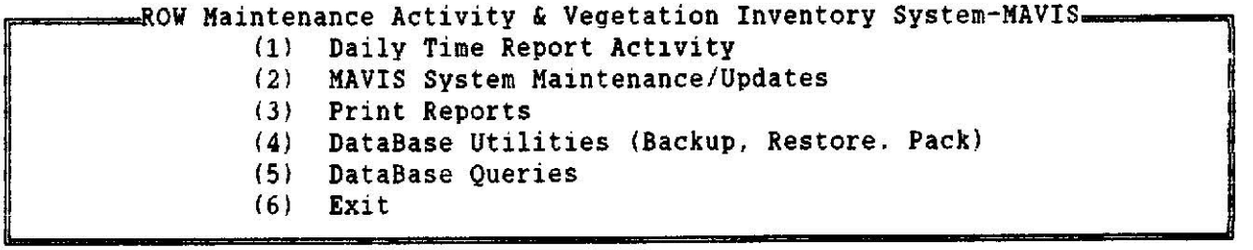
2) MAVIS System Maintenance/Updates - which is used to add or edit other information used by MAVIS to produce reports and to initiate posting procedures which provide updated data.

3) Print Reports - provides various reports required by SCL Unit# 502 - ROW Maintenance Unit.

4) Database Utilities - provides utilities to keep the database structure healthy and intact.

5) Database Queries - provides the user with a flexible method of requesting information about the database.

These sections are accessed via the MAVIS Main Menu.



For each option on the main menu, there is a sub menu. In addition, some sub-menus have their own sub-menu. (See Next Page)

(3)

Print Reports

(1) Print Labor Hour Report
(2) Print Labor Comparison Report
(3) Print Productivity Reports
(4) Print Maintenance History Reports
(5) Print Inventory and Map Listings
(6) Print Cost Analysis Reports
(7) Print Data Base Change Report
(8) Exit

(3)

Print Productivity Reports

(1) Unit# 502 - "Old Style"
(2) Unit# 502 - "New Style"
(3) Unit# 750
(4) Exit

(4)

Print Maintenance History Reports

(1) List of Clearing Activities - By Year By Span
(2) Summary of Clearing Hours By Span
(3) List of Spans With No Clearing Activity
(4) Exit

(6)

Print Cost Analysis Reports

(1) Labor Hour And Cost Analysis Summary
(2) Detailed Cost Comparison Analysis of Clearing Activities
(3) Cost Analysis of Vegetation Control Methods- BY ROW Line
(4) Exit

(4)

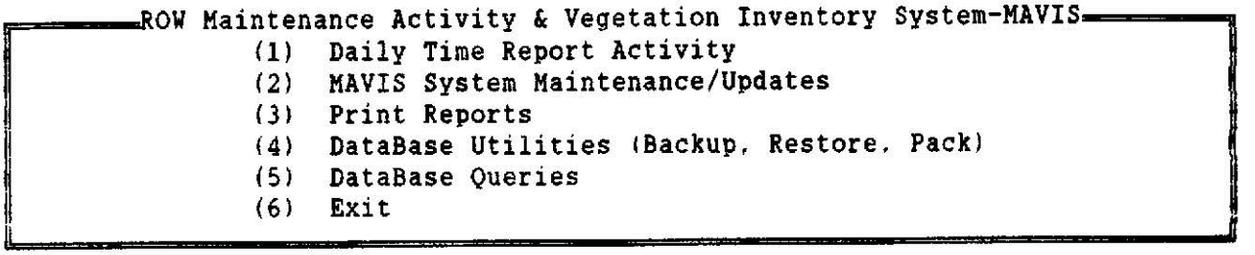
DataBase Utilities

(1) Backup Database
(2) Backup Database Table to Drive A:
(3) Restore Database
(4) Restore Database Table from Drive A:
(5) Pack Database (Squeeze out deleted records)
(6) Format A:
(7) Exit

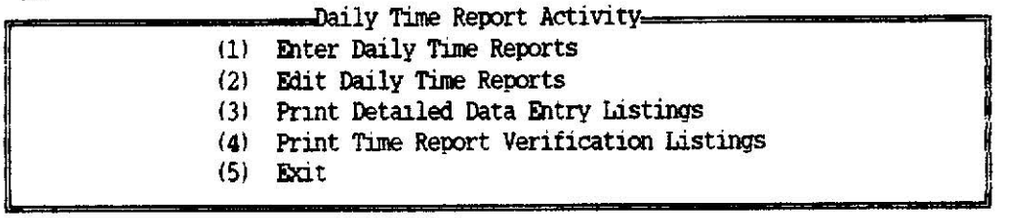
(5) Database Queries

Choose an action

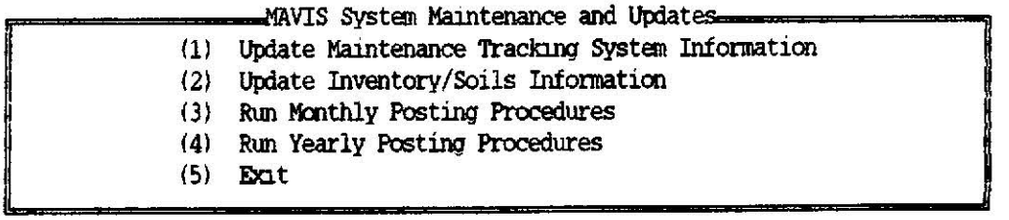
Look at data List structure Print data Open


ROW Maintenance Activity & Vegetation Inventory System-MAVIS
(1) Daily Time Report Activity
(2) MAVIS System Maintenance/Updates
(3) Print Reports
(4) DataBase Utilities (Backup, Restore, Pack)
(5) DataBase Queries
(6) Exit

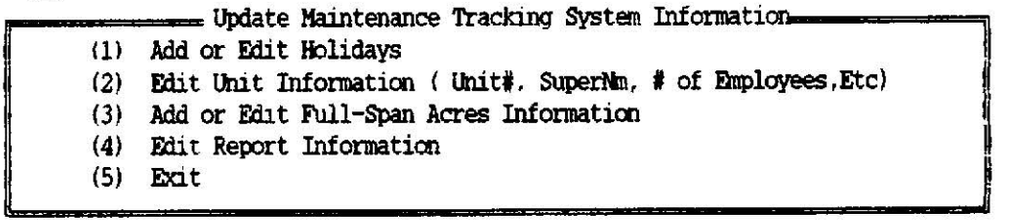
(1)


Daily Time Report Activity
(1) Enter Daily Time Reports
(2) Edit Daily Time Reports
(3) Print Detailed Data Entry Listings
(4) Print Time Report Verification Listings
(5) Exit

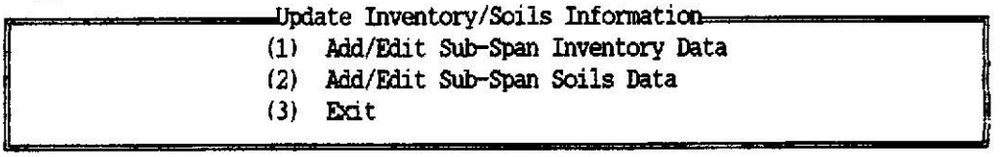
(2)


MAVIS System Maintenance and Updates
(1) Update Maintenance Tracking System Information
(2) Update Inventory/Soils Information
(3) Run Monthly Posting Procedures
(4) Run Yearly Posting Procedures
(5) Exit

(1)


Update Maintenance Tracking System Information
(1) Add or Edit Holidays
(2) Edit Unit Information (Unit#, SuperNm, # of Employees,Etc)
(3) Add or Edit Full-Span Acres Information
(4) Edit Report Information
(5) Exit

(2)


Update Inventory/Soils Information
(1) Add/Edit Sub-Span Inventory Data
(2) Add/Edit Sub-Span Soils Data
(3) Exit

C-1 Daily Work Activity Tracking

RIGHT OF WAY ACTION REPORT

CREW: MONTH:

DATE M/D/YR	TOWER/LOCATION FROM	TO	ACRES	CLEARING	LOPPING	SELECTIVE CLRNG	MANIPULATION-ROW	PATROL/INSPECT	GARBAGE REMOVAL	Clean (L) [illegible]				ROW ROAD MAIN.	ROAD MAIN. CAMP	REC. FACILITIES	CAMP MAINTENANCE	RESERVOIR DEBRIS	BOOM & FLOAT MAIN.	SAFETY	MEETING/TRAINING	LEAVE	~~TRAVEL~~	~~HOURS OF UNFILLED~~ POSITIONS	TOTAL HOURS	Crew size
10/2/89	B 72/24	B 72/34	.7		48									8											56	7
	B 72/45	B 73/7	.3																							
10/3/89	B 72/43	B 73/7	.7																							
	D 72/24	D 72/32	.3																							
10/4/89	B 72/32	B 72/31	.3		56									8											60	8
	D 72/24	D 72/32	.6																							
10/5/89	B 72/24	B 72/34	.7		64					8															72	9
	B 72/41	B 73/7	.5																							
10/6/89	B 72/23	B 72/34	.3	16	40																				56	7
	B 72/24	B 72/43	.2																							
	D 72/24	D 72/32	.2																							
10/9/89	B 72/24	B 72/34	.2		64																				64	8
	B 72/34	B 73/7	.3																							
10/10/89	B 72/43	B 73/7	1.4		62																				62	7.75
	D 72/51	D 73/8	1.4																							
TOTALS:			123	16	354				E	8				16											374	

DAILY TIME REPORT

L-501-32 (10-86)

DATE	CREW #	CREW CHIEF	CREW SIZE	CREW NAMES

SINGLE SPAN		ROADSIDE BRUSH MOWING	ROAD, GRADING, REPAIR	ROAD, CULVERT INSTALLATION	ROAD, GATES, FENCE, BARRIERS	CLEARING, MECHANICAL	CLEARING, MANUAL	CLEARING, CHIPPING	CLEARING, BURNING	CLEARING, CHEMICAL	CLEARING, AROUND TOWERS	MANIPULATION, PREPARATION	MANIPULATION, SEED, PLANT	MOWING/GRASS	NOXIOUS WEED CONTROL, MANUAL	NOXIOUS WEED CONTROL, CHEMICAL	TREE TOPPING/TRIMMING	DANGER TREE REMOVAL	WATER CONTROL (MULTI SPAN OK)	GARBAGE REMOVAL (MULTI SPAN OK)	TOTAL HOURS
TOWER FROM	TOWER TO																				
DAILY TOTALS																					

CREW SIZE _____ X 8HR = _____

OVERTIME HOURS _____

TOTAL REPORTED HOURS _____

PATROL INSPECTION	EQUIP.DOWN-TRANSPORT, & LOST WORK TIME	EQUIPMENT, FIELD REPAIR	TRAVEL/EQUIPMENT TRANSPORT	MEETINGS, TRAINING, SAFETY	LEAVE

COMMENTS _____

FY 1987	Span	CLEARING ACTIVITY HOURS								
		Manual	Chemical	Chipping	Burning	Mechanical In-house	Mechanical Contract	Tree Topping	Total Clearing Hrs	Acres
LineID= CF										
	C02/022	6.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.93
	C02/049	6.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.95
	C02/102	3.0	0.0	0.0	0.0	3.0	0.0	0.0	6.0	0.93
	C02/129	3.0	0.0	0.0	0.0	3.0	0.0	0.0	6.0	0.90
	C02/154	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	1.00
	C02/183	2.0	0.0	0.0	0.0	7.0	0.0	0.0	9.0	0.69
	C02/203	2.0	0.0	0.0	0.0	4.0	0.0	0.0	6.0	1.00
	C02/233	2.0	0.0	0.0	0.0	5.0	0.0	0.0	7.0	1.03
	C02/319	0.0	0.0	0.0	0.0	4.0	0.0	0.0	4.0	0.93
	C02/346	0.0	0.0	0.0	0.0	4.0	0.0	0.0	4.0	0.93
	C02/373	0.0	0.0	0.0	0.0	4.0	0.0	0.0	4.0	0.90
	C02/427	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.93
	C02/454	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.93
	C02/481	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.93
	C02/508	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.93
	C03/007	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.96
	C03/034	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.93
	C03/061	3.0	0.0	0.0	0.0	1.0	0.0	0.0	4.0	0.93
	C03/088	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.93
	C03/115	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.93
	C03/143	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.98
	C03/171	3.0	0.0	0.0	0.0	1.0	0.0	0.0	4.0	0.95
	C03/199	4.0	0.0	0.0	0.0	4.0	0.0	0.0	8.0	0.96
	C03/227	1.0	0.0	0.0	0.0	3.0	0.0	0.0	4.0	0.90
	C03/253	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.91

C-2 Reports and Table Information

MAVIS REPORTS
UNIT 502 - MAINTENANCE ACTIVITY AND VEGETATION INVENTORY SYSTEM

REPORT NAMES	REPORT INFORMATION/USAGE
CLEARANCES	Line clearance info by ROW and sub-span
COST ANALYSIS OF VEGETATION CONTROL ON SCL ROWs By ROW and Vegetation Control Methods	Cost per Acre/Span/Mile Analysis of Crew Activity Hours - For Each Type of Work Activity - By R.O.W. Line. (Used for annual plan and budget preparation)
DETAILED COST ANALYSIS FOR CLEARING ACTIVITIES ON SCL ROW (Comparison of Manual, Mechanical and Chemical Activities)	Cost/Acre Breakdown and Analysis of Vegetation Clearing Method -summarized by Year and Unit (Used for annual plan and budget preparation.)
DETAILED DATA ENTRY LISTINGS	Lists detailed information about daily time reports (hours/activity/span). Used for data entry verification.
LABOR HOUR AND COST ANALYSIS SUMMARY - UNIT 502	Cost Analysis Summary for All Unit 502 Work Activity - By Activity Type with Yearly Subtotals. Provides info for budget and annual plan preparation.
LABOR HOUR AND COST ANALYSIS SUMMARY - UNIT 750	Cost Analysis Summary for All Unit 750 Work Activity - By Activity Type - Yearly Subtotals Provided. (Used for annual plan and budget preparation.)
LIST OF SPANS WITH CLEARING ACTIVITY - BY YEAR, BY SPAN	Summary of clearing activity hours by year, by span.
LIST OF SPANS WITH NO CLEARING ACTIVITY	Spans with no clearing activity within the last 2-year cycle are listed. Used to flag potential problem units.
LIST OF SPANS IN TABLE ACRES	Valid span numbers/names for maintenace activity information, acre information - Reference reports used for data entry preparation.
MAP AND SOIL DATA	ROW soil,landuse, ownership and easement information - by ROW and sub-span.
NEW PRODUCTIVITY MEASURES WORKSHEET - UNIT 502	Productivity summary using new (1988) indexes - spans/acres per MIS hours for selected R.O.W. activities. Provides productivity information to the director.
OLD PRODUCTIVITY MEASURES WORKSHEET - UNIT 502	Productivity summary using old indexes - spans per MIS hours for selected R.O.W. activities. Provides productivity information to the director.
POTENTIAL DANGER TREES	Information about potential danger tree locations - by ROW and sub-span.
PRODUCTIVITY MEASURES WORKSHEET - UNIT 750	Productivity summary using unit 750 information and index - spans per 750 MIS hours for clearing activities. Provides productivity information to the director.
SPAN TREATMENT ACTIVITY LISTINGS - BY TREATMENT TYPE	List of spans by treatment type, line, span, and fiscal year. Used to identify locations of each treatment type for verification of effectivness of various types of treatment and for work load planning.
STREAM INVENTORY FOR SCL ROWS	Stream information by span. Provides fish, water-system and culvert info for streams on ROW - for supervisor & EAD.

MAVIS REPORTS

UNIT 502 - MAINTENANCE ACTIVITY AND VEGETATION INVENTORY SYSTEM

REPORT NAMES	REPORT INFORMATION/USAGE
SUMMARY OF CLEARING HOURS BY SPAN	Summary and average of clearing activities with vegetation information included. Used for vegetation maintenance planning
TIME REPORT ENTRY VERIFICATION	Summary of hours for each crew report and totals for entry session or dates Used for data entry verification.
TRANSMISSION AND DISTRIBUTION DIVISON - UNIT 502 MONTHLY LABOR HOUR REPORT	Monthly labor hour report summary information for Unit 502. Sent monthly to the director
TRANSMISSION AND DISTRIBUTION DIVISION -UNIT 502 MONTHLY LABOR REPORT COMPARISONS	Comparison of Estimate to Actuals -ROW Crew Activity Hours-By Month and Year-To-Date For Activity Catagories. Used for budget and annual plan preparation.
VEGETATION INVENTORY LISTING	Provides a combination of vegetation and map information by sub-span. Used in vegetation maintenance planning

ABC VEGETATION INVENTORY

DATE	CO	SPANS	S	H	AREA	SOIL	INC1	INC2	SL	ASP	OWN	PROPERTY#	LANDUSE ROW	LANDUSE LCD	LANDUSE RSD	RANGE LIMITS	CL		CONIFERS SPP	CONIFERS HT	CONIFERS DN	DECIDUOUS SPP	DECIDUOUS HT	DECIDUOUS DN	SHRUB SPP	SHRUB CV	HERB SPP	HERB CV	COMMENTS
0385	N	A00/00	X	-	195000	39	-0-	-0-	-	-0	S	270504/3/301	WV	FDY	FCM	GG1WX	-0	1	PM	3	0	AR	3	1	SD	4	TL	2	-0-
																		2	TS	3	0	SX	E	0	RS	3	JE	I	
																		3	TP	3	0	SP	3	0	CB	1	GF	1	
0385	N	A00/01	X	-	225000	1	69	39	-	-0	S	270504/3/301	BV	FCM	BV	GG1WX	34	1	PM	2	0	AR	2	1	SD	3	GR	3	-0-
																		2	TS	2	0	SX	E	0	RS	3	BX	2	
																		3	TP	2	0	-0	-	-	GS	2	LL	2	
0385	N	A00/08	A	-	36000	69	-0-	-0-	-	-0	S	270504/3/301	BV	FCM	BV	N 3WX	49	1	PM	2	0	AR	2	1	SD	3	-0	-	-0-
																		2	TS	2	0	-0	E	-	GS	2	-0	-	
																		3	TP	2	0	-0	-	-	CB	2	-0	-	
0385	N	A00/08	B	-	96000	1	69	-0-	-	-0	S	270504/3/301	WV	FCM	BV	DG1WX	43	1	PM	3	0	AR	3	1	SD	4	-0	-	-0-
																		2	TS	3	0	SX	E	0	RS	2	-0	-	
																		3	TP	3	0	-0	-	-	LL	2	-0	-	
0385	N	A00/08	C	-	64500	1	-0-	-0-	-	-0	S	270505/4/301	BV	FCM	BV	N 3WX	43	1	PM	3	0	AR	3	1	CB	4	-0	-	-0-
																		2	TS	3	0	-0	E	-	GS	2	-0	-	
																		3	TP	3	0	-0	-	-	SD	1	-0	-	
0385	N	A00/14	A	-	120000	1	-0-	-0-	-	-0	S	270505/4/301	AP	FCM	BV	N 1WO	39	1	LB	2	0	AR	2	0	CB	1	GR	5	-0-
																		2	PM	2	0	-0	E	-	SR	1	JE	2	
																		3	-0	-	-	-0	-	-	SD	1	-0	-	
0385	N	A00/14	B	-	62350	1	-0-	-0-	-	-0	E	270508/1/001	BV	FCM	FCM	GG1WX	35	1	PM	3	0	-0	-	-	CB	4	GR	1	-0-
																		2	-0	-	-	-0	E	-	GS	3	BX	1	
																		3	-0	-	-	-0	-	-	RV	2	-0	-	
0385	N	A00/20	A	-	101500	1	-0-	-0-	-	-0	E	270508/1/001	WW	FCM	FCM	GG3WX	35	1	TS	1	0	AR	3	1	SD	4	GR	1	-0-
																		2	TP	1	0	SX	E	0	RS	1	-0	-	
																		3	-0	-	-	-0	-	-	GS	1	-0	-	
0385	N	A00/20	B	-	49300	1	-0-	-0-	-	-0	E	270508/1/001	FDY	FCM	FCM	GG3WO	36	1	-0	-	-	AR	4	3	SD	2	GR	3	-0-
																		2	-0	-	-	SX	E	2	CB	1	TL	1	
																		3	-0	-	-	PT	4	1	-0	-	EA	1	
0385	N	A00/20	C	-	78300	1	-0-	-0-	-	-0	E	270508/1/001	BV	FCM	FCM	GG3NX	36	1	-0	-	-	AR	3	2	RD	2	GR	4	-0-
																		2	-0	-	-	PT	E	0	CB	1	BX	1	
																		3	-0	-	-	SX	3	0	GS	1	-0	-	
0385	N	A00/28	X	-	210250	1	-0-	-0-	-	-0	E	270508/1/001	BV	FCM	FCM	GG1NO	32	1	PM	2	0	AR	3	1	CB	4	GR	3	-0-
																		2	-0	-	-	PT	E	0	RU	2	BX	1	
																		3	-0	-	-	AM	3	0	GS	1	-0	-	
0385	N	A00/35	X	-	208800	1	-0-	-0-	-	-0	E	270508/1/001	FDY	FCM	FCM	GG3NO	31	1	PM	3	2	AR	3	3	CB	3	GR	3	-0-
																		2	TS	3	0	-0	E	-	GS	3	BX	1	
																		3	-0	-	-	-0	-	-	RV	2	-0	-	
0385	N	A00/43	A	-	82650	32	-0-	-0-	-	-0	E	270508/1/001	FDY	FCM	URC	GG1NX	31	1	PM	2	1	AR	3	2	GS	3	GR	3	-0-
																		2	TS	2	0	-0	E	-	RS	2	BX	2	
																		3	TP	2	0	-0	-	-	SD	1	EA	1	

