APPENDICES A-G

Appendix A

USFWS Correspondence

Department of Energy
Western Area Power Administration
Sierra Nevada Customer Service Region
114 Parkshore Drive
Folsom, California 95630-4710

MAY 18 2006

Ms. Holly Herod
Chief, Sacramento Valley Branch
United States Department of the Interior
United States Fish and Wildlife Service
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

Dear Ms. Herod:

This letter is a request to open dialogue and establish informal Section Seven consultation between the Western Area Power Administration (Western) and the United States Fish and Wildlife Service (USFWS) regarding Western's North Area Right-of-Way (ROW) Maintenance Project.

Western would like to extend an invitation to USFWS to attend an inter-agency meeting to discuss the data collected and the approach to preparation of the Environmental Assessment. The meeting is scheduled for June 28, 2006, at the Red Lion Inn in Redding, California. A project newsletter will be published shortly that contains final details of the meeting.

Western appreciates your coordination with our office. We look forward to working with USFWS on the North Area ROW Maintenance Project. If you have any questions, please contact Mr. Steve Tuggle at (916) 353-4549 or tuggle@wapa.gov.

Sincerely,

Cherie Johnston-Waldear

Cherie Johnston-Waldear
Acting Natural Resources Manager

cc:
Mr. Tom Murphy
Aspen Environmental Group
8801 Folsom Blvd., Suite 290
Sacramento, CA 95826

AUG 31 2007

Mr. Justin Cutler
Senior Biologist
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, CA 95825

Dear Mr. Cutler:

Please find one enclosed hard copy and one electronic copy of the Preliminary Draft Biological Assessment for the North Area Right-of-Way Maintenance Project. This document is a working draft intended to foster discussion regarding the content of and approach to preparing the Draft and Final Biological Assessments.

At the meeting scheduled for October 2, 2007, at 10:00 a.m., we look forward to discussing the following, among other items:

Project Conservation Measures for listed plants
Estimation of incidental take
Questions and concerns that have come up during your review of the document

If you have any questions, please do not hesitate to contact me at (916) 353-4549 or tuggle@wapa.gov.

Sincerely,

ORIGINAL SIGNED BY

Steve Tuggle
Natural Resources Manager

Enclosure (1)

MAY 7 2009

Ms. Jana Milliken
Branch Chief
Sacramento Valley Branch
U.S. Fish and Wildlife Service
2800 Cottage Way, Room W-2605
Sacramento, CA 95825

Dear Ms. Milliken:

Please find one enclosed hard copy of the Biological Assessment (BA) for the Western Area Power Administration's (Western) North Area Rights-of-Way Maintenance (North Area) Project. For convenience of preparing a concurrence letter and any other documentation, an electronic copy has been affixed to the back cover of the hard copy document. The BA analyzes the effects of Western's routine operations and maintenance activities on the Federally-listed species and designated critical habitats that are under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS) and that have potential to occur within the Project area. A separate BA addressing listed species and their critical habitats under the jurisdiction of the National Marine Fisheries Service (NMFS) was prepared and sent for review by NMFS.

As the lead Federal agency, Western has made the determination of may affect, but not likely to adversely affect large-flowered fiddleneck, palmate-bracted bird's beak, Contra Costa goldfields, Hartweg's golden sunburst, Hoover's spurge, Butte County meadowfoam, Greene's tuctoria, Solano grass, slender orcutt grass, hairy orcutt grass, Antioch Dunes evening primrose, conservancy fairy shrimp, Delta green ground beetle, longhorn fairy shrimp, valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, Delta smelt, Lost River sucker, shortnose sucker, California red-legged frog, California tiger salamander, Oregon spotted frog, Alameda whipsnake, giant garter snake, northern spotted owl, western yellow-billed cuckoo, San Joaquin kit fox, and Pacific fisher. Additionally, Western has determined that critical habitat designated for Hoover's spurge, Butte County meadowfoam, Greene's tuctoria, hairy orcutt grass, conservancy fairy shrimp, Delta green ground beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, Delta smelt, California tiger salamander, and northern spotted owl will not be adversely modified by any activity proposed by the North Area Project. These determinations are based on the approach that if the proposed standard operating procedures and project conservation measures cannot be adhered to for a specific action, then that actions falls outside of the scope of this consultation and would require its own individual consultation.

The U.S. Forrest Service, Bureau of Land Management, and National Parks Service – as cooperating agencies – agree with this approach and the determinations. Additionally, Western has been informally consulting with USFWS over the past three years with Jason Hanni and Terry Adelsbach as our most recent points of contact. Western now requests concurrence from USFWS with the above-listed determinations for the North Area Project. If you have any questions, please do not hesitate to contact Ms. Ami Goerdt at (916) 353-4526 or goerdt@wapa.gov.

Sincerely,

ORIGINAL SIGNED BY

Stephen Tuggle
Natural Resources Manager

Enclosure

cc:

Ms. Stacy Smith
USDA Forest Service
Shasta Trinity, Lassen, Modoc NF
3644 Avtech Parkway
Redding, CA 96002

Mr. Howard Matzat
BLM
Redding Field Office
355 Hemsted Drive
Redding, CA 96002

Ms. Barbara Alberti
National Park Service-DOI
P.O. Box 118
Whiskeytown, CA 96095

bcc:
N1400, N1417, N1411, N5000 (w/o enclosure)

N1417:A.Goerdt:X4526:AW:5/6/09
R:\Groups\W_PROCES\WP_DIRS\ENV\Goerdt\090501_NAEA final BA cover letter.docx

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

In Reply Refer To:
81420-2009-I-0743-1

OCT 09 2009

Mr. Steven Tuggle
Western Area Power Administration
114 Parkshore Drive
Folsom, California 95630-4710

Subject: Programmatic Informal Consultation for the Western Area Power Administration (Western) North Area Right of Way Operations and Maintenance Project, from Klamath County, Oregon through Alameda County, California

Dear Mr. Tuggle:

This is in response to your May 7, 2009, letter requesting that the U.S. Fish and Wildlife Service (Service) concur with your determination that the proposed Western North Area Right of Way Operations and Maintenance Project (proposed project) may affect, but is not likely to adversely affect the federally-listed species and designated critical habitat outlined below in Table 1. Our primary concern and mandate is the protection of federally-listed species and this response has been prepared in accordance with section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act). At issue are potential effects to the following species and/or critical habitat that that may occur within the proposed project's action area as defined in 50 CFR §402.02 as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action."

Table 1:

Listed Species and Designated Critical Habitat	**Status**
Mammals	
San Joaquin kit fox (*Vulpes macrotis mutica*)	Endangered
Reptiles and Amphibians	
giant garter snake (*Thamnophis gigas*)	Threatened
Alameda whipsnake (*Masticophis lateralis euryxanthus*)	Threatened
California red-legged frog (*Rana aurora draytonii*)	Threatened

California tiger salamander (*Ambystoma californiense*) and designated critical habitat	Threatened

Fish

delta smelt (*Hypomesus transpacificus*) and designated critical habitat	Threatened

Invertebrates

vernal pool fairy shrimp (*Branchinecta lynchi*) and designated critical habitat	Threatened
vernal pool tadpole shrimp (*Lepidurus packardi*) and designated critical habitat	Endangered
Conservancy fairy shrimp (*Branchinecta conservatio*) and designated critical habitat	Endangered
longhorn fairy shrimp (*Branchinecta longiantenna*)	Endangered
delta green ground beetle (*Elaphrus viridis*) and designated critical habitat	Threatened
valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	Threatened
Shasta crayfish (*Pacifastacus fortis*)	Endangered

Plants

Contra Costa Goldfields (*Lasthenia conjugens)*	Endangered
Butte County meadowfoam (*Limnanthes floccosa* sp. *californica*)	Endangered
Hoover's spurge (*Chamaesyce hooveri*) and designated critical habitat	Threatened
Hairy Orcutt grass (*Orcuttia pilosa*) and designated critical habitat	Endangered
Slender Orcutt grass (*Orcuttia tenuis*) Threatened and designated critical habitat	
Greene's tuctoria (*Tuctoria greenei*) and designated critical habitat	Endangered
Solano grass (*Tuctoria mucronata*)	Endangered
Colusa grass (*Neostapfia colusana*)	Threatened
large-flowered fiddleneck (*Amsinckia grandiflora*)	Endangered
palmate-bracted bird's beak (*Cordylanthus palmatus*)	Endangered
Hartweg's golden sunburst (*Pseudobahia bahiifolia*)	Endangered

Birds

Northern Spotted Owl (*Strix Occidentalis caurina*) and designated critical habitat	Endangered

The purpose of this programmatic informal consultation (programmatic) is to allow Western to implement the majority of their operations and maintenance (O&M) along their right-of-way pursuant to the guidelines established by this document. This programmatic also establishes a streamlined review process for Western activities conducted as part of the proposed project that do not meet the criteria stated below or that were not presented in the April 2009 Biological Assessment (BA). This streamlined review will determine if proposed O&M activities meet the criteria established by this consultation for avoiding an adverse affect or if Western needs to initiate formal consultation. The streamlined review process will be memorialized between the Service and Western prior to the first annual reporting meeting. Western and the Service have agreed to meet annually regarding the implementation and effectiveness of this informal consultation process in allowing Western to conduct their operations and maintenance activities while ensuring these activities do not adversely affect listed species or designated critical habitats. The Service concurs with your determination that the proposed project may affect not likely to adversely affect (NLAA), for all activities within category A, and all activities within category B, with the exception of activities within the sub-category Transmission Line Maintenance.

This consultation is based upon the following information: (1) the *August 2007, Preliminary Draft Biological Assessment;* (2) the *July 2008 Draft Environmental Assessment for the North Area Right-of-Way Maintenance Program;* (3) the May 7, 2009, letter of initiation from Western (4) the April 2009, *Biological Assessment for the North Area Right-of-Way Maintenance Program;* (5) a September 29, 2009, email from Western requesting an addendum to the project description and project conservation measures for the northern spotted owl; and (6) other information available to the Service. A complete administrative record is on file at the Sacramento Fish and Wildlife Office.

Informal Consultation History

On May 18, 2006, Western sent a request to the U.S. Fish and Wildlife Service to initiate a dialog regarding the proposed project and invited the Service to an inter-agency meeting on June 28, 2006, in Redding, California. On June 28, 2006, a representative of the Service attended the meeting in which Western introduced the project. Agency representatives included staff from the U.S. Forest Service (USFS), Bureau of Land Management (BLM), and National Park Service (NPS). Representatives of the Service, Western, and Aspen Environmental Group (Aspen) have held several meetings and conference calls (July 18, 2006; September 17, 2008; October 14, 2008; February 19, 2009; May 21, 2009) to discuss the North Area project, the consultation strategy, and the relationship to Western's current 1998 programmatic biological opinion (Service File Number 1-1-97-F-140). On May 7, 2009, the Service received an initiation letter from Western.

Project Description

The action area for the proposed project includes approximately 800 miles of transmission lines and associated right-of-ways, 250 miles of access roads, and existing substation and communication facilities. Western owns, operates, and maintains all or a portion of fifteen 230kV

transmission lines and one 500 kV transmission line that occur within portions of Modoc, Siskiyou, Shasta, Trinity, Tehama, Butte, Yuba, Glenn, Colusa, and Sutter Counties, California, and Klamath County, Oregon. These lines include the Central Valley Project (CVP) and the Pacific Alternating Current Intertie (PACI) transmission lines. Additionally, Western operates and maintains the California-Oregon Transmission Project (COTP), which is owned by the Transmission Agency of Northern California, and is composed of a 500kV line that extends from the Captain Jack Substation in Klamath County, Oregon, to the Tesla Substation in Alameda County, California. These three transmission systems, along with access and maintenance roads, comprise the action area.

Routine operation and maintenance activities include aerial inspections, ground inspections, climbing inspections, vegetation management, and maintenance activities. These O&M activities have been separated into three categories (A, B, C), as determined by their potential for adverse effects to listed species. Western has additionally developed a Geographical Information System (GIS) database to assist them in determining which species may occur in the action area based on data from the California Natural Diversity Database, Service species lists, species range maps, and technical experts at the Service, USFS, BLM, and NPS. The GIS database has been developed to assist Western and their contractors in project planning and implementation. Western intends to use this system in implementing the O&M program to: 1) identify non-sensitive areas in which effects to listed species is not likely, thus avoidance and minimization measures are unnecessary; 2) areas in which avoidance and minimization measures such as the species-specific project conservation measures (PCMs) and standard operating procedures (SOPs) developed by Western are required to avoid adverse effects to listed species, and; 3) and areas in which no work can occur without additional coordination and approval from Western's Natural Resources Department and the Service. A complete list of the categorical actions and a more detailed description of the proposed project can be found in the April 2009 BA.

All activities meeting the criteria established for each category as described below will be considered as to NLAA listed species. This determination requires strict adherence to the SOPs and PCMs as identified in the April 2009 BA. Those projects not meeting the criteria below or that cannot fully implement all required SOPs and PCMs will be subject to individual Service review to determine if additional measures are necessary to avoid adverse impacts or if formal consultation is necessary. Any activities proposed within San Joaquin County may fall under the San Joaquin Multi Species Conservation Plan (SJMSCP). Western must contact the San Joaquin Council of Governments to receive coverage for their any proposed activities within this area.

The categorical criteria are as follows:

Category A

Category A activities includes inspection and minor maintenance activities. These types of activities include existing substation maintenance, aerial inspections, ground inspections, and minor transmission line maintenance (e.g., no ground disturbance or heavy equipment use necessary).

1. Western will follow the SOPs and PCMs as proposed for Category A activities.

2. All Category A activities identified in the April 2009 BA are approved for inclusion under this consultation for those species and critical habitats outlined in Table 1.

3. Western will consult with the Service on any future projects not identified within the BA if they may affect any listed or proposed species or designated or proposed critical habitat.

Category B

Category B activities are mostly routine maintenance activities. Equipment is limited to rubber-tired vehicles such as bucket trucks, backhoes, front-end loaders, cranes, auger trucks, bobcats, and pole trucks.

1. Western will follow the SOPs and PCMs proposed for Category B activities.

2. For those activities that cannot fully implement all necessary SOPs and PCMs, Western will be required to consult with the Service to determine if additional measures are necessary to avoid any adverse affects to listed species or if formal consultation is necessary.

3. All Category B activities identified in the April 2009 BA are approved for inclusion under this consultation with the following exceptions:

    a. Western will consult with the Service on any future projects not identified within the Biological Assessment if they may affect any listed or proposed species or designated or proposed critical habitat.

    b. Activities included in the sub-category Transmission Line Maintenance have the potential to result in adverse effects to listed species or designated critical habitats. Western is required to consult with the Service to determine if these activities meet the criteria established by this programmatic or if formal consultation is necessary.

    c. Western is required to consult with the Service when any ground disturbing activities are proposed within critical habitat to determine if additional measures are necessary to avoid any adverse affect.

    d. For those activities that occur within the range of the delta smelt or in delta smelt critical habitat, Western will adhere to National Marine Fisheries Service and California Department of Fish and Game fish screen criteria (http://swr.ucsd.edu/hcd/fishscrn.htm, and http://iep.water.ca.gov/cvffrt/DFGCriteria2.htm) for delta smelt. In addition all in-water work will adhere to the work window of August 1-November 30 and adhere to approach velocity of 0.2 ft/sec or less during pumping.

Category C

Category C activities include larger scale transmission line and communication system maintenance of existing facilities as well as construction and/or installation of new facilities and infrastructure. Category C activities have the potential to disturb large areas caused by utilizing heavy equipment such as steel-tracked and/or rubber tired bulldozers, graders, backhoes, and front-end loaders to complete particular tasks. Due to the potential for significant ground disturbance and adverse effects to listed species and designated critical habitats, Category C activities are not covered by this consultation. However, Western has included them in the April 2009 BA to give the Service an idea of the types of larger scale activities that could occur as part of the proposed project. Western will submit these activities on an individual basis through an expedited review process. The Service will then determine if a specific activity meets the criteria established in this document for concurring with a not likely to adversely affect, or if Western needs to initiate formal consultation with the Service.

Conclusion

Based on the proposed project, including the SOPs, and the PCMs described in the April 2009 BA, the Service looked at all possible effects of the action, their overlap with the species and designated critical habitat outlined in Table 1, and determined that those activities meeting all the required criteria detailed above are not likely to adversely affect the listed species and designated critical habitat included in this consultation. Therefore, no further action pursuant to the Act is necessary unless new information reveals effects of the proposed action that may affect listed species or designated critical in a manner or to an extent not considered; the action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this determination; or a new species or critical habitat is designated that may be affected by the proposed action. Should any of these things occur, our concurrence with your "not likely to adversely affect" determination must be re-evaluated. In such a case, Western must consult with the Service, either formally or informally, to ensure compliance with the Act.

Please contact Jason Hanni, Staff Biologist, or Jana Affonso, the Sacramento Valley Branch Chief, at (916) 414-6645 if you have any questions regarding this correspondence for the North Area Right of Way Operations and Maintenance Project.

Sincerely,

Peter A. Cross
Deputy Assistant Field Supervisor

cc:
Cliff Harvey, State Water Resources Control Board, Sacramento, California
Stacey Smith, USDA Forest Service, Redding, California

Howard Matzat, Bureau of Land Management, Redding, California
Barbara Alberti, National Park Service, Whiskeytown, California
Trisha Roninger, United States Fish and Wildlife Service, Klamath Falls, Oregon
Michelle Havens, United States Fish and Wildlife Service, Red Bluff, California

Appendix B

NMFS Correspondence

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Sacramento Area Office
650 Capitol Mall, Suite 8-300
Sacramento, California 95814-4706

SNR ROUTING

CODE	INITIAL	DATE
N0000		
N0010	/	
N1000		
N2000		
N4000	/	
N5000		
N6000		
N8000	/	
Library/Recycle		
F/Code		

January 31, 2005

In Response Refer To:
151422SWR2005SA2021:HLB

James D. Keselburg
Regional Manager
Department of Energy
Western Area Power Administration
Sierra Nevada Customer Service Region
114 Parkshore Drive
Folsom, California 95630-4710

Dear Mr. Keselburg:

This letter responds to your January 7, 2005 notice to prepare an Environmental Assessment (EA) regarding proposed changes in operation and maintenance procedures along Western Area Power Administration's (WAPA) North Area Transmission Line Right-of-Way. Your letter announced that WAPA will conduct a meeting on February 2, 2005 to solicit input from Federal and State agencies concerning the project. The National Marine Fisheries Service (NOAA Fisheries) is providing written comments.

The North Area Transmission Line Right-of-Way generally extends from Klamath County in Southern Oregon, southwest towards Redding, California, and continues south, along the eastern side of the Sacramento Valley toward Sacramento, California. Other segments of the North Area Transmission Line extend from Lewiston Lake, in Trinity County California, southeast to Redding, and from Maxwell, California southeast toward Sacramento, California.

Based on the map provided in your notice, the North Area Transmission Line appears to cross numerous streams that support populations of Federally listed endangered Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*), threatened Central Valley spring-run Chinook salmon (*O. tshawytscha*), threatened Central Valley steelhead (*O. mykiss),* and Central Valley fall/late fall-run Chinook salmon (*O. tshawytscha*), a Federal species of special concern. Some of these streams also contain designated critical habitat for Sacramento River winter-run Chinook salmon, proposed critical habitat for Central Valley spring-run Chinook salmon and Central Valley steelhead, or essential fish habitat (EFH) of Pacific Salmon.

Because of the location of the project in relation to populations of Federally listed anadromous fish populations, there is a potential for the proposed project to affect salmon, steelhead, and their habitat. NOAA Fisheries recommends that WAPA initiate consultation pursuant to section

7(a)(2) of the Endangered Species Act (ESA). Consultation is necessary if a Federal action may affect listed species or their critical habitat. If the action may affect listed species or their habitat, but is not likely to result in adverse effects, informal consultation may be initiated. An informal consultation is appropriate only when it can be clearly demonstrated that the effects of the proposed action on listed salmonids are expected to be discounted (*i.e.*, extremely unlikely to occur), insignificant (*i.e.*, the impacts of the proposed project should never reach the scale where take of listed species or adverse modification of designated critical habitat occurs), or completely beneficial (*i.e.*, positive effects without any adverse effects to listed species). If the action is likely to adversely affect listed species, formal consultation must be initiated by the action agency. WAPA should develop a biological assessment (BA) for the project using the best scientific and commercial information available to analyze the potential direct, indirect, and cumulative effects of the project on anadromous fish and their habitat, as well as the effects of interrelated and interdependent actions. Where adverse impacts are unavoidable, WAPA should work with NOAA Fisheries to develop adequate minimization and compensation measures to ensure the conservation of anadromous salmonids and their habitat.

If you have any questions regarding this correspondence or if NOAA Fisheries can provide further assistance on this project, please contact Mr. Howard Brown in our Sacramento Area Office, 650 Capitol Mall, Suite 8-300, Sacramento, California 95814. Mr. Brown may be reached by telephone at (916) 930-3608, or by Fax at (916) 930-3629.

Sincerely,

Michael E. Aceituno
Supervisor, Sacramento Area Office

cc: NOAA Fisheries-PRD, Long Beach, California
NOAA Fisheries-HCD, Santa Rosa, California

AUG 1 2 2005

Michael E. Aceituno
Supervisor, Sacramento Area Office
United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814-4706

Dear Mr. Aceituno:

Thank you for your comments regarding the Western Area Power Administration's (Western) North Area Right-of Way (ROW) Maintenance Project. Your recommendation to initiate consultation pursuant to Section 7(a)(2) of the Endangered Species Act is noted and appreciated. Western would like to reiterate our invitation for the National Oceanic and Atmospheric Administration (NOAA Fisheries) to become a cooperating agency for this Project as stated in Western's letter to your office dated February 17, 2005.

As described in our February 17, 2005 letter, the proposed action for this project involves changes in operations and maintenance (O&M) procedures along Western's North Area transmission line ROW and the Transmission Agency of Northern California's California-Oregon Transmission Project ROW. These proposed changes include the expanded use of herbicides in combination with manual and mechanical vegetation removal methods and promotion of low growing plant communities. In addition, erosion repair, geotechnical borings, and fiber optics installation may be added to the current routine ROW O&M procedures.

An Environmental Assessment (EA) is under preparation in response to the proposed expansion of existing O&M methods that are currently allowed under the Biological Opinion (BO) with the U.S. Fish and Wildlife Service and the Programmatic Agreement (PA) with the California State Office of Historic Preservation. Western's National Environmental Policy Act documentation will support Section 7 consultation activities under the Endangered Species Act and Section 106 consultation activities under the National Historic Preservation Act for those activities that are not covered under the current BO or PA.

The Project Area extends along Western's transmission line ROW from Modoc County in northeastern California, southwest towards Redding, and continues south, along the eastern side of the Sacramento Valley toward Sacramento, California. Other segments of the ROW extend from the Trinity Reservoir in Trinity County, southeast to Redding and from Maxwell, California southeast toward Sacramento and to Tesla.

Western has reviewed the NOAA Fisheries' preliminary concerns regarding the potential for the Project to affect salmon and steelhead and their habitat. Western will work with the NOAA Fisheries to assure that the issues raised in your letter dated January 31, 2005, are adequately addressed and appropriate measures are taken to minimize impacts and ensure the conservation of anadromous salmonids and their habitat.

As a Cooperating Agency, NOAA Fisheries would be invited to provide input on the scope of the EA, review the biological and cultural resource survey data collected in the field, and provide comments on the Draft EA prior to public release. Western understands that Mr. Howard Brown of the Sacramento office will be the point of contact for this project. We will keep Mr. Brown up to date on all project activities and decisions.

Western looks forward to NOAA Fisheries' involvement in the North Area ROW Maintenance Project. If you have any questions, please contact me at (916) 353-4549 or tuggle@wapa.gov.

Sincerely,

Steve Tuggle
Project Manager
Western Area Power Administration
Sierra Nevada Region

N1415:STuggle:ll:8/2/05
R:\Groups\W_PROCES\WP_DIRS\ENV\Tuggle\050803_CoopAgency letter-NOAA.doc

Department of Energy
Western Area Power Administration
Sierra Nevada Customer Service Region
114 Parkshore Drive
Folsom, California 95630-4710

MAY 18 2006

Mr. Michael E. Aceituno
Supervisor, Sacramento Area Office
United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
650 Capitol Mall, Suite 8-300
Sacramento, California 95814-4706

Dear Mr. Aceituno:

This letter is a request to continue dialogue and establish informal Section Seven consultation between the Western Area Power Administration (Western) and the National Marine Fisheries Service (NMFS) regarding Western's North Area Right-of-Way (ROW) Maintenance Environmental Assessment Project.

Western would like to extend an invitation to NMFS to attend an inter-agency meeting to discuss the data collected and the approach to preparation of the Environmental Assessment. The meeting is scheduled for June 28, 2006, at the Red Lion Inn in Redding, California. A project newsletter will be published shortly that contains final details of the meeting.

Western appreciates your coordination with our office. We look forward to working with NMFS on the North Area ROW Maintenance Project. If you have any questions, please contact Mr. Steve Tuggle at (916) 353-4549 or tuggle@wapa.gov.

Sincerely,

Cherie Johnston-Waldear

Cherie Johnston-Waldear
Acting Natural Resources Manager

cc:
Mr. Howard Brown
United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
650 Capitol Mall, Suite 8-300
Sacramento, California 95814-4706

Mr. Tom Murphy
Apsen Environmental Group
8801 Folsom Blvd., Suite 290
Sacramento, CA 95826

OCT 30 2007

Ms. Maria Rea
Sacramento Area Office Supervisor
National Marine Fisheries Service
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

Dear Ms. Rea:

Please find one enclosed hard copy and one electronic copy of the Preliminary Draft Biological Assessment (BA) for the North Area Right-of-Way (ROW) Maintenance Project. This document is a working draft intended to foster discussion regarding the content of and approach to preparing the Draft and Final Biological Assessments, including the analysis of federal species of concern.

We would appreciate the opportunity to meet with you at your earliest convenience to discuss this BA and the North Area ROW Maintenance Project. Please let us know if you have any questions or require additional information by contacting Ami Goerdt at (916) 353-4526 or at goerdt@wapa.gov.

Sincerely,

ORIGINAL SIGNED BY

Steve Tuggle
Natural Resources Manager

Enclosures (2)

APR 29 2008

Ms. Maria Rea
Sacramento Area Office Supervisor
National Marine Fisheries Service
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

Dear Ms. Rea:

The Western Area Power Administration's (Western) Sierra Nevada Region (SNR) is proposing to update its operations and maintenance activities and requests coordination within the National Marine Fisheries Service (NMFS) under section 7 of the Endangered Species Act, as amended. The purpose of this letter is to request a species list for Western's North Area Right-of-Way (ROW) Maintenance Environmental Assessment (EA) Project. This Project encompasses the northern portion of SNR that extends from Klamath County, Oregon, to San Joaquin County, California and crosses the counties of Modoc, Siskiyou, Shasta, Trinity, Tehama, Glenn, Colusa, Butte, Yuba, Yolo, Sacramento, Solano, Sutter, San Joaquin, Contra Costa, and Alameda (refer to enclosed Figure 1).

The Proposed Action includes expansion of Western's current operation and maintenance activities, including the expanded use of herbicides in combination with manual and mechanical vegetation removal methods to promote low growing plant communities. Other activities include, but are not limited to, erosion repair, geotechnical boring, and fiber optic installation. Implementation of the Proposed Action would ensure consistency with reliability, safety, and environmental regulations and policies, including the National Electric Safety Code, the Western Systems Coordinating Council, North America Electric Reliability Corporation Reliability Standards (Standard FAC-003-1 – Transmission Vegetation Management Program) and Western directives for protecting human safety and maintaining system reliability.

Western looks forward to the opportunity to work with the NMFS on the North Area ROW Maintenance EA Project. If you have any questions or need additional information, please contact Ami Goerdt at (916) 353-4526 or goerdt@wapa.gov.