STREAM INVENTORY FOR SEATTLE CITY LIGHT'S RIGHTS-OF-WAY

SPAN	SCL#	DIST/TWR	NAME	WRIA/WDF#	DNR TYPE	4S/4S/S.	TOWN/RGE	USGS MAP	ANADROMOUS	RESIDENT	ACCESS	TYPE	COND	COMMENTS
D21/23N	10		No Name	05-0347	5	SW4/SW4/S.20	T.31N,R.6E	ArlingtonE	?	?	Yes	C-S	Good	Crosses ROW 2X, drainage along road-crk drains into lrge pond created by prop owner? - farther down road = lrge nat. pond15-18" clvrt/very shallow/prob owner built/JB will check.
D23/11N	14	350	No Name	05-(*)	5	SW4/S.16	T.31N,R.6E	ArlingtonE	?	?	Ys-n/u7	C-S	?	Road not used (7) 12" culvert ends in flume dwnstrm - some drop. Overgrwn, strm bottom substrate-Indian ridge area/we should check not used status - any future pl
D23/26N	15	550	Siberia Crk	05-0324	3	SW4/NE4/S.16	T.31N,R.6E	ArlingtonE	Co,Ch	Yes7,	Yes	C-S7	Good7	Steep slope upstream/veg overgrown, not impeding flow/our rd/
D23/41N	16	500	No Name	05-0325	5	NW4/NE4/S.16	T.31N,R.6E	ArlingtonE	(Co)7,(Ch)7	Yes7,	Yes	C-S	Fair	Fairly steep upstream; small cobble substrate, culvert size OK - didn't check condition/2" drop dwnstrm/drainage overgrwn/reed canary grass/salmnbrry
D24/22N	17	650	Bear Crk	05-0329	3	NW4/SW4/S.10	T.31N,R.6E	ArlingtonE	Co	?	Yes	C-S	Good	10" undercut on stream side(7) - looks like culv almost full after heavy rains, may need larger size? steel culvert
D25/31N	19	500	No Name	05-0332	3	SE4/SE4/S.3	T.31N,R.6E	ArlingtonE	Co7,	Yes7,	Yes	C-S(7)	Good(7)	Locals call this Porter Crk/sev inch drop downstrm/drps into pool/trout present in summer/upstrm less open/thicker cvr
D25/31N	20	1200	Porter Crk	05-0330	-0	SW4/SW4/S.2	T.31N,R.6E	ArlingtonE	Co	Yes7,	Yes	C-S(7)	Good(7)	Locals call this Lime Crk/upstrm lrge cobble/small boulder/thck cvr/dwnstrm poolsndy bottom/trout fry this summer

sel all from [illegible] where [illegible] and actdate between 10/[illegible]
31/87

ActDate	CrewID	CrewSub	Patrol	EqDown	EqRepair	Travel	Meetings	Leave	MiscHrs	TotHonPd	CrewSize	OT Hrs	TotHonSo	TotalHrs	EntDate	Comment
10/01/87	5	1	-0	0-	0-	4.	1.	0	-0	[illegible]	2.	-0	[illegible]	16.	06/27/88	-0
10/01/87	5	2	-0-	-0-	-0-	2.	4.	0	-0	[illegible]	2.	-0	6.	6.	06/27/88	-0
10/01/87	4	1	-0-	-0-	0-	5.	[illegible]	-0-	0	[illegible]	[illegible]	0		[illegible]	07	
10/01/87	6	1	-0	0-	-0-	17.	0.	-0-	-0	17.	5.	-0	17.	40.	08/06/88	-0-
10/01/87	750	1	-0-	-0-	-0-	5.	-0-	0-	-0	5.	5.	-0	[illegible]	72.	10/25/88	-0-
10/02/87	5	1	-0-	-0-		1.	1.	-0-	-0-	-0	[illegible]	2.	0	6.	16.	06/27/88	[illegible] Chipper
10/02/87	5	2	-0-	-0-	-0-	4.	2.	-0-	-0-	6.	2.	0-	6.	16.	06/27/88	-0
10/02/87	4	1	-0-	-0-	-0-	3.	-0-	-0-	-0-	3.	3.	0-	3.	24.	07/12/88	-0
10/02/87	6	1	-0-	-0-	-0-	7.	-0-	-0-	-0-	7.	5.	-0-	7.	40.	08/06/88	-0-
10/02/87	750	1	-0-	-0-	-0-	3.	-0-	-0-	-0-	3.	5.	-0-	3.	40.	10/25/88	-0-
10/05/87	5	1	-0-	-0-	-0-	4.	-0-	-0-	-0-	1.	2.	-0-	4.	16.	06/27/88	-0
10/05/87	5	2	-0-	0.5	0.5	1.5	-0-	0	-0-	1.5	[illegible]	0	1.5	17.	06/27/88	Got n[illegible] (4.89), chipper plug[illegible]
10/05/87	4	1	-0-	-0-	-0-	2.	-0-	8.	-0-	10.	[illegible]	-0-	10.	24.	07/12/88	STENDAL ON LEAVE
10/05/87	6	1	-0-	-0-	-0-	1.	-0-	-0-	-0-	4.	[illegible]	-0	4.	16.	08/06/88	-0-
10/05/87	6	2	-0-	-0-	-0-	6.	-0-	-0-	-0-	6.	2.	-0-	6.	24.	08/06/88	-0-
10/05/87	750	1	-0-	-0-	-0-	6.	-0-	-0-	-0-	6.	2.5	-0-	6.	[illegible]	10/25/88	-0-
10/06/87	5	1	-0-	-0-	-0-	6.	-0-	-0-	-0-	6.	3.	-0	[illegible]	21.	06/27/88	-0-
10/06/87	4	1	-0-	-0-	-0-	2.	-0-	8.	-0-	10.	3.	-0-	10.	24.	07/12/88	STENDAL ON LEAVE
10/06/87	6	1	-0-	4.	-0-	4.	-0-	-0-	-0-	8.	2.	-0-	8.	16.	08/06/88	-0-
10/06/87	6	2	-0-	-0-	-0-	5.	-0-	-0-	-0-	5.	3.	-0-	5.	24.	08/06/88	-0
10/06/87	750	1	-0-	-0-	-0-	5.	-0-	-0-	-0-	5.	4.	-0-	5.	64.	10/25/88	-0-
10/07/87	5	1	-0-	-0-	-0-	6.	-0-	-0-	-0-	6.	3.	-0-	6.	21.	06/27/88	-0-
10/07/87	4	1	-0-	-0-	-0-	2.	-0-	8.	-0-	10.	3.	-0-	10.	24.	07/12/88	STENDAL ON LEAVE
10/07/87	6	1	-0-	-0-	-0-	6.	-0-	-0-	6.	12.	2.	-0-	12.	16.	08/06/88	PICKED UP TRAILER AT STEEL SHOP
10/07/87	6	2	-0-	-0-	-0-	5.	-0-	-0-	-0-	5.	3.	-0-	5.	24.	08/06/88	-0-
10/07/87	750	1	-0-	-0-	-0-	4.	-0-	-0-	-0-	4.	7.5	-0-	4.	40.	10/25/88	-0-
10/08/87	5	1	-0-	-0-	-0-	6.	-0-	-0-	-0-	6.	3.	-0-	6.	24.	06/27/88	-0-
10/08/87	4	1	-0-	-0-	-0-	2.	-0-	8.	-0-	10.	3.	-0-	10.	24.	07/12/88	STENDAL ON LEAVE
10/08/87	6	1	-0-	-0-	-0-	3.	-0-	-0-	-0-	3.	2.	-0-	3.	16.	08/06/88	-0-
10/08/87	6	2	-0-	-0-	-0-	5.	-0-	-0-	-0-	5.	3.	-0-	5.	24.	08/06/88	-0-
10/08/87	750	1	-0-	-0-	-0-	6.	-0-	-0-	-0-	6.	8.	-0-	6.	64.	10/25/88	-0-
10/09/87	5	1	-0-	-0-	-0-	2.	-0-	-0-	-0-	2.	2.	-0-	2.	16.	06/27/88	TUNYAI SICK
10/09/87	4	1	-0-	-0-	-0-	2.	-0-	8.	-0-	10.	3.	-0-	10.	24.	07/12/88	STENDAL ON LEAVE
10/09/87	6	1	-0-	-0-	-0-	3.	-0-	-0-	-0-	3.	2.	-0-	3.	16.	08/06/88	-0-
10/09/87	6	2	-0-	-0-	-0-	3.	-0-	-0-	-0-	3.	3.	-0-	3.	24.	08/06/88	-0-
10/09/87	750	1	-0-	-0-	-0-	6.	-0-	-0-	-0-	6.	8.	-0-	6.	64.	10/25/88	-0-
10/12/87	5	1	-0-	-0-	-0-	6.	-0-	-0-	-0-	6.	3.	-0-	[illegible]	21.	06/27/88	-0-
10/12/87	4	1	-0-	-0-	-0-	3.	-0-	-0-	-0-	3.	3.	-0-	[illegible]	24.	07/12/88	-0
10/12/87	6	1	-0-	-0-	-0-	3.	-0-	-0-	-0-	3.	2.	-0-	3.	16.	08/06/88	-0-
10/12/87	6	2	-0-	-0-	-0-	3.	-0-	-0-	-0-	3.	2.	-0-	[illegible]	24.	08/06/88	-0
10/12/87	750	1	-0-	-0-	-0-	-0-	-0-	-0-	-0-	0.	0.	-0-	0.	0.	10/25/88	-0-
10/13/87	5	1	-0-	-0-	-0-	6.	-0-	-0-	-0-	6.	7.	-0-	6.	24.	06/27/88	-0-
10/13/87	4	1	-0-	-0-	-0-	3.	-0-	-0-	-0-	3.	3.	-0-	3.	24.	07/12/88	-0-
10/13/87	6	1	-0-	-0-	-0-	3.	-0-	-0-	-0-	3.	2.	-0-	3.	16.	08/06/88	-0-
10/13/87	6	2	-0-	-0-	-0-	4.	-0-	-0-	-0-	4.	3.	-0	[illegible]	24.	08/06/88	-0-
10/13/87	750	1	-0-	-0-	-0-	6.	-0-	-0-	-0-	6.	[illegible]	-0-	6.	[illegible]	10/25/88	-0-
10/14/87	5	1	-0-	-0-	-0-	6.	-0-	-0-	-0-	6.	2.	-0-	6.	24.	06/27/88	-0-
10/14/87	4	1	-0-	-0-	-0-	3.	-0-	-0-	-0-	3.	3.	-0-	3.	24.	07/12/88	-0
10/14/87	6	1	-0-	-0-	-0-	3.	-0-	-0-	-0-	3.	2.	-0-	3.	16.	08/07/88	-0-
10/14/87	6	2	-0-	-0-	-0-	3.	-0-	8.	-0-	11.	3.	-0-	11.	24.	08/06/88	-0-
10/14/87	750	1	-0-	-0-	-0-	10.	-0-	-0-	-0-	20.	10.	-0-	20.	20.	10/25/88	-0-
10/15/87	5	1	-0-	-0-	-0-	6.	-0-	-0-	-0-	6.	3.	-0-	6.	24.	06/27/88	-0-
10/15/87	4	1	-0-	-0-	-0-	3.	-0-	-0-	-0-	3.	3.	-0-	[illegible]	24.	07/12/88	-0-
10/15/87	6	1	-0-	-0-		1.	3.	-0-	-0-	-0-	4.	2.	-0-	4.	16.	08/06/88	-0-
10/15/87	6	2	-0-	-0-	-0-	2.	-0-	8.	-0-	11.	[illegible]	-0-	11.	24.	08/06/88	-0-
10/15/87	750	1	-0-	-0-	-0-	-0-	-0-	-0-	-0-	0.	0.	-0-	0.	0.	10/25/88	NO MOW WORK TODAY
10/16/87	5	1	-0-	-0-	-0-	4.	[illegible]	[illegible]	-0-	14.	[illegible]	-0-	14.	24.	06/27/88	-0-
10/16/87	4	1	-0-	-0-	-0-	3.	-0-	-0-	-0-	[illegible]	[illegible]	-0-	[illegible]	[illegible]	[illegible]	-0-
10/16/87	6	1	-0-	-0-	-0	[illegible]	[illegible]	[illegible]	-0-	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	6	2	[illegible]	[illegible]												

[illegible]
31/87

Span	ActDate	CrewID	CrewSub	LineID	Hours	MaintTyp	Category	NonSch	OTHours	OTNonSch	Comments	fyear
C01/160	10/01/87	5	1	CF	1.	CMan	C	N	-0-	Y	[illegible]	[illegible]
C01/160	10/01/87	5	1	CF	1.	CChi	C	N	-0	Y	[illegible]	[illegible]
C01/225	10/01/87	5	1	CF	1.	CMan	C	N	[illegible]	[illegible]	[illegible]	[illegible]
C01/225	10/01/87	5	1	CF	1.	CChi	C	[illegible]	[illegible]	Y	[illegible]	[illegible]
C04/508	10/01/87	5	1	CF	1.	CChi	C	N	-0	Y		[illegible]
C05/026	10/01/87	5	1	CF	2.	CChi	C	N	-0-	Y	-0	1988
D34/02S	10/01/87	5	2	CRCO	10.	Pole	PO	y	-0-	Y	Assist Steel Sh[illegible] onD34/02S	1988
B19/44S	10/01/87	4	1	EAST	12.	CChi	C	N	-0-	Y	TOPPED DOUG FIRS	1988
B19/44S	10/01/87	4	1	EAST	4.	TTop	CT	N	-0-	Y	-0-	1988
PNT90	10/01/87	6	1	PNT	2.	Garb	G	N	-0-	Y	-0-	1988
PNT110	10/01/87	6	1	PNT	2.	Garb	G	N	-0-	Y	-0-	1988
PNT143	10/01/87	6	1	PNT	2.	Garb	G	N	-0-	Y	-0-	[illegible]
PNT187	10/01/87	6	1	PNT	1.	Garb	G	N	-0-	Y	-	[illegible]
PNT155	10/01/87	6	1	PNT	2.	Garb	G	N	-0-	Y	-0-	1988
D24/46N	10/01/87	6	1	SK	4.	RGrd	R	N	-0-	Y	-0-	1988
D73/28N	10/01/87	750	1	SK	39.	CMan	C	N	0.	Y	-0-	1988
D73/28N	10/01/87	750	1	SK	28.	CChe	CC	N	0.	Y	-0-	1988
C16/145	10/02/87	5	1	CF	3.	CChi	C	N	-0-	Y	-0-	1988
C16/174	10/02/87	5	1	CF	4.	CChi	C	N	-0-	Y	-0-	1988
C16/203	10/02/87	5	1	CF	4.	CChi	C	N	-0-	Y	-0-	1988
C07/519	10/02/87	5	2	CF	3.	CMec	CM	N	-0-	Y	-0-	1988
C07/220	10/02/87	5	2	CF	3.	CMec	CM	N	-0-	Y	-0-	1988
C07/249	10/02/87	5	2	CF	2.	CMec	CM	N	-0-	Y	-0-	1988
C07/278	10/02/87	5	2	CF	2.	CMec	CM	N	-0-	Y	-0-	1988
B19/44S	10/02/87	4	1	EAST	9.	TTop	CT	N	-0-	Y	-0-	1988
B19/44S	10/02/87	4	1	EAST	12.	CChi	C	N	-0-	Y	-0-	1988
D21/23N	10/02/87	6	1	SK	2.25	CTow	CO	N	-0-	Y	-0-	1988
D21/23N	10/02/87	6	1	SK	1.5	RMow	M	N	-0-	Y	-0-	1988
D21/23N	10/02/87	6	1	SK	4.5	Pole	PO	N	-0-	Y	HANG SIGNS	1988
D21/36N	10/02/87	6	1	SK	4.5	Pole	PO	N	-0-	Y	HANG SIGNS	1988
D21/36N	10/02/87	6	1	SK	1.5	RMow	M	N	-0-	Y	-0-	1988
D21/36N	10/02/87	6	1	SK	2.25	CTow	CO	N	-0-	Y	-0-	1988
D21/43N	10/02/87	6	1	SK	2.25	CTow	CO	N	-0-	Y	-0-	1988
D21/43N	10/02/87	6	1	SK	1.5	RMow	M	N	-0-	Y	-0-	1988
D21/43N	10/02/87	6	1	SK	4.5	Pole	PO	N	-0-	Y	HANG SIGNS	1988
D21/48N	10/02/87	6	1	SK	4.5	Pole	PO	N	-0-	Y	HANG SIGNS	1988
D21/48N	10/02/87	6	1	SK	1.5	RMow	M	N	-0-	Y	-0-	1988
D21/48N	10/02/87	6	1	SK	2.25	CTow	CO	N	-0-	[illegible]	-0-	1988
B73/51N	10/02/87	750	1	SK	14.	CChe	CC	N	0.	Y	-0-	1988
B73/51N	10/02/87	750	1	SK	23.	CMan	C	N	0.	Y	-0-	1988
C02/049	10/05/87	5	1	CF	4.	CMec	CM	N	-0-	Y	-0-	1988
C02/074	10/05/87	5	1	CF	4.	CMec	CM	N	-0-	Y	-0-	1988
C02/102	10/05/87	5	1	CF	4.	CMec	CM	N	-0-	Y	-0-	1988
C15/411	10/05/87	5	2	CF	2.	CChi	C	N	-0-	Y	-0-	1988
C15/523	10/05/87	5	2	CF	2.	CChi	C	N	-0-	Y	-0-	1988
C16/024	10/05/87	5	2	CF	0.5	CChi	C	N	-0-	Y	-0	1988
C16/085	10/05/87	5	2	CF	2.	CChi	C	N	-0-	Y	-0-	1988
C14/276	10/05/87	5	2	CF	2.	CChi	C	N	-0-	Y	-0-	1988
C14/307	10/05/87	5	2	CF	1.	CChi	C	N	-0-	Y	-0-	1988
C14/341	10/05/87	5	2	CF	1.	CChi	C	N	-0-	Y	-0-	1988
C15/090	10/05/87	5	2	CF	2.	CChi	C	N	-0-	Y	-0-	1988
C15/177	10/05/87	5	2	CF	1.	CChi	C	N	-0-	Y	-0-	1988
B19/05S	10/05/87	4	1	EAST	8.	CChi	C	N	-0-	Y	-0-	1988
B19/05S	10/05/87	4	1	EAST	6.	CMan	C	N	-0-	Y	-0-	1988
D20/44N	10/05/87	6	1	SK	3.	RMow	RM	N	-0-	Y	-0-	1988
D21/03N	10/05/87	6	1	SK	3.	RMow	RM	N	-0-	Y	-0-	1988
D21/[illegible]N	10/05/87	6	1	SK	3.	RMow	RM	N	-0-	Y	-0-	1988
D21/30N	10/05/87	6	1	SK	3.	RMow	RM	N	-0-	Y	-0-	1988
[illegible]	[illegible]/05/87	6	2	[illegible]	13.	Pole	PO	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	750	[illegible]	[illegible]								

APPENDIX D. RECLAMATION/REVEGETATION

ESTABLISHMENT AND MONITORING
of
EXPERIMENTAL GRASSLANDS
on the
SKAGIT TRANSMISSION LINE RIGHT-OF-WAY

DRAFT
FINAL REPORT

CONTAINS: INTRODUCTION
DISCUSSION
CONCLUSION

Prepared For:

City of Seattle - City Light Department
Transmission and Distribution Division

Prepared By:

Beak Consultants Incorporated

February 1989
23031

For a copy of the complete report contact Unit 502

1.0 INTRODUCTION

In 1983, the City of Seattle Light Department (City Light) issued Department Policy and Procedure 500 P 506 which addressed the maintenance of transmission line rights-of-way. Section 4.3 of the policy directed City Light to investigate, evaluate and where feasible, implement integrated vegetation management practices on its rights-of-way. In response to the policy, City Light contracted with Beak Consultants Incorporated to design and implement a demonstration study of the effectiveness of fertilized grasslands at suppressing the growth of danger trees. This is the final report of that study.

The control of tree growth is a primary concern among managers of powerline rights-of-way. Trees pose a serious threat to the operation of electrical powerlines when they grow into and/or fall onto the lines. Traditional methods of controlling tree growth beneath powerlines include manual and mechanical removal of trees, periodic burning of right-of-way vegetation and the use of selective herbicides. As traditional methods have proved to be costly and/or environmentally controversial, right-of-way managers have explored the use of various forms of "biological control" which rely on the natural plant processes to inhibit or control tree growth. One such form of biological control is the use of grassland vegetation, maintained artificially by fertilizing with nitrogen, to inhibit the establishment and early growth of tree seedlings. This report presents the results of a 4-year field study of the use of fertilized grasslands to control tree growth.

Dense communities of sod-forming grasses are known to inhibit tree growth through a number of different processes. First, dense grasses can intercept tree seeds and prevent them from reaching mineral soil. If suspended seeds germinate, they root in the mat of living and dead grasses where they are susceptible to desiccation during periods of summer drought. This is probably the principal manner by which sod-forming grasses inhibit the growth of small-seeded invader species such as red alder (Alnus rubra). Alder seeds carry little nourishment and are dependent on contact with

mineral soil for both nutrients and water (Kenady 1978).

The second process by which grassland communities inhibit tree growth is through competition for environmental resources, including light, water and nutrients. Tall grasses can shade tree seedlings for one or more years following germination and stunt or kill the young trees. Grasses also compete for soil moisture and have been known to cause significant decreases in the growth of trees at all stages from seedlings through maturity (Barrett 1979). Interspecific competition for nutrients is less documented, but it undoubtedly occurs when one or more nutrients are in short supply and are the limiting factor(s) to plant growth, as is the case for nitrogen in the forests of the Pacific Northwest. Finally, grassland vegetation can provide habitat for herbivorous mammals that eat seeds, shoots or leaves of young trees, thereby affecting trees through the sapling stage.

Taber and West (1984) first noted the competitive effects of fertilized grasslands in the western Cascades while monitoring a site that had been cleared, treated with municipal sludge and seeded with grasses. The site supported a vigorous grass community that resisted tree invasion for at least 15 years through a combination of plant competition and grazing by herbivores. The reports by Taber and West spawned interest by right-of-way managers in the Northwest and resulted in a number of follow-up studies. The first was a field trial of urea fertilizer at various application rates on a recently cleared right-of-way managed by the BPA (West 1987). It was found that fertilization of grass communities at rates between 200 and 400 pounds of nitrogen per acre produced dense grass turfs and suppressed tree seedling establishment. Suppression was complete for 5 years after fertilization with 400 pounds of nitrogen per acre on good growing sites (productive soils) but incomplete on less fertile sites. The poorer sites appeared to be incapable of supporting dense grass cover, even under heavy fertilization, that could suppress tree seedlings.

Encouraged by the preliminary results of the BPA study, Pacific Power and Light Company (PP&L) funded a field trial of nitrogen fertilization of existing grass and shrub communities beneath a powerline (Beak 1987). They

found increases in grass biomass and total above ground plant biomass after fertilization with nitrogen. Suppression of tree seedling establishment lasted at least 2 years.

The study presented in this report was begun concurrent with those of BPA and PP&L, but was designed to test different aspects of grassland ecology. While the BPA study (Taber and West 1984) showed significant suppression of seedling establishment, it was limited to several small (23 feet by 23 feet) plots where microsite conditions and irregularities of terrain could be controlled. The PP&L study (Beak 1987) involved entire spans of right-of-way, but was concerned with the effects of fertilizing established vegetation. Clearly, there was need for field trials of fertilization and seeding of recently cleared or disturbed sites, as are often found along powerline rights-of-way, complete with all the heterogeneous growing conditions typical of western Washington. This study was designed with that in mind.

The objectives of the study were: a) to determine the practical limitations of establishing grasslands on existing rights-of-way and b) to determine if grass seeding on a large area controls the growth of danger trees.

4.0 DISCUSSION

The first objective of this study was to determine the practical feasibility of establishing grasslands under typical right-of-way conditions. Feasibility appears dependent on both technical and economic factors. From a technical standpoint, grassland establishment was hindered by rough terrain and unpredictable weather. Site preparation, seeding and fertilization were difficult because of the irregular terrain on the Treatment Spans, even though both spans were among the flattest and most uniform on the right-of-way. The bulldozer used for site preparation was unable to reach several small depressions on both Treatment Spans, and it got mired down in the seeps and areas of saturated soils on the Wet Treatment Span. As a consequence of the varied terrain, seeding was conducted with hand spreaders, and fertilization required the use of a specialized all-terrain vehicle. It seems unlikely, therefore, that site preparation as conducted in this study would be feasible on a larger scale. Certainly, portions of almost every right-of-way could be worked by bulldozer, but the percentage of unaccessible spots within the right-of-way increases as the terrain becomes more irregular, thereby decreasing the overall effectiveness of the method.

Weather was another major hinderence to grassland establishment. Rain during fertilization slowed equipment and delayed the spreading of fertilizer. The lack of rain during the succeeding summer inhibited germination and growth of grass seedlings and probably reduced the effectiveness of the fertilization. Problems with site preparation and seeding can be avoided by careful planning, but problems such as drought cannot be avoided. Even in normal years, the months of July, August and September are relatively dry in the western Cascades. The grass species used on the Treatment Spans are all relatively drought tolerant (adapted to precipitation ranges of 12 to 60 inches; Snyder 1977), but none is capable of germinating or growing aggressively under prolonged drought.

The cost of initial site preparation, seeding and fertilization in 1985 averaged $577 per acre. Following the drought in the summer of 1985, both

Treatment Spans were re-seeded at a cost of $139 per acre, bringing total establishment costs to $716 per acre. If the spans had been re-fertilized, the actual cost would have been approximately $1,000 per acre. During 1987 and 1988, City Light costs averaged $118 per acre for manual tree control, $58 per acre for in-house mechanical control and $266 per acre for contract mechanical control. The conditions under which each of these methods was used varied considerably, but in all cases control lasted approximately three years. This translates to $39 per acre per year for manual, $19 per acre per year for in-house mechanical and $89 per acre per year for contrast mechanical control. For the grassland to be cost effective, the control of tree growth from a single treatment would have to last for roughly 15 years. Control on the Wet Treatment Span diminished by the end of the third growing season, while it appears to have continued through the end of 1988 (the fourth growing season) on the Dry Treatment (Figure 3.10). Control probably could have been extended on the Wet Treatment by re-fertilizing, but it is unlikely that it could have lasted 15 years.

Fertilization of existing vegetation may be more feasible than attempting to establish an entirely new plant community as we did here. The PP&L study (Beak 1987) showed that fertilization of an established community can increase grass biomass and decrease alder seedling invasion for up to two years. PP&L started with an established grass component in the plant community, but that is not an unusual situation. Most existing rights-of-way have at least some grass present because of seeding that was done at the time of powerline construction or during routine vegetation management. Both Control Spans (and presumably both Treatment Spans as well) in our study had grass present at the beginning of the study. It is likely that fertilization of the existing vegetation on the Control Spans would increase the coverage and overall dominance of grasses. In situations where grass is absent or makes up a very small part of the right-of-way plant community, a combination of fertilizer and grass seed (i.e., hydro seed) may be feasible. Creation of a grass monoculture would be extremely difficult without clearing prior to seeding, but it may be possible to achieve full utilization of the growing space (i.e., competitive exclusion of tree

seedlings) by a combination of grasses, forbs and shrubs. The advantages to seeding without site preparation are: a) lower initial establishment cost, b) elimination of the scarified stage during which alder invasion is temporarily facilitated rather than discouraged and c) greater flexibility in the use of fertilized grasslands on rough and irregular terrain.

The second objective of this study was to determine the effectiveness of grasses at inhibiting the establishment and growth of tree seedlings. The treatment appears to have been effective on the Dry Site, where tree seedling density was reduced significantly through August 1988. However, the treatment was not effective on the Wet Site. The density of tree seedlings on the Wet Treatment Span was low initially, but increased dramatically by September 1986 and continued to increase through the end of the study (August 1988). The explanation for this variable response between the two sites appears to involve a combination of soil fertility and soil moisture. Soil fertility was supplemented with nitrogen fertilizer on the assumption that grasses become more competitive than other forms of vegetation on high nitrogen soils (West 1987). Every indication is that the fertilizer had little or no effect on either site. Because of the 1985 drought, the amount of vegetation (particularly grasses) on the Treatment Spans was greatly reduced. Nitrogen was applied shortly after scarification and seeding, but most likely volatized before it could be taken up by plants. The decision not to re-fertilize was made in April 1986 when the grass on the Treatment Spans appeared greener and more advanced in its annual growth than grass on Control Spans. This was taken at the time as an indication of nitrogen fertilizer, but it probably was due to the abundance on the Treatment Span of perennial and annual rye, which are characteristically darker in color and lusher early in the growing season than other grasses (Hitchcock 1971). A more accurate measure of the presence of nitrogen is provided by the biomass data. Fertilization with nitrogen should have produced an increase in total above-ground biomass on the Treatment Spans (Goetz 1969), but that did not happen. There was a clear shift from ferns to grasses on both Treatment Spans, but total biomass did not increase (Table 3.1). Grass coverage increased as a result of the treatment, but it never exceeded 60 percent on the Dry Treatment Span and it

exceeded 60 percent on the Wet Treatment Span only at the April 1987 sampling (Table 3.2). Apparently the dense sod layer necessary to control tree seedling establishment never developed on either Treatment Span. Partial suppression of tree seedlings may have occurred, because the decline in grass coverage at the Wet Treatment Span in late 1987 corresponds with an increase in the density of tree seedlings (Table 3.5).

Examination of the data on tree seedling densities indicates that the presence of grasslands inhibited tree establishment through April 1986 on the Wet Treatment Span and through September 1987 on the Dry Treatment Span. Comparison with the grass/forb coverage data, however, show that grass coverage was 54 percent or less during years of low tree seedling densities (1985 and 1986). This suggests that a factor other than grass coverage was responsible for inhibiting seedling establishment. Low soil moisture was most likely the cause. In both 1985 and 1986 there was very little precipitation between June and September. This probably had a strong inhibitory effect on young tree seedlings, particularly alder seedlings which have low drought tolerance (Kenady 1978).

5.0 CONCLUSIONS

The establishment of grassland vegetation on a western Cascade right-of-way is technically feasible, but it is complicated by irregular terrain and unpredictable weather. Terrain problems involve primarily the use of heavy equipment to prepare the site and spread fertilizer. Methods that rely less on scarification of the site would: a) reduce establishment costs, b) reduce the risk of tree invasion during the first two years following treatment and c) expand the usefulness of this technique to more rugged terrain. The establishment of grasslands through seeding and fertilizing of existing vegetation should be tested on similar right-of-way spans. Weather conditions, especially drought, cannot be predicted, however, measures such as mulch application can be employed to minimize the risk of grass failure.

The effectiveness of grasslands at inhibiting tree seedling growth cannot be demonstrated by the results of this study. Densities of tree seedlings were lower on Treatment Spans during the initial years of the study, but low grass density during the same years suggests that grasses were not the primary factor inhibiting tree seedling establishment. Most likely, unusually dry growing conditions in 1985 and 1986 inhibited the establishment of both grasses and trees alike.

SUGGESTED SEED MIXES FOR RESTORATION OF DISTURBED AREAS

For all applications install a 20-10-10 fast release nitrogen fertilizer at 220 lbs/acre or 5 lbs/MSF.

A. Seed mixes for wet-to-moist conditions in Western Washington: the following mixes are approved by the Washington State Department of Game, although the rates of application have been reduced to reflect recent research in England on the creation of diverse grassland swards. In general, that research suggests that lower seed application rates provide for superior establishment of diverse species.

Seed Mix No. 1 - seeding rate of 60 pounds per acre.

percent by weight		
10%		Agrostis tenuis (Colonial bentgrass)
40%		Festuca rubra (Red fescue)
40%		Lolium perenne (Perennial ryegrass)
10%		Trifolium repens (White dutch clover)
	and/or	Lotus corniculatus (Birdsfoot trefoil)

Seed Mix No. 2 - seeding rate of 25 pounds per acre plus Seed Mix No. 1 at 30 pounds per acre.

percent by weight	
60%	Rosa nutkana (Nootka rose)
40%	Vaccinium parvifolium (Red huckleberry)

Seed Mix No. 3 - seeding rate of 60 pounds per acre.

percent by weight	
80%	Festuca pratensis (Meadow fescue)
10%	Agrostis tenuis (Colonial bentgrass)
10%	Polygonum hydropiperoides (Smartweed)

B. Flower/Shrub/Grass Mix for Wet Meadow in Western Washington:

pounds per acre	
6 lbs/acre	Wildflowers - Applewood Seed Company #8044, Moist Mixture or equal
9.5 lbs/acre	*Vaccinium ovatum or parvifolium
14.5 lbs/acre	*Rosa nutkana
2.5 lbs/acre	Lolium multiflorum - provides quick cover

*Shrubs may be replaced with other wildflowers; suggestions: Lupinus polyphyllus (Big-leaf lupine), Monarda sp. (beebalm), and Mimulus guttata (Yellow monkeyflower) at appropriate seed application rates per acre.

C. Legume Seed for Wet-to-Moist Conditions in Western Washington:

percent by weight	
100%	Trifolium repens, inoculated

D. Wildflower/Grass Seed Mix for Erosion Control in Dry-to-Moist Conditions in Western Washington:

pounds per acre	
6 lbs/acre	Agropyron trachycaulum (Slender wheatgrass)
.125 lbs (2 oz)/acre	Epilobium angustifolium (Fireweed)
6.5 lbs/acre	Festuca ovina (Sheep fescue)
2.5 lbs/acre	Lolium multiflorum (Annual ryegrass)

E. Shrub/Grass Seed Mix for Dry/Unirrigated Slopes in Western Washington:

Apply the following shrub seeds at 4 pounds per acre.

percent by weight	
12%	Ceanothus velutinus
11.4%	Ceanothus prostratus
22.8%	Cercis occidentalis
1.8%	Cistus villosus
9.7%	Manonia aquifolium
1.3%	Ribes sanguineum
34%	Rosa nutkana
1.3%	Sambucus cerulea
5.7%	Symphoricarpus albus

Apply the following grass seeds at 30 pounds per acre.

percent by weight	
50%	Festuca arundinacea 'Rebel 2'
28%	Festuca ovina var. duriuscula 'Durar'
12%	Poa compressa 'Reubens'
10%	Trifolium repens, inoculated

F. Grass Seed Mix for Dry Conditions in Western Washington:

Apply the following grass seed mix at 60-90 pounds per acre.

percent by weight	
13%	Fylking Kentucky Bluegrass
13%	Reubens Canada Bluegrass
37%	Sheep Fescue
37%	Durar Hard Fescue

Seed mixture applied to the Skagit Grassland Study sites in the spring and fall of 1985.

	lbs/ac
Perennial Ryegrass (Lolium perenne)	4.2
Annual Ryegrass (Lolium multiflorum)	4.2
Alta Tall Fescue (Festuca arundinaceae)	2.7
Creeping Red Fescue (Festuca rubra)	1.3
Birdsfoot Trefoil (Lotus corniculatus)	4.0

Hydroseeding would only be practical for large disturbed areas or a steeper slope. The most common need for hydroseeding on the rights-of-way would be to revegetate after road construction. Hydroseeders simultaneously apply mulch, tackifier and fertilizer at the following rates:

Mulch (Silva-mulch or equal)	2,000 lbs/acre
Tackifier	45 lbs/acre
Fertilizer (20-10-10)	220 lbs/acre
For grass seed mixes	65 lbs/acre
For native wetland wildflower/shrub/grass mix	50 lbs/acre

For hydroseeding of slopes 2.5:1 and steeper, double the amount of tackifier applied from 45 lbs/acre to 90 lbs/acre.

APPENDIX E. WEED/PEST CONTROL

Chapter 16–750 WAC
STATE NOXIOUS WEED LIST AND SCHEDULE OF MONETARY PENALTIES

WAC

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

16-750-010 Proposed noxious weed list. [Statutory Authority: RCW 17.10.080. 87-05-016 (Order 18, Resolution No. 18), § 16-750-010, filed 2/11/87; 86-07-024 (Order 17, Resolution No. 17), § 16-750-010, filed 3/13/86; 85-07-003 (Order 16, Resolution No. 16), § 16-750-010, filed 3/7/85; 84-06-047 (Order 15, Resolution No. 15), § 16-750-010, filed 3/6/84; 83-07-042 (Order 14, Resolution No. 14), § 16-750-010, filed 3/17/83; 82-06-045 (Order 13, Resolution No. 13), § 16-750-010, filed 3/3/82. Statutory Authority: Chapter 17.10 RCW. 81-07-039 (Order 12, Resolution No. 12), § 16-750-010, filed 3/13/81; 80-03-075 (Order 11, Resolution No. 11), § 16-750-010, filed 2/29/80; 78-06-014 (Order 10, Resolution No. 10), § 16-750-010, filed 5/10/78; Order 8, § 16-750-010, filed 3/1/77; Order 7, § 16-750-010, filed 4/15/76; Order 5, § 16-750-010, filed 3/7/75; Order 4, § 16-750-010, filed 3/27/74; Order 3, § 16-750-010, filed 4/3/73; Order 2, § 16-750-010, filed 3/16/72; Order 1, § 16-750-010, filed 4/9/71.] Repealed by 88-07-016 (Order 22, Resolution No. 22), filed 3/7/88. Statutory Authority: RCW 17.10.080.

WAC 16-750-001 State noxious weed list—Purpose. In accordance with RCW 17.10.080 a state noxious weed list comprising the names of those plants which the state noxious weed control board finds to be highly destructive, competitive, or difficult to control by cultural or chemical practices is hereby adopted in this chapter. [Statutory Authority: RCW 17.10.080. 88-07-016 (Order 22, Resolution No. 22), § 16-750-001, filed 3/7/88.]

WAC 16-750-005 State noxious weed list—Class A noxious weeds. Class A noxious weeds are as follows:

(1) All those weeds which have not been reported in the state of Washington as of January 1, 1984, and whose introduction to the state of Washington was not intentional, or whose intentional introduction poses a serious threat to the state for which no control is assured and which is included in one or more of the following publications:

(a) *A Checklist of Names for 3000 Vascular Plants of Economic Importance*, by Edward E. Terrell, Steven R. Hill, John H. Wiersema and William E. Rice. USDA-ARS Ag. handbook number 505, revised October 1986;

(b) *A Geographical Atlas of World Weeds*, by LeRoy Holm, Juan V. Pancho, James P. Herberger and Donald L. Plucknett. John Wiley and Sons, New York, 1979;

(c) *The World's Worst Weeds, Distribution and Biology*, by LeRoy G. Holm, Donald L. Plucknett, Juan V. Pancho and James P. Herberger. University Press of Hawaii, Honolulu, 1977;

(d) *Economically Important Foreign Weeds—Potential Problems in the United States*, by Clyde F. Reed, USDA-ARS Ag. handbook number 498, 1977;

(e) The federal noxious weed list, 7.360.200 CFR;

(f) The state noxious weed list of any state; and

(2)

Common Name	Scientific Name
blueweed, Texas	Helianthus ciliaris
buffalobur	Solanum rostratum
crupina, common	Crupina vulgaris
garden rocket	Eruca vesicaria spp. sativa
hedgeparsley	Torilis arvensis
johnsongrass	Sorghum halepense
knapweed, bighead	Centaurea macrocephala
knapweed, featherhead	Centaurea trichocephala
knapweed, Vochin	Centaurea nigrescens
mallow, Venice	Hisbiscus trionum
nightshade, silverleaf	Solanum elaeagnifolium
rupturewort	Herniaria cinerea
snapdragon, dwarf	Chaenorrihinum minus
unicorn-plant	Proboscidea louisianica
velvetleaf	Abutilon theophrasti
woad, dyers	Isatis tinctoria

[Statutory Authority: RCW 17.10.080. 88-07-016 (Order 22, Resolution No. 22), § 16-750-005, filed 3/7/88.]