Sincerely,

ORIGINAL SIGNED BY

Stephen Tuggle
Natural Resources Manager

Enclosure

bcc:
N1400
N1416

N1416:AGoerdt:x4526:AW:4/24/08
R:\Groups\W_PROCES\WP_DIRS\ENV\Goerdt\2008\080408_NAEA NMFS species list.doc

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Sacramento Area Office
650 Capitol Mall, Suite 8-300
Sacramento, California 95814-4706

May 21, 2008

Mr. Stephen Tuggle
Natural Resources Manager
U.S. Department of Energy
Western Area Power Administration
Sierra Nevada Customer Service Region
114 Parkshore Drive
Folsom, California 95630-4710

Dear Mr. Tuggle:

This is in response to your letter dated April 29, 2008, requesting a species list from NOAA's National Marine Fisheries Service (NMFS) for the Western Area Power Administration's North Area Right-of-Way Maintenance Environmental Assessment project. In your letter you identified a large geographic region in the state of California through which the Project's alignment could extend, including Modoc, Siskiyou, Shasta, Trinity, Tehama, Glenn, Colusa, Butte, Yuba, Yolo, Sacramento, Solano, Sutter, San Joaquin, Contra Costa, and Alameda counties. Your letter was received in our office on May 1, 2008.

NMFS has reviewed the information you provided with your April 29, 2008, letter. Available information indicates that the following listed species and/or designated critical habitat may occur in or downstream from the project areas:

Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*)
endangered (June 28, 2005, 70 FR 37160)
critical habitat (June 16, 1993, 58 FR 33212)

Central Valley spring-run Chinook salmon (*O. tshawytscha*)
threatened (June 28, 2005, 70 FR 37160)
critical habitat (September 2, 2005, 70 FR 52488)

Central Valley steelhead (*O. mykiss*)
threatened (January 5, 2006, 71 FR 834)
critical habitat (September 2, 2005, 70 FR 52488)

North American green sturgeon southern (*Acipenser medirostris*)
threatened (April 7, 2006, 71 FR 17757)

Please contact Mr. Doug Hampton at (916) 930-3610, or via email at Douglas.Hampton@noaa.gov, if you have any questions regarding this project or require additional information.

Sincerely,

for Maria Rea
Supervisor, Sacramento Area Office

cc: Copy to File - ARN #2008SA00177
NMFS-PRD, Long Beach, CA

DEC - 1 2008

Ms. Maria Rea
Sacramento Area Office Supervisor
National Marine Fisheries Service
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

Dear Ms. Rea:

Please find one enclosed hard copy of the Biological Assessment (BA) for the North Area Right-of-Way (ROW) Maintenance Project. For convenience of preparing a Biological Opinion, an electronic copy has been affixed to the back cover of the hard copy document. The BA analyzes the effects of the Western Area Power Administration's (Western) routine operations and maintenance activities on the Federally-listed anadromous fish species that have potential to occur within the Project area. A separate BA addressing listed species under the jurisdiction of the U. S. Fish and Wildlife Service (FWS) is being prepared for review by FWS.

Western has been informally consulting with the National Marine Fisheries Service over the past year with Mr. Doug Hampton as our point of contact. As the lead Federal agency, Western now requests formal consultation on the North Area ROW Maintenance Project for listed species addressed in the BA. Additionally, Western requests a conference consultation for the green sturgeon's proposed critical habitat.

Any additional suggestions you may have regarding mitigation or conservation would be appreciated. Please let us know if you have any question or require further information by contacting Ms. Ami Goerdt at 916-353-4526 or at goerdt@wapa.gov.

Sincerely,

ORIGINAL SIGNED BY
Ami Goerdt
for

Stephen Tuggle
Natural Resources Manager

1 Enclosure

cc: (w/ Enclosure:)
Ms. Irma V. Lagomarsino
Arcata Area Office Supervisor
National Marine Fisheries Service
1655 Heindon Road
Arcata, CA 95521

bcc:
(w/out Enclosure:)
N1400
N1417

N1417:A.Goerdt:X4526:A.W.:12/01/08
R:\Groups\W_PROCES\WP_DIRS\ENV\Goerdt\2008\081201_NAEA BA cover letter NMFS.doc

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

In response refer to:
2008/07762

DEC 23 2009

Mr. Stephen Tuggle
Natural Resources Manager
Western Area Power Administration
114 Parkshore Drive
Folsom, California 95630-4710

Dear Mr. Tuggle:

This letter is in response to your request for consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*), as it pertains to the Western Area Power Administration's (WAPA) proposed North Area Right of Way (ROW) Maintenance Program. The North Area ROW Maintenance Program includes a suite of actions associated with the routine maintenance of existing transmission lines and access road ROWs in order to ensure system reliability and safe all-weather access to transmission line structures and appurtenant facilities ranging over a large geographic area extending from Klamath County, Oregon just north of the California border, in a southerly direction to a substation just west and south of Tracy, California in San Joaquin County. Within this area there are also many streams and watersheds that contain habitat occupied by or supportive of several federally listed Evolutionarily Significant Units (ESU) and Distinct Population Segments (DPS), including the endangered Sacramento River winter-run Chinook salmon ESU (*Oncorhynchus tschawytscha*), threatened Central Valley spring-run Chinook salmon ESU (*O. tschawytscha*), threatened Central Valley steelhead DPS (*O. mykiss*), and threatened Southern DPS of North American green sturgeon (*Acipenser medirostris*), including their respective designated critical habitats. In order to streamline the process of consulting on routine activities associated with ROW and access road maintenance that are similar in scope and frequency, WAPA developed programmatic, activity, and species-specific criteria that are specifically designed to reduce potential effects to listed species resulting from individual and cumulative instances of covered activities to insignificant and discountable levels. The program, activities and criteria are described in detail in your November 2008 Biological Assessment (BA) for the North Area ROW Maintenance Program which was received in our office on December 2, 2008, and will hereinafter be referred to as the NAROW Program.

In addition, this letter includes NMFS's consultation regarding the potential of program related activities to adversely affect the essential fish habitat (EFH) of Pacific salmon pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSA). This letter also serves as consultation under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act of 1934 (FWCA), as amended.

Proposed Action

Within the area under consideration WAPA is responsible for the operations and maintenance of the following three transmission lines: the Central Valley Project (CVP), the Pacific Alternating Current Intertie (PACI), and the California-Oregon Transmission Project (COTP). These three lines collectively consist of roughly 800 miles of transmission line ROWs, 250 miles of access roads, and seven communication facilities. As outlined in the 2008 BA, the NAROW Program provides a detailed description of the various types of activities that are necessary in order to maintain overall system reliability and safe all-weather access to the transmission lines. These activities range from inspections to vegetation, access road, and transmission line maintenance, and include system component upgrades as well. Operations and maintenance activities have been grouped into three distinct categories based on the scope and frequency of the activity under consideration as well as the potential for the covered activity to disturb the surrounding area. Category A, for example, covers inspections and minor maintenance activities including aerial, ground, and climbing surveys, as well as some minor repairs to existing structures. All of the activities in Category A are low impact, relatively benign, and unlikely to require any specific conservation measures in order to avoid significant disturbances or adverse effects to sensitive resources. Category B refers to routine maintenance activities that include manual, mechanical, and herbicidal methods of vegetation management, some heavy equipment use that may result in minor amounts of ground disturbance, culvert maintenance, grading and fill of existing access roads, placement of rock around existing towers and structures, or other similar activities that are moderate in scope and frequency. Category B activities will typically involve the incorporation of best management practices and standard operating procedures in order to avoid any significant disturbances or adverse effects to sensitive resources. Finally, Category C activities refer to the development of new infrastructure such as access roads, culverts, foundations for storage buildings, erosion control projects, tower relocation, realignment, or replacement, and other activities that are more likely to disturb a large area or require the incorporation of specific conservation measures in order to avoid significant disturbances or adverse effects to sensitive resources. While the three categories of activities described above may vary with regard to scope, frequency, or anticipated level of disturbance, none of the activities in any of the categories are expected to result in significant disturbances or adverse effects to sensitive resources as a result of the implementation of the NAROW Program and the incorporation and application of the specific conservation measures described therein.

In order to address the potential for any of the covered activities in the three categories described above to adversely impact listed species, WAPA has incorporated two levels of protective measures into the overall NAROW Program. The first level of protective measures include standard operating procedures (SOPs) which will be implemented in all cases for all covered activities regardless of the presence of sensitive resources within close proximity to the immediate action area or not. The second level of protective measures include project conservation measures (PCMs) which will be applied in a focused manner to protect a specific targeted sensitive resource, species, habitat, or group of associated species in a particular habitat, that are known to occur within the immediate area of the activity under consideration. The focused PCMs were developed with specific species and/or habitats in mind, and therefore vary across the broad range of the action area in accordance with which species and habitats are likely to co-occur with specific program related activities in different areas throughout the action area.

For example, one specific PCM is the incorporation of seasonal work windows that will serve to avoid exposing listed fish to program related activities. Finally, WAPA has integrated all of the species specific PCMs along with the occurrence potential for each sensitive resource into a master GIS database that will be available as maintenance activities are scheduled or become necessary along any given segment of the transmission line and access road ROWs throughout the Sierra-Nevada Region under WAPA's jurisdiction.

All of the activities, categories, SOPs, PCMs, and sensitive resources that have been considered and proposed as part of the NAROW Program have been described in sufficient detail in the BA to allow for a comprehensive analysis of the potential for the Program to cause adverse effects to listed species or their habitat. In addition, WAPA has included a monitoring plan to periodically review and assess the effectiveness of the NAROW Program, and will report the results of the monitoring plan to NMFS at regularly scheduled coordination meetings between the two agencies. Lastly, while the NAROW Program was developed to specifically address the potential for adverse effects to listed species to occur as a result of routine activities associated with ROW maintenance, it does not consider or preclude the possibility of either unforeseen or larger scale projects becoming necessary in the future maintenance of the ROW or the power distribution system as a whole. For that reason, should additional projects that exceed the scope of the NAROW Program become necessary, those projects or activities would require individual consultation pursuant to the ESA on a case by case basis.

Action Area

Consistent with ESA consultation requirements, the action area includes all areas that may be directly or indirectly affected by any of the activities covered in the proposed program, including any interrelated and interdependent actions, and not merely the immediate area involved in the action (50 CFR §402.02). For the purposes of this consultation, program related activities were assessed for their potential to cause adverse effects to listed fish or their habitat along more than 800 miles of transmission line ROWs and 250 miles of access roads wherever those alignments intersect or come within 300 feet of habitat that supports or is occupied by listed anadromous fish species, including the watersheds that are hydrologically connected to and upstream from those habitats, within WAPA's Sierra Nevada Region of northern and central California extending from just north of the Oregon border in a southerly direction to a substation just west and south of Tracy, California. This area includes portions of Klamath County, Oregon and Modoc, Siskiyou, Shasta, Trinity, Tehama, Glenn, Colusa, Butte, Yuba, Yolo, Sacramento, Solano, Sutter, San Joaquin, Contra Costa, and Alameda Counties in California. Since the action area includes but also extends beyond the geographic boundaries of several ESA listed anadromous fish species, and the potential for species exposure to the effects of NAROW Program activities varies across the action area, we have defined five distinct sub-areas that will help determine which seasonal work window to observe in order to avoid protected species exposure to covered activities in each geographical region. The sub-areas and the associated allowable work-windows in each are as follows:

- The Delta: Any of the waterways in the action area that are south and west of the City of Sacramento. In-water or near shore work within the Delta should be performed between June 1 and October 15 of any given year.

- The Mainstem Sacramento River – South: The waters of the Sacramento River from the City of Sacramento north to Hamilton City. In-water or near shore work on the mainstem Sacramento River in this region should be performed between June 1 and October 15 of any given year.

- The Mainstem Sacramento River – North: The waters of the Sacramento River from Hamilton City north to Keswick Dam. In-water or near shore work on the mainstem Sacramento River in this region should be performed between December 1 and April 1 of any given year.

- Butte, Mill, Deer, and Battle Creeks: Any of the waters that comprise the forks or mainstems of these four named creeks. In-water or near shore work that occurs on Butte, Mill, Deer, or Battle Creek should be performed between December 1 and April 1 of any given year.

- The North State Tributary Area: Any of the waterways in the action area that are north of the City of Sacramento and flow into the mainstem Sacramento River, excluding Butte, Mill, Deer, and Battle Creeks, as described above. In-water or near shore work that occurs in the North State Tributary Area should be performed between June 1 and October 15 of any given year.

The BA for the NAROW program associates the adoption and observation of seasonal work windows as the primary conservation measure to be employed in avoiding listed anadromous fish exposure to potential effects resulting from program related operations and maintenance activities. While the precise spatial and temporal extent of these seasonal work windows were not specifically defined in the BA, WAPA explicitly identified the ESA consultation process with NMFS as the vehicle by which seasonal work windows would be clearly defined, adopted, and adhered to in section7.4 of the BA. Therefore, the seasonal work windows as defined above are hereby incorporated into the BA for the purposes of minimizing the potential for listed fish to be exposed to program related effects to a level that is either insignificant or discountable.

ESA Section 7 Consultation

NMFS has received the information necessary to initiate consultation on federally listed anadromous fish species and their designated critical habitat within the action area. Based on our review of the material provided and the best scientific and commercial information currently available, NMFS has determined that performing the above described NAROW Program activities may affect, but is not likely to adversely affect, Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, the Southern DPS of North American green sturgeon, or any of the critical habitat designated for these species. This concurrence is based on WAPA implementing all of the conservation and protective measures intended to avoid or minimize adverse effects to fish and fish habitat as identified in the November 2008 BA.

Potential direct, indirect, temporary, and permanent adverse effects that could result from implementation of covered NAROW Program activities include, but are not limited to, increased turbidity and/or sedimentation, loss of shaded riparian habitat and consequent increased

temperatures, reduced recruitment and retention of large woody debris, introduction of toxins and/or hazardous materials to the aquatic environment, changes to oxygen availability and water quality, changes to the predator density and/or prey availability, and impaired access to or loss of spawning and rearing habitats. The potential for adverse effects to occur as a result of the implementation of the NAROW Program has been reduced to an insignificant or discountable level based on the following reasons: 1) Seasonal work windows developed through consultation with NMFS will be adopted and adhered to throughout the action area; 2) most of the existing ROWs were constructed between the 1940's and 1960's, and no new significant impacts are expected to occur as a result of routine maintenance activities within the existing ROWs; 3) SOPs and species and habitat specific PCMs have been developed and incorporated into the NAROW Program for the express purpose of avoiding adverse effects to listed species throughout the action area; 4) potential impacts were considered beyond the limits of the ROWs to an expanded area that includes downstream and watershed effects as well; 4) WAPA has developed a GIS database accessible on laptop computers that maps and catalogues sensitive biological resources span by span throughout the action area and cross references the appropriate PCM that must be followed for the type of activity proposed (*i.e.*, Category A, B, or C) with the type of species and/or habitat that may be present so that WAPA personnel and subcontractors will know at a glance exactly what PCMs need to be implemented in every location where work is proposed; 5) short-term, localized vegetation management activities will result in a long-term reduction in the need for broader invasive treatments in the future; and 6) all covered NAROW Program activities, including the installation of new facilities such as cell towers and fiber optic cable (*i.e.*, Category C activities), will take place within existing ROWs and any larger actions will trigger the necessity to consult on a case by case basis.

This concludes informal consultation for the proposed NAROW Program. Reinitiation of consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered; or (3) a new species is listed or critical habitat designated that may be affected by the action.

EFH Consultation

With regards to EFH consultation, much of the action area has been identified as EFH for Pacific salmon, in Amendment 14 of the Pacific Salmon Fishery Management Plan pursuant to the MSA. Federal action agencies are mandated by the MSA (section 305(b)(2)) to consult with NMFS on all actions that may adversely affect EFH, and NMFS must provide EFH conservation recommendations to those agencies (section 305(b)(4)(A)). Because the program related activities covered in this consultation include specific measures (described above) to avoid adverse affects to the habitat that supports Chinook salmon, NMFS has determined that the proposed program related activities will not adversely affect the EFH of Pacific salmon, and additional EFH conservation recommendations are not being provided at this time; however, if there is substantial revision to the program or any of the covered activities described therein, the lead Federal agency will need to re-initiate EFH consultation.

FWCA

The purpose of the FWCA is to ensure that wildlife conservation receives equal consideration, and is coordinated with other aspects of water resources development (16 U.S.C. 661). The FWCA establishes a consultation requirement for federal departments and agencies that undertake any action that proposes to modify any stream or other body of water for any purpose, including navigation and drainage (16 U.S.C 662(a)). Consistent with this consultation requirement, NMFS provides recommendations and comments to Federal action agencies for the purpose of conserving fish and wildlife resources. The FWCA provides an opportunity to offer recommendations for the conservation of species and habitats beyond those currently managed under the ESA and MSA. Because the proposed project is designed to avoid environmental impacts to aquatic habitat within the action area, NMFS has no additional FWCA comments to provide.

Please contact Doug Hampton at (916) 930-3610, or via email at Douglas.Hampton@noaa.gov, if you have any questions regarding this letter.

Sincerely,

for Rodney R. McInnis
Regional Administrator

cc: Copy to File - ARN #151422SWR2008SA00177
Bryant Chesney, Long Beach, CA
NMFS-PRD, Long Beach, CA

Appendix C

BLM Correspondence

CENTRAL FILE CODE NO. North Valley ROW EA Coordination Meeting #1

JAN - 7 2005

CONCURRENCE	
RTG.SYMBOL	N1001
INITIALS/SIG.	
DATE	1/3/05
RTG.SYMBOL	N1415
INITIALS/SIG.	
DATE	1/3/05
RTG.SYMBOL	N1400
INITIALS/SIG.	
DATE	1-5-05
RTG.SYMBOL	N1000
INITIALS/SIG.	
DATE	1/5/05
RTG.SYMBOL	N0001
INITIALS/SIG.	
DATE	1/6/05
RTG.SYMBOL	N0004
INITIALS/SIG.	
DATE	1/6/05
RTG.SYMBOL	
INITIALS/SIG.	
DATE	
RTG.SYMBOL	
INITIALS/SIG.	
DATE	
RTG.SYMBOL	
INITIALS/SIG.	
DATE	

Francis Berg
Assistant Field Manager
Bureau of Land Management
355 Hemstead Drive
Redding, CA 96002

Dear Interested Party:

The Western Area Power Administration (Western), a power marketing administration of the Department of Energy, owns, operates, and maintains fifteen 230-kilovolt (kV) transmission lines, one 500-kV transmission line, and one 115-kV transmission line in Shasta, Trinity, Tehama, Butte, Yuba, Glen, Colusa, and Sutter counties, California, and Klamath County, Oregon (Enclosure 1). Western must comply with the National Electric Safety Code, the Western Electricity Coordinating Council, and the Western directives for protecting human safety and maintaining the reliable operation of the transmission system.

Western is preparing an Environmental Assessment regarding the proposed changes in operation and maintenance procedures along Western's North Area Transmission Line Right-of-way (ROW). Western proposes to change the current vegetation maintenance procedures to include the expanded use of herbicides in combination with manual and mechanical removal methods in an effort to promote low-growing plant communities. Additional maintenance activities that may be added to the current routine ROW operation and maintenance practices include erosion repair, geotechnical borings, and fiber optics installation. Western currently has a Biological Opinion from the U.S. Fish and Wildlife Service addressing routine ROW operation and maintenance practices for these transmission lines. In addition, Western has a Programmatic Agreement (PA) with the California Office of Historic Preservation (OHP) that allows for certain types of maintenance activities to proceed without further consultation. The Biological Opinion identifies threatened and endangered species and their habitats and identifies mitigation measures to apply based on Western's current routine ROW maintenance methods. However, as described above, Western proposes expanding the scope of these maintenance methods. Western is currently in the process of developing an Environmental Assessment (EA) to support Section 7 consultation activities under the Endangered Species Act and Section 106 consultation activities required under the OHP when Western conducts maintenance activities that are beyond those covered in the Biological Opinion or the PA.

The project area extends northward from approximately Sutter County to the California-Oregon border and covers 434 miles of transmission line ROW and 77 miles of legal access roads. Our team of biologists and archaeologists will be conducting biological and cultural resource surveys within the project area to collect comprehensive environmental baseline data. All biological and

cultural data will be logged using Geographical Positioning System technology and other mapping media. All surveys are scheduled to occur between April and September 2005.

Western will conduct a meeting to solicit input from key Federal and State agencies concerning this project as well as Native American groups having a cultural heritage in the project area. The meeting is scheduled for 9 a.m. on February 2, 2005, at the Red Lion Hotel, 1830 Hilltop Drive, Redding, California. Other issues to discuss at the meeting include: the proposed EA schedule, purpose and need; opportunities for agencies to be involved in the EA process with Western; ROW access and field survey coordination; agency Geographical Information System data of special status species within the project area; and other agency resource data that can be used to characterize the baseline conditions along the ROW.

Western is looking forward to collaborating with other Federal and State agencies on this project. Please contact Ms. Lavender Mee at (916) 353-4045 or mee@wapa.gov whether or not you are planning to attend the meeting by January 24, 2005. Please contact Mr. Steve Tuggle at 916-353-4549 or tuggle@wapa.gov if you would like to request further information.

Sincerely

ORIGINAL SIGNED BY

James D. Keselburg
Regional Manager

2 Enclosures

bcc:
N1000, N1001, N1400, N1415, N1416, N1610, N1662, N6220

N1415:STuggle:x4549:Lm:12/21/04
R:\Groups\W_PROCES\WP_DIRS\ENV\Tuggle\041203_NorthValleyROWAgencyMtgInv.doc

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Redding Field Office
355 Hemsted Drive
Redding, CA 96002
www.ca.blm.gov/redding

April 6, 2005

In Reply Refer To:
1610(P)
CA-360

Mr. Bruce Thomas
Environmental Manager
Western Area Power Administration
Sierra Nevada Customer Service Region
114 Parkshore Drive
Folsom, California 95630-4710

Dear Mr. Thomas:

The Bureau of Land Management (BLM) as manager of public lands over which the Western Area Power Administration (Western) transmits energy, is willing to be a cooperating agency with Western in your environmental assessment (EA) for the North Valley Right-of-Way Maintenance Project. Your staff has presented excellent briefings on the project and your operational needs. BLM strongly supports the engagement with other agencies in developing resource management plans.

I support a formal Memorandum of Understanding (MOU) that describes the working relationship and sharing of information between our offices for completion of your EA. Our planning staffs have discussed the contents and drafting of the MOU with Western as the lead agency and BLM assisting with identification of scoping issues such as recommendations on vegetation treatment prescriptions.

Our resource and planning staff are ready to review a draft of the MOU in which respective agency roles are specified and agency interests and areas of expertise are identified. Two specific issues already identified are recommendations from our Fire Management Officer and coordination between our agency cultural resource specialists. Staffs from both agencies have consulted in the field to better define recommended management practices.

Our anticipated major participation will be to assist formation of your final proposed management alternative. Our point of contact for this project is Glen Miller, environmental coordinator, at (530) 224-2153 or gmiller@ca.blm.gov.

Sincerely,

S. W. Anderson

Steven W. Anderson
Field Manager

CENTRAL FILE CODE NO. _____

CONCURRENCE	
RTG.SYMBOL	N1413
INITIALS/SIG.	
DATE	8/2/05
RTG.SYMBOL	N141C
INITIALS/SIG.	
DATE	8/11/05
RTG.SYMBOL	
INITIALS/SIG.	
DATE	
RTG.SYMBOL	
INITIALS/SIG.	
DATE	
RTG.SYMBOL	
INITIALS/SIG.	
DATE	
RTG.SYMBOL	
INITIALS/SIG.	
DATE	
RTG.SYMBOL	
INITIALS/SIG.	
DATE	
RTG.SYMBOL	
INITIALS/SIG.	
DATE	

AUG 12 2005

Mr. Steven W. Anderson
Field Manager
Bureau of Land Management
Redding Field Office
335 Hemsted Drive
Redding, CA 96002

Dear Mr. Anderson:

We appreciate your response to our February 17, 2005 letter inviting the Bureau of Land Management (BLM) to be a cooperating agency in the preparation of National Environmental Policy Act (NEPA) documentation for the North Area Right-of-Way (ROW) Maintenance Project. This letter documents the Western Area Power Administration's (Western) understanding that BLM has agreed to be a Cooperating Agency for this Project.

As described in our letter dated February 17, 2005, the proposed action for this project involves changes in operations and maintenance (O&M) procedures along Western's North Area transmission line ROW and the Transmission Agency of Northern California's California-Oregon Transmission Project ROW. These proposed changes include the expanded use of herbicides in combination with manual and mechanical vegetation removal methods and the promotion of low-growing plant communities. In addition, erosion repair, geotechnical borings, and fiber optics installation may be added to the current routine ROW O&M procedures.

An Environmental Assessment (EA) is under preparation in response to the proposed expansion of existing O&M methods that are currently allowed under the Biological Opinion (BO) with the U.S. Fish and Wildlife Service and the Programmatic Agreement (PA) with the California State Office of Historic Preservation. Western's NEPA documentation will support Section 7 consultation activities under the Endangered Species Act and Section 106 consultation activities under the National Historic Preservation Act for those activities that are not covered under the current BO or PA.

The Project Area extends along Western's transmission line ROW from Modoc County in northeastern California, southwest towards Redding, and continues south, along the eastern side of the Sacramento Valley toward Sacramento, California. Other segments of the ROW extend from the Trinity Reservoir in Trinity County, southeast to Redding and from Maxwell, California southeast toward Sacramento and Tesla. The ROW includes portions that traverse BLM lands.

OFFICIAL FILE COPY

As a Cooperating Agency, BLM will be invited to provide input on the scope of the EA, including recommendations on vegetation treatment prescriptions. In addition, BLM may review the biological and cultural resource survey data collected in the field and provide comments on the Draft EA prior to public release. Western looks forward to BLM's assistance in preparing proposed management alternatives for this project.

Western has reviewed BLM's preliminary concerns regarding the North Area ROW Maintenance Project. Western will work with BLM, including the Fire Management Officer and Cultural Resource Specialists, to ensure that these issues are addressed during the survey period and in preparation of the NEPA document for this project.

Western understands that Mr. Glen Miller will be the point of contact for the North Area ROW Maintenance project. We will keep Mr. Miller up to date on all project activities and decisions. Western appreciates your coordination with our office. If you have any questions, please contact me at (916) 353-4549 or tuggle@wapa.gov.

Sincerely,

ORIGINAL SIGNED BY

Steve Tuggle
Project Manager
Western Area Power Administration
Sierra Nevada Region

N1415:STuggle:x4549:ll:8/2/05
R:\Groups\W_PROCES\WP_DIRS\ENV\Tuggle\050802_CoopAgency letter-BLM.doc

Appendix D

NPS Correspondence

CENTRAL FILE CODE NO. North Area EA

CONCURRENCE	
RTG.SYMBOL	N100
INITIALS/SIG.	JM
DATE	2/17/05
RTG.SYMBOL	N1415
INITIALS/SIG.	BT
DATE	2/17/05
RTG.SYMBOL	N1400
INITIALS/SIG.	BGT
DATE	2-17-05
RTG.SYMBOL	
INITIALS/SIG.	
DATE	
RTG.SYMBOL	
INITIALS/SIG.	
DATE	
RTG.SYMBOL	
INITIALS/SIG.	
DATE	
RTG.SYMBOL	
INITIALS/SIG.	
DATE	
RTG.SYMBOL	
INITIALS/SIG.	
DATE	

Mr. Jim Milestone
Superintendent
National Park Service
Whiskeytown National Recreation Area
Kennedy Memorial Drive
P.O. Box 188
Whiskeytown, CA 96095-0188

Dear Mr. Milestone:

The Department of Energy, Western Area Power Administration (Western) would like to invite your agency to become a cooperating agency in the preparation of the environmental assessment (EA) for the North Valley Right-of-Way (ROW) Maintenance Project. Western is preparing this EA in regards to the proposed changes in operation and maintenance procedures along Western's North Area Transmission Line ROW. These changes include the expanded use of herbicides in combination with manual and mechanical removal methods in an effort to promote low-growing plant communities. Additional maintenance activities that may be added to the current routine ROW operation and maintenance practices include erosion repair, geotechnical borings, and fiber optics installation. Western currently has a Biological Opinion (BO) from the U.S. Fish and Wildlife Service and a Programmatic Agreement (PA) with the California Office of Historic Preservation. These agreements allow for certain types of routine ROW operation and maintenance practices/activities to proceed without further consultation. However, as described above, Western proposes expanding the scope of exsisting maintenance methods.

While ROW maintenance is in a class of action that normally does not require an EA, Western's determination to prepare an EA is based on the potential presence of sensitive biological and cultural resources within the project area and the additional maintenance practices proposed for use within the project area. Western is currently in the process of preparing an EA to support Section 7 consultation activities under the Endangered Species Act and Section 106 consultation activities required under the National Historic Preservation Act for those maintenance activities that are not covered in the BO or the PA. Western will be the lead agency for preparation of the EA.

OFFICIAL FILE COPY

The Council of Environmental Quality's National Environmental Policy Act Implementing Regulations (40 CFR part 1501.6), requests that the lead Federal agency solicit participation with other Agencies early in the NEPA process. Based on this authorization, does your agency wish to participate as a cooperating agency to ensure that all your concerns are appropriately addressed in the EA? The benefits of becoming a cooperating agency include disclosure of relevant information early in the EA process and establishment of a mechanism to address any intergovernmental issues.

Your responsibilities as a cooperating agency may include:

1. Providing input on the scope and adequacy of information gathered for the EA,
2. Aiding in identification of issues which need to be addressed in the EA,
3. Providing information to be included in the EA, especially where you have specialized expertise related to environmental concerns,
4. Helping answer questions related to your authority and practices related to the project, and
5. Assuring that your regulatory authorizations related to the proposed action are adequately addressed in the EA.

A copy of the project fact sheet is enclosed. We would appreciate a response at your earliest convenience. We are available to meet with you and/or your staff to discuss the proposed project and your participation. If you have any questions, please contact Mr. Steve Tuggle at (916) 353-4549 or tuggle@wapa.gov.

Sincerely,

Original Signed By

Bruce Thomas
Environmental Manager

Enclosure

cc:
Mr. Tom Murphy
Aspen Environmental Group
8801 Folsom Blvd., Suite 290
Sacramento, CA 95826-3250

Ms. Roberta Tassey
Burleson Consulting, INC.
1625 Creekside Drive, Suite 202
Folsom, CA 95630

cc:
Mr. Tom Murphy
Aspen Environmental Group
8801 Folsom Blvd., Suite 290
Sacramento, CA 95826-3250

Ms. Roberta Tassey
Burleson Consulting, INC.
1625 Creekside Drive, Suite 202
Folsom, CA 95630

Mr. Laurence Crabtree
United States Forest Service
Modoc National Forest
800 West 12th Street
Alturas, CA 96101

Ms. Stacy Smith
United States Forest Service
Shasta-Trinity National Forest
204 West Alma
Mt. Shasta, CA 96067-2204

Ms. Arlene B. Kallis
United States Forest Service
Shasta-Trinity National Forest
204 West Alma
Mt. Shasta, CA 96067-2204

bcc:
N1000, N1400, N1410, N1415, N1416, N5000, N5300, D. Swanson, A7400, Lakewood, CO

Department of Energy
Western Area Power Administration
Sierra Nevada Customer Service Region
114 Parkshore Drive
Folsom, California 95630-4710

APR 21 2005

Mr. Jim Milestone
Superintendent
National Parks Service
Whiskeytown National Recreation Area
Kennedy Memorial Drive
P.O. Box 188
Whiskeytown, CA 96095

Dear Mr. Milestone:

This letter is in regards to our meeting dated March 24, 2005. Per our discussion, the Western Area Power Administration (Western) would like to coordinate with your office in regards to the following understood agreements communicated at the meeting:

- Western would like to coordinate with NPS to ensure that Western's access roads are gated and locked with a Western lock. In the past NPS has offered assistance in replacing and installing access road gates. Western requests that NPS send a proposal for the cost and installation of installing access road gates where no gate exists and replacing gates where damage to the gate has occurred. Western will work with NPS to identify needed access road gates within the Whiskeytown National Recreation Area (NRA).

- Upon completion of a current collection effort, Western will share access road infrastructure in regards to the Whiskeytown NRA and will work with NPS staff to define infrastructure operation and maintenance practices and priorities. Western would also lend assistance in identifying "duplicate" access roads, work with NPS to reduce unneeded access roads, and reduce any ecological impairment of park resources.

- Prior to any maintenance activities, Western will contact your office to inform you that Western's crews will be performing maintenance within the Whiskeytown NRA on Western's Right-of-way (ROW), except for emergency response and patrol activities.

- Prior to any of the North Area ROW Maintenance Environmental Assessment Survey's, a Western representative will contact your office to keep you informed of the scheduled dates Western will be performing surveys within the Whiskeytown NRA. Please provide Western a point of contact and their phone number.

- Vegetation management activities within the Whiskeytown NRA will be coordinated with your office to ensure that both Western's mission of system reliability and NPS's mission of

aesthetics and habitat preservation are met. Western will coordinate with NPS to work within NPS vegetation standards and develop a vegetation prescription for the Whiskeytown NRA that meets both agencies standards.

- Herbicide use within the Whiskeytown NRA will be selective and applied via cut stump or a target foliar method and applied when needed and approved by both Western and NPS.

- Western has enclosed a list of herbicides that Western currently uses under the transmission line for NPS's approval within the Whiskeytown NRA.

- Mr. Anton Kozhevnikov, Western's Senior GIS Specialist will coordinate with Mr. Russ Weatherbee, NPS's GIS contact for the Whiskeytown NRA in regards to any electronic resource data sharing that may be beneficial to both Agencies.

- Western would like to coordinate with your office about any sensitive cultural, biological, infrastructure, water pipes, past surveys/reports, and GIS information within the Whiskeytown NRA. Western would like this information prior to our resource survey collection at the Whiskeytown NRA. The resource collection survey team is scheduled to arrive at the Park on June 6, 2005.

- Western will draft a Memorandum of Understanding between Western and NPS to cover in detail the above mentioned issues.

Western appreciates your coordination with our office. If you have any questions or believe that there are any other issues that need to be addressed, please contact Mr. Steve Tuggle at (916) 353-4549 or tuggle@wapa.gov.

Sincerely,

Bruce Thomas
Environmental Manager
Sierra Nevada Region

2 Enclosures

cc:
Tom Murphy
Project Manager
Aspen Environmental Group
8801 Folsom Boulevard, Suite 290
Sacramento, CA 95826

United States Department of the Interior

NATIONAL PARK SERVICE
WHISKEYTOWN NATIONAL RECREATION AREA
WHISKEYTOWN-SHASTA-TRINITY NATIONAL RECREATION AREA
P.O. BOX 188 WHISKEYTOWN, CA 96095-0188

www.nps.gov/whis

IN REPLY REFER TO:

L7617 (WHIS)

June 29, 2005

SNR ROUTING

	CODE	INITIAL	DATE
	N0000		
	N0010		
Environment →	N1000		7/5/05
	N2000		
	N4000		
	N5000		7/6/05
	N6000		
	N8000		
	Library/Recycle		
	F/Code		

Jim Keselburg
Regional Director
Western Area Power Administration
114 Parkshore Drive
Folsom, CA 95630

Dear Mr Keselburg:

This letter is a continuation of the dialog that has been established between Whiskeytown National Recreation Area and Western Area Power Administration (WAPA) aimed at developing long range management strategies for the high voltage transmission lines and related facilities within the Park. Through this process we wish to present clear guidance that details our specific needs and also spells out overall desires as they pertain to the management of park and the maintenance of the WAPA facilities that cross through the Park.

As you are aware, as a National Park Service Unit we have a number of legal requirements that we need to consider, including the protection of threatened and endangered species and the avoidance of adverse effects to historic properties. Additional guidance for the management of the park is well summarized by the following mission statement found in the Whiskeytown NRA General Management Plan (July 1999).

> *Whiskeytown National Recreation Area provides compatible water and land-based recreation in a mountain setting and conserves and interprets scenic, scientific, natural, cultural and other values for the enjoyment and benefit of present and future generations.*

The park recognizes the value and need for the development of a proactive maintenance program for the WAPA facilities. Such an approach would foster the reliable flow of electricity, the compliance with California State Public Resources Codes 4292-4293, the mitigation of risks to public health and safety and the protection of facilities and other capital investments. Moreover, we support the development of a programmatic maintenance schedule that is predictable and allows our staff to ensure our needs are being met to the fullest extent possible.

When completed we expect that your final Environmental Assessment will be comprehensive and provide clear guidance to the management of WAPA facilities. We look forward to continuing our cooperation with you as that process proceeds. In the interim, we present the following as guiding practices for the maintenance of WAPA facilities within the park. These points are organized around a few general topic areas, although in some situations there is overlap and we recognize that management is a holistic process. We would appreciate your feedback and look forward to continuing our ongoing dialog in this process.

1. **Roadways**
   a) Various roads leading to the transmission towers are used by visitors for approved recreational purposes. The park anticipates continued use along selected roads. A few sections, such as the lower section of Boulder Creek Trail, are important corridors in our trails system. To ensure access for routine or emergency work, appropriate signage should be posted on this and all other gates to ensure

routine or emergency work, appropriate signage should be posted on this and all other gates to ensure that access is not blocked by visitors using the pull-outs as trailhead parking areas. Gates should be maintained to ensure unauthorized vehicle access does not occur. Where possible, gates should be designed to be aesthetically compatible and consistent with other park facilities.

b) New roads have numerous adverse impacts to park resources, including accelerated erosion and downstream sedimentation, potential damage to historic resources, scarring of viewsheds and the loss of soil productivity. If emergency measures are presented that for some reason make new road construction a necessity, written approval must be obtained from the park Superintendent prior to commencing work.

c) In some situations, multiple access routes may exist to the same tower. Wherever feasible, the park would prefer to eliminate unneeded road sections. Specific actions may include removal, revegetation or other rehabilitation efforts. The park would be interested in collaborating with WAPA in efforts aimed at eliminating roadway scars that have no use for access.

d) Ongoing erosion as a result of design flaws or site conditions is a primary concern of the park. In some situations, erosion gullies are many feet deep and preclude access by maintenance vehicles. The park would prefer to work with WAPA staff and identify high priority areas where adverse impacts could be mitigated with a long-term solutions such as road outsloping or hardening. This approach would serve to ensure reliable access for routine and emergency maintenance activities and reduce cumulative impacts from the legacy relating to construction and maintenance of the facilities.

e) The park recognizes a need to clear vegetation around towers up to thirty feet from the tower base. It should be stated, however, the park encourages the retention of low-growing vegetation in this zone. Standards for clearing along access roads are sixteen feet total road width and twelve feet height.

2. **Vegetation Management:** The park requests notification of all work orders prior to implementation to allow staff adequate time to make independent field observations. This notification is also needed to minimize impact to endangered species and ensure work does not conflict with other permitted or planned park operations. Currently, Steve Femmel (530) 242-3440 is the approved point of contact for all vegetation management activities within the park. Included in the work order should be an estimated schedule for commencement and completion dates. The potential spread of exotic plant species or pathogens, most notably sudden oak death syndrome, are very real concerns. The park expects that all contractors should verify that they have sanitized equipment prior to commencing work and are not transporting vegetation residue from other sites that could harbor exotic seeds of concern. All pine species cut that are greater than 6 inches diameter at base should be promptly treated with sporax under the supervision of a certified pest applicator. The NPS wash rack is available at park headquarters to facilitate cleaning any heavy equipment. Access to this facility can be coordinated by contacting Jerry Wheeler, Chief of Facilities Management at (530) 242-3430

a) *Herbicides*: The park restricts herbicide use to invasive exotic plant species. Mechanical means are the preferred treatment method for native vegetation management. Specific restrictions and conditions of herbicide use are detailed below.

- Herbicides appropriate for use are triclopyr (i.e. Garlon) and glyphosate (i.e. Round-up)
- Herbicides may only be applied by a licensed applicator.
- When herbicides are used, the park requests that the following information be provided by WAPA following each occurence:
  i) material used
  ii) amount (including concentration) used
  iii) location used
  iv) application method
  v) date used
  vi) target species

b) *Vegetation*: The following list details added park preferences with regard to vegetation maintenance and establishment.

- Avoid work in riparian zones (riparian zone defined as 150ft buffer around all perennial streams). Where topography and span alignment make this impractical, identify on a map or in a GIS and route

all work orders through park with special notice of riparian zone work. On site inspections will be required for all proposed work in riparian zones.

- Maintain maximum plant cover whenever feasible
- Reduce or eliminate bare mineral soil wherever feasible
- Reduce or eliminate exotic vegetation.
- Promote slow growing tree species underneath electrical conductors. With the exception of valley oak and selected non-native ornamentals, all oaks within the park are considered slow growing tree species.
- Where topography and span placement exclude the establishment of slow growing tree species, promote slow growing native shrub/herbaceous plant vegetation. Slow growing shrub species of preference include redbud, styrax, ceanothus, buckeye, gamble oak, manzanita and toyon.
- Promote vegetation characteristics that reduce visual evidence of alteration, particularly from high visibility locations such as Hwy 299, campgrounds and the visitor center.

c) *Cutting preferences*

- Where pruning occurs, limbing or trimming of individual branches that encroach into the areas that need treatment is the preferred method. Topping is not acceptable, since it typically encourages faster growth in an undesirable direction (i.e. toward the transmission lines).
- To avoid long term maintenance, removal of fast growing tree species that will eventually impact lines while still small is the preference. Such actions will allow shorter and/or slow growing vegetation to become established, resulting in competition that limits undesirable vegetation development. This approach also limits visual impacts, reduces spread or dominance of exotic species and promotes stability of a site. When there is no compelling need to remove the entire tree or shrub, however, that tree or shrub should not be cut down. Projections for tree growth should be realistic and take into account site specific conditions, location of tree, tree species, actual span to ground distance and expected line sag.
- Cut materials may be chipped and spread out thinly to cover bare mineral soil but should not be deeper than three inches and should not be distributed where they may accumulate in culverts or other drainage structures. Cut materials may also be deposited in erosion trenches along or in WAPA roadways to aid in reducing erosion. In other situations, cut materials should be removed wherever possible. Where access prevents removal, materials may be lop and scattered on site where minimal amounts of vegetation are cut, with total height of scattered materials no higher than 1 ft. In other areas, materials should be left in small piles (approximately 5ft x 5ft x 5ft). Piles should be clear of any overstory trees and should be located in clearings.

We appreciate your interest in working with us in this effort to develop a management program for the park resources that are impacted by the WAPA facilities. Our overall preference is to maintain a park-like appearance within the ROW and to minimize vegetation cutting where possible. Please feel free to contact me with questions or comments in our effort to continue this process.

Sincerely,

Jim F Milestone
Park Superintendent

CENTRAL FILE CODE NO. _____

AUG 12 2005

CONCURRENCE	
RTG.SYMBOL	N1413
INITIALS/SIG.	
DATE	8/8/05
RTG.SYMBOL	N1413
INITIALS/SIG.	
DATE	8/11/05
RTG.SYMBOL	
INITIALS/SIG.	
DATE	
RTG.SYMBOL	
INITIALS/SIG.	
DATE	
RTG.SYMBOL	
INITIALS/SIG.	
DATE	
RTG.SYMBOL	
INITIALS/SIG.	
DATE	
RTG.SYMBOL	
INITIALS/SIG.	
DATE	
RTG.SYMBOL	
INITIALS/SIG.	
DATE	
RTG.SYMBOL	
INITIALS/SIG.	
DATE	

Mr. Jim Milestone
Superintendent
National Parks Service
Whiskeytown National Recreation Area
Kennedy Memorial Drive
P.O. Box 188
Whiskeytown, CA 96095

Dear Mr. Milestone:

Thank you for your comments regarding the Western Area Power Administration's (Western) North Area ROW Maintenance Project. Western would like to reiterate our invitation for the National Parks Service (NPS) to become a Cooperating Agency for this Project as stated in Western's letter to your office dated February 17, 2005.

As described in our February 17, 2005 letter, the proposed action for this project involves changes in operations and maintenance (O&M) procedures along Western's North Area transmission line ROW and the Transmission Agency of Northern California's California-Oregon Transmission Project ROW. These proposed changes include the expanded use of herbicides in combination with manual and mechanical vegetation removal methods and promotion of low growing plant communities. In addition, erosion repair, geotechnical borings, and fiber optics installation may be added to the current routine ROW O&M procedures.

An Environmental Assessment (EA) is under preparation in response to the proposed expansion of existing O&M methods that are currently allowed under the Biological Opinion (BO) with the U.S. Fish and Wildlife Service and the Programmatic Agreement (PA) with the California State Office of Historic Preservation. Western's National Environmental Policy Act documentation will support Section 7 consultation activities under the Endangered Species Act and Section 106 consultation activities under the National Historic Preservation Act for those activities that are not covered under the current BO or PA.

The Project Area extends along Western's transmission line ROW from Modoc County in northeastern California, southwest towards Redding, and continues south, along the eastern side of the Sacramento Valley toward Sacramento, California. Other segments of the ROW extend from the Trinity Reservoir in Trinity County, southeast to Redding and from Maxwell, California southeast toward Sacramento. The ROW includes portions that traverse NPS lands, specifically the Whiskeytown National Recreation Area.

OFFICIAL FILE COPY

As a Cooperating Agency, NPS would be invited to provide input on the scope of the EA, review the biological and cultural resource survey data collected in the field, and provide comments on the Draft EA prior to public release.

Western has reviewed NPS's preliminary concerns regarding the proposed project and agency coordination. A Memorandum of Understanding is being prepared that details the issues addressed at the March 24, 2005 meeting and described in the letter to NPS dated April 21, 2005.

Western appreciates the opportunity to involve NPS in the North Area ROW Maintenance Project. If you have any questions, please contact me at (916) 353-4549 or tuggle@wapa.gov.

Sincerely,

ORIGINAL SIGNED BY

Steve Tuggle
Project Manager
Western Area Power Administration
Sierra Nevada Region

N1415:STuggle:ll:8/2/05
R:\Groups\W_PROCES\WP_DIRS\ENV\Tuggle\050804_CoopAgency letter-NPS.doc

Department of Energy
Western Area Power Administration
Sierra Nevada Customer Service Region
114 Parkshore Drive
Folsom, California 95630-4710

MAY 18 2006

Mr. Jim F. Milestone
Superintendent
National Parks Service
Whiskeytown National Recreation Area
P.O. Box 188
Whiskeytown, CA 96095

Dear Mr. Milestone:

This letter is a continuation of the dialogue established between the Western Area Power Administration (Western) and the National Park Service, Whiskeytown National Recreation Area (NPS) regarding agency cooperation with the North Area Right-of-Way (ROW) Maintenance Project. Western would like to reiterate our invitation for NPS to become a Cooperating Agency for this Project (see February 17, 2005, and August 12, 2005, letters).

As a Cooperating Agency, NPS would be invited to provide input on the scope of the Environmental Assessment (EA), review the biological and cultural resource survey data collected in the field, and provide comments on the Draft EA prior to public release. Per 40 CFR part 1501.6, please submit a written response to this request.

Additionally, Western would like to extend an invitation to the NPS to attend an inter-agency meeting to discuss the data collected and the approach to preparation of the EA. The meeting is tentatively scheduled for June 28, 2006, at the Red Lion Inn in Redding, California. A project newsletter will be published shortly that contains final details of the meeting.

Western appreciates your coordination with our office. We look forward to working with NPS on the North Area ROW Maintenance Project. If you have any questions, please contact Mr. Steve Tuggle at (916) 353-4549 or tuggle@wapa.gov.

Sincerely,

Cherie Johnston-Waldear

Cherie Johnston-Waldear
Acting Natural Resources Manager

cc:
Mr. Steve Femmel
National Parks Service
Whiskeytown National Recreation Area
Kennedy Memorial Drive
P.O. Box 188
Whiskeytown, CA 96095

Mr. Tom Murphy
Aspen Environmental Group
8801 Folsom Blvd., Suite 290
Sacramento, CA 95826

United States Department of the Interior

NATIONAL PARK SERVICE
WHISKEYTOWN NATIONAL RECREATION AREA
WHISKEYTOWN-SHASTA-TRINITY NATIONAL RECREATION AREA
P.O. BOX 188 WHISKEYTOWN, CA 96095-0188

www.nps.gov/whis

IN REPLY REFER TO:

L7617 (WHIS)

May 24, 2006

Mr. Steve Tuggle
Right of Way Resource Specialist
Western Area Power Administration
114 Parkshore Drive
Folsom, CA. 95630

Dear Mr. Tuggle:

The National Park Service at Whiskeytown National Recreation Area would like to formally accept Western Area Power Administration' s (WAPA) invitation for us to become a Cooperating Agency for the North Area Right-of-Way Maintenance Project Environmental Assessment.

We look forward to continuing our conversations to discuss some serious resource management concerns on the part of the park staff that involve vegetation management of trees and plants throughout the utility corridor under the WAPA lines and towers, utility access road routes, erosion control and long term maintenance activities, gate security to these utility access roads and protection of the park' s cultural resources.

I would like to stress the park' s efforts over the past six years in working with WAPA that our message related to park concerns has been consistent. I look forward to the opportunity for the National Park Service and WAPA to move from dialogue to WAPA actually instituting good land stewardship projects on the ground within Whiskeytown National Recreation Area.

Sincerely,

Jim F. Milestone
Superintendent

Appendix E

USFS Correspondence

North Valley ROW EA

CENTRAL FILE CODE NO. NRA comment Letter

JAN 14 2005

CONCURRENCE
RTG.SYMBOL N100
INITIALS/SIG. JM
DATE 1/14/
RTG.SYMBOL N14
INITIALS/SIG.
DATE 1/14/05
RTG.SYMBOL N140
INITIALS/SIG.
DATE
RTG.SYMBOL
INITIALS/SIG.
DATE
RTG.SYMBOL
INITIALS/SIG.
DATE
RTG.SYMBOL
INITIALS/SIG.
DATE
RTG.SYMBOL
INITIALS/SIG.
DATE
RTG.SYMBOL
INITIALS/SIG.
DATE

Ms. Kristy Cottini
District Ranger
United States Department of Agriculture
Shasta-Trinity National Recreation Area
14225 Holiday Road
Redding, CA 96003

Dear Ms. Cottini:

The Western Area Power Administration (Western), Department of Energy, would like to thank you for the opportunity to comment on the Shasta-Trinity National Forest's scheduled revision of the Management Plan for the Shasta-Trinity Units for the Whiskeytown-Shasta-Trinity National Recreation Area (NRA). Western currently owns and operates the Trinity-Carr Carr-Keswick 230-kilovolt transmission line that runs through the NRA.

The scheduled NRA management plan states that the Shasta-Trinity National Forest plans to change the Land Use and Ownership of the management of major travel and utility corridors. As stated in the Cooperative Agreement between the Bureau of Reclamation, the National Parks Service, and Western dated August 5, 1985, "The Service and Reclamation hereby consent to Western's construction, reconstruction, operation, and maintenance of a transmission line and substation...and made part of this document. This consent includes the right to use the existing access roads for the construction, operation, and maintenance of the lines and substation (Enclosure 1)." Western needs to maintain access to our Right-of-way (ROW) for Western's Operation and Maintenance (O&M) activities. Routine maintenance of access roads and ROWs through vegetation management and other O&M activities prevents operational hazards, protects facilities from fire, prevents safety problems for Western's employees and neighboring members of the public, and ensures all weather access and system reliability.

The scheduled NRA management plan also states that the Shasta-Trinity National Forest plans to change the use of vegetation within the area. Western is currently conducting and Environmental Assessment (EA) for its O&M activities within the Shasta-Trinity NRA, which includes vegetation management activities.

OFFICIAL FILE COPY

Western understands your concerns regarding the NRA revision plan and looks forward to working with the United States Department of Agriculture, Shasta-Trinity National Forest to come to an agreement for access and O&M activities of our transmission line ROW that runs through the NRA. If you require any additional information regarding our vegetation management program or Western's EA, please contact me at (916) 353-4542 or bthomas@wapa.gov.

Sincerely,

ORIGINAL SIGNED BY

Steve Thggle

FOR Bruce Thomas
Environmental Manager

3 Enclosures

cc:
Mr. Jim Milestone
National Parks Service
P.O. Box 188
Whiskeytown, CA 96095

bcc:
N1400, N1415

N1415:STuggle:x4549:lm:1/13/05
R:\Groups\W_PROCES\WP_DIRS\ENV\Tuggle\041202_Shasta-Trinity NRA comment ltr.doc

FEB 17 2005

Ms. Sharon Heywood
Forest Supervisor
United States Forest Service
Shasta-Trinity National Forest
3644 Avtech Parkway
Redding, CA 96002

Dear Ms. Heywood:

The Department of Energy, Western Area Power Administration (Western) would like to invite your agency to become a cooperating agency in the preparation of the environmental assessment (EA) for the North Valley Right-of-Way (ROW) Maintenance Project. Western is preparing this EA in regards to the proposed changes in operation and maintenance procedures along Western's North Area Transmission Line ROW. These changes include the expanded use of herbicides in combination with manual and mechanical removal methods in an effort to promote low-growing plant communities. Additional maintenance activities that may be added to the current routine ROW operation and maintenance practices include erosion repair, geotechnical borings, and fiber optics installation. Western currently has a Biological Opinion (BO) from the U.S. Fish and Wildlife Service and a Programmatic Agreement (PA) with the California Office of Historic Preservation. These agreements allow for certain types of routine ROW operation and maintenance practices/activities to proceed without further consultation. However, as described above, Western proposes expanding the scope of exsisting maintenance methods.

While ROW maintenance is in a class of action that normally does not require an EA, Western's determination to prepare an EA is based on the potential presence of sensitive biological and cultural resources within the project area and the additional maintenance practices proposed for use within the project area. Western is currently in the process of preparing an EA to support Section 7 consultation activities under the Endangered Species Act and Section 106 consultation activities required under the National Historic Preservation Act for those maintenance activities that are not covered in the BO or the PA. Western will be the lead agency for preparation of the EA.

The Council of Environmental Quality's National Environmental Policy Act Implementing Regulations (40 CFR part 1501.6), requests that the lead Federal agency solicit participation with other Agencies early in the NEPA process. Based on this authorization, does your agency wish to participate as a cooperating agency to ensure that all your concerns are appropriately addressed in the EA? The benefits of becoming a cooperating agency include disclosure of relevant information early in the EA process and establishment of a mechanism to address any intergovernmental issues.

Your responsibilities as a cooperating agency may include:

1. Providing input on the scope and adequacy of information gathered for the EA,

2. Aiding in identification of issues which need to be addressed in the EA,

3. Providing information to be included in the EA, especially where you have specialized expertise related to environmental concerns,

4. Helping answer questions related to your authority and practices related to the project, and

5. Assuring that your regulatory authorizations related to the proposed action are adequately addressed in the EA.

A copy of the project fact sheet is enclosed. We would appreciate a response at your earliest convenience. We are available to meet with you and/or your staff to discuss the proposed project and your participation. If you have any questions, please contact Mr. Steve Tuggle at (916) 353-4549 or tuggle@wapa.gov.

Sincerely,

ORIGINAL SIGNED BY

Bruce Thomas
Environmental Manager

Enclosure

United States
Department of Agriculture

Forest Service

Shasta-Trinity National Forest
Headquarters

3644 Avtech Parkway
Redding, CA 96002
(530) 226-2500
(530) 226-2490 - TDD
www.fs.fed.us/r5/shastatrinity

File Code: 2700
Date: March 25, 2005

Steve Tuggle
Western Area Power Administration
114 Parkshore Drive
Folsom, CA 95630-4710

Dear Mr. Tuggle:

Bruce Thomas of your office, in a letter dated February 17, 2005, invited the Forest Service to act as cooperating agency for the North Valley Right-Of-Way Maintenance Project environmental assessment.

To fully understand the nature and magnitude of the proposal, I would like my staff to meet with you. Would a meeting on Tuesday April 12th, at 8:30 a.m., at the Shasta-Trinity National Forest headquarters in Redding work with your schedule? Please respond to John Schuyler, Public Uses Staff Officer to confirm this meeting.

If you have any questions, please call Special Use Officer Stacy Smith at the Mt. Shasta Ranger Station at (530) 926-9643 or Public Uses Staff Officer John Schuyler at Forest headquarters at (530) 226-2525.

Sincerely,

J. SHARON HEYWOOD
Forest Supervisor

United States
Department of Agriculture

Forest Service

Shasta-Trinity National Forest
Headquarters

3644 Avtech Parkway
Redding, CA 96002
(530) 226-2500
(530) 226-2490 - TDD
www.fs.fed.us/r5/shastatrinity

File Code: 2720-3
Date: April 29, 2005

Bruce Thomas
Environmental Manager
Western Area Power Administration
114 Parkshore Drive
Folsom, CA 95630-4710

Dear Mr. Thomas:

This is in response to your letter, dated February 17, 2005, regarding the North Valley Right-of-Way Maintenance Project. You requested the Forest Service to serve as a cooperating agency in the preparation of National Environmental Protection Act (NEPA) documentation for this project. I've delayed my response back to you until my staff was able to get a better understanding of the proposed project. John Schuyler, Public Uses Staff Officer, met with several of your staff and contractors, including Steve Tuggle, on April 12th to discuss this project.