WAC 16-750-011 State noxious weed list—Class B noxious weeds. Class B noxious weeds are as follows:

Common Name	Scientific Name
apera, interrupted	Apera interrupta
blueweed	Echium vulgare
broom, Scotch	Cytisus scoparius
bryony, white	Bryonia alba
bugloss, common	Anchusa officinalis
camelthorn	Alhagi pseudalhagi
catsear, spotted	Hypochaeris radicata
daisy, oxeye	Chrysanthemum leucanthemum
dogtailgrass, hedgehog	Cynosurus echinatus
foxtail, slender	Alopecurus myosuroides
goatgrass, jointed	Aegilops cylindrica
gorse	Ulex europaeus
hawkweed, orange	Hieracium aurantiacum
hawkweed, yellow	Hieracium pratense
indigobush	Amorpha fruticosa
knapweed, black	Centaurea nigra
knapweed, brown	Centaurea jacea
knapweed, diffuse	Centaurea diffusa
knapweed, meadow	Centaurea jacea X nigra

Common Name	Scientific Name
knapweed, Russian	Centaurea repens
knapweed, spotted	Centaurea maculosa
lepyrodiclis	Lepyrodiclis holosteoides
lythrum, purple	Lythrum salicaria
medusahead	Taeniatherum caput-medusae
nutsedge, yellow	Cyperus esculentus
oxtongue, hawkweed	Picris hieracioides
peaweed, Austrian	Sphaerophysa salsula
pepperweed, perennial	Lepidium latifolium
ragwort, tansy	Senecio jacobaea
sage, Mediterranean	Salvia aethiopsis
sandbur, longspine	Cenchrus longispinus
skeletonweed, rush	Chondrilla juncea
sowthistle, perennial	Sonchus arvensis
spurge, leafy	Euphorbia esula
starthistle, yellow	Centaurea solstitialis
thistle, musk	Carduus nutans
thistle, plumeless	Carduus acanthoides
thistle, Scotch	Onopordum acanthium
toadflax, Dalmatian	Linaria genistifolia spp. dalmatica
ventenata	Ventenata dubia
watermilfoil, Eurasian	Myriophyllum spicatum

[Statutory Authority: RCW 17.10.080. 88-07-016 (Order 22, Resolution No. 22), § 16-750-011, filed 3/7/88.]

WAC 16-750-015 State noxious weed list--Class C noxious weeds. Class C noxious weeds are as follows:

Common Name	Scientific Name
babysbreath	Gypsophila paniculata
bindweed, field	Convolvulus arvensis
carrot, wild	Daucus carota
cocklebur, spiny	Xanthium spinosum
cress, hoary	Cardaria draba
dodder	Cuscuta spp
henbane, black	Hyoscyamus niger
houndstongue	Cynoglossum officinale
jimsonweed	Datura stramonium
kochia	Kochia scoparia
mullein, common	Verbascum thapsus
nightshade, bitter	Solanum dulcamara
poison-hemlock	Conium maculatum
puncturevine	Tribulus terrestris
quackgrass	Agropyron repens
rye, cereal	Secale cereale
St. Johnswort, common	Hypericum perforatum
tansy, common	Tanacetum vulgare
toadflax, yellow	Linaria vulgaris
thistle, bull	Cirsium vulgare
thistle, Canada	Cirsium arvense
whitetop, hairy	Cardaria pubescens
wormwood, absinth	Artemisia absinthium

[Statutory Authority: RCW 17.10.080. 88-07-016 (Order 22, Resolution No. 22), § 16-750-015, filed 3/7/88.]

WAC 16-750-900 Noxious weeds--Civil infractions--Schedule of monetary penalties. Civil infractions under chapter 17.10 RCW shall be assessed a monetary penalty according to the following schedule:

(1) Any owner knowing of the existence of any noxious weeds on the owner's land who fails to control such weeds in accordance with chapter 17.10 RCW and the rules and regulations in force pursuant thereto shall be assessed as follows:

(a) Any Class A noxious weed:

1st offense within five years	$ 750
2nd and any subsequent offense	1,000

(b) Any Class B designate noxious weed in the noxious weed control region in which the land lies:

1st offense within five years	$ 500
2nd offense	750
3rd and any subsequent offense	1,000

(c) Any Class B nondesignate noxious weed in the noxious weed control region in which the land lies; or any Class C noxious weed:

1st offense within five years	$ 250
2nd offense	500
3rd offense	750
4th and any subsequent offense	1,000

(2) Any person who enters upon any land in violation of an order in force pursuant to RCW 17.10.210 shall be assessed as follows:

1st offense within five years	$ 500
2nd offense	750
3rd and any subsequent offense	1,000

(3) Any person who interferes with the carrying out of the provisions of chapter 17.10 RCW shall be assessed as follows:

1st offense within five years	$ 500
2nd offense	750
3rd and any subsequent offense	1,000

[Statutory Authority: RCW 17.10.080. 88-07-016 (Order 22, Resolution No. 22), § 16-750-900, filed 3/7/88.]

Chapter 17.10 RCW
NOXIOUS WEEDS——CONTROL BOARDS

Sections

RCW 17.10.010 Definitions. Unless a different meaning is plainly required by the context, the following words and phrases as hereinafter used in this chapter shall have the following meanings:

(1) "Noxious weed" means any plant which when established is highly destructive, competitive, or difficult to control by cultural or chemical practices.

(2) "State noxious weed list" means a list of noxious weeds adopted by the state noxious weed control board which list is divided into three classes:

(a) Class A shall consist of those noxious weeds not native to the state that are of limited distribution or are unrecorded in the state and that pose a serious threat to the state;

(b) Class B shall consist of those noxious weeds not native to the state that are of limited distribution or are unrecorded in a region of the state and that pose a serious threat to that region;

(c) Class C shall consist of any other noxious weeds.

(3) "Person" means any individual, partnership, corporation, firm, the state or any department, agency, or subdivision thereof, or any other entity.

(4) "Owner" means the person in actual control of property, or his agent, whether such control is based on legal or equitable title or on any other interest entitling the holder to possession and, for purposes of liability, pursuant to RCW 17.10.170 or 17.10.210, means the possessor of legal or equitable title or the possessor of an easement: *Provided*, That when the possessor of an easement has the right to control or limit the growth of vegetation within the boundaries of an easement, only the possessor of such easement shall be deemed, for the purpose of this chapter, an "owner" of the property within the boundaries of such easement.

(5) As pertains to the duty of an owner, the words "control", "contain", "eradicate", and the term "prevent the spread of noxious weeds" shall mean conforming to the standards of noxious weed control or prevention adopted by rule or regulation by the state noxious weed control board and an activated county noxious weed control board.

(6) "Agent" means any occupant or any other person acting for the owner and working or in charge of the land.

(7) "Agricultural purposes" are those which are intended to provide for the growth and harvest of food and fiber.

(8) "Director" means the director of the department of agriculture or the director's appointed representative.

(9) "Weed district" means a weed district as defined in chapters 17.04 and 17.06 RCW. [1987 c 438 § 1; 1975 1st ex.s. c 13 § 1; 1969 ex.s. c 113 § 1.]

RCW 17.10.020 County noxious weed control boards——Created——Jurisdiction——Inactive status. (1) In each county of the state there is hereby created a noxious weed control board, which shall bear the name of the county within which it is located. The jurisdictional boundaries of each board shall be coextensive with the boundaries of the county within which it is located.

(2) Each noxious weed control board shall be inactive until activated pursuant to the provisions of RCW 17-.10.040. [1969 ex.s. c 113 § 2.]

RCW 17.10.030 State noxious weed control board——Members——Terms——Elections——Meetings——Reimbursement for travel expenses. There is hereby created a state noxious weed control board which shall be comprised of nine voting members. Four of the members shall be elected by the members of the various activated county noxious weed control boards, shall be residents of a county in which a county noxious weed control board has been activated and a member of said board, and those qualifications shall continue through their term of office. Two such members shall be elected from the west side of the state, the crest of the Cascades being the dividing line, and two from the east side of the state. The director of agriculture shall be a member of the board. One member shall be elected by the directors of the various active weed districts formed under chapter 17.04 or 17.06 RCW. The Washington state association of counties shall appoint one voting member who shall be a member of a county legislative authority. The director shall appoint three nonvoting members representing scientific disciplines relating to weed control. The director shall also appoint two voting members to represent the public interest, one from the west side and one from the east side of the state. The term of office for all members of the board shall be three years from the date of election or appointment.

The board, by rule, shall establish a position number for each elected position of the board and shall designate which county noxious weed control board members are eligible to vote for each elected position. The elected members shall serve staggered terms. Elections for the elected members of the board shall be held thirty days prior to the expiration date of their respective terms. Nominations and elections shall be by mail and conducted by the board.

The board shall conduct its first meeting within thirty days after all its members have been elected. The board shall elect from its members a chairman and such other officers as may be necessary. A majority of the voting members of the board shall constitute a quorum for the transaction of business and shall be necessary for any action taken by the board. The members of the board shall serve without salary, but shall be reimbursed for travel expenses incurred in the performance of their duties under this chapter in accordance with RCW 43.03-.050 and 43.03.060 as now existing or hereafter amended. [1987 c 438 § 2; 1975-'76 2nd ex.s. c 34 § 23; 1969 ex.s. c 113 § 3.]

Effective date——Severability——1975-'76 2nd ex.s. c 34: See notes following RCW 2.08.115.

RCW 17.10.040 Activation of inactive county noxious weed control board. An inactive county noxious weed control board may be activated by any one of the following methods:

(1) Either within sixty days after a petition is filed by one hundred registered voters within the county or, on its own motion, the county legislative authority shall hold a hearing to determine whether there is a need, due to a damaging infestation of noxious weeds, to activate the county noxious weed control board. If such a need is found to exist, then the county legislative authority shall, in the manner provided by RCW 17.10.050, appoint five persons to hold seats on the county's noxious weed control board.

(2) If the county's noxious weed control board is not activated within one year following a hearing by the county legislative authority to determine the need for activation, then upon the filing with the state noxious weed control board of a petition comprised either of the signatures of at least two hundred registered voters within the county, or of the signatures of a majority of an adjacent county's noxious weed control board, the state board shall, within six months of the date of such filing, hold a hearing in the county to determine the need for activation. If a need for activation is found to exist, then the state board shall order the county legislative authority to activate the county's noxious weed control board and to appoint members to such board in the manner provided by RCW 17.10.050.

(3) The director, with notice to the state noxious weed control board, may order a county legislative authority to activate the noxious weed control board immediately if an infestation of a class A noxious weed or class B noxious weed designated for control within the region wherein the county lies as defined in RCW 17.10.080 is confirmed in that county. The county legislative authority may, as an alternative to activating the noxious weed board, combat the class A noxious weed or class B noxious weed with county resources and personnel operating with the authorities and responsibilities imposed by this chapter on a county noxious weed control board. No county may continue without a noxious weed control board for a second consecutive year if the class A noxious weed or class B noxious weed designated for control within the region wherein the county lies has not been eradicated. [1987 c 438 § 3; 1975 1st ex.s. c 13 § 2; 1969 ex.s. c 113 § 4.]

RCW 17.10.050 Activated county noxious weed control board——Members——Election——Terms——Meetings——Quorum——Expenses——Officers——Vacancy. (1) Each activated county noxious weed control board shall consist of five voting members who shall be appointed by the county legislative authority. In appointing such voting members, the county legislative authority shall divide the county into five sections, none of which shall overlap and each of which shall be of the same approximate area, and shall appoint a voting member from each section. At least four of the voting members shall be engaged in the primary production of agricultural products. There shall be one nonvoting member on such board who shall be the chief county extension agent or an extension agent appointed by the chief county extension agent. Each voting member of the board shall serve a term of four years, except that the county legislative authority shall, when a board is first activated under this chapter, designate two voting members to serve terms of two years. The board members shall not receive a salary but shall be compensated for actual and necessary expenses incurred in the performance of their official duties.

(2) The voting members of the board shall represent the same sections designated by the county legislative authority in appointing members to the board at its inception and shall serve until their replacements are appointed. New members of the board shall be appointed at least thirty days prior to the expiration of any board member's term of office.

Notice of expiration of a term of office shall be published at least twice in a weekly or daily newspaper of general circulation in said section with last publication occurring at least ten days prior to the nomination. All persons interested in appointment to the board and residing in the section with a pending nomination shall make a written application that includes the signatures of at least ten registered voters residing in the section supporting the nomination to the county noxious weed control board. After nominations close, the county noxious weed control board shall, after a hearing, send the applications to the county legislative authority recommending the names of the most qualified candidates, and shall post the names of those nominees in the county courthouse and in three places in the section. The county legislative authority, within ten days of receiving the list of nominees, shall appoint one of those nominees to the county noxious weed control board to represent that section during that term of office.

(3) Within thirty days after all the members have been appointed, the board shall conduct its first meeting. A majority of the voting members of the board shall constitute a quorum for the transaction of business and shall be necessary for any action taken by the board. The board shall elect from its members a chairperson and such other officers as may be necessary.

(4) In case of a vacancy occurring in any voting position on a county noxious weed control board, the county legislative authority of the county in which such board is located shall appoint a qualified person to fill the vacancy for the unexpired term. [1987 c 438 § 4; 1980 c 95 § 1; 1977 ex.s. c 26 § 6; 1975 1st ex.s. c 13 § 3; 1974 ex.s. c 143 § 1; 1969 ex.s. c 113 § 5.]

RCW 17.10.060 Activated county noxious weed control board——Weed coordinator——Authority——Rules and regulations. (1) Each activated county noxious weed control board may employ a weed coordinator whose duties shall be fixed by the board but which shall include inspecting land to determine the presence of noxious weeds. Within sixty days from initial employment the weed coordinator shall obtain a pest control consultant license, a pesticide operator license, and the necessary endorsements on the licenses as required by law. Each board may purchase, rent or lease such equipment, facilities or products and may hire such additional persons as it deems necessary for the administration of the county's noxious weed control program.

(2) Each activated county noxious weed control board shall have the power to adopt such rules and regulations, subject to notice and hearing as provided in chapters 42.30 and 42.32 RCW as now or hereafter amended, as are necessary for an effective county weed control or eradication program. [1987 c 438 § 5; 1969 ex.s. c 113 § 6.]

RCW 17.10.070 State noxious weed control board——Powers——Report. (1) In addition to the powers conferred on the state noxious weed control board under other provisions of this chapter, it shall have power to:

(a) Employ a state noxious weed control board executive secretary who shall disseminate information relating to noxious weeds to county noxious weed control boards and weed districts and who shall work to coordinate the educational and weed control efforts of the various county and regional noxious weed control boards and weed districts;

(b) Adopt, amend, change, or repeal such rules, pursuant to the administrative procedure act, chapter 34.04 RCW, as may be necessary to carry out the duties and authorities assigned to the board by this chapter.

(2) The state noxious weed control board shall provide a written report before January 1 of each odd-numbered year to the governor, the legislature, the county noxious weed control boards, and the weed districts showing the funds disbursed by the department to each noxious weed control board or district, specifically how the funds were spent, and recommendations for the continued best use of state funds for noxious weed control. The report shall include recommendations as to the long-term needs regarding weed control. [1987 c 438 § 6; 1975 1st ex.s. c 13 § 4; 1969 ex.s. c 113 § 7.]

RCW 17.10.074 Director——Powers. (1) In addition to the powers conferred on the director under other provisions of this chapter, the director shall, with the advice of the state noxious weed control board, have power to:

(a) Require the county legislative authority or the noxious weed control board of any county or any weed district to report to it concerning the presence, absence,

or estimated amount of noxious weeds and measures, if any, taken or planned for the control thereof;

(b) Employ such staff as may be necessary in the administration of this chapter;

(c) Adopt, amend, change, or repeal such rules, pursuant to the administrative procedure act, chapter 34.04 RCW, as may be necessary to carry out this chapter;

(d) Do such things as may be necessary and incidental to the administration of its functions pursuant to this chapter including but not limited to surveying for and detecting noxious weed infestations;

(e) Upon receipt of a complaint signed by a majority of the members of an adjacent county noxious weed control board or weed district, require the county legislative authority or noxious weed control board of the county or weed district that is the subject of the complaint to respond to the complaint within forty-five days with a plan for the control of the noxious weeds cited in the complaint;

(f) If the complaint in subsection (e) of this section involves a class A or class B noxious weed, order the county legislative authority, noxious weed control board, or weed district to take immediate action to eradicate or control the noxious weed infestation. If the county or the weed district does not take action to control the noxious weed infestation in accordance with the order, the director may control it or cause it to be controlled. The county or weed district shall be liable for payment of the expense of the control work including necessary costs and expenses for attorneys' fees incurred by the director in securing payment from the county or weed district;

(g) In counties which have not activated their noxious weed control board, enter upon any property as provided for in RCW 17.10.160, issue or cause to be issued notices and citations and take the necessary action to control noxious weeds as provided in RCW 17.10.170, hold hearings on any charge or cost of control action taken as provided for in RCW 17.10.180, issue a notice of civil infraction as provided for in RCW 17.10.230, and 17.10.310 through 17.10.350, and place a lien on any property pursuant to RCW 17.10.280, 17.10.290, and 17.10.300 with the same authorities and responsibilities imposed by these sections on county noxious weed control boards;

(h) Adopt a list of noxious weed seeds and toxic weeds which shall be controlled in designated articles, products, or feed stuffs as provided for in RCW 17.10.235.

(2) The moneys appropriated for noxious weed control to the department shall be used for administration of the state noxious weed control board for determining the economic impact of noxious weeds in the state of Washington, the purchase of materials for controlling, containing, or eradicating noxious weeds, the purchase or collection of biological control agents for controlling noxious weeds, and the contracting for services to carry out the purposes of this chapter. In a county with an activated noxious weed control board, the director shall make every effort to contract with that board for the needed services.

(3) If the director determines the need to reallocate funds previously designated for county use, the director shall convene a meeting of the state noxious weed control board to seek its advice concerning any reallocation. [1987 c 438 § 7.]

RCW 17.10.080 State noxious weed list——Hearing——Adoption——Dissemination. (1) The state noxious weed control board shall each year or more often, following a hearing, adopt a state noxious weed list.

(2) At the hearing any person may request the inclusion of any plant to the lists to be adopted by the state noxious weed control board. Any hearing held pursuant to this section shall conform to the administrative procedure act, chapter 34.04 RCW: *Provided*, That adding a weed to or deleting a weed from the list shall constitute a substantial change as provided for in RCW 34.04.025(2).

The state noxious weed control board shall send a copy of the lists to each activated county noxious weed control board, to each regional noxious weed control board, to each weed district, and to the county legislative authority of each county with an inactive noxious weed control board. The record of hearing shall include the written findings of the board for the inclusion of each plant on the list. Such findings shall be made available upon request to any interested person. [1987 c 438 § 8; 1975 1st ex.s. c 13 § 5; 1969 ex.s. c 113 § 8.]

RCW 17.10.090 State noxious weed list——Selection of weeds for control by county board. Each county noxious weed control board shall, within thirty days of the receipt of the state noxious weed list from the state noxious weed control board and following a hearing, select those weeds from the class C list and those weeds from the class B list not designated for control in the noxious weed control region in which the county lies which it finds necessary to be controlled in the county. The weeds thus selected and all class A weeds and those class B weeds that have been designated for control in the noxious weed control region in which the county lies shall be classified within that county as noxious weeds, and those weeds shall comprise the county noxious weed list. [1987 c 438 § 9; 1969 ex.s. c 113 § 9.]

RCW 17.10.100 Order to county board to include weed from state board's list in county's noxious weed list. Where any of the following occur, the state noxious weed control board may, following a hearing, order any county noxious weed control board or weed district to include a noxious weed from the state board's list in the county's noxious weed list:

(1) Where the state noxious weed control board receives a petition from at least one hundred registered voters within the county requesting that the weed be listed.

(2) Where the state noxious weed control board receives a request for such inclusion from an adjacent county's noxious weed control board or weed district, which board or district has included that weed in the county list and which board or weed district alleges that its noxious weed control program is being hampered by

the failure to include the weed on the county's noxious weed list. [1987 c 438 § 10; 1969 ex.s. c 113 § 10.]

RCW 17.10.110 Regional noxious weed control board——Creation. A regional noxious weed control board comprising the area of two or more counties may be created as follows:

The county legislative authority and/or noxious weed control board of two or more counties may, upon a determination that the purpose of this chapter will be served by the creation of a regional noxious weed control board, adopt a resolution providing for a limited merger of the functions of their respective counties noxious weed control boards. Such resolution shall become effective only when a similar resolution is adopted by the other county or counties comprising the proposed regional board. [1987 c 438 § 11; 1975 1st ex.s. c 13 § 6; 1969 ex.s. c 113 § 11.]

RCW 17.10.120 Regional noxious weed control board——Members——Meetings——Quorum——Officers——Effect on county boards. In any case where a regional noxious weed control board is created, the county noxious weed control boards comprising the regional board shall still remain in existence and shall retain all powers and duties provided for such boards under this chapter.

The regional noxious weed control board shall be comprised of the voting members and the nonvoting members of the component counties noxious weed control boards or county legislative authorities who shall, respectively, be the voting and nonvoting members of the regional board: *Provided*, That each county shall have an equal number of voting members. The board may appoint other nonvoting members as deemed necessary. A majority of the voting members of the board shall constitute a quorum for the transaction of business and shall be necessary for any action taken by the board. The board shall elect a chairperson from its members and such other officers as may be necessary. Members of the regional board shall serve without salary but shall be compensated for actual and necessary expenses incurred in the performance of their official duties. [1987 c 438 § 12; 1969 ex.s. c 113 § 12.]

RCW 17.10.130 Regional noxious weed control board——Powers and duties. The powers and duties of a regional noxious weed control board are as follows:

(1) The regional board shall, within thirty days of the receipt of the state noxious weed list from the state noxious weed control board and following a hearing, select those weeds from the state list which it finds necessary to be controlled on a regional basis. The weeds thus selected shall also be contained in the county noxious weed list of each county in the region.

(2) The regional board shall take such action as may be necessary to coordinate the noxious weed control programs of the region and shall adopt a regional plan for the control of noxious weeds. [1987 c 438 § 13; 1969 ex.s. c 113 § 13.]

RCW 17.10.134 Liability of county and regional noxious weed control boards. Obligations or liabilities incurred by any county or regional noxious weed control board or any claims against a county or regional noxious weed control board shall be governed by chapter 4.96 RCW or RCW 4.08.120: *Provided*, That individual members or employees of a county noxious weed control board shall be personally immune from civil liability for damages arising from actions performed within the scope of their official duties or employment. [1987 c 438 § 14.]

RCW 17.10.140 Owner's duty to control spread of noxious weeds. Except as is provided under RCW 17-.10.150, every owner shall perform, or cause to be performed such acts as may be necessary to control and to prevent the spread of noxious weeds from his property. [1969 ex.s. c 113 § 14.]

RCW 17.10.150 Owner's duty in controlling noxious weeds on nonagricultural land——Buffer strip defined——Limitation. (1) The county noxious weed control board in each county may classify lands for the purposes of this chapter. In regard to any land which is classified by the county noxious weed control board as not being used for agricultural purposes, the owner thereof shall have the following limited duty to control noxious weeds present on such land:

(a) The owner shall eradicate all class A noxious weeds, and shall control and prevent the spread of class B noxious weeds designated for control within the region in which such land lies. The owner shall also control and prevent the spread of class C noxious weeds on any portion of such land which is within the buffer strip around land used for agricultural purposes. The buffer strip shall be all land which is within one thousand feet of land used for agricultural purposes.

(b) In any case of a serious infestation of a particular noxious weed, which infestation exists within the buffer strip of land described in paragraph (a) of subsection (1) of this section, and which extends beyond said buffer strip of land, the county noxious weed control board may require that the owner of such buffer strip of land take such measures, both within said buffer strip of land as well as on other land owned by said owner contiguous to said buffer strip of land on which such serious infestation has spread, as are necessary to control and prevent the spread of such particular noxious weed.

(c) Forest lands classified pursuant to RCW 17.10.240(3) shall be subject to the weed control requirements established in subsection (1) (a) and (b) of this section at all times whether such lands are used for agricultural purposes or are not used for such purposes. In addition, forest lands shall be subject to RCW 17.10-.140 and all other provisions of this chapter for a single five-year period designated by the county noxious weed control board following the harvesting of trees for timber.

(2) In regard to any land which is classified by the county noxious weed control board as scab or range land, the board may limit the duty of the owner thereof

to control class C noxious weeds present on such land. The board may share the cost of controlling such weeds, may provide for a buffer strip around the perimeter of such land or may take any other reasonable measures to control or contain noxious weeds on such land at an equitable cost to the owner. The board shall classify as range or scab land all that land within the county for which the board finds that the cost of controlling all of the noxious weeds present would be disproportionately high when compared to the benefits derived from noxious weed control on such land. [1987 c 438 § 15; 1975 1st ex.s. c 13 § 7; 1974 ex.s. c 143 § 2; 1969 ex.s. c 113 § 15.]

RCW 17.10.154 Owners' agreements with county noxious weed control boards——Terms——Enforcement. It is recognized that the prevention, control, and eradication of noxious weeds presents a problem for immediate as well as for future action. It is further recognized that immediate prevention, control, and eradication is practicable on some lands and that prevention, control, and eradication on other lands should be extended over a period of time. Therefore, it is the intent of this chapter that county noxious weed control boards may use their discretion and, by agreement with the owners of land, may propose and accept plans for prevention, control, and eradication which may be extended over a period of years. The county noxious weed control board may make an agreement with the owner of any parcel of land by contract between the landowner and the respective county noxious weed control board, and the board shall enforce the terms of any agreement. The county noxious weed control board may make any terms which will best serve the interests of the owners of the parcel of land and the common welfare which comply with this chapter and the rules adopted thereunder. [1987 c 438 § 16.]

RCW 17.10.160 Right of entry——Warrant for noxious weed search——Civil liability——Penalty for preventing entry. Any authorized agent or employee of the county noxious weed control board or of the state noxious weed control board or of the department of agriculture where not otherwise proscribed by law may enter upon any property for the purpose of administering this chapter and any power exercisable pursuant thereto, including the taking of specimens of weeds or other materials, general inspection, and the performance of eradication or control work. Prior to carrying out the purposes for which the entry is made, the official making such entry or someone in his or her behalf, shall have first made a reasonable attempt to notify the owner of the property as to the purpose and need for the entry.

(1) When there is probable cause to believe that there is property within this state not otherwise exempt from process or execution upon which noxious weeds are standing or growing and the owner thereof refuses permission to inspect the property, a judge of the superior court or district court in the county in which such property is located may, upon the request of the county noxious weed control board or its agent, issue a warrant directed to such board or agent authorizing the search for the noxious weeds described in the request for the warrant.

(2) Application for issuance and execution and return of the warrant authorized by this section shall be in accordance with the applicable rules of the superior court or the district courts.

(3) Nothing in this section requires the application for and issuance of any warrant not otherwise required by law: *Provided*, That civil liability for negligence shall lie in any case in which entry and any of the activities connected therewith are not undertaken with reasonable care.

(4) Any person who improperly prevents or threatens to prevent entry upon land as authorized in this section or any person who interferes with the carrying out of this chapter shall be upon conviction guilty of a misdemeanor. [1987 c 438 § 17; 1969 ex.s. c 113 § 16.]

RCW 17.10.170 Finding presence of noxious weeds——Notice for failure of owner to control——Control by county board——Liability of owner——Lien——Alternative. (1) Whenever the county noxious weed control board finds that noxious weeds are present on any parcel of land, and that the owner thereof is not taking prompt and sufficient action to control the same, pursuant to the provisions of RCW 17.10.140 and 17.10.150, it shall notify the owner that a violation of this chapter exists. The notice shall be in writing and sent by certified mail, and shall identify the noxious weeds found to be present, order prompt control action, and specify the time, of at least ten days from issuance of the notice, within which the prescribed action must be taken. Upon deposit of the certified letter of notice, the noxious weed control authority shall make an affidavit of mailing which shall be prima facie evidence that proper notice was given. If seed dispersion is imminent, immediate control action may be taken forty-eight hours following the time that notification is reasonably expected to have been received by the owner or agent by certified mail or personal service.

(2) The county noxious weed control board or its authorized agents may issue a notice of civil infraction as provided for in RCW 17.10.230 and 17.10.310 through 17.10.350 to owners who do not take action to control noxious weeds in accordance with the notice.

(3) If the owner does not take action to control the noxious weeds in accordance with the notice, the county board may control them, or cause their being controlled, at the expense of the owner. The amount of such expense shall constitute a lien against the property and may be enforced by proceedings on such lien except as provided for by RCW 79.44.060. The owner shall be liable for payment of the expense, and nothing in this chapter shall be construed to prevent collection of any judgment on account thereof by any means available pursuant to law, in substitution for enforcement of the lien. Necessary costs and expenses including reasonable attorneys' fees incurred by the county noxious weed control board in carrying out this section may be recovered at the same time as a part of the action filed under

this section. Funds received in payment for the expense of controlling noxious weeds shall be transferred to the county noxious weed control board to be expended as required to carry out the purposes of this chapter.

(4) The county auditor shall record in his office any lien created under this chapter, and any such lien shall bear interest at the rate of twelve percent per annum from the date on which the county noxious weed control board approves the amount expended in controlling such weeds.

(5) As an alternative to the enforcement of any lien created under subsection (3) of this section, the county legislative authority may by resolution or ordinance require that each such lien created shall be collected by the treasurer in the same manner as a delinquent real property tax, if within thirty days from the date the owner is sent notice of the lien, including the amount thereof, the lien remains unpaid and an appeal has not been made pursuant to RCW 17.10.180. Liens treated as delinquent taxes shall bear interest at the rate of twelve percent per annum and such interest shall accrue as of the date notice of the lien is sent to the owner: *Provided*, That any collections for such lien shall not be considered as tax. [1987 c 438 § 18; 1979 c 118 § 1; 1975 1st ex.s. c 13 § 8; 1974 ex.s. c 143 § 3; 1969 ex.s. c 113 § 17.]

RCW 17.10.180 Hearing on liability for expense of control——Notice——Review. Any owner, upon request pursuant to the rules and regulation of the county noxious weed control board, shall be entitled to a hearing before the board on any charge or cost for which the owner is alleged to be liable pursuant to RCW 17.10.170 or 17.10.210. The board shall send notice by certified mail within thirty days, to each owner at the owner's last known address, as to any such charge or cost and as to his right of a hearing. The hearing shall be scheduled within forty-five days of notification. Any determination or final action by the board shall be subject to judicial review by a proceeding in the superior court in the county in which the property is located, and such court shall have original jurisdiction to determine any suit brought by the owner to recover damages allegedly suffered on account of control work negligently performed: *Provided*, That no stay or injunction shall lie to delay any such control work subsequent to notice given pursuant to RCW 17.10.160 or pursuant to an order under RCW 17.10.210. [1987 c 438 § 19; 1969 ex.s. c 113 § 18.]

RCW 17.10.190 Notice and information as to noxious weed control. Each activated county noxious weed control board shall cause to be published annually and at such other times as may be appropriate in at least one newspaper of general circulation within its area a general notice. The notice shall direct attention to the need for noxious weed control and shall give such other information with respect thereto as may be appropriate, or shall indicate where such information may be secured. In addition to the general notice required hereby, the county noxious weed control board may use any appropriate media for the dissemination of information to the public as may be calculated to bring the need for noxious weed control to the attention of owners. The board may consult with individual owners concerning their problems of noxious weed control and may provide them with information and advice, including giving specific instructions and methods when and how certain named weeds are to be controlled. Such methods may include definite systems of tillage, cropping, management, or use of livestock. Publication of a notice as required by this section shall not be a condition precedent to the enforcement of this chapter. [1987 c 438 § 20; 1975 1st ex.s. c 13 § 9; 1969 ex.s. c 113 § 19.]

RCW 17.10.200 Control of noxious weeds on federal and Indian lands. (1) In the case of land owned by the United States on which control measures of a type and extent required pursuant to this chapter have not been taken, the local noxious weed control authority, with the approval of both the director of the department of agriculture and the appropriate federal agency, may perform, or cause to be performed, such work. The cost thereof, if not paid by the agency managing the land, may be paid from any funds available to the department of agriculture or the local noxious weed control authority for the administration of this chapter.

(2) The county noxious weed control board is authorized to enter into any reasonable agreement with the appropriate authorities for the control of noxious weeds on Indian or federal lands.

(3) The state shall make all possible efforts to obtain reimbursement from the federal government for costs incurred under this section: *Provided*, That the state shall actively seek to inform the federal government of the need for noxious weed control on federally owned land where the presence of noxious weeds adversely affects local control efforts: *Provided further*, That the state shall actively seek adequate federal funding for noxious weed control on Indian or federally owned land. [1987 c 438 § 21; 1979 c 118 § 3; 1969 ex.s. c 113 § 20.]

RCW 17.10.205 Control of noxious weeds in open areas. Open areas subject to the spread of noxious weeds, other than crop land, including but not limited to subdivisions, school grounds, playgrounds, parks, and rights of way shall be subject to regulation by activated county noxious weed control boards in the same manner and to the same extent as is provided for agricultural lands. [1975 1st ex.s. c 13 § 16.]

RCW 17.10.210 Quarantine of land——Order——Expense. (1) Whenever the director or the county noxious weed control board or a weed district finds that a parcel of land is so seriously infested with class A or class B noxious weeds that control measures cannot be undertaken thereon without quarantining the land and restricting or denying access thereto or use thereof, the director or the county noxious weed control board or weed district, with the approval of the director of the

department of agriculture, may issue an order for such quarantine and restriction or denial of access or use. Upon issuance of the order, the director or the county noxious weed control board or weed district shall commence necessary control measures and shall prosecute them with due diligence.

(2) An order of quarantine shall be served, by any method sufficient for the service of civil process, on all persons known to qualify as owners of the land within the meaning of this chapter.

(3) The director shall, with the advice of the state noxious weed control board, determine how the expense of control work undertaken pursuant to this section, and the cost of any quarantine in connection therewith, shall be apportioned. [1987 c 438 § 22; 1969 ex.s. c 113 § 21.]

RCW 17.10.230 Violations——Penalty. Any owner knowing of the existence of any noxious weeds on the owner's land who fails to control such weeds in accordance with this chapter and rules and regulations in force pursuant thereto; or any person who enters upon any land in violation of an order in force pursuant to RCW 17.10.210; or any person who interferes with the carrying out of the provisions of this chapter has committed a civil infraction. [1987 c 438 § 23; 1979 c 118 § 2; 1969 ex.s. c 113 § 23.]

RCW 17.10.235 Selling product, article, or feed containing noxious weed seeds or toxic weeds——Penalty——Rules——Inspections——Fees. (1) Any person who knowingly or negligently sells a product, article, or feed stuff designated under subsection (2) of this section containing noxious weed seeds or toxic weeds designated for control under subsection (2) of this section and in an amount greater than the amount established by the director for the seed or weed under subsection (2) of this section is guilty of a misdemeanor.

(2) The director of agriculture shall adopt, with the advice of the state noxious weed control board, rules designating noxious weed seeds the presence of which shall be controlled in products or articles to prevent the spread of noxious weeds. The rules shall identify the products and articles in which such seeds must be controlled and the maximum amount of such seed to be permitted in the product or article to avoid a hazard of spreading the noxious weed by seed from the product or article. The director shall also adopt, with the advice of the state board, rules designating toxic weeds the presence of which shall be controlled in feed stuffs to prevent injury to the animal that consumes the feed. The rules shall identify the feed stuffs in which the toxic weeds must be controlled and the maximum amount of the toxic weed to be permitted in such feed.

(3) The department of agriculture shall, upon request of the buyer, inspect products, articles, or feed stuffs designated under subsection (2) of this section and charge fees, in accordance with chapter 22.09 RCW, to determine the presence of designated noxious weed seeds or toxic weeds. [1987 c 438 § 30; 1979 c 118 § 4.]

RCW 17.10.240 Special assessments, appropriations for noxious weed control——Assessment rates. The activated county noxious weed control board of each county shall annually submit a budget to the county legislative authority for the operating cost of the county's weed program for the ensuing fiscal year: *Provided*, That if the board finds the budget approved by the legislative authority is insufficient for an effective county noxious weed control program it shall petition the county legislative authority to hold a hearing as provided in *RCW 17.10.890. Control of weeds is a special benefit to the lands within any such section. Funding for the budget shall be derived from either or both of the following:

(1) The county legislative authority may, in lieu of a tax, levy an assessment against the land for this purpose. Prior to the levying of an assessment the county noxious weed control board shall hold a public hearing at which it shall gather information to serve as a basis for classification and shall then classify the lands into suitable classifications, including but not limited to dry lands, range lands, irrigated lands, nonuse lands, forest lands, or federal lands. The board shall develop and forward to the county legislative authority, as a proposed level of assessment for each class, such an amount as shall seem just. The assessment rate shall be either uniform per acre in its respective class or a flat rate per parcel rate plus a uniform rate per acre: *Provided*, That if no special benefits should be found to accrue to a class of land, a zero assessment may be levied. The legislative authority, upon receipt of the proposed levels of assessment from the board, after a hearing, shall accept, modify, or refer back to the board for its reconsideration all or any portion of the proposed levels of assessment. The findings by the county legislative authority of such special benefits, when so declared by resolution and spread upon the minutes of said authority shall be conclusive as to whether or not the same constitutes a special benefit to the lands within the section. The amount of such assessment shall constitute a lien against the property. The county legislative authority may by resolution or ordinance require that notice of the lien be sent to each owner of property for which the assessment has not been paid by the date it was due and that each such lien created shall be collected by the treasurer in the same manner as delinquent real property tax, if within thirty days from the date the owner is sent notice of the lien, including the amount thereof, the lien remains unpaid and an appeal has not been made pursuant to RCW 17-.10.180. Liens treated as delinquent taxes shall bear interest at the rate of twelve percent per annum and such interest shall accrue as of the date notice of the lien is sent to the owner: *Provided further*, That any collections for such lien shall not be considered as tax; or

(2) The county legislative authority may appropriate money from the county general fund necessary for the administration of the county noxious weed control program. In addition the county legislative authority may make emergency appropriations as it deems necessary for the implementation of this chapter.

(3) Forest lands used solely for the planting, growing, or harvesting of trees and which are typified, except

during a single period of five years following clear-cut logging, by canopies so dense as to prohibit growth of an understory may be subject to an annual noxious weed assessment levied by a county legislative authority that shall not exceed one-tenth of the weighted average per acre noxious weed assessment levied on all other lands in unincorporated areas within the county that are subject to the weed assessment. This assessment shall be computed in accordance with the formula in subsection (4) of this section.

(4) The calculation of the "weighted average per acre noxious weed assessment" shall be a ratio expressed as follows: (a) The numerator shall be the total amount of funds estimated to be collected from the per acre assessment on all lands except (i) forest lands as identified in subsection (3) of this section, (ii) lands exempt from the noxious weed assessment, and (iii) lands located in an incorporated area. (b) The denominator shall be the total acreage from which funds in (a) of this subsection are collected. For lands of less than one acre in size, the denominator calculation may be based on the following assumptions: (i) Unimproved lands shall be calculated as being one-half acre in size on the average, and (ii) improved lands shall be calculated as being one-third acre in size on the average. The county legislative authority may choose to calculate the denominator for lands of less than one acre in size using other assumptions about average parcel size based on local information.

(5) For those counties that levy a per parcel assessment to help fund noxious weed control programs, the per parcel assessment on forest lands as defined in subsection (3) of this section shall not exceed one-tenth of the per parcel assessment on nonforest lands. [1987 c 438 § 31; 1975 1st ex.s. c 13 § 10; 1969 ex.s. c 113 § 24.]

*Reviser's note: The original reference in this section to "section 35 of this act" appears to be erroneous. It has been changed to refer to section 37 of the act, codified as RCW 17.10.890, which relates to hearings.

RCW 17.10.250 Applications for noxious weed control funds. The legislative authority of any county with an activated noxious weed control board or the board of any weed district may apply to the director for noxious weed control funds. Any such applicant must employ adequate administrative personnel to supervise an effective weed control program as determined by the director with advice from the state noxious weed control board. The director with advice from the state noxious weed control board shall adopt rules on the distribution and use of noxious weed control account funds. [1987 c 438 § 32; 1975 1st ex.s. c 13 § 11; 1969 ex.s. c 113 § 25.]