Since a significant portion of the proposed action is on National Forest System lands, we accept your offer to participate as a cooperating agency for this effort. It is my understanding that this project is also on the Lassen and Modoc National Forests and that the Shasta-Trinity may be the lead Forest in the coordination of environmental information and document review.

At this time, I share the following concerns that we have with this project:

- *There is a certain amount of inherent controversy over the use of herbicides on national forest lands.* We suggest that you strongly consider documenting your analysis in an Environmental Impact Statement.
- *The Forest Service has built an important government-to-government relationship with several local Indian tribes.* We would like any consultation conducted for this project to be sensitive to these relationships.
- *Forest Service funding to support this type of action is very limited.* We are interested in discussing any opportunities for funding assistance that you can offer. This has been done through a Collection Agreement in the past.

In order to participate as a Cooperating Agency and work as efficiently as possible, we are requesting copies of the following documents:

- Easement from the Forest Service to Western Area Power Administration authorizing the 500 kV line from Malin to Round Mountain.
- Copy of the Biological Opinion from the U. S. Fish and Wildlife Service.

- Copy of the Programmatic Agreement with the State Historic Preservation Officer.
- Copies of the survey protocols for archaeology, biology and botany that will be used for both the Western and TANC lines.
- Copy of the Proposed Action for this NEPA document. Include the type and manner of application of herbicides you would consider, as well as any standard mitigation that you would propose for sensitive species or sites when conducting activities under the line.
- A copy of the GIS layer that includes your towers and road system that can be combined with the resource layers (both the layers we currently have and those that will be developed based on your survey results).

Your proposal included the installation of a fiber optic line on your transmission lines. While we support and endorse the expanded use of existing rights-of-way, fiber optic equipment is not considered ancillary to transmission line permits and easements and must be authorized under separate permit and authority. When you are prepared to move forward with that stage of the proposal, please submit a separate application on Standard Form 299.

For the Shasta-Trinity National Forest, your contact for GIS work will be Jonna Cooper who can be reached at the McCloud Ranger Station at (530) 964-2184. Your contacts for specialists doing the surveys will be Archaeologist Julie Cassidy, Botanist Rhonda Posey and Biologist Debbie Derby. They can be reached at the Mt. Shasta Ranger Station at (530) 926-4511. They will be available under the Collection Agreement to provide any existing resource data and to review and provide comments on survey protocol and reports from this summer's work.

John Schuyler will be the contact person for this project. He can be reached in our Redding headquarters at (530) 226-2525. Special Use Administrator Stacy Smith is also assigned to this project and can be reached at the Mt. Shasta Ranger Station at (530) 926-4511.

Sincerely,

Kathleen A Jordan (for)

J. SHARON HEYWOOD
Forest Supervisor

cc: Laurence Crabtree, Stan Sylva, Laurie A Tippin

Department of Energy
Western Area Power Administration
Sierra Nevada Customer Service Region
114 Parkshore Drive
Folsom, California 95630-4710

SEP - 2 2005

Ms. J. Sharon Heywood
Forest Supervisor
United States Department of Agriculture
Shasta-Trinity National Forest
3644 Avtech Parkway
Redding, CA 96002

Dear Ms. Heywood:

We appreciate your response to our February 17, 2005 letter inviting the Shasta-Trinity National Forest to be a Cooperating Agency in the preparation of the National Environmental Policy Act (NEPA) documentation for the North Area Right-of-Way (ROW) Maintenance Project. This letter documents Western Area Power Administration's (Western) understanding that the National Forest has agreed to be a Cooperating Agency for this project.

As described in our February 17, 2005 letter, the proposed action for this project involves changes in operations and maintenance (O&M) procedures along Western's North Area transmission line ROW and the Transmission Agency of Northern California's (TANC) California-Oregon Transmission Project (COTP) ROW. These proposed changes include the expanded use of herbicides, in combination with manual and mechanical vegetation removal methods, and promotion of low growing plant communities. In addition, erosion repair, geotechnical borings, and fiber optics installation may be added to the current routine ROW O&M procedures. Because fiber optic installation will be included as part of the proposed action, Western would like to request a copy of Form 299 to submit to the Forest Service in conjunction with the Environmental Assessment (EA).

An EA is under preparation in response to the proposed expansion of existing O&M methods that are currently allowed under the Biological Opinion with the U.S. Fish and Wildlife Service and the Programmatic Agreement with the California Office of Historic Preservation. NEPA documentation will support Section 7 consultation activities under the Endangered Species Act and Section 106 consultation activities under the National Historic Preservation Act for those activities that are not covered under the current BO or PA.

The Project Area extends along Western's transmission line ROW from Modoc County in northeastern California, southwest towards Redding, and continues south along the eastern side of the Sacramento Valley toward Sacramento, California. Other segments of the ROW extend from the Trinity Reservoir in Trinity County, southeast to Redding, and from Maxwell southeast

toward Sacramento. The ROW includes portions that traverse national forest lands, including Lassen, Modoc, and Shasta-Trinity National Forests.

As a Cooperating Agency, the National Forest's will be invited to provide input on the scope of the EA, review the biological and cultural resource survey data collected in the field, and provide comments on the Draft EA prior to public release. Western understands that Mr. John Schuyler from the Redding headquarters will be the point of contact for this project. We will keep Mr. Schuyler up to date on all project activities and decisions and we will set up a meeting in the near future to discuss funding assistance.

Western has reviewed the National Forest's preliminary concerns on the North Area ROW Maintenance project. The following information provides a response to your concerns:

- Western understands the controversy surrounding the use of herbicides in national forest lands and we appreciate the Forest Service's recommendation to expand the analysis in an Environmental Impact Statement. However, Western believes that an EA is the appropriate level of NEPA review at this time.

- With regard to local tribal relations, Western will be sensitive to the government-to-government relationships established with local Indian tribes. We are currently taking a proactive approach in our coordination efforts with local Indian tribes in the vicinity of the proposed project and the State Historic Preservation Officer (SHPO). For example, the Pit-River Tribe has employed monitors to accompany Western's archaeologists during surveys. The SHPO has been provided with any available information pertaining to project activities and known cultural resources in the project area prior to commencing with surveys. Western is willing to coordinate with the Forest Service's cultural resource specialist to ensure that any concerns regarding tribal relations or cultural resources are addressed.

- Western would like to set up a meeting with Mr. Schuyler to discuss funding assistance.

- The GIS data is being reviewed for quality assurance/quality control and will be sent to your office once the data is finalized.

We have enclosed all requested documents and data associated with the subject project. Western will contact the National Forest personnel highlighted in your April 29, 2005 memo to make sure they have the information they need to participate effectively in the NEPA process.

Western appreciates your coordination with our office. If you have any questions, please contact me at (916) 353-4549 or tuggle@wapa.gov.

Sincerely,

Steve Tuggle
Project Manager
Western Area Power Administration
Sierra Nevada Region

6 Enclosures

Appendix F

Aquatic Conservation Strategy

NORTH AREA RIGHT-OF-WAY MAINTENANCE PROGRAM WESTERN AREA POWER ADMINISTRATION

The Aquatic Conservation Strategy was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. Because activities are proposed for Riparian Reserves the proposed action and all action alternatives were evaluated to determine how planned activities would affect implementation of the Aquatic Conservation Strategy. This evaluation was accomplished by evaluating the effects of proposed management activities in Riparian Reserves for each of the nine Aquatic Conservation Strategy Objectives as described in the USFS/BLM memorandum *Compliance with the Aquatic Conservation Strategy,* dated May 22, 2007. A description of the how the proposed action and alternatives will affect each ACS objective follows.

Evaluation of the Nine ACS Objectives and how the Proposed Action "meets", "does not adversely affect", or "does not retard or prevent attainment of" or otherwise achieve ACS objectives.

Aquatic Conservation Strategy Objectives	How the Proposed Activities for All Action Alternatives Meet the ACS
1) Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.	The proposed actions and alternatives do not propose any additional impacts to watersheds, and provide both Standard Operating Procedures including Best Management Practices and resource specific Project Conservation Measures for both water features and riparian dependant species.
2) Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.	This project does not propose any changes to watercourse alignments or flow regimes. All watercourses will be protected from impacts using both Standard Operating Procedures and Project Conservation Measures detailed in the EA and Operations Plan. Connectivity will not be changed or affected as a result of operation and maintenance of the right of way corridors.
3) Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	Water courses, wetlands and vernal pools within the right of way will be avoided during maintenance and operation of the power lines. Buffers around each feature vary from 50 feet to 300 feet depending on the proposed maintenance activtiy. Only hand operations are permitted within the perimeter of aquatic and riparian features.
4) Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	Standard Operating Procedures including Best Management Practices and Project Conservation Measures will ensure that water quality is not affected by routine maintenance activities. Riparian vegetation will be maintained and only those limbs or tops that encroach or threaten to encroach into the legally required clear area will be hand trimmed and removed.

Aquatic Conservation Strategy Objectives	How the Proposed Activities for All Action Alternatives Meet the ACS
5) Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	All road maintenance and repair will be conducted according to the Standard Operating Procedures and the Project Conservation Measures to protect soils and water resources within and on access roads leading to the rights of way. Operations will be conducted in summer and fall when flows are at their lowest point. No new road construction is proposed that could create additional sources of sediment.
6) Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats, and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	Operation and maintenance activities will not affect in-stream flows on watercourses within the rights of way. Buffering and limits on methods of vegetation maintenance will limit impacts on water courses and wetlands to negligible levels. Activities near water courses or wetlands will be scheduled for summer and fall to take advantage of the lowest flows and driest conditions.
7) Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	Operation and maintenance of the line will occur after the winter/spring period of rainfall and will have no material affect on the natural cycle of flooding and inundation of meadows, vernal pools and riparian wetlands.
8) Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.	Buffering around all water courses, wetlands, and vernal pools will limit the impacts to these resources. Species composition and structural diversity will be unaffected. Any clearing or maintenance work will be limited to those actions needed to keep the legally mandated clear area around the wires within the rights of way.
9) Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.	Buffering around all water courses, wetlands, and vernal pools will limit impacts to these resources and maintain habitats needed to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

Appendix G

Herbicide Information

APPENDIX G HERBICIDE APPLICATION

This section describes Western's approach to using herbicides to control vegetation along the North Area ROWs. The approach is based on Western's 2007 Integrated Vegetation Management Guidance (IVM) document and related operations and maintenance (O&M) activities planned for the North Area. Western has developed specific requirements for herbicide use on National Park Service (NPS), U.S. Forest Service, Bureau of Land Management, and private lands. Section 1 outlines Western's overall approach to herbicide use for vegetation management. Section 2 summarizes Western's negotiated approach for herbicide use on NPS, USFS, and BLM lands. Section 3 discusses past herbicide use and the associated risks.

1. Western IVM Herbicide Procedures

Historically, Western's vegetation management activities have been restricted primarily to the control of vegetation which will pose a fire or safety hazard to transmission facilities. However, the IVM expands the vegetation management activities to include the control of noxious or undesirable weeds and to promote low-growing plant communities within the ROW.

Western considered several factors when selecting the appropriate, effective, and safe herbicide for IVM. It is generally desirable to select an herbicide that has low toxicity, will not move from its target or leach into groundwater (low water solubility), and will not remain in the environment for a long period of time (low persistence). Western uses several different ways to apply herbicides. The method selected depends on the type of control needed, the type of vegetation, and the site situation (site conditions and locations). Some of the methods that Western utilizes are stump treatment, basal spray/treatment, foliage spray/treatment, soil treatment (preemergence), and under surfacing materials treatment.

Sections 7 and 8 of the 2007 IVM provide a wealth of information on herbicide formulation, herbicide application, pre-application procedures, safety precautions, record keeping, and clean up (see Exhibit G.1 for a copy of Sections 7 and 8 of the 2007 IVM). Table G-1 provides the list of herbicides Western plans to use on NPS, BLM, USFS, and private lands.

2. Western's Approach to Herbicide in NPS, USFS, & BLM

Western has been proactive in collaborating with the NPS, USFS, and BLM in order to understand their concerns with herbicide use on Federal lands. As such, Western has conducted several meetings with the respective agencies to discuss their concerns, especially, the use of herbicides. Understandably, the use of herbicides is an important topic of concern. Western has recognized this extremely important issue and has taken initiative to learn more about the use of herbicides on Federal lands. Western has even attended herbicide training with David Bakke, Pesticide-Use Specialist and Invasive Plants Coordinator State and Private Forestry, of the USFS. The training took place in

Sacramento, CA on March 14 – 16, 2007. This training provided guidance on herbicide use and the associated human and ecological risks.

Western is responsible for the development of Interagency Agreements which includes the management of noxious weeds. Unlike on private lands where Western develops cooperative agreements with County Agents or Boards, on Federal lands Western will defer compliance with Federal and state weed control laws and regulations to the landowner or administrator. Herbicide use on NPS, USFS, and/or BLM lands is restricted to specifically approved herbicides that the respective agency has approved for application on their jurisdictional lands.

Western will only use herbicides that have been approved and which have had human health and ecological risk assessments prepared. USFS has prepared comprehensive risk assessments for 14 herbicides routinely used in the forest (see website www.fs.fed.us/foresthealth/pesticide/risk.shtml). These documents, quantitatively evaluate the probability that a given pesticide use might impose harm on humans or other species in the environment. Table G-1 provides a list of herbicides that Western would use on NPS, USFS, and BLM lands. Refer to Exhibits G.2 and G.3 for summaries of risks associated with these herbicides.

3. Past Herbicide Use and Associated Risks

In order to determine the risks associated with herbicide use, Western requested detailed information from contractors on past herbicide use along the North Area ROW. Both Asplundh and Atlas-Tree indicated that they primarily apply herbicide as a stump treatment, rather than a spray. Atlas-Tree does not apply herbicide using a spray applicator. Asplundh indicated that they do very little spraying of vegetation, less than 1 acres of blackberry per year.

With regard to quantities, Atlas-Tree has used 23 gallons of Garlon 4, a stump treatment, over 175 acres. This results in approximately 0.13 gallons per acre. Again, there is no spray or aerial application associated with Garlon 4. These numbers are typical for the amount of herbicide used along North Area ROW.

Risk is based on the hazard (what you are using) and exposure (who or what will come in contact with the hazard in the target area. A majority of the vegetation management activities would occur between Red Bluff and the Oregon Border, areas with dense vegetation. Based on real data from Western's contractors, the anticipated application methodology (e.g., stump treatment), the proposed conservation measures (e.g., buffers around riparian areas), and the remoteness of the North Area ROW maintenance activities, it is assumed that the risks to humans and the environment is very low. No significant impacts would occur from herbicide application.

HERBICIDE APPLICATION

Table B-1 Herbicides Planned for Use in NPS, BLM, USFS and Private Lands

Herbicide	Trade Name**	EPA Registration Number	Use	Aquatic	Land Use Application			
					NPS	BLM	USFS	Private Lands
Bromacil and Diuron	Krovar® 1 DF**	352-505	Substations; non-sensitive areas only	No				Yes
Chlorsulfuron	Telar® DF**	352-522	ROW	No	Yes[1]	No	Yes	Yes
Clopyralid	Transline®**	62719-259	Noxious Weed Control	No	Yes[1]	No	Yes	Yes
2,4-D	Weedar 64®** 2,4-D LV6 Ester®** HI-DEP®** 2,4-D Amine 4**®	71368-1 228-95 2217-703 1381-103	Substations, ROW Substations, ROW Substations, ROW Substations, ROW	No No No No	Yes[1] Yes[1] Yes[1] Yes[1]	Yes Yes Yes Yes	Yes Yes Yes Yes	Yes Yes Yes Yes
Clopyralid and 2,4-D	Curtail®**	62719-48	Substations, ROW; noxious weed control	No				Yes
Dicamba	Vanquish®** Banvel®**	228-397 51036-289	ROW (Stump Treatment), Substations	No No	Yes[1]	Yes	Yes	Yes Yes
Dithiopyr	Dimension Ultra 40®	62719-445	Landscaped Areas	No				Yes
Diuron	Karmex® DF** Diuron 80 DF IVM®	1812-362 62719-310	Substations Substations	No No				Yes Yes
Flumioxazin	Payload®	59639-120	Bareground – Substations, *Kochia* control	No				Yes
Fosamine Ammonium	Krenite® S**	352-395	ROW	No				Yes

Herbicide	Trade Name**	EPA Registration Number	Use	Aquatic	Land Use Application			
					NPS	BLM	USFS	Private Lands
Glyphosate	Roundup® PRO** Aquamaster® (aquatic)** Rodeo® (aquatic)**	524-475 524-343 62719-324	Substations Areas near water, wetlands Areas near water, wetlands	No Yes Yes	Yes[1]	Yes Yes	Yes Yes	Yes Yes Yes
Imazapyr	Arsenal® (liquid)** Stalker®** Arsenal® 0.5G**	241-346 241-398 34913-23	Substations, ROW Stump Treatment Substations	No No No	Yes[1] Yes[1]	Yes Yes	Yes Yes	Yes Yes Yes
Oxyfluorfen	GoalTender®	62719-447	Landscaped Sites – Bareground Control	No	Yes[1]	Yes	Yes	Yes
Sulfometuron Methyl	Oust® XP**	352-601	Storage Yards, Subs	No	Yes[1]	Yes	Yes	Yes
Sulfometuron Methyl and Chlorsulfuron	Landmark® MP®	352-621	Bareground - Substations	No				Yes
Tebuthiuron and Diuron	Sprakil SR-13®*8	34913-15	Substations	No				Yes
Mefluidide	Embark® 2S** (Plant growth regulator)	2217-759	Buffers, around subs. (on grass)	No				Yes
Imazapyr and Diuron	Topsite 2.5G®** Sahara DG®**	34913-22 241-372	Substations, some ROW Substations	No No				Yes Yes
Tebuthiuron	Spike® 80DF**	62719-107	Substations	No				Yes
Triclopyr	Garlon 3A®** Garlon 4®*8 Pathfinder ®**	62719-37 62719-40 62719-176	ROW Stump Treatment	Yes No No	Yes[1] Yes[1]	Yes Yes	Yes Yes	Yes Yes Yes
Triclopyr	Garlon 3A®** Garlon 4®*8 Garlon 4 Ultra® Pathfinder ®**	62719-37 62719-40 62719-527 62719-176	ROW Stump Treatment	Yes No No No	Yes[1] Yes[1] Yes[1]	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes Yes
Pendamethalin	Pendulum WDG®	241-340	Substations	No				Yes
Oryzalin	Surflan A.S. ®	70506-44-829	Substations	No				Yes

HERBICIDE APPLICATION

Herbicide	Trade Name**	EPA Registration Number	Use	Aquatic	Land Use Application			
					NPS	BLM	USFS	Private Lands
Fluroxypyr	Vista®	62719-308	ROW, Substation esp. for Kochia	No				Yes
Paclobutrazol	Profile 2SC® (Tree growth regulator)	67690-22	ROW (sensitive areas) Substations (screens)	No				Yes
Trifluralin	Biobarrier® Biobarrier II®	59823-1 59823-3	Substations, yards	No				Yes

[1] These herbicides have been previously used. However, NPS does not pre-approve herbicides. On an annual basis, Western shall submit to the NPS regional office an application with intended herbicides and amounts, and identify target species and locations. NPS shall enter the request into the Pesticide Use Proposal system and track its approval process.

This page intentionally left blank.

EXHIBIT G.1 HERBICIDE APPLICATION

7.0 CHEMICAL CONTROL METHODS

7.1 CLASSIFICATION AND TYPES OF HERBICIDES

An herbicide is a type of pesticide used to kill or suppress the growth of unwanted plants, including trees. The most satisfactory classification of herbicides is based upon how they are used for vegetation control and how they work. Table 3-2 lists advantages and disadvantages of these methods.

Classification by Use

- **Selective herbicide** implies that certain vegetation species are killed but other desirable plants are not significantly injured. Many selective herbicides kill broadleaf plants (including brush) but do not affect grasses.
- **Nonselective** refers to chemicals that are generally toxic to plants without regard to species. Plants differ in susceptibility to any specific chemical and the choice of herbicide and application rate depends on the species to be controlled.

Classification by Mode of Activity

There are generally three classes of herbicides based on activity (all may be selective or nonselective):

- **Contact herbicides - foliage applied** - control vegetation by direct contact with plant parts. They are referred to as chemical “mowers,” as only the plant area contacted is controlled. Good coverage is necessary.
- **Translocated or systemic herbicides - foliage applied** - products move through the entire plant system in both the water stream and the food stream. They accumulate in, and affect the active growth centers. In general, these compounds are selective. Some are effective in the soil and can be taken into the plant through the roots. However, they are most effective when applied to the plant foliage.
- **Residual soil-active herbicides - soil applied** - are sometimes referred to as “soil sterilants”. The length of time the soil remains relatively vegetation-free depends upon the chemical used, amount applied, rainfall, soil type, and the plant species invading the treated area.

Figure 7-1 illustrates how contact, translocated, and nonselective residual herbicides work.

Compounds that can be used selectively in some situations may be used nonselectively by increasing the rate of application. Soil residual herbicides generally have little effect upon plants when sprayed on foliage. The main effect is when they are absorbed through the shoot or root and moved in the water stream of the plant to the leaves.

7.2 HERBICIDE FORMULATIONS

The active ingredients in a pesticide are the chemicals that control the target plant. The herbicide you purchase is rarely made up of only one active ingredient. Usually the herbicide is diluted in water or a petroleum solvent, and other chemicals are added before the product is offered for sale. These other chemicals may include wetting agents, spreaders, stickers, extenders, or diluents. They usually make the product safer, easier to apply, more convenient to handle, and more accurate to measure. This mixture of active and inert (inactive) ingredients is called a **herbicide formulation**. Some formulations are ready for use. Others must be further diluted with water, a petroleum solvent, or air by the user before they are applied.

7.2.1 Types of Formulations

A single active ingredient often is sold in several different kinds of formulations. You must choose the formulation that will be best for each use. In making your choice, consider:

- Application machinery available and best suited for the job
- Hazard of drift and runoff (nearness to sensitive areas, likelihood of wind or rain)
- Safety to applicator, helpers, and other humans and pets likely to be exposed
- Habits or growth patterns of the plant to be controlled
- Cost

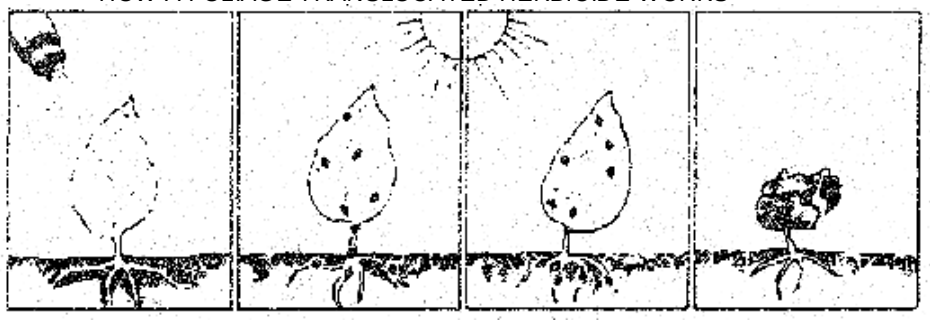
CONTACT HERBICIDES HALT VISIBLE PLANT GROWTH, AT LEAST FOR A SHORT TIME

Spraying of visible plant foliage initiates the action of a contact herbicide. A spray wand or spray boom is used to apply the compound, with application being made after growth has started.

Herbicide is taken into the plant leaves where it interferes with growth processes. The plant begins to curl, wither, and then turn brown.

Weed growth above ground is eliminated. Some weeds will not come back but many will reappear later in the season, since germinating seeds or perennial root systems are usually not affected by contact materials.

HOW A FOLIAGE TRANSLOCATED HERBICIDE WORKS

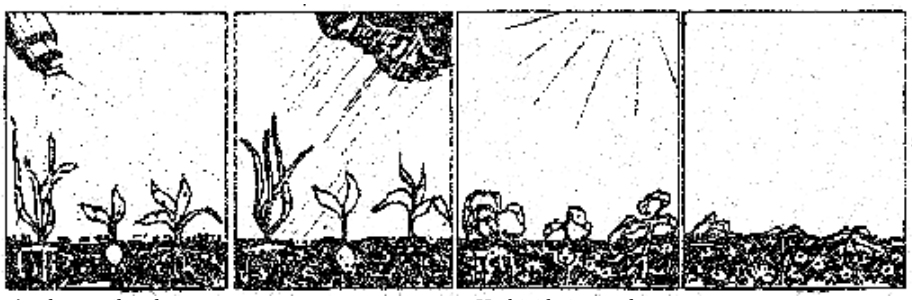


Spray growing vegetation to wet.

Chemical translocated down to roots and growing points and throughout the plant.

Susceptible plant then gradually dies.

HOW A NONSELECTIVE RESIDUAL WORKS



Apply to soil and young plants in early spring.

Rain washes herbicide in the soil; It dissolves and is absorbed by shoots or roots.

Herbicide is translocated to growing points, plant yellows and gradually dies.

Plants die and bare ground occurs for a year or more

SOURCE: BPA 1994

CONTACT, TRANSLOCATED, AND RESIDUAL HERBICIDES

121B

FIG. 7-1

7.2.1.1 *Liquid Formulations*

Emulsifiable Concentrations (EC or E)

An emulsifiable concentrate formulation usually contains the active ingredient, one or more petroleum solvents, and an emulsifier which allows the formulation to be mixed with water. Each gallon of EC usually contains 2 to 8 pounds of active ingredient. EC's are among the most versatile formulations. They are used against agricultural, ornamental and turf, forestry, structural, food processing, livestock, and public health pests. They are adaptable to many types of application equipment, from small, portable sprayers to hydraulic sprayers, low-volume ground sprayers, mist blowers, and low-volume aircraft sprayers.

Advantages:

- o High concentration means price per pound of active ingredient is relatively low and product is easy to handle, transport, and store.
- o Little agitation required; not abrasive; will not settle out or separate when equipment is running.

Disadvantages:

- o High concentration makes it easy to overdose or underdose through mixing or calibration errors.
- o Easily absorbed through skin of humans or animals.
- o May be corrosive.

Invert Emulsions

This unusual mixture contains a water-soluble pesticide dispersed in an oil carrier. Invert emulsions require a special kind of emulsifier that allows the pesticide to be mixed with a large volume of petroleum carrier, usually fuel oil. When applied, invert emulsions form large droplets which do not drift easily. Invert emulsions are most commonly used in vegetation control along rights-of-way where drift to susceptible nontarget plants is a problem.

7.2.1.2 *Granules (G)*

The sandy particles are made from an absorptive material such as clay, limestone, corn cobs, or walnut shells. The active ingredient either coats the outside of the granules or

is absorbed into them. The amount of active ingredient is relatively low, usually ranging from 1 to 15 percent.

Granular pesticides are most often used to apply chemicals to the soil to control weeds, nematodes, and insects living in the soil. They also may be used as residual herbicides - formulations that are applied to the soil, then absorbed into the plant through the roots and carried throughout the plant.

Advantages:

- Ready to use; no mixing.
- Drift hazard is low - particles settle quickly.
- Low hazard to applicator - no spray, little dust.
- Weight carries the formulation through foliage to soil target.
- Simple application equipment - often seeders or fertilizer spreaders.

Disadvantages:

- More expensive than Wettable Powders or EC's.
- May need to be incorporated into soil.
- May need moisture to activate pesticidal action.

7.2.1.3 *Pellets (P or PS)*

Pellet formulations are very similar to granular formulations; the terms often are used interchangeably. A pellet, however, is a formulation manufactured to create a pellet of specific weight and shape. The uniformity of the particles allows them to be applied by precision applicators such as those being used for precision planting of pelleted seed.

7.2.1.4 *Wettable Powders (WP or W)*

Wettable powders are dry, finely ground formulations which look like dusts. They usually must be mixed with water for application as a spray. Wettable powders contain 5 to 95 percent active ingredient, usually 50 percent or more. Wettable powder particles do not dissolve in water. They settle out quickly unless constant agitation is used to keep them suspended.

Wettable powders are one of the most widely used pesticide formulations. They can be used for most pest problems and in most types of spray machinery where agitation is possible.

Advantages:

- Low cost.
- Easy to store, transport, and handle.
- Easily measured and mixed.
- Less skin and eye absorption than EC's and other liquid formulations.

Disadvantages:

- Require good and constant agitation (usually mechanical) in the spray tank.
- Inhalation hazard to applicator while pouring and mixing the concentrated powder.
- Abrasive to many pumps and nozzles, causing them to wear out quickly.