RCW 17.10.260 Administrative powers to be exercised in conformity with administrative procedure act——Use of weed control substances subject to other acts. The administrative powers granted under this chapter to the director of the department of agriculture and to the state noxious weed control board shall be exercised in conformity with the provisions of the administrative procedure act, chapter 34.04 RCW, as now or hereafter amended. The use of any substance to control noxious weeds shall be subject to the provisions of the water pollution control act, chapter 90.48 RCW, as now or hereafter amended, the Washington pesticide control act, chapter 15.58 RCW, and the Washington pesticide application act, chapter 17.21 RCW. [1987 c 438 § 33; 1969 ex.s. c 113 § 28.]

RCW 17.10.270 Noxious weed control boards——Authority to obtain insurance or surety bonds. Each noxious weed control board may obtain such insurance or surety bonds, or both with such limits as they may deem reasonable for the purpose of protecting their officials and employees against liability for personal or bodily injuries and property damage arising from their acts or omissions while performing or in good faith purporting to perform their official duties. [1987 c 438 § 34; 1974 ex.s. c 143 § 5.]

RCW 17.10.280 Lien for labor, material, equipment used in controlling noxious weeds. Every activated county noxious weed control board performing labor, furnishing material, or renting, leasing or otherwise supplying equipment, to be used in the control of noxious weeds, or in causing control of noxious weeds, upon any property pursuant to the provisions of chapter 17.10 RCW has a lien upon such property for the labor performed, material furnished, or equipment supplied whether performed, furnished, or supplied with the consent of the owner, or his agent, of such property, or without the consent of said owner or agent. [1987 c 438 § 35; 1975 1st ex.s. c 13 § 13.]

RCW 17.10.290 Lien for labor, material, equipment used in controlling noxious weeds——Notice of lien. Every county noxious weed control board furnishing labor, materials, or supplies or renting, leasing, or otherwise supplying equipment to be used in the control of noxious weeds upon any property pursuant to RCW 17.10.160 and 17.10.170 or pursuant to an order under RCW 17.10.210 as now or hereafter amended, shall give to the owner or reputed owner or his agent a notice in writing, within ninety days from the date of the cessation of the performance of such labor, the furnishing of such materials, or the supplying of such equipment, which notice shall cover the labor, material, supplies, or equipment furnished or leased, as well as all subsequent labor, materials, supplies, or equipment furnished or leased, stating in substance and effect that such county noxious weed control board is furnishing or has furnished labor, materials and supplies or equipment for use thereon, with the name of the county noxious weed control board ordering the same, and that a lien may be claimed for all materials and supplies or equipment furnished by such county noxious weed control board for use thereon, which notice shall be given by mailing the same by registered or certified mail in an envelope addressed to the owner at his place of residence or reputed residence. [1987 c 438 § 36; 1975 1st ex.s. c 13 § 14.]

RCW 17.10.300 Lien for labor, material, equipment used in controlling noxious weeds——Claim——Filing——Contents. No lien created by RCW 17.10.280 shall exist, and no action to enforce the same shall be maintained, unless within ninety days from the date of cessation of the performance of such labor, furnishing of materials, or the supplying of such equipment, a claim for such lien shall be filed for record as hereinafter provided, in the office of the county auditor of the county in which the property, or some part thereof to be affected thereby, is situated. Such claim shall state, as nearly as may be, the time of the commencement and cessation of performing the labor, furnishing the material, or supplying the equipment, the name of the county noxious weed control board which performed the labor, furnished the material, or supplied the equipment, a description of the property to be charged with the lien sufficient for identification, the name of the owner, or reputed owner if known, or his agent, and if the owner is not known, that fact shall be mentioned, the amount for which the lien is claimed, and shall be signed by the county noxious weed control board, and be verified by the oath of the county noxious weed control board, to the effect that the affiant believes that claim to be just; and such claim of lien may be amended in case of action brought to foreclose the same, by order of the court, as pleadings may be, insofar as the interest of third parties shall not be affected by such amendment. A claim or lien substantially in the same form provided by RCW 60.04.060 and not in conflict with this section shall be sufficient. [1975 1st ex.s. c 13 § 15.]

RCW 17.10.310 Notice of infraction——Issuance——Refusal to identify self or respond to notice a misdemeanor. The county noxious weed control board may issue a notice of civil infraction if after investigation it has reasonable cause to believe an infraction has been committed. It shall be a misdemeanor for any person to refuse to identify himself or herself properly for the purpose of issuance of a notice of infraction. Any person wilfully violating a written and signed promise to respond to a notice of infraction shall be guilty of a misdemeanor regardless of the disposition of the notice of infraction. [1987 c 438 § 24.]

RCW 17.10.320 Notice of infraction——Response——Failure to respond——Assessment of penalty. (1) A person who receives a notice of infraction shall respond to the notice as provided for in this section within fifteen days of the date on the notice.

(2) Any employee or agent of an owner subject to this chapter may accept a notice of infraction on behalf of the owner. The county noxious weed control board shall also furnish a copy of the notice of infraction to the owner by certified mail within five days of issuance.

(3) If the person determined to have committed the infraction does not contest the determination, that person shall respond by completing the appropriate portion of the notice of infraction and submitting it, either by mail or in person, to the court specified on the notice. A check or money order in the amount of the penalty prescribed for the infraction shall be submitted with the response. When a response that does not contest the determination is received, an appropriate order shall be entered into the court's record and a record of the response shall be furnished to the county noxious weed control board.

(4) If a person determined to have committed the infraction wishes to contest the determination, that person shall respond by completing the portion of the notice of the infraction requesting a hearing and submitting it either by mail or in person to the court specified in the notice. The court shall notify the person in writing of the time, place, and date of the hearing which shall not be sooner than fifteen days from the date on the notice, except by agreement.

(5) If the person determined to have committed the infraction does not contest the determination but wishes to explain mitigating circumstances surrounding the infraction, the person shall respond by completing the portion of the notice of infraction requesting a hearing for that purpose and submitting it either by mail or in person to the court specified in the notice. The court shall notify the person in writing of the time, place, and date of the hearing.

(6) If a person issued a notice of infraction fails to respond to the notice of infraction or fails to appear at the hearing requested pursuant to this section, the court shall enter an appropriate order assessing the monetary penalty prescribed in the schedule of penalties submitted to the court by the state noxious weed control board and shall notify the county noxious weed control board of the failure to respond to the notice of infraction or to appear at a requested hearing. [1987 c 438 § 25.]

RCW 17.10.330 Determination of infraction——Hearing——Appeal——Review. A hearing held for the purpose of contesting the determination that an infraction has been committed shall be held without jury. The court may consider the notice of infraction and any other written report submitted by the county noxious weed control board. The person named in the notice may subpoena witnesses and has the right to present evidence and examine witnesses present in court. The burden of proof is upon the county noxious weed control board to establish the commission of the infraction by preponderance of evidence.

After consideration of the evidence and argument, the court shall determine whether the infraction was committed. Where it is not established that the infraction was committed, an order dismissing the notice shall be entered in the court's record. If it is established that the infraction was committed, an appropriate order shall be entered in the court's record, a copy of which shall be furnished to the county noxious weed control board. Appeal from the court's determination or order shall be to the superior court and must be within ten days of the determination or order. The decision of the superior court is subject only to discretionary review pursuant to Rule 2.3 of the rules of appellate procedure. [1987 c 438 § 26.]

RCW 17.10.340 Commission of infraction——Mitigating circumstances——Hearing. A hearing held for the purpose of allowing a person to explain mitigating circumstances surrounding the commission of an infraction shall be an informal proceeding. The person named in the notice may not subpoena witnesses. The determination that the infraction has been committed may not be contested at a hearing held for the purpose of explaining circumstances. After the court has heard the explanation of the circumstances surrounding the commission of the infraction, an appropriate order shall be entered in the court's record. A copy of the order shall be furnished to the county noxious weed control board. There may be no appeal from the court's determination or order. [1987 c 438 § 27.]

RCW 17.10.350 Infraction——Penalty. Any person found to have committed a civil infraction under this chapter shall be assessed a monetary penalty. No monetary penalty so assessed may exceed one thousand dollars. The state noxious weed control board shall adopt a schedule of monetary penalties for each violation of this chapter classified as a civil infraction and shall submit the schedule to the appropriate court. If a monetary penalty is imposed by the court, the penalty is immediately due and payable. The court may, at its discretion, grant an extension of time, not to exceed thirty days, in which the penalty must be paid. Failure to pay any monetary penalties imposed under this chapter shall be punishable as a misdemeanor. [1987 c 438 § 28.]

RCW 17.10.890 Deactivation of county noxious weed control board——Hearing. The following procedures shall be followed to deactivate a county noxious weed control board:

(1) The county legislative authority shall hold a hearing to determine whether there continues to be a need for an activated county noxious weed control board if:

(a) A petition is filed by one hundred registered voters within the county;

(b) A petition is filed by a county noxious weed control board as provided in RCW 17.10.240; or

(c) The county legislative authority passes a motion to hold such a hearing.

(2) Except as provided in subsection (4) of this section, the hearing shall be held within sixty days of final action taken under subsection (1) of this section.

(3) If, after hearing, the county legislative authority determines that no need exists for a county noxious weed control board, the county legislative authority shall deactivate the board.

(4) The county legislative authority shall not convene a hearing as provided for in subsection (1) of this section more frequently than once a year. [1987 c 438 § 37.]

RCW 17.10.900 Weed districts——Continuation——Dissolution. Any weed district formed under chapter 17.04 or 17.06 RCW prior to the enactment of this chapter, shall continue to operate under the provisions of the chapter under which it was formed: *Provided*, That if ten percent of the landowners subject to any such weed district, and the county noxious weed control board upon its own motion, petition the county legislative authority for a dissolution of the weed district, the county legislative authority shall provide for an election to be conducted in the same manner as required for the election of directors under the provisions of chapter 17.04 RCW, to determine by majority vote of those casting votes, if such weed district shall continue to operate under the act it was formed. The land area of any dissolved weed district shall forthwith become subject to the provisions of this chapter. [1987 c 438 § 38; 1975 1st ex.s. c 13 § 12; 1969 ex.s. c 113 § 26.]

RCW 17.10.905 Purpose——Construction——1975 1st ex.s. c 13. The purpose of this chapter is to limit economic loss due to the presence and spread of noxious weeds on or near agricultural land.

The intent of the legislature is that this chapter be liberally construed, and that the jurisdiction, powers, and duties granted to the county noxious weed control boards by this chapter are limited only by specific provisions of this chapter or other state and federal law. [1975 1st ex.s. c 13 § 17.]

RCW 17.10.910 Severability——1969 ex.s. c 113. If any provision of this act, or its application to any person or circumstance is held invalid, the remainder of this act, or the application of the provision to other persons or circumstances is not affected. [1969 ex.s. c 113 § 27.]

Your Seattle City Light

Memorandum

DATE : October 6, 1982

TO : Walt Sickler/Paul Weintraub

FROM : W. Newby WN

SUBJECT : Policies Concerning Pesticides

The following suggestions should be considered:

I. Protective Gear
   A. Rubber gloves (check gloves for holes)
   B. Rubber boots (check boots for holes)
   C. Eye protection (goggles or face shield)
   D. Respirators - a must when mixing concentrated chemicals, or when fumes, dust, or fine spray is present.
   E. Dust mask

II. Equipment
All spraying equipment should be checked out prior to any project. An immediate shut-down (job) if any defective or leaking equipment is detected. Equipment should be cleaned as per instruction on the chemical label and/or Washington State laws. Designated areas for rinsing and cleaning isolated from the general public, away from any waterway, and knowledge of the "lay of the land."

III. Temperature
Follow instructions from the label. Cooler temperatures slow down the active ingredient considerably. Higher temperatures will cause volitization.

IV. Drift Factor
Minute particles will drift even with no apparent wind. Adjust nozzles and/or add a chemical to the mix to enlarge the droplets, therefore reducing the risks of drifting.

V. Wind Factor
No spraying unless wind is a 5 MPH or less.
No spraying when wind is swirling or constantly changing direction.

VI. Transport of toxic materials to job site.
   A. Partially filled containers should be in a compartmentalized box marked either with "Insecticide" or "Herbicide," equipped with handles, painted red, and padlocked. Said box should be secured to the vehicle in some manner in case of vehicular accident.
   B. Larger containers should be secured to the vehicle in some manner to also prevent spills in case of accident. Vehicle should be equipped with a tail gate and gate should be secured.

VII. Knowledge of water sources (shower, running water)
A. In case of accidental spill on the body.

VIII. Protecting the Environment
Good knowledge of the "lay of the Land," where waterways exist or have existed (dry creeks), terrain tilt, farmlands.

IX. Availability of phone numbers for the following:
A. Poison control center
B. EPA spill control units
C. Medical aid.
Policies should be set up to what our crews can do until the EPA swat team can arrive. Liason with county dump or contractor should be maintained.

X. Medical checks
All personnel who will be using organphosphates during the spraying season should have a blood base level for cholinesterase.

XI. First Aid Kit for field use:
A. Contents
1. Detergent
2. Salt
3. Baking soda or Milk of Magnesia
4. Lemon juice or vinegar
5. Activated charcoal
6. Shaped plastic airway
7. Thermos of clean water
8. Band aids, bandages, and tape
9. Blanket
10. Empty jar

Terry Tawerly

WW:mjon

cc: Stretch
Faulconer
file

8404

Form 1

Seattle City Light
R&D Project Goals
1990-91

Project Title: ALTERNATIVE CONTROL OF TANSY RAGWORT

I.D. Number: F11
Date Started: 1986
Expected Completion Date: 1991

Sign-offs
Date: March 29, 1989
Org. Unit: 120
Project Manager: Laurie Geissinger LG
Supervisor: Terry Kakida
Director: Lynn Best, Acting KK for LB
Phone: (proj. manager) 3462

I.a. Statement of Project Goals:

The primary goal of this project is to eliminate the use of herbicides to control the noxious weed, tansy ragwort, on City Light's right-of-way (ROW). This project is a continuation of a project begun in 1986 (as one part of the Alternatives to Use and Disposal of Hazardous Substances R&D project). This study seeks to establish the feasibility of biological control of tansy ragwort and to improve the efficiency of manual control. The most promising biological control agents are three insect species--the cinnabar moth, the tansy flea beetle, and the tansy seedfly. Recent experiments in similar habitats in Western Oregon have produced encouraging results (see section I.b.).

City Light is legally required to control tansy ragwort where it occurs on the ROW because this weed can cause liver damage and death in livestock when ingested. The current method of control is through the use of the herbicide Banvel except near streams where hand pulling is used. City Light can realize numerous benefits from reducing the use of hazardous substances such as herbicides and substituting safer, more environmentally benign alternatives.

These benefits include:

1. Reduced exposure of City Light employees to hazardous substances. Although Banvel is one of the safer herbicides available, it is still a hazardous substance and some tests indicate that it may pose a threat to developing fetuses.

2. Increased compliance with state and federal law. The Resource Conservation and Recovery Act (RCRA) requirements and state law call for the reduction of the use of hazardous substance.

3. Reduced risk of environmental contamination. Herbicides such as Banvel are extremely mobile in water. They can be carried in surface runoff and ground water to nontarget vegetation and to fish and wildlife. This problem is especially troubling in the control of ragwort as it tends to concentrate near streams.

4. Reduced risk to the public. Most of the ROW is accessible to the public. Although a posting has been developed, there is no effective way of preventing access.

5. Reduced long-term liability for the Utility. By limiting the risks to workers, the public, and the environment, this project, if successful, will reduce City Light's potential liability.

6. Achievement of Departmental policies and goals. This project will help City Light to carry out the DPP on Maintenance of the ROW calling for minimization of herbicide use and the goals of the Worker Right-to-Know Program, to develop less hazardous procedures.

7. Long-term reduction in maintenance costs. Once successfully established, biological control requires minimal monitoring and occasional reintroduction of the control species. Alternatively, herbicides must be spot sprayed individually on each ragwort plant, a labor-intensive job. Also, over time, pest species develop resistance to herbicides, requiring increasingly strong dosages or a switch to a more potent alternative, increasing both costs and environmental and health risks. Herbicides cannot be used safely near streams; biological control can, further reducing labor costs.

Progress on this continuing project has been reported in reports to the R&D Committee. To briefly summarize, during 1987, sampling indicated that a small population of flea beetles had successfully overwintered. Additional inspects were introduced to establish a more vigorous population and by October, 1988 the population increased by 12 times. Cinnabar moth larvae released the summer of 1986 survived poorly through the following winter, however, the larvae released in 1987 did much better. In 1988 there was some evidence of cinnabar moth damage to ragwort plants. Seedfly damage was also evident throughout the study area in the summer of 1988; however, as expected the seedfly population is taking longer to become established. The success of the biological control experiments depends on the continuance of careful monitoring and evaluation. Delaying development of this program continues the potential for environmental damage, exposure of workers and the public, and future liability.

This project will affect the work of the Environmental Affairs Division (EAD) and Transmission and Distribution Division. (See Form 2 for a description of labor impacts during the course of the project.) If successful, it will greatly reduce the labor costs in the Transmission and Distribution Division currently used for tansy ragwort control. Hand spraying and pulling is very labor intensive. Labor hours spent in EAD to review herbicide use and practices and advise on environmental concerns on tansy ragwort would also be eliminated.

This project fits into the R&D nonenergy, environmental category with long-term benefits to the Utility. It is designed as a controlled experiment to test the feasibility of a new methodology of vegetation control. If successful, it will reduce future costs to the Utility for maintaining the ROW as well as limit exposure to hazardous chemicals and risk to employees, the public, and the environment.

I.b. Explain in detail the steps you have taken to determine what information exists related to this project.

Forty hours were devoted to a literature review of information on alternative control of tansy ragwort and related species. Researchers currently working on biological control of ragwort, including Dr. Peter McEvoy of Oregon State University, Robert Brown of the Oregon Department of Agriculture, and Dr. Judy Myers of the University of British Columbia have been contacted for information. Dr. McEvoy, Robert Brown and Fred Wilkinson, an entomologist from British Columbia, are all currently advising on this project.

In a paper published in March 1988, Dr. McEvoy reported on experiments designed to test the effectiveness of the flea beetles and cinnabar moths in controlling tansy ragwort. The experiments showed that these herbivores depressed the ragwort density to very low levels in experimental plots, reducing the density of vegetative plants by 89 percent, and the number of flower heads by 93 percent compared to untreated plots. The experiments also showed that the complementary action of the two insects was a key element in successful control, since each insect has its greatest impact on different parts of the plants in different seasons.

Form 2

Seattle City Light
R&D Methodology
1990-91

Project Title: Alternative Control of Tansy Ragwort I.D.# F11

II. Methodology

Do not be constrained by the amount of space provided.

1. Who? This project will be conducted by a consultant under the direction of staff from EAD. Assistance will be provided by staff from the Transmission and Distribution Division. One hundred twenty hours will be required in EAD for project management for each year of the study. Twenty labor hours will be required in Transmission and Distribution, Unit 502, to assist in monitoring.

2. What? Biological Control: Plots established previously will be treated by each control technique. The techniques to be tested are (1) spot spraying with the herbicide Banvel, (2) hand pulling, and (3) control by introduced populations of the tansy flea beetle (Longitarsus jacobaeae) and the cinnabar moth (Tyria jacobaeae). Before each treatment the population level of tansy ragwort will be recorded in each plot. The labor hours and other expenses associated with each treatment will be recorded as well.

   The plots will be inventoried regularly to measure the population density of tansy ragwort and the insects. The beetle population density will be measured by collecting individual plants and counting the number of larvae within the stems. After the first inventory in 1989 in May, tansy flea beetles and cinnabar moths will be reintroduced where population levels have dropped below critical levels. Monitoring will continue for two more years. Analysis of variance will be used to compare success rates of each technique. Based on experiments conducted by the National Park Service in California and by Dr. Peter McEvoy in Oregon, it is expected that the tansy flea populations will be well established and be able to significantly reduce ragwort populations on the ROW by 1989 or 1990.

3. Where? The experimental plots are set up in City Light's ROW near the Skagit-Snohomish County line where tansy ragwort occurs.

4. When? The first inventory in 1990 will take place in May. Reintroduction of insects, if necessary, will follow. Monitoring of the plots will continue on a regular basis. Spraying will take place in May-June.

5. How funded? The project was funded by the R&D program in 1986 through 1989. Funds for 1990 and 1991 are now being sought from R&D. No other source of funding is anticipated.