7.2.1.5 Dry Flowables (DF)

Dry flowables are highly concentrated granules designed to break up and disperse in water in a manner similar to that of wettable powders. These require agitation, and have similar advantages and disadvantages as those listed for wettable powders.

7.2.2 Adjuvants

An adjuvant is an inert material added to a pesticide formulation or tank mix to increase the effectiveness of the active ingredient. Most pesticide formulations contain at least a small percentage of additives. Some applicators add additional adjuvants while mixing for special applications. Some product labels may caution the user against adding adjuvants, and some surfactants have been known to adversely affect fish and other aquatic life, including amphibians. If there are sensitive aquatic species, a formulation such as Rodeo® or Aquamaster® without added surfactants could be used. These formulations contain water as their active ingredient.

Common adjuvants are:

- **Wetting agents** - allow wettable powders to mix with water and stick on plant or animal surfaces.

- **Emulsifiers** - allow petroleum-based pesticides (EC's) to mix with water.
- **Invert emulsifiers** - allow water-based pesticides to mix with petroleum carrier.
- Spreaders - allow pesticide to form a uniform coating layer over the treated surface.
- **Stickers or Surfactants** – enhance the ability of the pesticide to stay on the treated surface.
- **Penetrants** - allow the pesticide to get through the outer surface to the inside of the treated area.
- **Drift Control Agents** - these include:
- **Foaming agents -** reduce drift.
- **Thickeners -** reduce drift by increasing droplet size.

7.2.3 Compatibility

Two or more pesticides which can be mixed together to control a wider range of pests with a single application are said to be compatible with each other. Sometimes the pesticides are formulated together by the manufacturer, but the applicator often must mix separate formulations in the tank. It is important to remember that not all pesticides work well in combination. Pesticides which are not compatible can cause:

- Loss of effectiveness against the target pests.
- Injury to the treated surface (phytotoxicity in plants, toxicity in treated animals, stains or corrosion on treated surfaces).
- Separation of ingredients into layers or settling out of solids.

Some pesticide labels list other pesticides with which the produce is compatible.

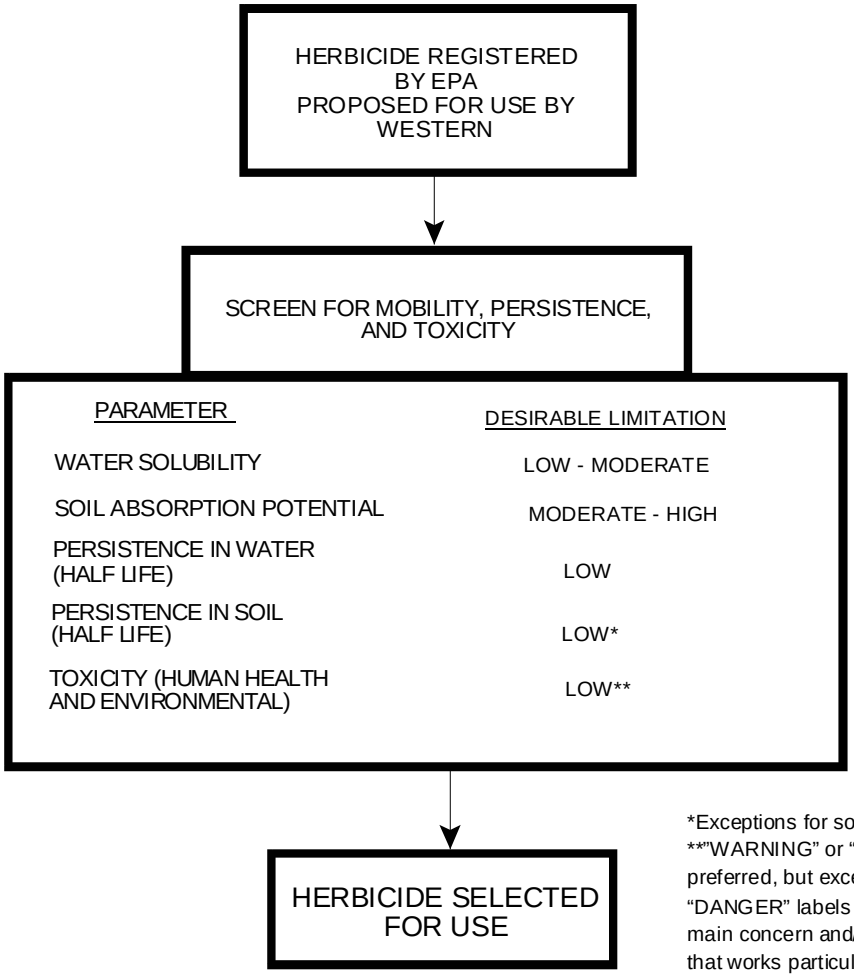
7.3 HERBICIDES SELECTED FOR USE BY WESTERN

Several factors are considered in selecting appropriate, effective and safe herbicides for use in Western's TVMP. Figure 7-2 demonstrates a screening process that can be used in selecting a herbicide. As the figure indicates, it is generally desirable to select a herbicide that has low toxicity, will not move from its target or leach into groundwater (low water solubility), and will not remain in the environment for a long period of time (low persistence). However, each factor must be considered in light of the herbicide's intended use, its effectiveness, the target vegetation, and the site characteristics.

Selecting the right herbicide treatment can also be done as a decision tree exercise, in which the most important factors are queried with a yes/no outcome to lead to the best herbicide mix for the species present, site conditions, seasonal or climatic conditions, and type of application used.

Based on information about herbicides that have been successfully used by Western, a list of suggested herbicides has been developed. Table 7-1 lists those herbicides by common (chemical) and trade names, along with their EPA Registration numbers, manufacturers, and type of use.

HERBICIDE RISK ASSESSMENT



*Exceptions for soil-applied herbicides
**"WARNING" or "CAUTION" labels are preferred, but exceptions are made for "DANGER" labels if eye protection is the main concern and/or the herbicide is one that works particularly well for certain weeds or situations.

23121E-S

HERBICIDE SCREENING PROCESS

FIGURE 7-2

TABLE 7-1
SUGGESTED HERBICIDE LIST
(Current as of 2006)

Herbicide	Trade Name**	EPA Registration Number	Manufacturer or Distributor*	Use
Bromacil and Diuron	Krovar® 1 DF**	352-505	DuPont	Substations; non-sensitive areas only
Chlorsulfuron	Telar® DF**	352-522	DuPont	ROW
Clopyralid	Transline®**	62719-259	Dow AgroSciences	Noxious Weed Control
2,4-D	Weedar 64®** 2,4-D LV6 Ester®** HI-DEP®** 2,4-D Amine 4**®	71368-1 228-95 2217-703 1381-103	Nufarm/Riverdale Nufarm/Riverdale PBI/Gordon Agriliance LLC.	Substations, ROW Substations, ROW Substations, ROW Substations, ROW
Clopyralid and 2,4-D	Curtail®**	62719-48	Dow Agrosciences	Substations, ROW; noxious weed control
Dicamba	Vanquish®** Banvel®**	228-397 51036-289	Nufarm/Riverdale Microflo Company	ROW (Stump Treatment), Substations
Dithiopyr	Dimension Ultra 40®	62719-445	Dow Agrosciences	Landscaped Areas
Diuron	Karmex® DF** Diuron 80 DF IVM®	1812-362 62719-310	Griffin Dow Agrosciences	Substations Substations
Flumioxazin	Payload®	59639-120	Valent USA	Bareground – Substations, *Kochia* control
Fosamine Ammonium	Krenite® S**	352-395	DuPont	ROW
Glyphosate	Roundup® PRO** Aquamaster® (aquatic)** Rodeo® (aquatic)**	524-475 524-343 62719-324	Monsanto Monsanto Dow	Substations Areas near water, wetlands Areas near water, wetlands
Imazapyr	Arsenal® (liquid)** Stalker®** Arsenal® 0.5G**	241-346 241-398 34913-23	BASF Corporation BASF Agricultural Products SSI Maxim	Substations, ROW Stump Treatment Substations, some ROW (around wood poles)

Herbicide	Trade Name**	EPA Registration Number	Manufacturer or Distributor*	Use
Oxyfluorfen	GoalTender®	62719-447	Dow Agrosciences	Landscaped Sites – Bareground Control
Picloram	Tordon® RTU Tordon® 22K**	62719-31 62719-6	Dow AgroSciences	ROW (Stump Treatment) ROW
Sulfometuron Methyl	Oust® XP**	352-601	DuPont	Storage Yards, Subs
Sulfometuron Methyl and Chlorsulfuron	Landmark® MP®	352-621	DuPont	Bareground - Substations
Tebuthiuron and Diuron	Sprakil SR-13®*8	34913-15	SSI Maxim	Substations
Mefluidide	Embark® 2S** (Plant growth regulator)	2217-759	PBI/Gordon	Buffers, around subs. (on grass)
Imazapyr and Diuron	Topsite 2.5G®** Sahara DG®**	34913-22 241-372	SSI Maxim BASF Corporation	Substations, some ROW Substations
Tebuthiuron	Spike® 80DF**	62719-107	Dow Agrosciences	Substations
Triclopyr	Garlon 3A®** Garlon 4®*8 Pathfinder ®**	62719-37 62719-40 62719-176	Dow AgroSciences	ROW Stump Treatment
Pendamethalin	Pendulum WDG®	241-340	BASF Specialty Products	Substations
Oryzalin	Surflan A.S. ®	70506-44-829	United Phosphorus Inc	Substations
Fluroxypyr	Vista®	62719-308	Dow AgroSciences	ROW, Substation esp. for Kochia
Paclobutrazol	Profile 2SC® (Tree growth regulator)	67690-22	SePRO Corporation	ROW (sensitive areas) Substations (screens)
Trifluralin	Biobarrier® Biobarrier II®	59823-1 59823-3	Reemay	Substations, yards

*Phone numbers and Internet addresses for the major herbicide manufacturers and distributors are provided in Appendix C.

** after the trade name -- These are also on the 2006 BLM approved herbicide list; see Appendix A for complete BLM nationwide list and information on other Federal land management agency approved herbicides.

Not all herbicides are equally appropriate, effective, or safe, given different site conditions and locations. In selecting a particular herbicide and formulation to use, it is important that the label be read and understood, and that the particular site conditions be considered and "matched" to the label precautions and type of herbicides (e.g., selective vs. nonselective). Also, one must check to see if the herbicide is restricted to certain uses under State regulations or if it is approved by a Federal land management agency, if one is involved. Table 7-2 presents some factors that should be considered in selecting a particular herbicide/formulation for vegetation control.

To help in determining which herbicide is most appropriate, Tables 7-3 and 7-4 present more information about the suggested herbicides, such as:

- Relative toxicity
- Persistence
- Leaching potential
- Label restrictions
- State-specific restrictions
- Formulation or application method normally used

Table 7-3 lists the **non-selective** herbicides that are used primarily at substations and yards. Table 7-4 lists the **selective** herbicides that affect broadleaf plants and trees, but not grasses, and are used on rights-of-way, plus some selective preemergent herbicides and growth regulators used at substations, yards, and tree screens.

Herbicide labels can usually be obtained from the manufacturer's web site (see Appendix C), from the Crop Data Management Systems (CDMS) web site at www.cdms.net/manuf/manuf.asp, or from Van Diest Supply Company (1-800-779-2424). The labels provide more detail regarding restrictions and precautions. See Table 7-5 for "highlights" that are important to look for when reading pesticide labels.

Table 7-6 explains the different EPA toxicity ratings, which are indicated on herbicide labels by the signal words "Danger/Poison," "Warning," or "Caution." These signal words tell how acutely toxic the herbicide is (i.e., if the herbicide is harmful within 24 hours of exposure or can damage the eyes or skin).

TABLE 7-2

FACTORS TO CONSIDER IN SELECTING A HERBICIDE

Factor	Comment
• Type of control needed	Generally use non-selective herbicides for "bareground" only or where can apply very selectively.
• Type of undesirable species	Check label/literature or applicator experience for plant susceptibility to certain herbicides; see Table 11-1 for herbicides recommended for specific noxious weeds.
• Potential damage to adjacent crops and/or desirable vegetation (from soil-applied herbicides)	Do not use herbicides which have the potential to move offsite into crops. Check label for precautions. Use only herbicides that will not injure or destroy desirable plants by root absorption if roots of desirable plants extend under area to be treated.
• Potential pollution of surface water - proximity and topography	Use only a herbicide approved for use close to water bodies where runoff could carry herbicide to water.
• Potential pollution of groundwater - site geology/soils and depth to groundwater	Use a herbicide with low leaching potential and low persistence if groundwater is shallow and/or soils are sandy (permeable) and have low organic matter. Check label for particular susceptibilities; use low-drift formulation and nonpersistent herbicide.
• Exposure of humans and animals	Check label for restrictions; use low toxicity herbicide.
• Exposure of sensitive aquatic species, including amphibians	Use herbicide labeled for aquatic use that does not contain a surfactant as an inert ingredient (e.g., Aquamaster®, Rodeo®); restrict or limit use near sensitive habitat.
• State or Federal Agency (BLM, USFS, NPS, e,g,) restrictions	Check State and agency approved lists or guidance

TABLE 7-3
NON-SELECTIVE HERBICIDES
(from Western's suggested herbicides list- also check with Federal land management agencies as needed)

Chemical Common Name	Trade Name(s)	Treatment Method(s) Available[7]	Soil Persistence	Leaching Potential	Toxicity Signal Word	Label Restrictions (see label for details)	State Restricted Use (R.U.) or Prohibited Pesticide?
Bromacil + Diuron[1]	Krovar 1 DF®	Soil Treatment	Bromacil: Remains active in the soil for 7 months to more than 1 year, depending on application rate.[1] Half-life is 5-6 months (90 days)[6]. (See also Diuron)	Bromacil: relatively high;[6] more likely if soils are low in organic matter[1]. (See also Diuron)	Caution	Limit drift; use in/near water, wetlands; endangered species habitat; inhalation skin/eye contact; combustible; do not apply to permeable soil or if drinking water aquifer present.	Yes R.U. in CA, CO, TX
Diuron[2]	Karmex DF® Diuron 80 DF IVM®	Soil Treatment	One month to more than one year depending on application rate. Half-life is 60 days.[6]	Moderate[6]	Caution	Limit drift; use in/near water, wetlands; sensitive crops; reentry until sprays have dried; skin/eye contact; soil type restrictions.	Yes - R.U. in CA, CO
Glyphosate[4]	Roundup® PRO; Rodeo® (aquatic), Aquamaster® (aquatic) Accord® Concentrate	Foliage Spray	Depends on soil texture and organic matter content. Half-life is from 3-130 days[1] (30 days).[6] Not active in soil.	Low potential[1,6]	Caution	Limit drift; use only when potential for drift to sensitive areas (e.g., endangered species habitat) is minimal. Skin/eye contact; inhalation; ingestion. Note: Rodeo® and Aquamaster® do not contain a surfactant; the inert ingredient is water.	No
Imazapyr[4]	Arsenal® Stalker®	Soil Treatment	Broken down by exposure to sunlight and by soil microorganisms. Remains active in the soil for 6 months to 2 years.[1] Half-life in soil is 90 days[6].	Low potential[1,7,8]	Caution	Limit drift; use in/near water, wetlands, irrigation ditches or water flows onto agricultural land; endangered plants and habitat; inhalation, ingestion, skin/eye contact.	No
Imazapyr & Diuron	Sahara DG® Topsite 2.5 G®	Soil Treatment	See Diuron	See Diuron	Caution	Do not apply to water/ surface water present; avoid contact with eyes, clothing; can injure offsite crops, plants.	Yes - not registered for use in CA. Diuron - R.U. in CA, CO.
Sulfometuron Methyl[2]	Oust® XP	Soil Treatment	Half-life in soil is 60 days[6].	Relatively high[6].	Caution	Limit drift or use in/near water; particles that move off site can damage non-target crops, vegetation.	Yes - not to be used in specified counties of CO: Saguache, Rio Grande, Alamosa, Costilla, Conejos (see label).

TABLE 7-3 (continued)
(from Western's suggested herbicides list- also check with Federal land management agencies as needed)

Chemical Common Name	Trade Name(s)	Treatment Method(s) Available[7]	Soil Persistence	Leaching Potential	Toxicity Signal Word	Label Restrictions (see label for details)	State Restricted Use (R.U.) or Prohibited Pesticide?
Sulfometuron methyl and Chlorsulfuron	Landmark MP®	Soil Treatment	See base chemicals	Relatively high – see base chemicals	Caution	Limit drift or use in/near water; particles that move off site can damage non-target crops, vegetation.	Yes - not to be used in specified counties of CO: Saguache, Rio Grande, Alamosa, Costilla, Conejos (see label).
Flumioxazin	Payload®	Foliage Spray	Low – half-life of 15 days(9)	Low (9)	Caution	Do not apply to water; toxic to aquatic invertebrates; so no apply where runoff is likely to occur	No
Diuron and Tebuthiuron	SpraKil SR-13®	Soil Treatment	See Diuron	Known to leach under certain conditions (10)	Caution	Do not apply to water; may result in groundwater contamination in areas with very permeable soils and shallow water table	Diuron - R.U. in CA, CO
Dithiopyr	Dimension Ultra 40®	Foliage spray	Highly adsorbed; persistent(11)	Highly immobile (11)	Caution	Highly toxic to aquatic organisms; watch for drift and runoff near aquatic sites; do not apply directly to water or when conditions favor drift	No
Oxyfluorfen	GoalTender®	Foliage Spray	Readily biodegradable (12)	High potential for mobility in soil (12)	Caution	Do not apply to water; highly toxic to fish, wildlife, aquatic invertebrates, and plants; runoff is an issue	No

1 Source: BPA Pesticide Fact Sheets for Bromacil (BPA 1994b)
2 Source: BPA Pesticide Applicators Course for Operations Personnel (BPA 1994a)
3 Source: Colorado Weed Management Association (no year)
4 Source: BPA Pesticide Fact Sheets (BPA 1994b)
5 Source: Kansas State University Cooperative Extension Service (1988)
6 Source: Weed Control Handbook (Whitson et al. 1993-1994)
7 Source: A. Roybal, pers. comm. (1995)
8 Source: Weed Science Society of America, Herbicide Handbook (1989)
9 Source: http://www.wsdot.wa.gov/maintenance/pdf/flumioxazin.pdf
10 Source: SpraKil Sr-13® label
11 Source; http://www.ncbi.nlm.gov
12. Source; MSDS for Goal Tender®

TABLE 7-4
SELECTIVE HERBICIDES
(from Western's suggested herbicides list- also check with Federal land management agencies as needed)

Chemical Common Name	Trade Name(s)	Treatment Method(s) Available[6]	Soil Persistence	Leaching Potential	Toxicity Signal Word	Label Restrictions (see label for details)	Restricted Use (R.U.) or Prohibited Pesticide?
Chlorsulfuron[1]	Telar® DF	Foliage Spray	6-12 months residual[2]. Half-life of 1-3 months.[1] (30 days)[4]	High potential in permeable soils.[4,1]	Caution	Limit drift, do not apply to water.	Yes - Not to be used in specified counties of Colorado: Saguache, Rio Grande, Alamosa, Costilla, and Conejos (see label).
Clopyralid[1]	Transline®	Foliage Spray	Moderate residual[2] 1-5 months. Half-life of 2-10 weeks. (20 days)[4]	Relatively high.[4]	Caution	Human health - ingestion, skin/eye contact. Do not apply to water, where have permeable soils.	No
2,4-D[1]	Esteron 99® Weedar 64® 2,4-DLV 6 Ester® HI-DEP® 2,4-D Amine 4®	Foliage Spray	30 days at highest application rate.[1] Half-life of 10 days.[4]	Small (ester) to moderate (acid and amine)[4]	Danger - Hi-Dep, Weedar 64, 2,4-D Amine 4 Caution - Esteron 99C, 2,4-D LV6 Ester®	Limit drift, use in/near water, wetlands; toxic to aquatic invertebrates; avoid endangered species; human health-ingestion, inhalation and skin/eye contact.	Yes - R.U. in CA, NM, TX
Dicamba[5]	Vanquish® Banvel®	Foliage Spray Stump Treatment	2-5 months residuals depending on rate of application and soil type.[2] Half-life of 1-6 weeks.[1]	Relatively high[1] - can leach into groundwater.	Caution – Vanquish® Warning – Banvel®	Limit drift; inhalation; skin/eye contact; ingestion; do not use near water or sensitive crops.	Yes - R.U. in CA, TX.
Fosamine[5] Ammonium	Krenite S®	Foliage Spray	Broken down quickly by soil.[3] Half-life of 7 days.[4]	Very low-none.[4,5]	Caution	Limit drift, use in/near surface water; can apply to floodplains.	Yes - not labeled for use in CA or AZ.
Picloram[1]	Tordon RTU® Tordon 22K®	Stump Treatment Foliage Spray	6-12 months residuals. Half-life of 90-120 days depending on rate of application and soil type.[2,4]	Relatively high - can leach into groundwater in certain soil (low organics) and weather conditions.[1]	Caution	Limit drift, use in/near water, wetlands, ditch banks; endangered plants and invertebrates; inhalation; skin/eye contact.	Yes - not approved for use in CA; R.U. in all other states for Tordon 22K®; Tordon RTU® is not restricted use.[5]
Clopyralid and 2,4-D	Curtail®	Foliage Spray	See Clopyralid and 2,4-D	Can be high due to clopyralid content.	Danger	Can leach; do not apply to soils with rapid permeability (loamy sand to sand) or where water table is shallow. Limit drift; do not apply to water.	Yes – R.U. in CA, NM, TX
Triclopyr[1]	Garlon 3A® Garlon 4® Pathfinder II®	Foliage Spray Basal Treatment	Moderately residual. Half-life or 46 days.[1]	Low to Moderate - leaching potential depends on soil type, acidity, and rainfall.[1]	Danger - Garlon 3A Caution - Garlon 4 Caution - Pathfinder II	Limit drift, use near endangered plants; irrigation ditches, domestic water; inhalation skin/eye contact; combustible.	No

TABLE 7-4 (Continued)
(from Western's suggested herbicides list- also check with Federal land management agencies as needed)

Chemical Common Name	Trade Name(s)	Treatment Method(s) Available[6]	Soil Persistence	Leaching Potential	Toxicity Signal Word	Label Restrictions (see label for details)	Restricted Use (R.U.) or Prohibited Pesticide?
Clopyralid and 2,4-D	Curtail®	Foliage Spray	See Clopyralid and 2,4-D	Can be high due to clopyralid content.	Danger	Can leach; do not apply to soils with rapid permeability (loamy sand to sand) or where water table is shallow. Limit drift; do not apply to water.	Yes – R.U. in CA, NM, TX
Triclopyr[1]	Garlon 3A® Garlon 4® Pathfinder II®	Foliage Spray Basal Treatment	Moderately residual. Half-life or 46 days.[1]	Low to Moderate - leaching potential depends on soil type, acidity, and rainfall.[1]	Danger - Garlon 3A Caution - Garlon 4 Caution - Pathfinder II	Limit drift, use near endangered plants; irrigation ditches, domestic water; inhalation skin/eye contact; combustible.	No
Pendamethalin (does not affect many weeds, trees)	Pendulum WDG®	Soil Treatment (Preemergent control; often used in mix with Roundup® in landscaped areas)	Half-life of 60 days.[6]	Low[6]	Caution	Toxic to fish; do not apply to water; limit drift. Avoid contact with eyes, skin, clothing. May discolor sprayed surfaces.	No
Oryzalin (does not affect many weeds, trees)	Surflan A.S.® Oryzalin 4®	Soil Treatment (Preemergent control; often used in mix with Roundup(r) in landscaped areas)	Half-life of 60-90 days.[4,6]	Low[4,6]	Caution	Do not apply to water; limit drift; avoid contact with skin, eyes, clothing. May discolor sprayed surfaces.	No
Melfluidide[5]	Embark® (Plant Growth Regulator)	Foliage Spray	Not persistent in soil. Half-life of 2 days.	Low - adsorption on the soil insignificant.	Caution	Limit drift; do not allow animals to graze on treated areas; avoid contact with skin, clothing; do not apply to water.	No
Paclobutrazol	Profile or Cambistat 2SC® Tree Growth Regulator	Soil drench, Soil injection	Average half-life = 1-3 years.[6]	Very low. High adsorption, low solubility.[6]	Caution	Do not apply to water or where surface water present; avoid contact with skin, eyes, clothing. (Can affect nearby non-target vegetation)	No
Tebuthiuron	Spike® 80W	Soil Treatment	Half-life of 360 days[8]	Very high[8]	Caution	Prevent drift; do not apply where soils have rapid permeability or where water table is shallow; do not apply in/near water or in any area where desirable vegetation (including roots) is in vicinity; see label restrictions for groundwater protection.	No

TABLE 7-4 (Concluded)
(from Western's suggested herbicides list- also check with Federal land management agencies as needed)

Chemical Common Name	Trade Name(s)	Treatment Method(s) Available[6]	Soil Persistence	Leaching Potential	Toxicity Signal Word	Label Restrictions (see label for details)	Restricted Use (R.U.) or Prohibited Pesticide?
Trifluralin	Biobarrier® Biobarrier II®	Subsurface herbicide impregnated geotextile placement	Half-life of 60 days.[4]	Usually high[4], but probably lower in this product (time-release nodules)	Caution	Toxic to fish; do not apply to water or wetlands; avoid contact with eyes, skin, clothing.	No
Fluroxypyr	Vista®	Foliage Spray	Half-life of 1-4 weeks[7]	Relatively low sorptivity and therefore has potential for leaching, but also low water solubility and rapid dissipation in field.[7]	Warning	Toxic to fish; do not apply to water or wetlands; drift can affect non-target aquatic organisms and plants.	No
Aminopyralid	Milestone®	Foliage Spray	Relatively immobile; not very persistent; shorter half-life than clopyalid and picloram, but longer than 2,4-D and dicamba (9)	Minimal leaching below 15-30 cm (9)	Caution	Do not apply to water	No

1 Source: BPA Pesticide Fact Sheets.
2 Source: Colorado Weed Management Association.
3 Source: Kansas State University Cooperative Extension Service.
4 Source: Weed Control Handbook.
5 Source: A. Roybal, pers. comm.
6 Source: B. Massey, Dow Elanco, pers. comm. and fact sheets.
7 Source: Vista Herbicide Technical Guide, Dow AgroScience.
8 Source: Oregon State University Extension Pesticides Properties Database
9 Source: EPA Fact Sheet 8/10/05

TABLE 7-5
PESTICIDE LABEL HIGHLIGHTS

- **Always read the label before you use it!**

- Pesticide labels include all the written information provided by the manufacturer about the product

- Pesticide Name:
  1. *Brand or Trade Name: T*he name by which the pesticide is sold
     "Pathfinder® II"
  2. *Common Name:* The shorter name for the active ingredients in the product
     "triclopyr"
  3. *Chemical Name:* The complex names for the individual active ingredients
     "3,5,6-trichloro-2-pyridinyloxyacetic acid, butoxyethyl ester"
  4. *Active Ingredients:* The chemicals used to kill the target pest
     "triclopyr … 13.6%"

- Types of Use: Each pesticide is registered to be used for only specific purposes

- Registration and Establishment Numbers

  Pathfinder® II: EPA Reg. No 352-508-Registration number
  Some products may have State-specific establishment numbers – e.g.:
  EPA Est. 55947-TX-1 - State where product was made (Texas)

- SLN: "Special Local Need" is noted when pesticide products are approved by specific states

  e.g., "EPA SLN No. KS-770009" or approved as a special local need for use in Kansas

- Signal Words: Danger/Poison/Skull & crossbones - Highly toxic
  Warning - Moderately toxic
  Caution - Slightly/not so toxic

- Precautionary Statements: Notes if the product is hazardous to people or domestic animals; health hazards

- Personal Protective Equipment (PPE): Provides information on required PPE

TABLE 7-5
(Concluded)

• User Safety/ First Aid	Provides health and safety information
• Environmental Hazards	Notes if the product is harmful to the environment, especially to fish or water bodies
• Physical or Chemical Hazards	Lists special fire, explosion or chemical hazards Examples: - "combustible" (often due to components of the inert ingredient) "corrosive - store in corrosion-resistant tank"
• Directions for Use	Notes when the pesticide should be applied and compatibility with other products
• Registered Uses	This is usually noted under the directions for use: - Restricted Use: use only by certified applicators or under their supervision General Use or "General Classification": can be used by non-certified applicators and the public at large Example: "General use herbicide for non-cropland brush and weed control" Pesticides may be used for only those uses noted on the label. All other uses would violate the label and FIFRA requirements.
• Uses and Application Rates	Exactly how much of the product should be mixed with water or other carrier for the use selected, if not ready-to-use formulation.
• Storage and Disposal	Provides information on storage of product, and disposal of products and containers.
• Name and Address of Manufacturer	

TABLE 7-6
TOXICITY CATEGORIES

	Signal Word on Label			
	"Danger/Poison"	"Warning"	"Caution"	"Caution"
Relative Toxicity:	Highly Toxic	Moderately Toxic	Slightly Toxic	Very Slightly Toxic/Nontoxic
Eye Effects:	Corrosive: corneal opacity not reversible in 7 days	Corneal opacity reversible within 7 days; irritation persisting for 7 days	No corneal opacity; irritation reversible in 7 days	No irritation
Skin Effects:	Corrosive	Severe irritation at 72 hours	Moderate irritation at 72 hours	Mild or slight irritation at 72 hours

Source: BPA 1994b

Special care should be taken if a "Danger/Poison" classified herbicide is selected for use. In general, Western prefers to limit use of herbicides that are classified as "Danger/Poison" (in some cases, the "Danger" signal is required because of special eye protection, which can readily be provided and used). The vast majority of herbicides have low toxicity to humans and are relatively safe to humans and animals if used properly. Worker exposure is minimal with the proper use of personal protective equipment (e.g., chemically resistant gloves, respirators if needed, etc. - see Section 7.6.3 - Applicator Safety Requirements).

Rates of application for weed control are often given in minimum and maximum amounts, depending on the situation. The reason for the range in application rates is that control is influenced by differences in response to weed species, stage of growth when treatment is made, the period of residual toxicity desired, the amount and distribution of rainfall, soil texture and organic matter, and other environmental conditions. Refer to Table 7-7, "Situations where Minimum and Maximum Rates of Herbicides Are Needed," for suggestions in selecting the proper rate for a specific situation.

7.4 CHEMICAL CONTROL METHODS

There are several different ways to apply herbicides, and the method selected depends on the type of control needed, the type of vegetation, and the site situation (site conditions, location). Selecting the appropriate method was discussed in Section 3.2 and summarized on Table 3-3; this section expands on that information and describes the **specific procedures and precautionary measures for each treatment method.** These methods include:

- o Stump treatment
- o Basal spray/treatment
- o Foliage spray/treatment (postemergence)
- o Soil treatment (preemergence)
- o Under surfacing materials treatment

Note that **tree growth regulators and biobarriers** are discussed in more detail in Section 13.0.

TABLE 7-7
SITUATIONS WHERE MINIMUM AND MAXIMUM RATES OF HERBICIDES ARE NEEDED

Use Minimum Rates	Use Maximum Rates
Herbaceous Plants:	
Susceptible species	Tolerant species
Annuals	Perennials
Seedlings	Annuals and Biennials in flower
Perennials in bud	Established perennials - flower to maturity
Shallow-rooted	Deep-rooted
Residual Toxicity:	
Short period	Several years
Arid regions	Humid regions
Soil Type:	
Low in organic-matter content	High in organic-matter content
Low in clay content	High in clay content
Well drained	Poorly drained
Root-Absorbed Chemical:	
Bare Soil	Heavy plant residue

Generally, all of these are options for use on rights-of-way to control brush or noxious weeds. At substations and yards, non-selective herbicides are usually applied either as soil treatments or foliage applications.

7.4.1 Stump Treatment

Stump Treatment generally involves cutting a tree down and treating the freshly cut surface with either an oil-based mixture or a ready-to-use non-oil solution (Figure 7-3). This type of treatment is used when vegetation is cut to ground line. Therefore, its primary uses are: (1) initial clearing and (2) maintenance clearing when trees have grown too tall to foliage spray or drift is an issue.

To treat stumps, cut the top of the stump level to allow uniform herbicide coverage. Thoroughly wet the cambium layer next to the bark so the conducting tissue will carry the herbicide to the roots. On larger trees, treat only the outer 2 to 3 inches of the stump (the internal heartwood of the tree is already dead). On trees 3 inches or less in diameter, treat the entire cut surface. Apply treatments immediately after cutting to achieve maximum effectiveness. If application is delayed after cutting, if possible, recut the stump and apply the herbicide to the live tissue. Delaying herbicide application to freshly cut trees can result in resprouting from the tree collar and roots. Moisture stress may affect control during the summer and early fall. Applications done during early spring when sap is flowing upward are not as successful as applications done during late spring or early summer, when upward sap flow has lessened. Undiluted water-soluble herbicide formulations are more effective than the esters.

Sometimes stump treatment is delayed when mechanical clearing is used, since stumps are not immediately locatable due to the volume of chips on the ground. In these cases, stumps may be treated several months after initial cutting.

Stump injection is another method of stump treatment. The method that has been used within Western is the EZJECT® capsule injection system. The system is composed of two parts - an application lance and a ready-to-use herbicide capsule, which can contain one of several different herbicides (e.g., glyphosate, imatapry, triclopyr,

picloram/2,4-D, or hexazinone). With this system, the herbicide is injected directly in the tree or stump, thereby avoiding drift or impacts to desirable vegetation. Also, EZJECT® requires no mixing or measuring, so the applicator never comes in contact with the herbicide. Appendix C provides manufacturer/distributor contact information for EZJECT®.

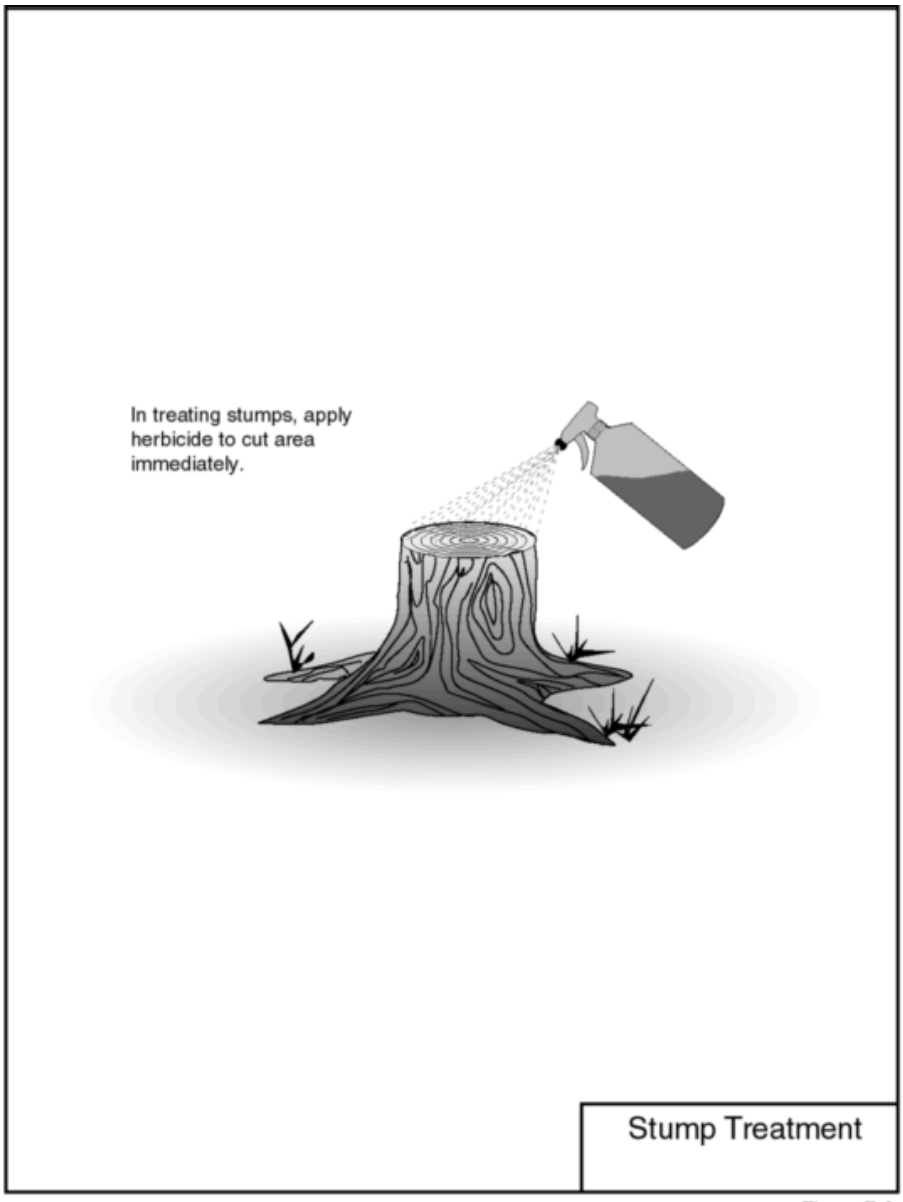


Figure 7-3

7.4.2 Basal Spray/Treatment

The **basal treatment** method involves spraying the lower part of the stem and the exposed roots of noncompatible vegetation with an oil-based formula (Figure 7-4). It is more selective than a foliage spray and does not produce immediate brownout of vegetation when applied during the dormant season. Therefore, this treatment may be prescribed where:

- Brush is too tall to foliage spray without causing unacceptable drift.
- The right-of-way is adjacent to cropland, residences, susceptible vegetation, or other sensitive areas, and drift is a problem.
- The right-of-way contains a high density of compatible species, and a foliage spray cannot be applied without injuring the compatible cover.
- The right-of-way is in a visually sensitive area where immediate brownout would be unacceptable, and, due to seasonal limitations, only those foliage sprays which cause immediate brownout can be used.

To basal spray, apply the herbicide to the lower 12 to 18 inches of the tree trunk or brush from early spring to mid-fall. Some species can be treated during winter, as long as snow/ice do not prevent contact of the chemical with the bark. The herbicide spray is often mixed with oil (diesel or kerosene) or other adjuvant, which acts as a carrier that adheres well to the tree trunk. Non-petroleum fatty acids (vegetable and animal oils) are now available, and these may be used as carriers for certain formulations. The herbicide spray mixed with oil is applied until the bark is saturated. The oil should be one that is made to be used with the particular herbicide and is approved for use.

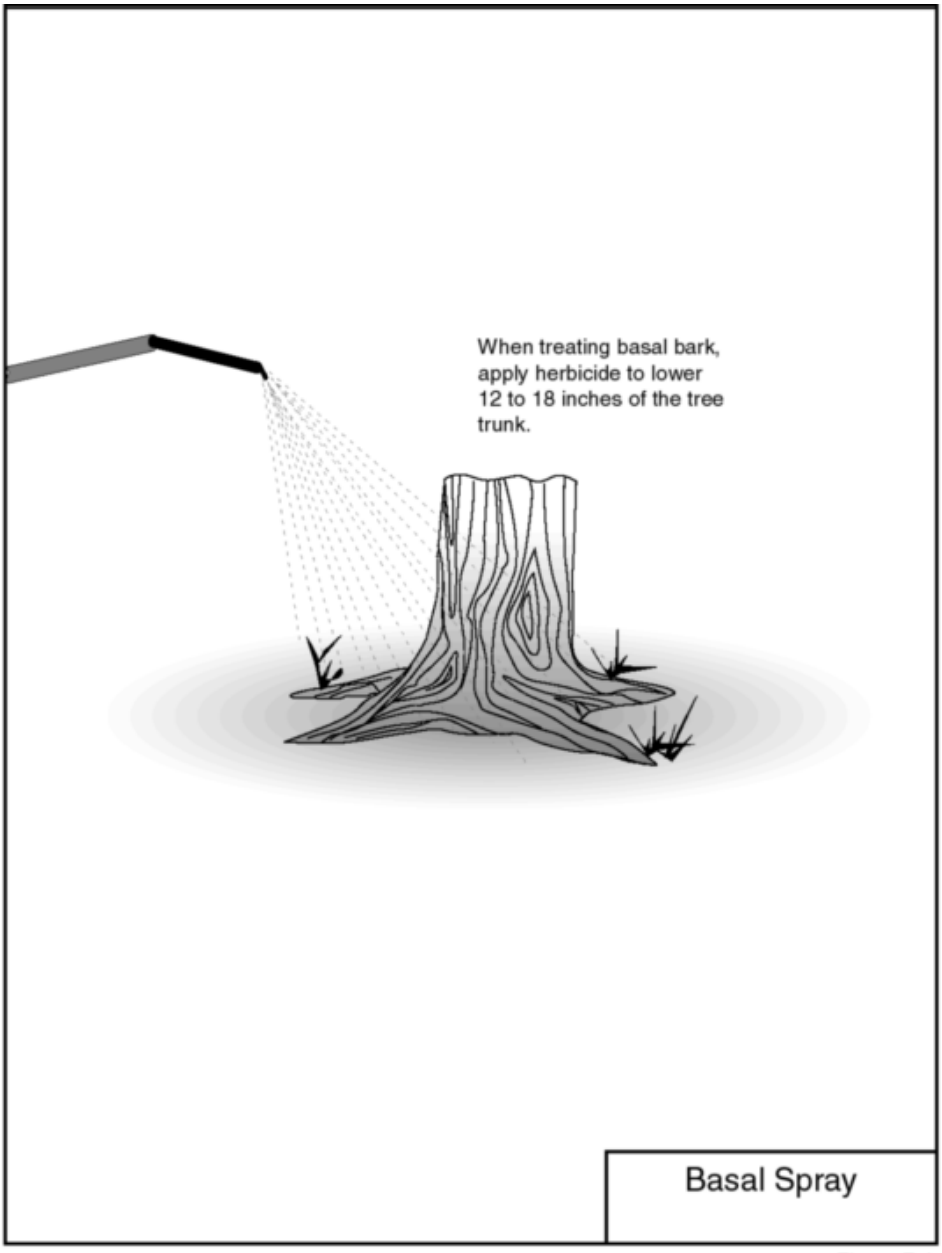

When treating basal bark, apply herbicide to lower 12 to 18 inches of the tree trunk.
Basal Spray

Figure 7-4

7.4.3 Foliage Spray

Foliar spraying is a common method of applying herbicides on brush up to 15 feet tall. This method uses a water-based formulation, applied to the entire plant's foliage and stems (Figure 7-5). Because it is sprayed up into the air, drift can be a problem under certain conditions. Also, most foliage sprays cause immediate brownout of vegetation. Therefore, in cases where drift or brownout is a problem, either foliage spraying is eliminated, or an alternate treatment (basal, or cut and stump treatment) is prescribed.

To apply herbicides using a foliar spray, make applications from early summer to late September, depending on the choice of herbicide. Treatments are least effective during very hot weather and when trees are under severe water stress. Fosamine ammonium (e.g., Krenite®) is labeled for use in floodplains and low lying areas where surface water is not present. Except in very sensitive species, spraying plants with rapidly elongating stems will often result in excessive sprouting. Saturation of the tree is not necessary.

7.4.4 Soil Treatment

Herbicides considered "soil sterilants" may be defined as compounds that, when applied to the soil, prevent the establishment of vegetation, ranging from a short time to relatively long periods of time. In the soil treatment method, applications are made to the base of plants or, when non-selective treatment is needed, to the ground surface. These herbicides are available in both liquid and solid (granular or pellet) formulations. Herbicides in granular or pellet form require precipitation to become activated (Figure 7-6).

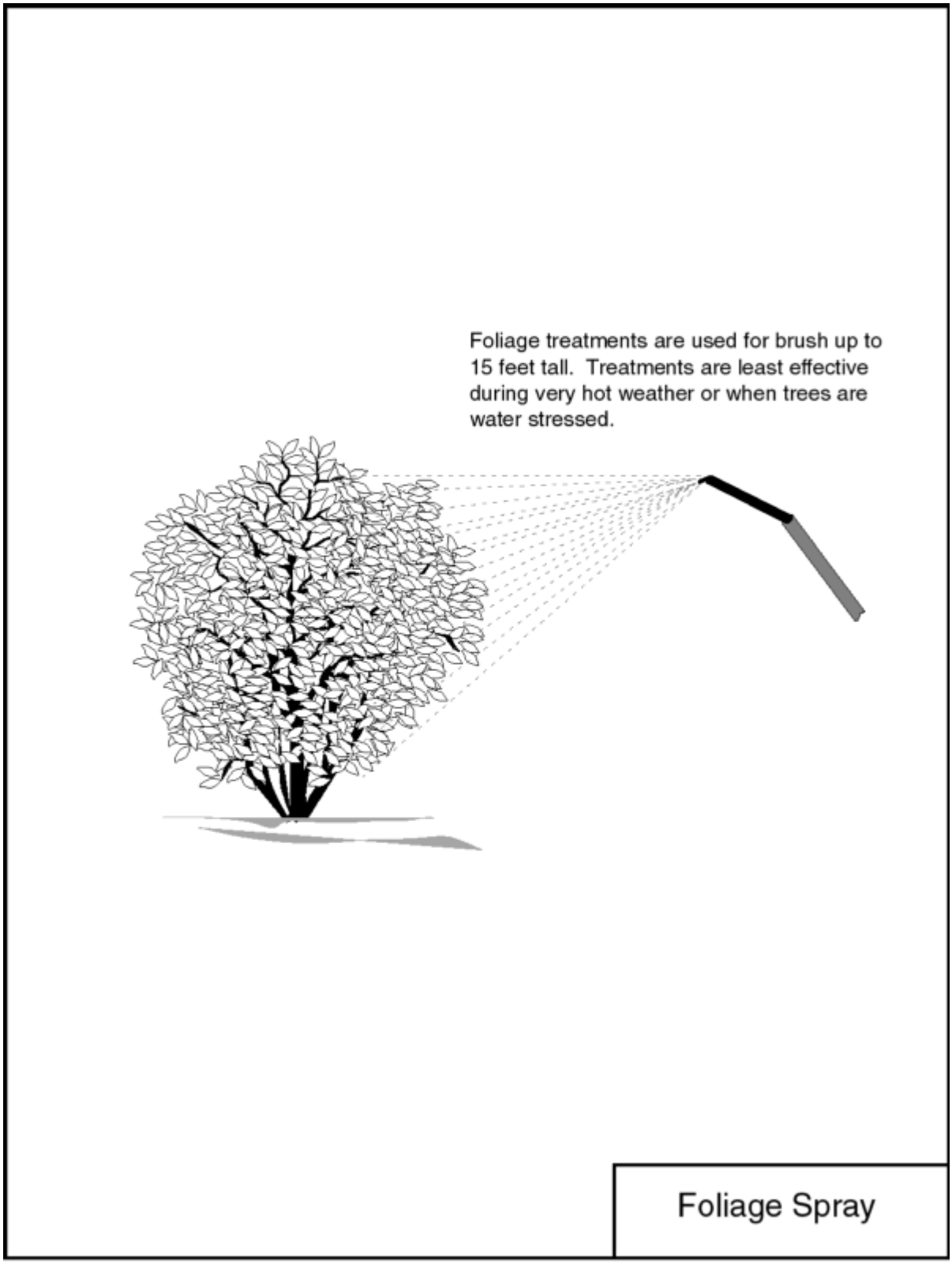

Foliage treatments are used for brush up to 15 feet tall. Treatments are least effective during very hot weather or when trees are water stressed.
Foliage Spray

Figure 7-5

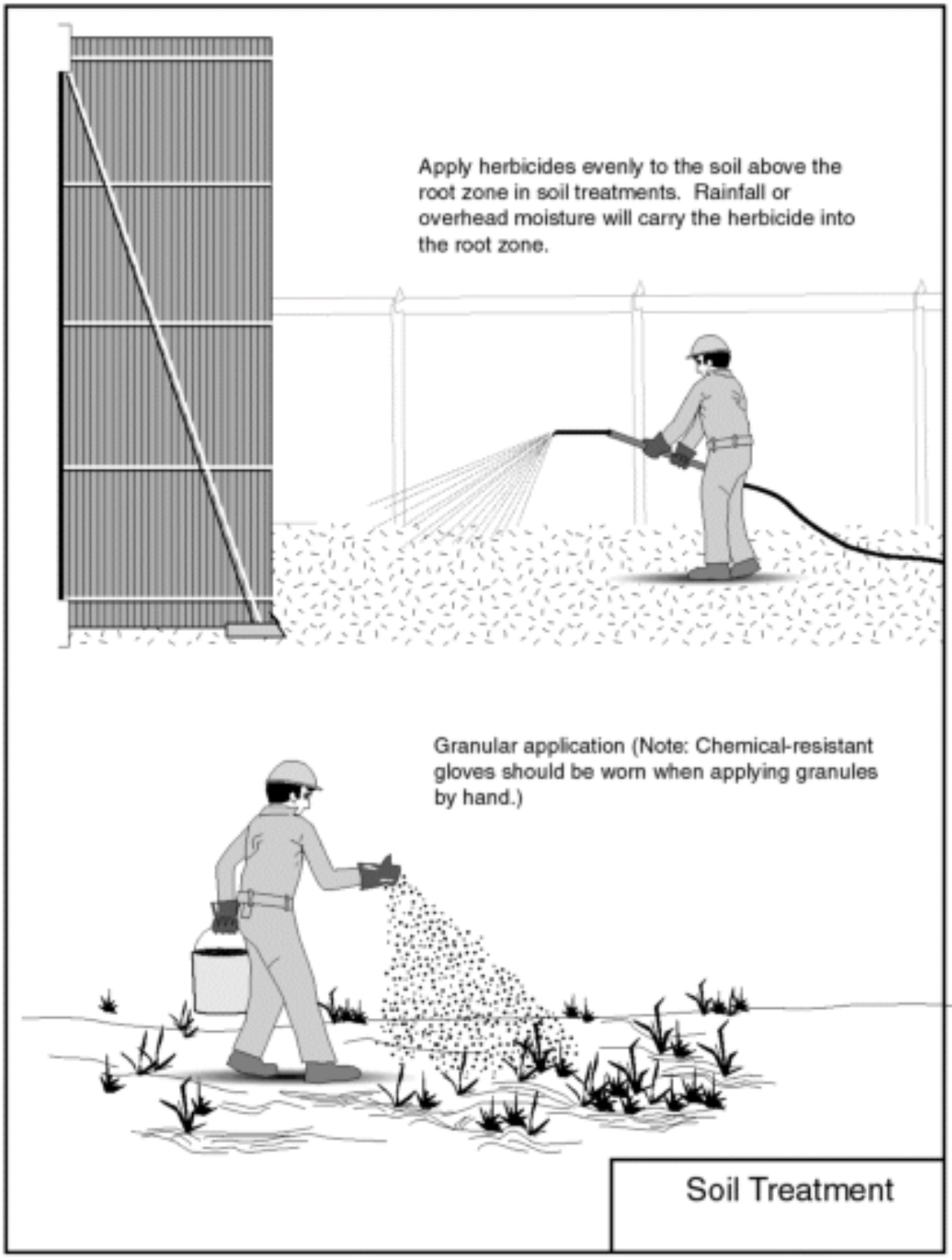

Apply herbicides evenly to the soil above the root zone in soil treatments. Rainfall or overhead moisture will carry the herbicide into the root zone.
Granular application (Note: Chemical-resistant gloves should be worn when applying granules by hand.)
Soil Treatment

Figure 7-6

Herbicides applied evenly to the soil surface move into the root zone of the targeted plants with rainfall or overhead moisture. For problem or noxious weed infestations, refer to Section 11.5.1 for information on herbicides recommended for each problem weed. For information on soil drench-applied tree growth regulators, see Section 13.0.

As a component of Western's Transmission Vegetation Management Program, Western has developed multiple year weed control programs for substations and other yards where "total" or bare ground residual weed control is necessary. Following this type of vegetation management program for bare ground control offers high performance, economical use of funds, and labor savings. Western can eliminate all vegetation from a given site by establishing a multiple year program. This plan is based on an initial first year program, followed by several years with a maintenance program.

Consistency, when using bare ground herbicides, is achieved when reducing the influence of key limiting factors. Western's standard for bare ground control should be an area that is clean, free of weeds, for an entire growing season, at a reasonable price. To achieve this expectation, manage these seven limiting factors:

1. Skipping an annual treatment typically results in weed escapes.
2. Mismatching a herbicide to a tolerant weed will result in poor control.
3. Rate shaving the recommended rate results in weed escapes.
4. The use of weak, less persistent herbicides allows for regrowth on the site.
5. The lack of a multiple year program adds unnecessary retreatment cost.
6. Failure to initially clean up the site results in chronic control problems.
7. Applications made after the weeds have emerged, late in the season, typically result in reduced performance. The weeds become established and moisture is not present to properly activate the residual herbicide to place it in the root zone of the germinating weeds.

Initial Treatment (First year clean up)

This program is implemented when an area has not been previously treated or the area is experiencing weed escapes during the growing season. Costs of this program are higher, but performance is greater. A preemergent application must be used to clean up areas previously untreated or neglected. It is imperative to use herbicides with substantial "punch"; consult with local distributors, as well as herbicide manufacturers,

to determine the best mix for your area, target vegetation, and site conditions.

Maintenance Treatment Programs (Second and Third years)

This program is used to maintain the initial treatment. Maintenance programs are lower in cost and provide good performance. If weeds begin to reenter this treatment, rotate back to the initial treatment program for one year. A yearly evaluation is encouraged to fine tune the herbicide rate and combination. Consult with local distributors, as well as herbicide manufacturers, to determine the best mix for your area, target vegetation, and site conditions.

Weed Resistance

These multi-year programs will involve the rotation of herbicide products to achieve better control and best management practices to minimize off-site environmental impacts. Different herbicide products have different modes of action related to how they affect weed growth. When tank mixing herbicides with different modes of action, a broader spectrum of control is achieved. Biotypes of kochia, Russian thistle, and prickly lettuce that are resistant to products such as Arsenal® and Oust® have been identified in areas of the northern Great Plains and the Pacific Northwest. It is recommended that these herbicides be used only in combination with other registered herbicides that have different modes of action and have similar soil residual activity. Do not let weed escapes go to seed; time postemergent treatments before seed formation. Respray problem areas in a timely and effective manner using a herbicide with a different mode of action.

Non-Selective Herbicides

Non-selective herbicides, such as Oust®, Curtail®, Spike® and Dimension Ultra 4O® can be very effective, but require special attention because they can affect adjacent desirable vegetation (including underlying roots) and/or readily leach into shallow groundwater. To reduce off-target risk, it is essential that great care be taken to apply these herbicides only (1) where they will not be carried from treated areas in drift or surface water runoff; (2) where treated soil will not be blown or otherwise be moved into cropland; and (3) where shallow groundwater will not be affected.

Postemergent Contact Herbicides

On occasion it will be necessary to add a postemergent contact herbicide to a tank mix of bare ground herbicides for a quick burn down, if weeds have already emerged from the ground. Postemergent contact herbicides have little or no residual soil activity, and therefore would need to be applied throughout the growing season. A very effective, nonselective postemergence herbicide is glyphosate. Any postemergent herbicide would have to be applied periodically to control weeds germinating throughout the growing season if no residual herbicides have been applied in conjunction with the postemergent contact herbicides. Rainfall within six hours after application may reduce effectiveness. Complete control of weeds may require retreatment. There are glyphosate formulations that are registered for aquatic sites.

Application Timing

There has been considerable debate over application timing in the spring or fall using bare ground herbicides. When evaluating the overall performance of bare ground residual herbicides, the following recommendations can be made.

The greatest performance consistency will be achieved when the timing is matched to your site. Consider regional specific climate factors and specific species.

Fall Applications Are Recommended (October - November) Prior to Freeze Up

1. When the rainfall is less than 15 inches per year.
2. Wind and temperature are more stable this time of year. Down time is reduced.
3. Winter rain and snow accumulation insure that the herbicide will be positioned into the soil below the plant's roots germinating in the spring. This insures herbicide uptake.
4. Fewer off-target complaints occur from fall applications because the product has had a chance to evenly disperse and bind in the soil with adequate moisture.
5. Herbicide degradation slows down significantly when soil temperatures reach 40 degrees Fahrenheit. The herbicide will remain stable and will not break down with these low soil temperatures.
6. Sensitive crops adjacent to treated areas will be harvested.

7. Commercial herbicide applicators are less busy during the fall, which would likely mean a lower bid for work.

Spring Applications Are Recommended (February - March) After the Winter Thaw

1. When the rainfall is greater than 15 inches per year.
2. When the herbicide is subject to breaking down in a warm, moist, open winter due to warmer soil temperatures.
3. When using postemergence, rescue treatments.

Check with the herbicide manufacturer's representative regarding optimal timing for best control.