Form 3

Seattle City Light
R&D Project Milestones
1990-91

Project Title: Alternative Control of Tansy Ragwort I.D.# F11

III. Project Milestones/Consultant Deliverables	Expected Completion Date	Revised Expected Completion Date	Completion Date
1. MILESTONES (1990-91)			
First inventory of experimental plots in 1990	5/90		
Reintroduction of herbivorous insects (if necessary)	6/90 and 9/90		
Inventories of plots	6/90,7/90, 9/90		
First inventory of 1991	5/91		
Inventories of plots	6/91,7/91, 9/91		
Compile, evaluate, assess results	11/91		
2. CONSULTANT DELIVERABLES			
Progress reports presenting results of ongoing inventories	Monthly		
Draft Report summarizing results for 1990	10/90		
Final Report on 1990 results	11/90		
Draft Report on 1991 results	10/91		
Final Report on project results	12/91		
3. Projection of Project Completion Date	12/91		
4. Presentations to R&D Committee	As requested		
Mid-Project --			
Final Project --			

Form 4

Seattle City Light
R&D Budget Information
1990-91

IV. Budget-Related Information

1. Assume your project budget must be reduced by 10 percent.

   a. Which budget items would be reduced (e.g., contract, labor, data processing, other)?

      If the project budget is reduced by 10 percent, the cut will have to come out of the consultant budget. This will reduce significantly the amount of data gathered and analyzed on plant survival, insect population levels, and insect damage. This will severely affect the validity of the results.

   b. How would the goals and objectives by impacted?

      A budget cut would undermine the primary goal of establishing the feasibility of biological control of ragwort.

2. Can the project activities/research proposed for 1990 be delayed or spread out beyond 1990? Explain.

   If the follow-up project is not carried out in 1990, the work carried out in the previous years is very likely to be lost and whatever results obtained inconclusive. Delaying development of this program continues the potential for environmental damage, exposure of workers and public, and future liability.

3. Given that the R&D Committee must reduce the overall program budget, what is a reasonable reduction for your 1990 project budget? Explain.

   A request for a consultant budget of $25,000 was made initially. The need to streamline costs was obvious from R&D Committee dicussions, thus BI 30 has been pared to a subsidance level of $15,000.

SEATTLE CITY LIGHT
R & D BUDGET

* * IN LABOR HOURS * *

PROJECT TITLE: Tansy Ragwort Control
I.D. #:
YEAR STARTED: 1986
YEAR COMPLETED: 1991

DATE: March 29, 1989
ORG UNIT: 120
PROJECT MANAGER: Laurie Geissinger
DIRECTOR: Lynn Best, Acting

BUDGET ITEM	BUDGET DESCRIPTION	ORG UNIT	1988 HOURS	1989 HOURS	1990 HOURS	1991 HOURS	1992 HOURS	1993 HOURS
PROJECT DETAIL INFORMATION:								
		120	120	120	120	120	0	0
		502	20	20	20	20	0	0
TOTAL FOR PROJECT			140	140	140	140	0	0

Project Title Alternative Control of Tansy Ragwort

Project Manager Laurie Geissinger

Project I.D. # F11

SEATTLE CITY LIGHT
BUDGET ITEM REQUESTS

ORG UNIT TITLE EAD

UNIT NUMBER 120

FOR THE YEAR 1990

DATE March 29, 1989

L-320.17 (2-83)

BUDGET ITEM NUMBER	PROGRAM ELEMENT	ORG UNIT REQUEST	BAL AFTER REVISION	BAL AFTER CL REVIEW	BAL AFTER OMB REVIEW	ADOPTED BUDGET	DESCRIPTION	JUSTIFICATION	CALCULATION
30	2580	$15,000					Funds for consultant to continue experiment to test biological control of tansy ragwort	Will allow continuance of ongoing experiment which will culminate in recommendations concerning alternative practices to control a noxious weed, as required by state law.	Based upon overall contract cost for one year of continued pro

NOTIFICATION OF PROJECTED WORK

REPORTING PERIOD 1990 THRU _____

ORIGINATING UNIT: 120 DATE PREPARED: March 29, 1989 RECEIVING DIVISION/UNIT: Operations 502 Hett

SUPERVISOR ORIGINATING UNIT: Lynn Best KK for LB DATE NPW RECEIVED:

FOR ORIGINATING UNIT USE ONLY						FOR RECEIVING UNIT USE ONLY		
PROJECT TITLE (INCL. W.O. No. AND P.E. No.)	PRIORITY	DESCRIPTION OF WORK	ESTIMATED DATE OF WORK TRANSFER	REQUESTED COMPLETION DATE	ESTIMATED EMPLOYEE HOURS	ESTIMATED START DATE	ESTIMATED COMPLETION DATE	DATE WORK RECEIVED
Alternative Control of Tansy Ragwort WO 70461-01 PE 2580		Assist in monitoring experiment and collecting data	3/90	8/90	20			

FS-16-771

SEATTLE CITY LIGHT
R & D BUDGET

* * PROJECT BY BUDGET ITEM * *

PROJECT TITLE: Tansy Ragwort Control
I.D. #:
YEAR STARTED: 1986
YEAR COMPLETED: 1991

DATE: March 29, 1989
ORG UNIT: 120
PROJECT MANAGER: Laurie Geissinger
DIRECTOR: Lynn Best, Acting

BUDGET ITEM	BUDGET DESCRIPTION	ORG UNIT	1988 HOURS	1989 HOURS	1990 HOURS	1991 HOURS	1992 HOURS	1993 HOURS
PROJECT DETAIL INFORMATION:								
11	Salaries	120	$2,016	$2,016	$2,016	$2,016	0	0
11	Salaries	502	337	337	337	337	0	0
14	Labor Loading	120	500	530	500	500	0	0
14	Labor Loading	502	84	89	84	84	0	0
30	Research	120	25,000	25,000	15,000	15,000	0	0
35	Paid Media Space	120	200	0	200	200	0	0
TOTAL FOR PROJECT:			$26,137	$27,972	$18,137	$18,137	0	0

CC: CT
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EAD 552, 811.04
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APPENDIX F. SAFETY RULES AND PROCEDURES

DISTRIBUTION DIVISION
TRANSMISSION AND DISTRIBUTION SERVICES SECTION

OPERATION & MAINTENANCE STANDARD

Your Seattle City Light

TITLE	NUMBER
PROCEDURES FOR HANDLING AND DISPOSAL OF POTENTIALLY HAZARDOUS MATERIALS LOCATED ON R.O.W.	4180-4
	DATE 05-11-88
ORIGINATING ORGANIZATION UNIT: 502 / APPROVAL: S. J. Chuck	Page 1 of 4

L-502-2 (7-84)

1.0 PURPOSE - To guide Rights-of-Way (ROW) personnel on disposal options and procedures to follow when discarded and potentially hazardous materials are found on the ROW.

2.0 ORGANIZATIONAL UNITS AFFECTED Unit 502

3.0 INSTRUCTIONS - The following procedures shall be followed by ROW personnel if any material found on the ROW is suspected of being hazardous and/or for identified materials requiring special handling which should not be removed by ROW personnel.

3.1 Precautions

- o Avoid contact with skin, clothing, or boots;
- o do not approach closely if there is a noticeable odor or fumes;
- o do not disturb or try to open bags, barrels, or other containers.

3.2 Notification Procedures

3.2.1 Immediately notify your crew chief through Service Center Coordinators; then begin making notes about the material found. Include:

- o Location
- o Description of material (i.e., boxes, bag, barrels, miscellaneous, garbage, etc.)
- o Quantity
- o Labels or any other marks identifying contents
- o Any other items which might help identify material
- o Distance to nearby residences

3.2.2 Check for spills or leaks which could be a danger to public, animals, waterways or any other drainages.

3.2.3 Attempt to contain spills if possible without touching the substances or breathing toxic fumes. Do not come in contact with the substances. Attempt to contain the substance by diking or use of sorbent materials.

3.2.4 Check for accessibility to public/grazing animals

3.2.5 Do not move material.

3.3 Crew Chief Procedures

3.3.1 Respond to ROW crew report immediately and assess the situation. If immediate action is needed, notify ROW Supervisor through Service Center Coordinators of site location and preliminary assessment and continue to gather information.

3.3.2 Ensure material is not moved until it has been identified.

3.3.3 Move the material to the SSC if and when told to do so by the ROW Supervisor. Ensure material is in leak proof containers. These can be obtained from SSC warehouse.

3.3.4 If ROW Supervisor is unavailable follow procedures in 3.4.

3.3.5 Locate property owner if possible.

3.4 ROW Supervisor Procedures

3.4.1 ROW Supervisor will respond immediately by contacting Environmental Affairs Division (4-3109); Safety and Health (4-3270), and/or Property Management (4-3310) and provide them the information from 3.2.1 and request the following:

- o EAD--site visit, assistance in removal, advice on material clean up and assistance in informing the public if there is a hazardous situation.
- o Safety and Health--assessment of potential hazard to ROW personnel, assistance in informing the public if there is a hazardous situation, advice on potential exposure of C/L personnel, and safe handling of material.
- o Property Management--ownership of property and assistance in informing property owners if necessary.

3.4.2 Assist EAD, Safety and Health, Property Management and any other agency in location and assessment of the hazardous material.

3.5 Materials Requiring Special Handling--The ROW crews are to follow these procedures for materials requiring special handling.

3.5.1 Asbestos

- o Note location and quantities and report to crew chief.
- o The Crew Chief notifies ROW Supervisor and Service Center coordinators asking that a certified asbestos handler be sent to the site to remove the material.

  NOTE: If any amounts are found, which will involve over one labor hour to bag and remove, the Puget Sound Air Pollution Control Authority (PSAPCA) (296-7330) and the Safety and Health Unit (684-3270) should be notified by the ROW Supervisor.

3.5.2 Pesticide Residues

- o Note location, quantities, condition of cans and report to crew chief. Also look for any labels on cans that will identify the chemical product.
- o Crew Chief notify the ROW Supervisor as to the amount and location and request disposal procedures. ROW Supervisor notify Environmental Affairs.

  NOTE: If ROW crew is transporting for disposal, wear appropriate safety equipment, including goggles, respirators, rubber gloves, rubber apron and rubber boots while handling material.

3.5.3 Paint Sludges

- o See procedures for Pesticide Residue (3.5.2)

3.6 Procedures for Materials not Requiring Special or Hazardous Material Handling

3.6.1 Tires

- o ROW crews note location and quantities and report to crew chief.
- o Crew Chief call Laurence Ashley, DOE (867-7014) for facilities which will accept or provide free pickup. If there is no free disposal available, transport to the SSC to be disposed of by the Salvage Unit.

3.6.2 Batteries

- o ROW crews note location, quantities, types of batteries and battery condition (intact or leaking) and report to crew chief.
- o Use rubber gloves and eye protection and take care not to get battery acid on the skin. Transport batteries in appropriate containers (which are available from SCC warehouse) to SSC Salvage Unit for disposal.

4.0 RESPONSIBILITIES:

4.1 Environmental Affairs

- o Investigation of site
- o Contact manufacturers or owner, if known, to remove material.
- o Contact Department of Ecology (DOE) Regional Office (206) 867-7000 NWRD/(503) 575-2800 CRO.

4.2 Safety and Health

- o Determine potential contamination of ROW personnel.

4.3 Property Management

- o Determine responsible property owner and assist EAD in the proper ownership notifications as required.

Your Seattle City Light

DISTRIBUTION DIVISION

MAINTENANCE STANDARD

NUMBER	4180-1
DATE	4/12/83
TITLE	OBTAINING GASOLINE & LUBRICANTS FOR R.O.W. VEHICLES & CHAIN SAWS
	Page 1 of 2
ORIGINATING ORGANIZATION UNIT	502 Transmission & Distribution Services
APPROVAL	J. F. Clark

1.0 PURPOSE: To standardize the procedures on purchasing gasoline and lubricants for vehicles and chain saws utilized on the transmission Rights-of-Way (R.O.W.).

2.0 ORGANIZATIONAL UNITS AFFECTED: 502

3.0 INSTRUCTIONS:

3.1 Whenever practicable, refuel vehicles, obtain fuel for chain saws and obtain lubricants at MTD facilities such as the North or South Service Centers or Haller Lake.

3.2 Use of the Chevron Credit Card - The Chevron Credit Card is to be used at Chevron Stations only. Gasoline or diesel fuel for the vehicles, gasoline for chain saws and lubricants may be purchased. When completing the purchase be sure the following information is on the sales slip and is legible.

- Org. Unit 502
- P.E. 4180
- B.I. 21
- W.O. 571-447

- Vehicle No. (if fuel is for chain saws, write "chain saw" in place of vehicle and license nos..)
- License No. (omit if for chain saws)
- Employee No.
- Employee Signature
- Turn in sales slips to your lead person or Crew Chief who will send them in with the time to the Transmission & Distribution Services Supervisor.

3.3 Use of "B" Contract No. B647022A - This "B" Contract is for purchase of automotive fuel and lubricants at Whitehorse Mercantile, 38710 State Road 530, Arlington, WA.. To use the "B" Contract, do the following:

- Following the purchase, the attendant will emboss a regular gasoline sales slip with the date, their name and address, etc.. The data normally embossed by a credit card will be absent.
- Check to see that the purchase information is present, i.e. type of fuel, price per gallon, no. of gallons, extension, Federal Excise Tax deducted, net amount of sale.
- In a clear area on the sales slip write in the following before you sign the slip: Org. Unit (502), P.E. 4180, B.I. 21, W.O. 571-447, Vehicle No., Employee No., and License No. If the fuel is for chain saws, write "chain saw" in place of the Vehicle and License Nos..
- Sign the sales slip; keep the top copy and turn it in to your lead person or Crew Chief.

Your Seattle City Light

DISTRIBUTION DIVISION
MAINTENANCE STANDARD

NUMBER	4180-2
TITLE	CHAIN SAW OPERATION & FIELD MAINTENANCE
DATE	6/23/83
	Page 1 of 8
ORIGINATING ORGANIZATION UNIT	502 Transmission & Distribution Services
APPROVAL	L.F. Clark

L-502 2 (1 83)

1.0 PURPOSE: To standardize operation and field maintenance of gasoline driven chain saws.

2.0 ORGANIZATIONAL UNITS AFFECTED: 502

3.0 SAFETY:

3.1 Equipment - the following safety equipment shall be worn while operating chain saws:

- Boots meetings safety specifications (steel toes)
- Hard hats
- Hearing Protection
- Protective leg chaps down to boot tops.
- Face and eye protection should be worn.

3.2 Safety Practices - the following safety practices shall be followed while operating chain saws.

3.2.1 Chainsaws being carried from one location to another shall be shut down. Chain saws shall be carried with the bar to the rear and the hot muffler away from the body.

3.2.2 Clutches shall be adjusted so the chain does not move with the engine at idle.

3.2.3 Fuel cans for chain saws shall not be placed closer than ten feet from a running saw.

3.2.4 Chain saws shall be shut down for ten minutes before being refueled.

3.2.5 Chain saws being transported or stored shall have the bar and chain sheathed.

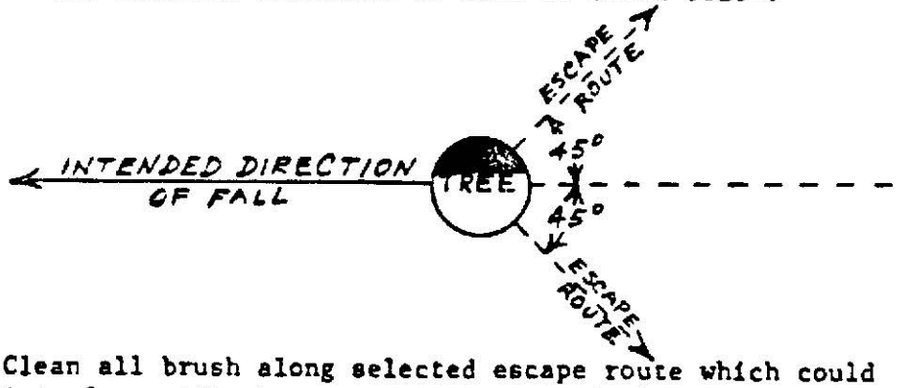
3.2.6 Rules for safe felling of trees - Trees near the edge of the right-of-way generally will have more branching and thus more weight on the side next to the right-of-way. As a result, extreme care must be taken when felling these trees.

- Wedges will be used to turn or guide a tree in the direction of fall or to keep the tree from settling back on the bar and chain. Wedge all trees twelve inches or greater with non-metalic wedges.

- Watch the sawdust while sawing. This will tell you the condition of the tree. Sawing tactics may change if the inside shows rot.

- Use extreme care in falling snags. They usually saw hard and have loose bark which comes loose. Snags usually fall when unexpected. Always use a safety watch person to warn of developing hazards.

- Have an escape route picked out before starting to fall a tree. The approved route is at 45° away from the intended direction of fall as shown below.



Clean all brush along selected escape route which could interfere with the escape movement and the saw.

- Thoroughly judge the natural direction of fall before deciding upon sawing and pulling requirements.

- A line will be attached to trees which are tall enough to make contact with a conductor. A winch line attached at a minimum of 25% of the height of the tree is required.

- Safe working distances will be maintained between trees to be felled and other members of the crew and equipment.

- Attempt to fell trees in the ROW. If trees must be felled on access roads or an adjoining property, first obtain permission of the landowner.

3.2.7 Rules for limbing

- This operation will be done with extreme caution due to the danger of saw "Kickback". Avoid limbing where the nose of the bar will contact other limbs or logs during the cut. Standing on the log while limbing it is to be avoided if at all possible.

- Start limbing from the butt if possible leaving limbs to support the log and/or prevent it from rolling until the trunk can be cut into sections.

- When limbing, attempt to always limb the far side of the log. Always stand on the uphill side when limbing on a slope.

3.2.8 Rules for Bucking

- When bucking, employees shall not stand on the log or on the downhill side.

- Only one log shall be cut at one time.

- Shattered logs should be bucked very carefully to avoid sharp slivers being thrown into the saw or operator.

- To prevent binding the chain and bar, logs should first be shallow cut on the compression side if accessible. Logs lying on flat ground (which is to be avoided if possible) should be cut 90% through then rolled to complete the cut.

- If possible, combine limbing and bucking from the butt of the tree to the top to keep the log off the ground and supported by the limbs.

4.0 Security:

4.1 Marking with "E" Number - All chain saws shall be identified as belonging to the Seattle City Light Department by marking the motor block and an outer cover with the identifying "E" number and "Seattle City Light". The identification shall be engraved by grinding on the block and vibra-tool on the outer cover.

4.2 All chain saws not in use shall be stored in locked vehicle tool lockers or other appropriate facility.

5.0 Field Maintenance - Operating a chainsaw is physically demanding work. A saw which is improperly maintained will increase the effort required to control it and will create unnecessary safety hazards. It is the responsibility of all employees operating chain saws to maintain them properly to assure maximum life, minimum repair and maximum safety.

5.1 Air Filter - A plugged, dirty filter reduces the power and causes the saw to run hotter.

5.1.1 Clean the filter each day after use and more often if necessary. Have the Crew Chief show you where it is located and how to remove it for cleaning. The location and method of fastening will vary on different saws.

5.1.2 Remove the filter screen from the plastic cover (unless the two are one unit).

5.1.3 Wash out the sawdust and grime with gasoline and replace it.

5.2 Muffler -

5.2.1 Inspect it regularly for loose screws and bent louvers.

5.2.2 Install a wire mesh spark arrester during fire season if it is necessary to operate a chain saw.

5.3 Bar -

5.3.1 Clean the bar daily by running a tool through the grooves to remove accumulated debris.

5.3.2 Fill the chain oil reservoir each time the saw is refueled.

5.3.3 On bars equipped with chain sprockets, grease the sprocket through the two small holes near the tip of the bar each time the saw is filed and oiled.

5.4 Sharpening - A dull chain causes undue stress on both the saw and the operator. Sharpen the chain whenever the saw feels as if it is not cutting properly.

5.4.1 Before attempting to sharpen a chain refer to a copy of the operator's manual furnished by the manufacturer and available from the toolroom. These manuals usually give detailed instructions on the proper tools and procedures to best sharpen their particular chain.

5.4.2 If possible, use a file holding jig which clamps to the bar and accurately positions the file. A file holder shall be used in the field if the jig is not available.

5.4.3 City Light chains are usually filed at an angle of 35 degrees horizontally and 5 degrees vertically.

5.4.4 File each tooth the same number of strokes in one direction only from the inside to the outside surface. Unless the cutters have become excessively dull, three strokes is adequate.