Application Parameters

Sensitive Crops – During application, spray drift must be prevented to avoid off-target damage to desirable plants. The applicator should be knowledgeable of the chemical tolerance of adjacent vegetation, crops and ornamentals. Care should be taken with treatments which will interface (e.g., surface runoff or drift) with agricultural crops. Observing the weather conditions and limiting applications accordingly is very important. Additionally, the use of drift control agents will aid in reducing drift.

Spray Marking Dye – A spray marking dye should be added to the spray solution when liquid herbicides are being applied. The spray marking dye is a temporary colorant added to the spray solution for marking spray applications. Sunlight or rain will entirely fade the colorant in about 1.5 to 2 days. By adding a colorant to the spraying system, spray application contractors will be able to accurately and uniformly apply herbicides. In addition, Western personnel will be able to observe where herbicides have and have not been applied to the surface of the graveled yard and outside the perimeter of the security fence. This makes inspection of contractor work by Western personnel much easier and more reliable.

Best Management Practice for Bare Ground Applications

When applying any bare ground herbicide there are always inherent risks that the chemical will move off-site with surface water runoff. To prevent future movement of herbicides from applications done at substations, yards, around transmission line

structures, and other facilities where bare ground control is desired, the following best management practices should be considered:

Climatic Conditions **–** The degree of pesticide leaching and transport in surface water at a particular site depends on the amount and nature (e.g., drizzle vs. downpour) of local precipitation events. These climatic factors are governed by the season and the geographical location. Runoff potential can be minimized by observing weather patterns and avoiding pesticide application before major precipitation events. In either situation, proper timing of herbicide application relative to climatic conditions involves knowledge or understanding of the period(s) of heavy precipitation for the geographical area in general. The immediate weather forecast, is, of course, of primary importance in making a specific application decision.

Application Perimeter Buffer Zone – Applications should be done so as to minimize off-site impacts by minimizing drift and restricting weed control to 2 feet outside the security fence of any substation or yard, and to minimize drift to any portion of the right-of-way around structures where clearing of vegetation is needed for fire control. On occasion, the ditches which collect and direct surface water runoff can act as detention structures where vegetation is killed. Outside the security fence, vegetation should be mowed if possible.

Highly Sensitive Areas – In those areas where potential exists to damage sensitive crops, the herbicide glyphosate should be considered. The use of glyphosate, however, will require multiple applications during the growing season since it is a postemergent contact herbicide. Consideration can be given to using glyphosate in a mix with other herbicides to gain broader coverage and preemergent control.

7.4.5 Under Surfacing Materials Treatment

For weed control under asphalt and concrete surfaces, the herbicide Arsenal® is recommended at an application rate of 5 pints per acre. It is recommended that all vegetation and debris from the subgrade be removed prior to application. Treated areas should be paved as soon as possible after application.

The use of a **biological barrier** should also be considered under surfacing materials. Information on this control method is provided in Section 13.0.

7.5 PRE-APPLICATION PROCEDURES

The following checklist should be consulted before applying any herbicide.

PRE-APPLICATION CHECKLIST

1. **Review All Applicable Regulations**
   As discussed in Sections 2.1 and 2.2, some herbicides are restricted or designated for limited uses only either by Federal or State regulations and policies. Table 7-1, Western's suggested herbicide list, includes only Federal (EPA) - registered herbicides that are approved for ROW or other non-crop uses. However, State regulations or Federal land management agencies can be more stringent, and it is important to **check any State or other Federal restrictions and obtain any State-specific labels.** State pesticide regulations are summarized in Appendix B, along with contact information for State pesticide offices and key staff. Also, if any tribal lands are involved, be sure to check for tribal requirements.

2. **Review Property Owner Restrictions**
   As Section 2.4 indicates, there are often specific agreements in place between Western and the property owner/land management agency. **Check for specific private landowner restrictions** on use of herbicides or use of particular herbicides and/or application methods.

3. **Review Site Conditions/Location**
   It is important to know your site conditions and match the specific herbicide/method to those conditions. **Check the following:** (a) the plants that are to be controlled; (b) the season of the year and associated limitations; (c) presence of sensitive environmental areas (e.g., endangered species habitat, wetlands, etc.); (d) presence/proximity of nontarget vegetation (e) vegetation conditions - height, amount of tall, growing brush, etc. Use the guidance provided in Table 7-2 and 3-3 to select the appropriate herbicide and method. Table 7-7 can aid in determining the correct application rate.

4. **Review Western Environmental Protection Requirements** (see Section 8.0). Apply these along with the knowledge of site conditions/locations to ensure that appropriate procedures, buffers and precautionary measures are taken.

5. **Read the label** and follow the instructions/precautions!

7.6 WESTERN EMPLOYEE APPLICATION OF HERBICIDES

7.6.1 Certification and Training

The Federal Insecticide Fungicide, and Rodenticide Act (FIFRA) requires that anyone applying restricted use pesticides be trained and certified in pesticide application or under the direct supervision of a certified applicator. As a minimum requirement for certification, the applicator must show that he/she possesses a practical knowledge of the pest problems and pest control practices associated with operations, proper storage, use, handling and disposal of the pesticides and containers; and any related legal responsibility (40 CFR 171.5). In addition, certified applicators acting in a supervisory role must demonstrate knowledge of Federal and State supervisory requirements.

Most States now administer their own certification programs and have developed their own standards of competency that are at least equal to the Federal requirements; in some cases, State requirements are more stringent. Applicators must successfully complete an EPA-approved training program and obtain a certificate with a certification number to meet FIFRA requirements for pesticide applicators. The certificate may be valid for up to 4 years, depending on State regulations. Thereafter, refresher courses or continuing education programs are required periodically for recertification.

An applicator certified in one state is not necessarily certified for all states. Applicators must refer to the regulations for each state for specific certification requirements. Appendix A provides contact information for State pesticide regulatory agencies, which can be consulted to obtain individual State program information and certification requirements.

7.6.2 Calibration of Equipment

Calibration is the process of measuring and adjusting the amount of herbicide your equipment will apply to the target area. Proper calibration is an essential but often neglected task. You need to be sure you are using the correct amount of herbicide.

Too little herbicide can result in inadequate control; too much can result in injury to the target plant, illegal residues, excess run-off or other movement from the target, injury to persons, pets or wildlife reentering the area, and lawsuits and fines.

Overdosing with herbicides is illegal and carries severe penalties. Another important consideration is the high cost of using the wrong dosage. You may have to repeat the entire application if insufficient control results from underdosing. With the high cost of chemicals, overdosing is very expensive. The key is to take time to calibrate your equipment carefully and correctly, then check it regularly to detect change due to wear, corrosion and aging.

Calibration does not have to be difficult. You must be familiar with the operation of the machinery you are using and follow the manufacturer's directions carefully. Pesticide labels give you much of the information you need in order to calibrate correctly.

Before you begin to calibrate any equipment, check it carefully to be sure that all components are clean and in good working order. Clean all lines and strainers, making sure all strainers are the correct size and properly placed. Check pressure gages against one known to be accurate. Check nozzles to be sure they are numbered alike. Check the flow from each nozzle. To check nozzle flow, collect the flow from each nozzle for 30 seconds into a calibrated container such as a measuring cup marked in ounces. Clean or replace nozzles when flow varies $\pm$5 percent from the average output of the nozzles. Nozzles should only be cleaned with a soft-bristled brush such as a toothbrush--never with a sharp or metal object.

Study the manufacturer's instructions carefully--they explain exactly how to adjust the equipment. They often contain suggestions on such things as the appropriate rate of travel, the range of most efficient pump pressures, approximate settings for achieving various delivery rates, and types of nozzles which can be used.

7.6.2.1 Pre-Calibration Decisions

Before beginning to calibrate, you need to develop an application strategy. Using your knowledge of the species to be controlled, the condition and location of the application site, the other control methods being used, and the risks and benefits involved, you must choose:

- o The herbicide to be applied (see Section 7.3)
- o The equipment used to apply it

These two factors are closely related. If you have a choice, select the formulation and equipment which are the least hazardous to you, other people, and the environment. In any situation, choose equipment which you feel competent to use, and which:

- o Is designed for the type of chemical being applied
- o Is appropriate for the size and type of application job

If the equipment you have chosen is not motorized, the calibration may be fairly simple. In fact, some equipment, such as aerosol cans and hand dusters, does not need any calibration. You are applying the correct dosage if you have covered the target completely. Other equipment of this type, such as granular spreaders for use on substations, needs to be calibrated only to adjust the delivery rate. This equipment delivers herbicides only when the wheels are in motion, and the speed doesn't affect the amount of chemicals being deposited per unit area.

If your equipment is motorized, you will need to determine the rate of speed best suited for the type of equipment and for the particular requirements of your application job. The equipment manufacturer’s directions may offer a range of appropriate speeds. Your knowledge of factors such as field conditions and drift hazard, plus your experience with the equipment, will help you to determine an appropriate speed.

7.6.2.2 Calibrating Sprayers

Before You Calibrate

If the equipment you have chosen is spray equipment, you must determine three other factors in addition to the pre-calibration decisions in the preceding section:

- o The appropriate pump pressure
- o The spray volume needed

- The type of carrier to be used

Pump Pressure

Pump pressure is largely controlled by the type of equipment--particularly the type of pump--you have chosen. Each pump has a range of optimum pressures which it should provide. To protect the pump and to ensure steady pressure output, do not attempt to exceed or go under the working capacity.

Spray Volume

The label (or other spray recommendations) often lists the amount of spray volume needed for effective application. The spray volume is the amount of diluted herbicide mixture (herbicide plus carrier) to be applied per unit of area. The recommendation may be for a specific volume, such as 20 gallons per acre or 2 1/2 gallons per 1,000 square feet. In other cases, a wide range of acceptable volumes may be listed; for example, "up to 400 gallons per acre," or "15 to 40 gallons per acre." You must choose the spray volume most appropriate for your spray job on the basis of your experience with the equipment and such factors as:

- The size of the spray tank
- The availability and cost of water or other carrier, such as kerosene or oil.
- The surface to be treated (dense foliage requires more volume)

Selecting Nozzle Tips

Nozzle manufacturers help applicators choose the right tip for each job by providing detailed charts of tip performance. The applicator matches the specific needs of the job to the "givens" on the chart to determine the tips and strainers to use.

The charts include the factors you must consider in order to choose appropriate nozzles--pressure, equipment speed, and spray volume. Charts which show spray volume in terms of both gallons per acre (gpa) and gallons per minute (gpm) allow you to choose your nozzles without further figuring.

Spray Gun Nozzles

Gun spraying is usually done by hand and is intended to wet surface thoroughly with spray material. In order to choose an appropriate spray gun nozzle, you must know the approximate operating pressure of your sprayer. Some guns are useful for pressures between 30 and 800 psi, but others are built only for pressures up to 200 psi or from 200 to 800 psi. The other variables are the spray angle which each nozzle delivers at various pressure settings and the maximum throw of each nozzle at different pressures.

You must decide which nozzle delivers spray at the appropriate angle and throw distances for your particular application job. Choose the tip according to the gallons per minute your sprayer will deliver and the pressure necessary to do the job. Nozzle capacities range from 0.25 gpm to 50 gpm at 30 to 800 psi, with throw distances up to 60 feet.

High Pressure (Hydraulic) Sprayer Calibration

High-pressure sprayers may be equipped with spray guns for treating livestock, orchards, nurseries, roadsides, or rights-of-way. Once the appropriate spray gun tip has been chosen and the flow rate has been checked, no further calibration is necessary. Flow rate may be checked by volume output.

Volume Output Method

Sometimes it is not practical to catch the flow from individual nozzles. Another method of calibration is to measure the volume of spray dispersed from the tank over a measured area. Your test area can be either one acre or part of an acre.

Spraying Less than One Acre: Another way to calibrate by the volume output method is to spray an area smaller than an acre:

1. Stake out a test area in the field to be sprayed. The distance should be at least 1,000 feet.
2. Fill the spray tank with water.
3. Spray the measured run using the pressure.
4. Refill the tank to the initial level, carefully measuring the quantity you add.
5. Calculate the rate of application.

To figure the gallons per acre for broadcast spraying:

Find the area sprayed in the test run:

$$\frac{\text{Sprayed width (in feet) x distance in test run (in feet)}}{\text{43,560 (Square feet in one acre)}} = \text{Area sprayed (in acres)}$$

Then find the gallons per acre being sprayed:

$$\frac{\text{Gallons used in test run}}{\text{Area (in acres) sprayed in test run}} = \text{Gallons per acre}$$

Example:

- Sprayed width = 20 feet
- Distance in test run = 1,000 feet
- Gallons used in test run = 8
- Spray volume desired = 18 gpa

$$\frac{\text{Sprayed with (20') x test run (1,000)}}{\text{43,560 sq. ft.}} = \text{Area sprayed (0.46 acre)}$$

$$\frac{\text{Gallons used (8)}}{\text{Area sprayed (0.46)}} = 17.4 \text{ gpa}$$

This is within 5% of the 18 gallons per acre you wish to spray.

7.6.2.3 Calibrating Granular Applicators & Dusters

General Application Equipment

There are many types of granular application equipment. Gravity-feed applicators may have one long hopper with a sliding gage or auger which regulates the flow to the multiple outlets.

In all types of granular equipment, the amount of granules applied per unit of area depends on the size of the adjustable opening, the speed at which the equipment travels (or the speed of the hopper agitator), the roughness of the surface of the application site, and the granular formulation chosen.

Different formulations have different flow rates depending on the size, weight, shape and texture of the granules. Granular equipment which is not motorized delivers

granules at a rate geared to the turns on the hopper agitator, which is in turn geared to the revolutions of the wheels. The faster the equipment is moved, the faster the release of granules, and vice versa. As a result, equipment speed does not affect the amount of granules deposited per unit area. The only way to change the application rate in this type of equipment is by changing the feed gate settings.

Consult the equipment manual for manufacturer's recommendations for approximate settings for the granules being applied.

Calibrate your equipment using one of the methods described below. If the application rate differs more than 5% from the desired rate, you should adjust the equipment and recalibrate.

Broadcast Granular Applicators

Run a pre-calibration check on the equipment:

- First, fill the hopper to a predetermined height or weight. Settle the material by shaking or shrinking the hopper; then refill the hopper.
- Set the flow rate as recommended by the equipment manual.
- Turn on the applicator and operate on a hard surface to check for uniform distribution along the swath width.

The next step is to determine whether the equipment is metering granules at the rate per acre you need. Calibrate the equipment by determining the amount of granules distributed over a measured area.

Volume Output Method - Treat Less than an Acre

Stake out a test area in the field to be treated. The total test run should be at least 1,000 feet.

- Treat the test area at the speed and setting you have chosen.
- Catch the granules in a pan, or refill the hopper and measure the amount added.
- Calculate the rate of application:

$$\frac{\text{Swath width x distance in test run (in feet)}}{\text{43,560 (Square feet in an acre)}} = \text{Area (in acres) treated in test}$$

$$\frac{\text{Pounds used in test run}}{\text{Area (in acres) treated in test run}} = \text{Pounds per acre}$$

Example:

- Swath width - 15 feet
- Test run - 1,000 feet
- Amount used in test run = 5 pounds
- Amount needed per acre = 15 pounds

$$\frac{\text{Swath width (15')} \times \text{test run (1,000')}}{\text{Square feet in an acre (43,560)}} = \text{Area treated (0.34 acre)}$$

$$\frac{\text{Pounds used in test run (5)}}{\text{Area treated (0.34)}} = \text{Pounds per acre (14.7)}$$

That is within 5% of the specified rate.

Appendix D provides conversion tables that can be used to determine the amount of liquid or dry pesticide needed per unit area.

7.6.3 Pesticide Applicator Safety Requirements

The following safety requirements apply to all Western employees applying herbicides.

7.6.3.1 *Handling of Pesticides (Mixing/Loading)*

It is extremely important to follow label requirements pertaining to the use of safety equipment and clothing (personal protective equipment, or PPE). Each job should be assessed for hazard - there may be occasions when common sense requires additional precautions to be taken even if not required by law. For more information, refer to WAPA Order 3790.1 (www.cso.wapa.gov/cao/1600/DIRECT/3700.1B pdf) and/or your Safety Office.

Pesticide poisoning of applicators or those associated with the application usually occurs from absorption through the skin. To avoid pesticides coming into contact with the skin, it is recommended that the minimum requirements shown on Figures 7-7 and 7-8 be followed.

Personal Protective Equipment (PPE) is designed to protect workers from various hazards. Use of PPE requires training and must be used according to its limitations, properly fitted, inspected, maintained, and disposed.

- **Coveralls** - Coveralls (or long-legged trousers and long-sleeved shirt) that cover the entire body from wrists to ankles will be worn at all times during handling and application. It is mandatory that these clothes be laundered often and they should be removed prior to going home. Note: Pant legs and sleeves should be worn outside of boots or gloves. Disposable or reusable coveralls are acceptable. Disposable coveralls are usually lightweight and more comfortable. If the operation will result in contact with heavy spray or mist, a waterproof suit should be worn. If liquid-proof clothing is required, it should be made of a tear-resistant plastic.
- **Gloves** - Chemical resistant gloves must be worn anytime pesticides are handled either during the mixing or loading operation or during hand application where prolonged exposure to spray or granules occurs. Unlined flexible plastic or neoprene gloves are the most desirable. Check the gloves for leaks prior to use, by filling with water and squeezing the glove. Do not use gloves that have cloth lining or wristband, or are made of leather, paper, or fabric.
- **Boots/Shoes and Socks** - When boots are required, unlined rubber boots which cover the ankles should be worn. Coverall legs should be worn outside the boots. Boots should be washed often. Do not use leather or fabric boots or shoes.
- **Goggles/Face Shield** - Goggles must be worn when pouring or mixing concentrates or anytime a harmful solution could contact the eyes through splash, spray, etc. Goggles should be the type that are non-fogging. Face shields should be made of clear plastic and be attached to the hat so they can be raised and lowered. Do not use goggle headbands that can absorb the pesticide.
- **Hats** - A liquid-proof washable plastic hard hat should be worn by applicators during pesticide application and mixing operations as shown on Figures 7-7 and 7-8. Leather, fabric, or fiber hats and sweatbands should not be worn.

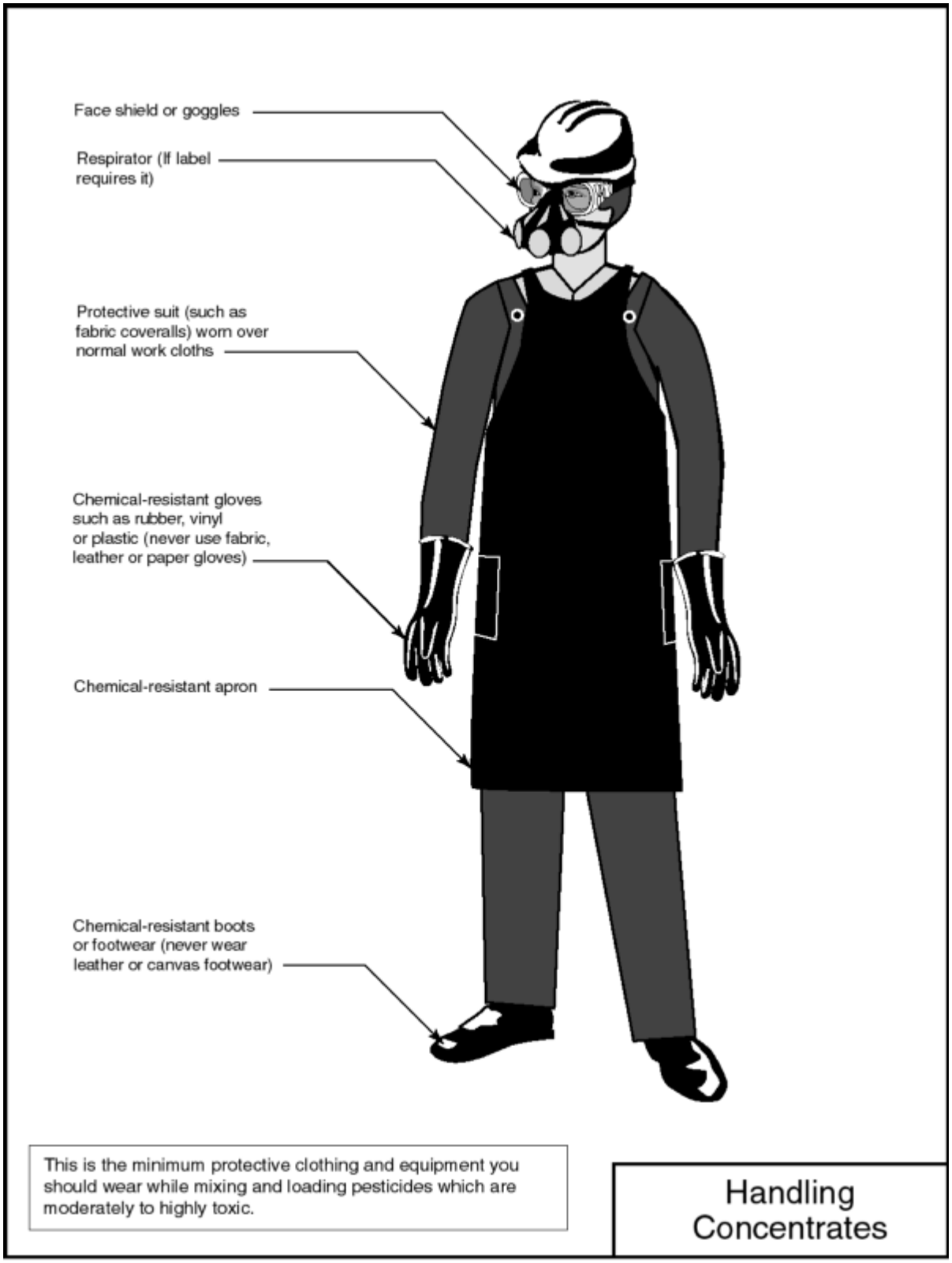

Face shield or goggles
Respirator (If label requires it)
Protective suit (such as fabric coveralls) worn over normal work cloths
Chemical-resistant gloves such as rubber, vinyl or plastic (never use fabric, leather or paper gloves)
Chemical-resistant apron
Chemical-resistant boots or footwear (never wear leather or canvas footwear)
This is the minimum protective clothing and equipment you should wear while mixing and loading pesticides which are moderately to highly toxic.
Handling Concentrates

Figure 7-7

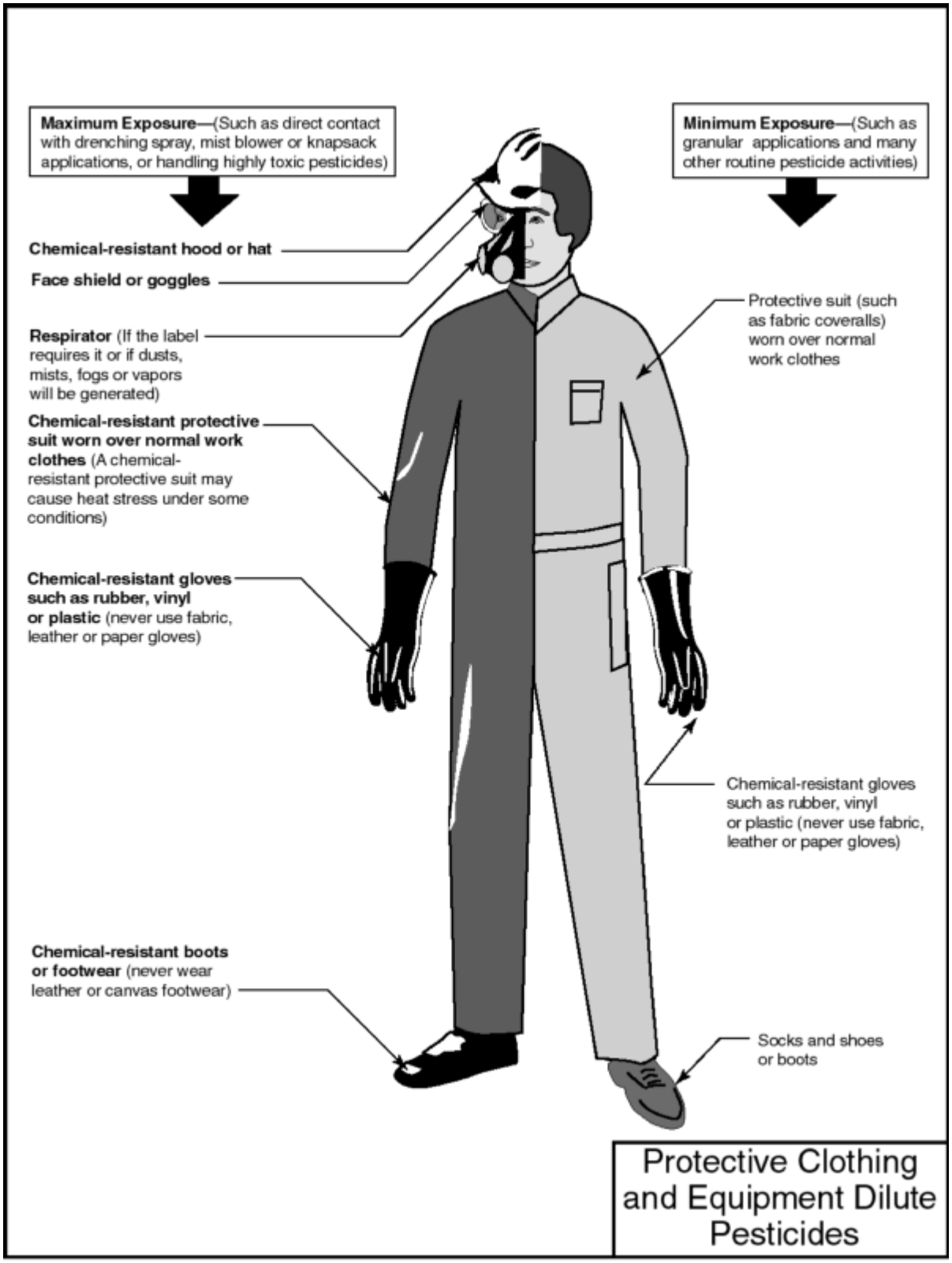

Maximum Exposure—(Such as direct contact with drenching spray, mist blower or knapsack applications, or handling highly toxic pesticides)
Minimum Exposure—(Such as granular applications and many other routine pesticide activities)
Chemical-resistant hood or hat
Face shield or goggles
Respirator (If the label requires it or if dusts, mists, fogs or vapors will be generated)
Chemical-resistant protective suit worn over normal work clothes (A chemical-resistant protective suit may cause heat stress under some conditions)
Chemical-resistant gloves such as rubber, vinyl or plastic (never use fabric, leather or paper gloves)
Chemical-resistant boots or footwear (never wear leather or canvas footwear)
Protective suit (such as fabric coveralls) worn over normal work clothes
Chemical-resistant gloves such as rubber, vinyl or plastic (never use fabric, leather or paper gloves)
Socks and shoes or boots
Protective Clothing and Equipment Dilute Pesticides

Figure 7-8

If respiratory devices or aprons are necessary, the following should be considered:

- **Aprons** - Aprons must be made of rubber or a synthetic liquid-proof material that will resist solvents. They should be long enough to cover the body from chest to boots.
- **Respiratory device** - The respirator must properly fit the face, so that air leakage does not occur - the user must be clean shaven. Use only equipment that is approved by the National Institute for Occupational Safety and Health or the Mining Enforcement and Safety Administration. The user must be adequately instructed in its use.

All equipment can be obtained from the Regional Safety Manager or other approved sources. Designs range widely and it is important to avoid the undesirable constraints of some equipment. The wrong equipment can result in increased exposure over that of using no protective equipment.

The following additional rules should be followed when handling pesticides:

- Handle barrels and containers of chemicals or diesel oil with care to avoid personal injury. Avoid lifting them.
- Handle all pesticides in well ventilated areas.
- Immediately wash any contamination off the skin, with water or according to label instructions. Frequently wash during and after pesticide application, especially before eating or smoking.

The following actions are recommended for respirator use:

- Change cartridges after each 8-hour exposure, or more often if needed.
- Change filters every other day, or more often if needed.
- Thoroughly wash at each day's end.
- When handling fumigants, wear gas masks specifically approved for fumigant materials.

7.6.3.2 *Safe Application*

The following guidelines pertain to safety precautions to be taken during the actual application. It is important that sufficient planning precedes the application so that contract specification or instructions reflect these issues.