5.4.5 Check the raker depth with a proper gauge each time the chain is sharpened. Also file the rakers if necessary.

5.4.6 Check the bar for groove wear and correct according to the operator's manual. Turn the bar at regular intervals.

5.5 General Instructions

5.5.1 Check and tighten all screws and nuts periodically.

5.5.2 Bar Oil - Obtain bar oil from the tool rooms. In an emergency use 30W engine oil.

5.5.3 Premixed Fuel - Premixed chain saw fuel is available from the tool rooms. Specify saw manufacturer when ordering.

5.5.4 Mixing fuel in the field - Use only leaded regular gasoline. Unleaded gasoline will be allowed only in an emergency and for short periods of time. Continued use is unauthorized. Use of super or premium gasoline is prohibited! Its use will "burn up" a chain saw engine.

- Always mix "two cycle" engine oil with the gasoline before use (available from the toolroom).
- Different saws require different gas-oil mixtures. Consult the Operator's manual for the saw you will be refueling.

- For Stihl saws mix one pint of engine oil with forty pints (5 gallons) of gasoline (40-1).
- For Homelite saws mix one pint of engine oil with 32 pints (4 gallons) of gasoline. (32-1).

Your Seattle City Light

DISTRIBUTION DIVISION
MAINTENANCE STANDARD

NUMBER	4180-3
TITLE: METHODS AND MAINTENANCE SCHEDULE FOR THE PNT ROW	DATE: 12/1/83
	Page 1 of 3
ORIGINATING ORGANIZATION UNIT: 520 Transmission & Distribution Services	APPROVAL: J. F. Clark

L-502-2 (1-83)

1.0 PURPOSE: To establish the maintenance methods and schedule for the PNT ROW.

2.0 ORGANIZATIONAL UNITS AFFECTED: 502; 510; 520; 522; 524

3.0 PATROL:

3.1 The PNT ROW will be ground patrolled by the NROW Maintenance Crews at least once each month. The date of the patrol and any significant observations related to water control, vegetation, encroachments, road conditions, trash dumping, etc., shall be documented in the patrol log book. Conditions requiring the attention/services of other units shall be documented using "Right-of-Way Incident Reports."

3.2 Emergency patrols required when elements of the regular ROW crew are not available shall be made by north-end line service crews, line crews, or by supervisory personnel.

4.0 TREE TRIM:

4.1 The PNT ROW is entirely confined to the distribution area; therefore, tree trimming will be performed by the distribution area tree trim contractor. The Tree Trim Coordinator will be informed of tree trim needs by the use of "Lighting Trouble" slips.

5.0 GRASS MOWING:

5.1 Those sections of the PNT ROW planted in grass shall be mowed twice each growing season, normally in May and August. This work, at the option of the ROW manager, may be done by the SROW crew or by contract.

6.0 TRASH REMOVAL:

6.1 Trash will be removed on an as needed basis, but a special effort will be made in May and September to ensure the tidiness of this section of the ROW. Trash removal will be performed by the NROW crew.

6.2 Trash will be disposed of at the King County solid waste transfer station located at First Avenue N.E., N. 163rd and Corliss N..

6.3 The Security Manager will be notified of all trash dumping via "Right-of-Way Incident Reports". Route through ROW manager, 201 C/L Building.

7.0 BARRICADES:

7.1 The PNT ROW will be barricaded by pole, cable and lock, concrete ecology blocks and/or other appropriate means wherever practicable. This ROW is owned in fee by City Light and it is our objective to prevent trespass, particularly that which will be detrimental to the Department's property interests and to those in the surrounding community.

7.2 The Property Management Section will be consulted before erecting barricades to ensure that the rights of permit holders or other property rights are not violated.

8.0 WATER CONTROL

8.1 The PNT ROW runs through a highly urbanized area which has both open and closed drainage facilities which, if obstructed, could cause considerable damage. The following facilities shall be inspected by the NROW crew at least once each month and once each week in September, October and November and cleared of all obstruction as needed:

Facility	Location
Open Ditch	West side of ROW, N. 152nd St.
Grated opening to 24" culvert	East side of ROW, 100' South of N. 165th St.

8.2 Each inspection and maintenance action taken regarding the facilities enumerated in 8.1 shall be documented in the patrol log book and significant events will be reported to the ROW manager Via "Right-of-Way Incident Reports".

MAINTENANCE STANDARD INDEX

Program Element: 4180

Maintenance Standard Number	Title	Origination Date	Revision Date
4180-1	Obtaining Gasoline & Lubricants for R.O.W. Vehicles & Chain Saws	5/12/83	
4180-2	Chain Saw Operation & Field Maintenance	6/23/83	
4180-3	Methods and Maintenance Schedule for the PNT ROW	12/01/83	

APPENDIX G. HYDRAULICS PERMITS

HYDRAULIC PROJECT APPROVAL

(R.C.W. 75.20.100)
(R.C.W. 75.20.103)

[4] August 29, 1988
(Applicant should refer to this date in all correspondence)

DEPARTMENT OF WILDLIFE
600 Capitol Way North
Olympia, Washington 98504
(206) 753-5897

[10] LAST NAME / FIRST: Seattle City Light	[18] CONTACT PHONE(S): 206-684-3799
[19] STREET OR RURAL ROUTE: 1015 Third Avenue, Room 922	[1] CONTROL NUMBER: 75822
CITY / STATE / ZIP: Seattle, Washington 98104	[7] 057 [8] A [9] WRIA 04
[12] WATER / TRIBUTARY TO: See Attached (Attachment A)	[14] 74 [15] 09
[13] QUARTER SECTION / SECTION / TOWNSHIP / RANGE (E-W) / COUNTY: See Attached (Attachment C) — Skagit, Snohomish	[11] TYPE OF PROJECT: Culvert Maintenance

TIME LIMITATIONS: [5] THIS PROJECT MAY BEGIN: Immediately — [6] AND BE COMPLETED BY: October 31, 1993

THIS APPROVAL IS TO BE AVAILABLE ON THE JOB SITE AT ALL TIMES AND ITS PROVISIONS FOLLOWED BY THE PERMITTEE AND OPERATOR PERFORMING THE WORK.

THE PERSON(S) TO WHOM THIS APPROVAL IS ISSUED MAY BE HELD LIABLE FOR ANY LOSS OR DAMAGE TO FISH LIFE OR FISH HABITAT WHICH RESULTS FROM FAILURE TO COMPLY WITH THE PROVISIONS OF THIS APPROVAL.

FAILURE TO COMPLY WITH THE PROVISIONS OF THIS APPROVAL COULD RESULT IN A CIVIL PENALTY OF UP TO ONE HUNDRED DOLLARS PER DAY OR A GROSS MISDEMEANOR CHARGE, POSSIBLY PUNISHABLE BY FINE AND/OR IMPRISONMENT.

ALL HYDRAULIC PROJECT APPROVALS ISSUED PURSUANT TO RCW 75.20.100 ARE SUBJECT TO ADDITIONAL RESTRICTIONS, CONDITIONS, OR REVOCATION IF THE DEPARTMENT OF FISHERIES OR DEPARTMENT OF WILDLIFE DETERMINE THAT NEW BIOLOGICAL OR PHYSICAL INFORMATION INDICATES THE NEED FOR SUCH ACTION. THE PERMITTEE HAS THE RIGHT PURSUANT TO CHAPTER 34.04 RCW, TO APPEAL SUCH DECISIONS. ALL HYDRAULIC PROJECT APPROVALS ISSUED PURSUANT TO RCW 75.20.103 MAY BE MODIFIED BY THE DEPARTMENT OF FISHERIES OR DEPARTMENT OF WILDLIFE DUE TO CHANGED CONDITIONS AFTER CONSULTATION WITH THE PERMITTEE: PROVIDED HOWEVER, THAT SUCH MODIFICATIONS SHALL BE SUBJECT TO APPEAL TO THE HYDRAULIC APPEALS BOARD ESTABLISHED IN RCW 75.20.130.

THIS APPROVAL PERTAINS ONLY TO THE PROVISIONS OF THE FISHERIES AND WILDLIFE CODES. ADDITIONAL AUTHORIZATION FROM OTHER PUBLIC AGENCIES MAY BE NECESSARY FOR THIS PROJECT.

1. This permit shall apply to all Seattle City Light powerline stream crossings in the Sauk/Skagit River drainages, except for Rinker Creek (#63) and Olson Creek (#81), where proposed activities will require individual hydraulics project approvals.

2. Timing for routine maintenance activities will occur between June 15 and October 31.

3. Emergency repair and maintenance outside the above time frame will require contact of Department of Wildlife representative, Art Stendal (206-424-1260) or Department of Fisheries representative, Mark Schuller (206-~~336-9538~~ 429-1520).

4. The culvert shall be removed in a manner that will keep siltation to a minimum.

5. The bed preparation and setting of the culvert(s) shall be accomplished with a backhoe or other equipment working from the bank.

6. Culvert fill shall be sufficient to direct runoff away from the stream. Ditches or similar methods may be necessary to accomplish this.

DEPARTMENT OF WILDLIFE

Jerry D Smith FOR DIRECTOR

ADDITIONAL PROVISIONS

August 29, 1988
Date

Approval given to ..... Seattle City Light .....

Stream or Lake ..... See Attached .....

Type of Project ..... See Attached .....

PROVISIONS:

7. The enclosed Technical Provisions are part of this approval.

Enclosure: Technical Provisions - Culvert Installation

SEPA: Exempt
Field Investigator, Art Stendal, 424-1260
cc: Dan Adkinson, Agent
Jim Johnston, Fish Biologist

7. CULVERT INSTALLATION

7-1 Culverts shall be designed and constructed so as not to impede fish passage.

7-2 The culvert shall be of a sufficient size to pass the fifty-year flood level. Exception shall be granted if applicant provides design criteria to support a more appropriate level.

7-3 Disturbance of the bed of a watercourse shall be held to a minimum and affected bed areas shall be restored to preproject condition following installation of the culvert.

7-4 Fill associated with the culvert installation shall be protected from erosion.

7-5 Culverts shall be designed and constructed to avoid inlet and outlet scouring.

7-6 The culvert facility shall be maintained, in perpetuity, by the owner(s), such that fish passage is not impeded.

STREAM INVENTORY FOR SKAGIT RIGHT-OF-WAY

DATE: May 05, 88
REPORT: REPORT1

SPAN	SCL#	NAME	WRIA/WDF#	DNR TYPE	ANADROMOUS	RESIDENT	ACCESS	TYPE	CROSSING COND.	COMMENTS
D47/19N	51	No Name	03/01-1093	3	?	?	Yes	C/B	Good	Dry drainage on 12/87 field visit/barely distinguish creek bed. 12" culvert w/wooden bridge above - check w/ JB
D47/42N	52	No Name	03/01-1090	3	(Co),(Ch)	?	Yes	B-W	Fair	Crosses Wayne's property - Wayne dredged channel/No SCL plans to alter bridge.
D48/12N	53	Beverly	03/01-1091	3	?	?	Yes	B-W	Poor	Tansy site. Wooden bridge in poor shape/May replace. Intermittent stream
D49/05N	54	No Name	03/04-1067	3	(Co),(Ch)	?	Yes	C-S	Good	Gravel access road to private homes/stream flowing well over small cobble. 36" culvert extends just beyond road
D49/27N	55	No Name	03/01-(*)	5	?	?	Yes	*	*	No apparent stream/pasture land
D49/39N	56	No Name	03/01-(*)	5	?	?	Yes	*	*	No apparent stream/pasture land
D51/31N	60	No Name	03/01-(*)	*	?	?	Yes	C-A	*	Small crk, average flow after rains (visited 3/8) large culv. 36-42"?/substrate large and small cobble/overgrown alder/bracken/no drop/prob. drainage from slopes.
D56/36N	64	Flume Crk	03/01-0688	3	(Co),(Ch),(None	?	Yes	C-A	*	One mainstem and small trib both cross rd./mainstem = 3 ft culv, substrate sand, gravel, some larger rx. Salmonberry, ferns,moss. 1 ft drop on main, 6" on sml trib (24" culv). Easily handling flow.
D58/13N	66	No Name	03/01-0680	3	?	?	Yes	C-S	Good	3 ft culvert looks like older/rusted steel/pooling at both ends, green, mossy, wood beams above/Spirea, salmonberry, sandy gravel. Culvert half full (3/8 during rain). Hilt Creek - trib.

	SPAN	SCL#	NAME	WRIA/WDF#	DNR TYPE	ANADROMOUS	RESIDENT	ACCESS	TYPE	CROSSING COND.	COMMENTS
	D59/09N	67	No Name	03/01-(*)	*	?	?	Yes	Ford	Fair	Looks like drainage, no culvert, Ford - some pooling on road during rain. Concrete ford. Steep slope upstream.
	D59/35N	68	Hilt Crk	03/01-0678	3	Co,Ch,Pk	?	Yes	C-A	Good	Also Hilt Crk - Large 1-6 ft culv/strong flow/major bank disturbance/flat dikeson either side/possibility of some re-veg. Downside of culv drops 1-2 feet, some rocks make flume. Clayey looking soil
	D60/10N	69	No Name	03/01-(*)	5	?	?	Yes	C-C	Fair	3/8 - 2 ft concrete culv/lrge cobble/some salal,sword fern, sedge/ 1ft drop on down side, size looks OK
	D61/47N	73	No Name	03/01-(*)	1	?	?	Yes	C-S	*	Three streams converge in this area/tribs to Barn.Slough - possibly go underground/couldn't find Rockport/Cascade highway crossing.
*	D61/47N	71	No Name	03/04-(*)	5	(None)2	Yes(2)	Yes	C-S	Good	3 ft drop on hanging culvert/maybe build steps if WDF or WDW determines yes. Some good pools/small cobble/
*	D62/20N	75	No Name	03/01-(*)	5	Possibly (2)	Probably	Yes	*	*	Site visit 1/5 - Flow good, large cobble, possible anad, probably res
	D62/48N	76	Illabot	03/04-1346	1	Ck,Co,Ch,Pk	Yes	Yes	*	*	Gravel Access/No crossing, but str floods/need to maintain tower access, may need individual HPA.
	D67/35N	81	Olson Crk	03/04-1747	3	Co,Ch5,(Pk),St3	Rb3,Ct3,	Yes	B-W	Out	Bridge scheduled for replacement/will need individual HPA
*	D71/47N	84	No Name	03/04-(*)	*	?	?	Yes	F-G	Ford	Small trib to BaconCrk - D.S. wants to put in culvert. Poss. salmon use in Fall/Winter - strm dries up summer/intermittent
	D73/28N	86	No Name	03/01-(*)	*	?	?	Yes	C-S	*	No Site Visit - Steep area, Mostly seepage drainage (9) - Dennis

SPAN	SCL#	NAME	WRIA/WDF#	DNR TYPE	ANADROMOUS	RESIDENT	ACCESS	TYPE	CROSSING COND.	COMMENTS
B74/22N	95	No Name	03/04-(*)	*	?	?	Yes	C-S	*	
D73/38N	87	No Name	03/04-(*)	5	?	?	Yes	*	*	Line splits into 2 here. This stream also on "B" line/ No site visit/Steep upstream slopes A.S. res fish unlikely
D73/47N	88	No Name	03/04-(*)	5	?	(None)2	Yes	*	*	Also on "B" line - No site visit/Steep upstream slopes, A.S. - res fish unlikely
D74/45N	90	No Name	03/04-(*)	*	(None)2	(None)2	Yes	C-S?	*	Culvert on North Side/Flows intermittent steep slopes/

Attachment C

DATE: ********
rptname

STREAM INVENTORY FOR SKAGIT RIGHT-OF-WAY
-Stream Numbers and Legal Descriptions-

SCL#	SPAN	DIST/TWR	NAME	4S/4S/S.	TOWN/RGE	USGS MAP
51	D47/19N	0	No Name	NW4/SW4/S.12	T.32N,R.9E	Darrington
52	D47/42N	550	No Name	SE4/SE4/S.1	T.32N,R.9E	Darrington
53	D48/12N	900	Beverly Crk	NW4/S.6	T.32N,R.10E	Darrington
54	D49/05N	600	No Name	E2/SW4/S.31	T.33N,R.10E	Darrington
55	D49/27N	700	No Name	SW4/NE4/S.31	T.33N,R.10E	Darrington
56	D49/39N	1000	No Name	N2/NE4/S.31	T.33N,R.10E	Darrington
58	D50/31N	150	No Name	NE4/S.30	T.33N,R.10E	Darrington
59	D51/12N	0	No Name	SW4/SW4/S.20	T.33N,R.10E	Darrington
60	D51/31N	700	No Name	E2/E2/S.20	T.33N,R.10E	Darrington
61	D52/03N	200	No Name	SW4/SW4/S.17	T.33N,R.10E	Darrington
62	D52/38N	100	No Name	E2/NE4/S.18	T.33N,R.10E	Darrington
63	D54/09N	600	Rinker Crk	W2/SE4/S.6	T.33N,R.10E	Darrington
64	D56/36N	500	Flume Crk	SE4/SW4/S.30	T.34N,R.10E	Rockport
65	D57/10N	0	Sauk Rvr	S.19	T.34N,R.10E	Rockport
66	D58/13N	400	No Name	SE4/SE4/S.18	T.34N,R.10E	Rockport
67	D59/09N	400	No Name	SE4/NW4/S.17	T.34N,R.10E	Rockport
68	D59/35N	500	Hilt Crk	NE4/SW4/S.8	T.34N,R.10E	Rockport
69	D60/40N	600	No Name	SW4/S.5	T.34N,R.10E	Rockport
70	D61/11N	700	No Name	NE4/SW4/S.4	T.34N,R.10E	Rockport
71	D61/20N		No Name	SE4/NW4/S.4	T.34N,R.10E	Rockport
72	D61/33N	1800	No Name	NE4/S.4	T.34N,R.10E	Rockport
73	D61/47N	450	No Name	SE4/SE4/S.33	T.35N,R.10E	Illabot
74	D61/17N	1450	No Name	NE4/SE4/S.33	T.35N,R.10E	Illabot
75	D62/20N	200	No Name	NE4/SE4/S.33	T.35N,R.10E	Rockport
76	D62/48N	450	Illabot Crk	NW4/NW4/S.34	T.35N,R.10E	
77	D63/05N	?	Illabot Crk	SW4/SW4/S.27	T.35N,R.10E	
78	D64/24N		Skagit Rvr	S.22	T.35N,T.10E	Marblemt
79	D64/45N		Corkindale	NW4/S.23	T.35N,R.10E	Marblemt
80	D67/22N	200	Backus Crk	SW4/NE4/S.12	T.35N,R.10E	Marblemt
81	D67/35N	700	Olson Crk	NW4/NE4/S.12	T.35N,R.10E	Marblemt
82	D69/37N	1000	Diobsud	SE4/SE4/S.31	T.36N,R.11E	Marblemt
83	D71/33N	900	Bacon Crk	SE4/SW4/S.20	T.36N,R.11E	Marblemt
84	D71/47N	?	No Name	NW4/SW4/S.21	T.36N,R.11E	Marblemt
85-	D72/24N	?	No Name	NW4/SE4/S.21	T.36N,R.11E	Marblemt
86	D73/28N	?	No Name	SW4/SW4/S.15	T.36N,R.11E	Marblemt
95	B74/22N	1300	No Name	NW4/SE4/S.10	T.36N,R.11E	Marblemt
96	B75/18N	?	No Name	NE4/NW4/S.11	T.36N,R.11E	Marblemt
87	D73/38N	700	No Name	NE4/SW4/S.15	T.36N,R.11E	Marblemt
88	D73/47N	?	No Name	SE4/NW4/S.15	T.36N,R.11E	Marblemt
89	D74/31N	1000	No Name	SE4/SE4/S.10	T.36N,R.11E	Marblemt
90	D74/45N	500	No Name	NW4/SW4/S.11	T.36N,R.11R	Marblemt
91	D75/37N	?	Damnation	NE4/NW4/S.11	T.36N,R.11E	Marblemt
92	D75/51N	200	Sky Crk	NE4/SE4.S.2	T.36N,R.11E	Marblemt
93	D76/33N	?	No Name	NW4/S.1	T.36N,R.11E	Marblemt
94	D77/45N	600	Thorton Crk	SE4/NE4/S.36	T.37N,R.11E	Marblemt
97	D78/07N	?	No Name	SE4/NE4/S.36	T.37N,R.12E	Marblemt
98	D78/20N	?	No Name	NW4/NW4/S.31	T.37N,R.12E	MArblemt
99	D79/09N	206	L. Goodell?	NW4/SE4/S.30	T.37N,R.12E	Marblemt