- Do not allow leaks in the spray distribution system or in the chemical mixing equipment. Keep equipment in good mechanical condition. Properly calibrate equipment prior to project start (see Section 7.6.2).
- Wear appropriate clothing as required for the type of chemical being used. Wash work clothing daily and change to clean clothing when not on duty. Cleanup is mandatory after each day's work. Coveralls should be furnished to those employees directly involved with spraying operations.
- Read the label on the chemical container and follow recommended safety practices. Do not use any chemical in a manner inconsistent with its label.
- Wash hands with soap and water immediately after contact with chemicals, and before smoking or handling food. Do not eat, drink, or smoke while using chemicals. Chemicals are absorbed through the skin more readily in the areas of the neck, wrists, and genitals.
- Select sites for loading, cleaning equipment and storage which will prevent contamination of streams, ponds, cisterns, food stocks, or crops adjacent to work area.
- Safely and appropriately dispose of empty chemical containers immediately after use.
- Do not work in direct spray drift.
- When working in high weeds, always go to the farthest point and work away from the area you are treating.
- Do not blow out clogged nozzles, hose, or lines with mouth.
- Never smoke, eat or drink while spraying or dusting.
- Avoid standing over the tank opening or downwind of materials when filling machines or mixing chemicals. When mixing concentrated liquids, use face shield.
- Never leave contaminated equipment or chemicals unattended.

7.6.4 Herbicide Storage Requirements

Federal regulations (40 CFR Part 165) recommend specific procedures and criteria for the storage, monitoring and inventory of pesticides, pesticide containers and the equipment used for the application of pesticides. In addition, most states have regulations for the storage of pesticides, particularly for bulk storage. The regulations for each state should be reviewed for details of the state's requirements.

In general, the following storage guidelines should be followed to prevent an uncontrolled release of herbicides into the environment and to prevent any unnecessary exposure of workers and the public.

7.6.4.1 *Storage Site Location*

Storage sites should be selected with due regard to the amount, toxicity, and environmental hazard of herbicides, and the number and sizes of containers to be handled.

- Storage site areas should be located in a separate room, building or covered area where fire protection is provided.
- Storage sites should be located where flooding is unlikely, and at least 100 feet from any drainage ditch, well, or water body.
- Storage sites should not be located adjacent to or upslope from sensitive landscaping, gardening areas, croplands, feeders, or rangeland.
- Storage sites should not be located near fuel storage areas or other flammable materials.
- Storage sites should be located where there is easy access for emergency vehicles. Inform local police, fire department, and medical officials of the location and layout of the storage area and the types of materials stored.

7.6.4.2 *Storage Facilities*

- Pesticides should be stored in a dry, well-ventilated building.
- Storage facilities should be kept neat and clean, and free from chemical spills in and around the storage area.
- The entire storage facility should be secured with a fence, gate and/or doors that can be locked to prevent unauthorized entry.

- An all-purpose fire extinguisher must be kept in a readily accessible location and maintained for proper performance. All employees should be familiar with its operation.
- Herbicide storage areas should be identified at all points of entry with waterproof signs reading “PESTICIDE STORAGE AREA” and “NO SMOKING,” and if applicable “DANGER, POISON.” and “FLAMMABLE.”
- An area should be provided for decontamination of personnel and equipment. Where required, the decontamination area should be paved or lined with impervious materials. All contaminated water should be disposed of as an excess herbicide.
- Storage areas should maintain a current inventory of the number and type of herbicides in the storage building. This inventory should be updated on an annual basis to minimize the accumulation of unwanted and unused materials.

7.6.4.3 *Operational Procedures*

- All moveable equipment used for handling herbicides, which might be used for other purposes should be labeled "contaminated with pesticides” and should not be removed from the site unless thoroughly decontaminated.
- Store herbicide containers according to label instructions, in an upright position, off the ground, and with the label plainly visible. Dispose of unlabeled herbicides according to Federal, State, and local regulations.
- Containers should be checked regularly for corrosion and leaks. Replace damaged containers with like containers and attach a copy of the original label. Never use any type of food containers for storage of toxic chemicals.
- Materials such as adsorptive clay, hydrated lime, corncobs, and sodium hypochlorite should be kept on hand for emergency treatment of spills and leaks.
- Clean water supply for emergency wash up and rinsing should be available outside the storage building and during applications. At least 3 gallons of water, along with soap and paper towels should be available.
- Keep chemicals separated by type to prevent cross-contamination.
- Ensure that a portable or stationary eyewash station is readily available.
- Herbicide containers should be further segregated according to the method of disposal (see Section 7.6.7) to prevent accidental mixing during removal operations.

- Keep herbicide containers, particularly glass, away from windows and sunlight so they will not be subject to heat and ignition.
- Keep combustibles away from steamlines and heat (see label for information on flammability).
- Store empty containers in the secured storage area until proper disposal can be arranged (see Section 7.6.7).
- Never store herbicides next to food or feed intended for human or animal consumption.
- Use locked storage on all vehicles used in pest control operations and transportation of toxic materials (see Section 7.6.5).

7.6.4.4 *Application Equipment*

- Empty unused herbicide from equipment after each application. Return unused herbicide into its original container.
- Clean and properly maintain application equipment after each use.
- Never store personal protective equipment near herbicide material, especially protective eye wear, gloves, or respirator apparatus.

7.6.4.5 *Bulk Storage of Pesticides*

Many states now have additional requirements for secondary containment for storage of bulk pesticide containers. Bulk amounts are generally considered as:

- Individual containers exceeding 55 gallons liquid concentrate or 300 pounds dry concentrate.
- Total stored liquid concentrate exceeding 300 gallons or 3,000 pound dry concentrate.
- Total quantity handled exceeding 300 gallons liquid or 3,000 pounds dry per year or total quantity of active ingredients exceeds 1,500 pounds per year.

This can vary from state to state and individual State regulations should be verified. In general, states that require secondary containment for storage of bulk pesticides will specify capacity, allowable construction materials, and additional drainage and operational containment structures required for these facilities. Loading and mixing pads may also be required, and the facility may not be located near streams, rivers,

wells, ditches or other bodies of water. Again, the regulations for each state should be reviewed prior to storing bulk quantities of pesticides.

The Superfund Act (CERCLA) and the Emergency Planning and Community Right-to-Know Act (SARA Title III) require annual chemical reporting about the presence of hazardous or Extremely Hazardous Substances (EHS) for any facility that uses or stores a hazardous substance or an EHS in quantities exceeding EPA or specific state quantity limits. Your Regional Environmental Specialist should be notified about any regulated bulk storage, so that the required reporting can be done.

7.6.4.6 *Fire*

If a fire should occur in a pesticide storage facility, the following actions should be taken:

- Evacuate and secure the area. Ensure that people maintain a safe distance in case of explosion.
- Call the Fire Department and ambulance.
- Inform fire-fighting personnel of the following:
  - (1) Type of chemicals contained in the facility and where they are located.
  - (2) Safety equipment that is required and possible poisoning if exposed to fumes or smoke without adequate protection.
- If necessary, a dike should be constructed to prevent run-off contamination and to contain overflow of burning liquid. This should be coordinated with emergency and spill crews.
- Rope off contaminated area and maintain it under continuous supervision until cleanup is completed.
- Do not smoke, drink or eat in the fire fighting vicinity, to avoid ingestion of toxic substances.
- Protect employees and nearby residents by assisting with evacuation of residents downwind of the fire, and requiring a medical check for those that may have been exposed.

7.6.5 Transportation of Pesticides

The Department of Transportation (DOT) regulations for the shipment of hazardous materials includes the following requirements that should be followed when transporting herbicides:

- Vehicles carrying 1,001 pounds or greater of pesticides in hazard class 3 or 6.1 (except inhalation hazard, Zone A or B) must be placarded. Vehicles carrying pesticides in hazard class 6.1, Inhalation Zone A or B, must be placarded for any amount.
- Pesticides with a Proper Shipping Name that includes "n.o.s.", must also specify the technical name of the primary constituent in parentheses as part of the Shipping Description.
- Pesticides must not be transported in the same compartment with a person, food, or feed intended for human or animal consumption.
- Pesticides must be transported in a secure upright position with the opening closed or sealed with lids or bungs tight.
- Pesticide packagings must comply with requirements of the appropriate Packaging Group specified in the DOT Hazardous Materials Table and must be marked and labeled as required in the Hazardous Materials Regulations. All containers must have either the original product label or a secure container label with the name of the pesticide and the signal word from the original container, and the name and address of the person responsible for the container.
- Drivers and handlers of pesticides must be trained on the proper handling, identification, and emergency response to releases of hazardous materials.
- Pesticides must not be left either unattended or in an unlocked vehicle either at the batching site or en route to or from the batching site.
- Spills or leaks during shipment must be cleaned up immediately as described in Section 7.6.6.
- A contaminated vehicle must not be used for any purpose until it can be completely decontaminated. Until the vehicle is cleaned, it must be locked and isolated so that no unauthorized person can come in contact with the hazardous material.

7.6.6 Spill Cleanup Procedures

All reasonable precautions should be taken to avoid spilling herbicides; however, should an accident occur, immediate action is required. A quick and effective response is necessary to minimize effects on employees, the public, and the environment. The following is provided as general guidance; however, any regional spill response plan that addresses herbicide spills should be followed.

7.6.6.1 *Minor Spills*

Minor spills will be the most common type of spill. When such spills occur, if at all possible, mix the spilled herbicide into soil or other absorbent material and spread it over areas where specific vegetation control is required at a rate equivalent to the label rate. If the spill occurs away from the application area (e.g., at a storage area), then proceed with the containment, notification, cleanup, decontamination and disposal procedures listed under Section 7.6.6.2.

7.6.6.2 *Major Spills*

A spill will be considered major if it has the potential to affect human health and/or:

- A spill of any quantity of mixed or undiluted herbicide directly into a water course or in the proximity of a water course where the herbicide might easily reach the water.
- A spill of five gallons or more of undiluted herbicide or five pounds of pellets, granules, or powders which cannot be recovered on or off the right-of-way, substation, or other facility.
- A spill of more than 50 gallons of herbicide mix on or off the right-of-way, substation or other facility.
- A spill where none of the herbicide can be recovered.
- A spill in a sensitive area such as where:
  - Highly sensitive crops are present, such as grapes, beans, potatoes, tomatoes.
  - Water is being used for domestic purposes, fish hatcheries, irrigation, etc.
  - Adjacent to any water source or an area where the water table is high.
- A spill which must be reported to the National Response Center (see Table 7-8).

TABLE 7-8
HERBICIDES QUALIFYING AS HAZARDOUS SUBSTANCES

Notify the National Response Center (Toll Free: 800-424-8802) if any of the following herbicides are spilled in amounts equal to or greater than the quantities listed in the right hand column. Additional packaging, labeling, storage, transportation and disposal procedures are required for 2,4-D because it is also a hazardous waste (U240) under Federal regulations. Although trifluralin is listed below, it would generally not be "spilled" if Biobarrier® is the product used, since it contains solid nodules of this herbicide. Check states (Appendix E contacts) for possible State-specific hazardous wastes listings; see also Herbicide Disposal (Section 7.6.7).

Reportable Pesticide	Quantities in lbs. of Active Ingredients
2.4-D (Acids, Salts, or Esters; various names)	100
Dicamba (Vanquish®, Banvel®)	1,000
Diuron (Karmex®, Krovar®, etc.)	100
Trifluralin (Biobarrier®)	10

The steps below are generalized procedures which should be adapted to various spill situations. Specific actions to be taken for each of these 6 steps are discussed below. If the spill is a major spill, steps 4-6 may be conducted by an outside waste removal contractor. This will be decided when notification is given in Step 3.

1. Take care of injured.
2. Contain spill.
3. Notify appropriate individuals/agencies.
4. Clean up spill.
5. Decontaminate area and equipment.
6. Dispose of spilled material.

Always refer to the Material Safety Data Sheets (MSDS's) for detailed information about the chemical and how to treat those who have come in contact with it, what PPE to use, etc.

1. ***Take Care of Injured***

Medical Emergencies

- First Aid - Pesticide manufacturers and medical personnel are the two best sources of information on how to help victims exposed to herbicides. Herbicide labels and MSDS's may note specific information on what to do for first aid and medical emergencies.

The following tips may be useful should emergency pesticide exposure occur:

- REMAIN CALM.
- AVOID CONTAMINATING YOURSELF WHEN HELPING THE VICTIM.
- INFORM MEDICAL PERSONNEL OF THE NAME OF THE HERBICIDES INVOLVED.
- IF POSSIBLE, SEND COPIES OF THE LABEL AND MSDS WITH THE VICTIM TO THE HOSPITAL.

Some basic first aid steps include:

- If skin is contaminated, wash the victim with clean water. Wear gloves and other necessary PPE.
- Remove contaminated clothes and loosen other clothing.
- Eyes should be washed with clean water for a minimum of 15 minutes while holding the victim's eyelids open.
- If the herbicide is ingested, check with the label and physician to see if vomiting should be induced. Vomiting should only be induced if the pesticide was taken by mouth, the person is fully conscious, and the pesticide is not corrosive.
- If the herbicide is airborne, protect yourself with an approved respirator before entering the contaminated area.
- Get the victim to fresh air as soon as possible.

Resources - The specific manufacturer is the best resource when it comes to medical emergency information. Often the manufacturer will list a 24 hour emergency number on the label or MSDS.

2. ***Contain Spill***

Spilled herbicide must be contained to facilitate clean-up and prevent the herbicide from further contaminating the environment. Follow these procedures:

- Wear protective clothing according to label instructions. Rubber or neoprene gloves, rain suits and rubber boots may be used when appropriate.
- Prevent further leakage by repositioning container and sealing with rags, tape or other material at hand.
- Cover the spill with an absorbent material if the spill is liquid; absorbent materials include clay-type cat litters, sawdust, etc. If the spill is a dry chemical, cover it with a plastic tarpaulin and secure.
- Prevent ignition of flammable materials by eliminating sources of ignition; for example, exhausts, electric motors, gasoline engines, etc.
- DO NOT flush the spill into a ditch, sewer, drain or off the road, since this further spreads the spill.

3. ***Notify Appropriate Individual/Agencies***

Minor Spills	Major Spills
Western Regional Environmental Manager	Western Regional Environmental Manager and Western CSO-Office of Environment, who will then notify the following: - National Response Center (800-424-8802) - DOE Unusual Occurrence Office - State Agencies (see Appendix E) - Land Owner - Safety Office

4. ***Clean Up Spill***

Spill clean-up is necessary to remove potential hazard. Because herbicides can liberate toxic fumes or vapors, always work in a well ventilated area. Open enclosed areas to prevent the accumulation of toxic fumes while working. NEVER WORK ALONE! Always maintain eye contact with a work partner. If additional information

about emergency spill clean-up is necessary, contact CHEMTREC (Chemical Transportation Emergency Center - phone 800-424-9300).

- o Dry Spills
  Immediately cover powders or dusts with plastic or a tarpaulin to prevent the pesticide materials from becoming airborne.
  - Clean up by rolling the tarp back little by little as you sweep.
  - Shovel the material into a plastic bag or drum.
  - Seal the bags or drums and identify the pesticide.
  - If necessary, set the bags or drums aside for subsequent disposal.

- o Liquid Spills
  - Use absorbent materials such as commercially bagged clay or cat litter to soak up the spill.
  - Spread the absorbent material around the perimeter of the spill and sweep toward the center.
  - Shovel the absorbent and pesticide into leak-proof container(s) for subsequent disposal.
  - Label the containers.

5. ***Decontamination***

The small amount of herbicide remaining after the clean-up process (on the road surface, storage area floor, or non-porous truck bed) must be decontaminated or neutralized. Nutra-Sol Equipment Cleaner (standard size container - 2 lb.) may not totally inactivate or detoxify the herbicide, but will react with it to form a less toxic or less mobile compound and may be used in place of a decontamination solution.

- o Soil
  - Contaminated soil should be removed to a depth of at least two inches below the contaminated zone and placed in drums for disposal. Activated charcoal may be spread to further absorb and dilute remaining herbicide residues.

- o Roadways, Floors and other Non-porous Surfaces

- Spread the appropriate decontamination agent on the spill and work it into the surface using a coarse broom or scrub brush. Allow the decontaminant to soak for two hours.
- Pick up the decontamination material by spreading fresh absorbent material around the perimeter of the spill area, sweeping it toward the center, and shoveling it into plastic bags or drums.
- Repeat the decontamination and clean-up process.

o Tool and Vehicles
- Before removing any vehicles involved with the spill, a decontamination solution should be used to clean all contaminated parts that might be exposed to the public or other employees. Nutra-Sol Equipment Cleaner may be used in place of a decontamination solution (standard size container - 2 lb.).
- Apply the appropriate decontamination solution to all tools and equipment. Allow to soak for two hours. Rinse with a sparing amount of water. Then wash the tools and equipment with detergent and water. The rinse solution should be collected for subsequent disposal.

o Wood and Other Porous Materials
- Discard or destroy porous material and equipment such as brooms or leather shoes. These cannot effectively be decontaminated.

o Protective Equipment
- All equipment should be scrubbed in a strong detergent solution, rinsed and dried before putting away for reuse. Discard any equipment that is grossly contaminated or that can't be decontaminated.

o Personnel
- All personnel should decontaminate themselves with detergent and lots of water. Inner clothing should be washed with strong detergent separately from other household laundry.

6. ***Disposal***

Disposal of herbicide and herbicide spill residues should be done in accordance with the procedures found in Section 7.6.7.

7.6.7 Disposal

Disposal of containers and excess material or debris from spills is regulated by the Environmental Protection Agency (EPA) and by various State and county agencies within Western's service area. In addition, some types of excess herbicides, some types of contaminated herbicides, and spill clean-up materials must be disposed of as hazardous waste.

7.6.7.1 *Action*

Check Appendix A for State-specific disposal requirements. Unless otherwise specified in State or local regulations, dispose of excess herbicides, herbicide containers, or spill clean-up materials in the following manner:

- Liquid Herbicide Containers: Triple rinse all containers for liquid herbicides and add rinse solution to spray tank mix. Each rinse solution should be equal to at least 1/4 of the container volume if the container is 5 gallons or less, and 1/5 the container volume if the container is over 5 gallons. Empty, triple-rinsed containers should be punctured or crushed and disposed of in a sanitary landfill or approved disposal site. Because the status of various landfills may change, check with the landfill operator prior to disposal. Contact the Regional Environmental Manager if there are questions or problems with local disposal sites.
- Dry Herbicide Containers: Paper and carton-type containers should be thoroughly emptied. Tear/cut open bags or boxes and shake out into spray tank. For fiber drums and large containers, strike or hit the container three times over working solution to dislodge dry herbicide; triple-rinse containers with plastic or foil liners if herbicide is formulated to be mixed in a liquid solution. Dispose of at a sanitary landfill or disposal site as above.

- Contaminated Materials from Spills: Debris resulting from spills must be disposed of as if it were the herbicide itself. Disposal should be at a designated disposal site.

7.6.7.2 *Hazardous Waste Disposal*

Some herbicides are subject to regulation as hazardous waste if large amounts are spilled or are to be otherwise discarded. State and Federal regulations should be checked to determine if you are dealing with a hazardous waste. Contact the Regional Environmental Manager to determine if the herbicide qualifies as a hazardous waste, and call the State hazardous waste agency listed in Appendix E to determine if more stringent State requirements exist. Additional packaging, labeling, storage, transportation, reporting, and disposal procedures will be required. Western personnel who apply pesticides may contact their Regional Environmental Manager for hazardous waste procedures for specific cases.

7.6.8 Recordkeeping Requirements

All applicators for Western, including contractors, shall complete an application record form for all herbicide applications. An example form is provided as Appendix F and includes the following:

- The legal description of the location of the land or the property where the herbicide was applied.
- The acreage, area or number of plants treated or other appropriate description.
- The year, month, day, and time the herbicide was applied.
- The name, certification number, and signature of the applicator.
- The company name appearing on the label (together with the EPA pesticide registration number and product lot number from the labels). Include name and manufacturer of any spray marking dye or drift control agents used.
- The weather conditions at the time of the application; including the direction and estimated velocity of the wind, rainfall, humidity and the temperature at the time the herbicide was applied.
- Amount of the herbicide applied and concentration in pounds or gallons per unit or percentages of active ingredient per unit of the pesticide used.
- Method of application (equipment used, carrier).

- o Specific vegetation, weed, or designated site to which pesticide application was made.
- o Any problems associated with the application of the herbicide.

Pesticide application records shall be completed at the close of each day, and shall be kept at the facility where pesticides and application equipment are stored for three years from the date of the application of any pesticides. Some states require an annual written summary of these records before renewing the applicators license or certification.

7.7 USE OF CONTRACTORS

Western may use contactors for herbicide applications, as well as other vegetation management work. Each Western region has procurement policies and procedures for contracting this work. A questionnaire that can be used to qualify or audit contractors for contract pesticide work is provided as Appendix G.

8.0 WESTERN ENVIRONMENTAL PROTECTION REQUIREMENTS

Adverse effects to the atmosphere, soil, or water in the environment can occur as a result of misapplication and misuse of herbicides. **Damage from herbicides as a result of misapplication is due either to (1) lack of understanding of how to safely and effectively apply herbicides, or (2) lack of concern or disregard for other private or public property.** Each herbicide should be selected based on site-specific conditions and applied according to all directions, warnings, and precautions on the herbicide label.

The following environmental standards and procedures are relevant to all methods of vegetation control in Western's service area. These measures should be looked upon as means to avoid or minimize environmental impacts of vegetation control, thereby mitigating the effects of the various control procedures. Table 3-3 also addresses environmental concerns and provides notes on use limitations that help prevent environmental impacts.

1. **Comply** with all applicable Federal and State **laws and regulations, and interagency agreements,** in conducting vegetation management treatments. If interagency agreements limit vegetation clearing such that power system reliability could be compromised, attempt to re-negotiate these agreements to allow for removal or reduction of vegetation where flashover or fire dangers exist.

2 **Select treatments** for specific sites **based on** considerations of sociological, economic, and ecological consequences; that is, use an **IVM** decisionmaking process.

3. **Strictly observe herbicide application rates, application techniques, and restrictions** as specified on EPA-approved label instructions; use pressures as low as possible, less volatile or low-drift formations. For **Phenoxy Herbicides,** use amine salt formulation if possible and if temperatures are expected to exceed 80ºF. If ester formulations must be used, apply low-volatile ester formulations when air temperatures are expected to be below 85ºF for several hours. High volatile ester formulations of 2, 4-D release vapors or fumes rapidly at about 80ºF; low volatile ester formulations at about 90ºF.

4. **Use licensed herbicide applicators** exclusively as specified by State law.

5. Strictly observe application **buffer zones around water bodies --** See Table 8-1 for minimal buffers that should be observed during herbicide application near water bodies, unless other buffers are specified by agency agreement or regulation.

TABLE 8-1
APPLICATION BUFFERS NEAR WATER BODIES

Herbicide Application Method	Minimum Water Buffer Width*
Foliage Spray	50 feet
Basal Spray	10 feet
Stump Treatment	10 feet
Soil Treatment - Pellets	10 feet

*These are minimum buffers – buffers used should be sufficient to prevent adverse environmental impacts and should depend on site specific conditions, label restrictions, and any land management agency restrictions

6. **Observe wind and weather limitations** for herbicide applications to minimize drift and runoff. **Apply chemicals when wind is calm** or when a light breeze is blowing away from non-target plants. Spray drift from 2,4-D can injure susceptible plants as far away as 6 or 7 miles. See Table 8-2 for a summary of weather-related restrictions for herbicides applications. Use drift control agents (if necessary) to avoid hazard of damage to nearby plants.

TABLE 8-2
WEATHER SUMMARY - RESTRICTIONS FOR HERBICIDE APPLICATIONS

Control Method	Max. Temp	Minimum Humidity	Precip.	Wind	Season
Foliar Spray	75º	30%	None	0-5 MPH	Spring/Summer[3]
Stump Treatment	--	--	Minimal	--	Frost Free[1]
Pellet/Soil Applications	--	--	[2]	--	Frost Free[1]
Basal Spray	75º	30%	Minimal	0-10 MPH	Frost Free[1]

1 Wood must not be frozen to permit penetration.
2 Moderate precipitation required to move chemical in soil.
3 Or as specified on herbicide label.

Source: BPA 1994a.

7. **Prevent groundwater and surface water contamination by using preventative measures.** Recognize that the greatest vulnerability from herbicides occurs with the following conditions:
   - o Herbicide - highly soluble; low soil absorption; persistent.
   - o Soil - permeable - sandy, gravel, low organic matter.
   - o Site - shallow groundwater, nearby surface water, wet climate, floodplain.
   - o Management - high rate or frequency of application, soil-applied herbicide, application before heavy rain.

8. Where warranted and feasible, monitor herbicide residues and soil and water; monitor the fate of herbicides (in groundwater and surface water) used as high allocation rates for substation weed control.

9. **Strictly observe all laws and regulations governing herbicide handling, storage, and disposal and spill cleanup.**

10. Observe buffers/reduce disturbance if **endangered/threatened/rare species** are likely; check label restrictions.

11. **Research** continually into new vegetation control methods and documentation of study designs and results.

12. **Train herbicide applicators** to ensure proper application rates and herbicide placement are used; **inspect herbicide operations** to ensure proper implementation.

This page intentionally left blank.

EXHIBIT G.2 HERBICIDE RISK

The following sections provide summaries of the risks determined in the USFS risk assessments on the USFS website: (see website www.fs.fed.us/foresthealth/pesticide/risk.shtml). Exhibit G.3 provides the actual executive summaries from the Human Health and Ecological Risk Assessments associated with each herbicide.

G.2.1 Clopyralid

The Forest Service uses only the commercial formulation of Clopyralid named Transline. Transline is a liquid formulation that is manufactured by Dow AgroSciences. The most common method of application of Transline is backpack (selective foliar) and boom spray (broadcast foliar). Transline is labeled for use only in non-crop areas such as right-of-ways and the maintenance of wildlife openings, tree plantations, rangeland, and permanent grass pastures (C&P Press 2003). Technical grade Clopyralid contains hexachlorobenzene as a contaminant, a classified carcinogen; however, Clopyralid is classified as practically nontoxic in microorganisms, aquatic vertebrates, aquatic freshwater invertebrates, estuarine/marine invertebrates, and slightly toxic in terrestrial animals.

The herbicide Clopyralid is used in the control and management of broadleaf weeds. This herbicide is relatively specific to broadleaf plants because Clopyralid is rapidly absorbed across leaf surfaces but much less readily absorbed by the roots of plants. Clopyralid is a plant growth regulator and acts as a synthetic auxin or hormone, altering the plant's metabolism and growth characteristics, causing a proliferation of abnormal growth that interferes with the transport of nutrients throughout the plant. Terrestrial plants are the nontarget species that would most likely be damaged by Clopyralid. Sensitive crops or other desirable sensitive plant species could be adversely affected by the off-site drift of Clopyralid under a variety of different scenarios depending on local site-specific conditions. However, more tolerant plant species are not likely to be affected unless they are directly sprayed or subject to substantial drift, although drift should not be allowed. Transline should only be used under calm conditions (wind no greater than 10 mph) and should be kept out of lakes, ponds, streams, and other bodies of water (Winter 2006-2007 Substation Bareground Herbicide Recommendations for WAPA).

Clopyralid has a tendency to move into soil rather than to be transported by runoff, additionally; off-site movement of Clopyralid by soil runoff does not appear to be a substantial risk to nontarget plant species. Clopyralid does not bind tightly to soil and thus would seem to have a high potential for leaching. Studies indicate that leaching and subsequent contamination of ground water is likely to be minimal (Rice et al. 1997, Leitch and Fagg 1985). Aquatic plants do not appear to be at any substantial risk from any plausible acute or chronic exposures; however, in the very extreme case of an accidental spill of a large amount of the herbicide into a relatively small body of water, sensitive aquatic plants could be damaged.

In technical grade Clopyralid, hexachlorabenzene, a carcinogen, is a contaminant with a concentration of approximately 2.5 ppm or less. Although technical grade Clopyralid has been subject to several chronic bioassays for carcinogenicity and none of the bioassays have shown that Clopyralid has carcinogenic potential, it does contain low levels of hexachlorobenzene which is ubiquitous and persistent in the environment. The major sources of general exposure for the public to hexachlorobenzene involve industrial emissions, proximity to hazardous waste sites, and the consumption of contaminated food. Virtually all individuals are exposed to hexachlorobenzene and virtually all individuals are exposed to hexachlorobenzene in their bodies. Due to the relatively small amounts of Clopyralid that will be used Western, the application of herbicide is not expected to increase ambient levels of hexachlorobenzene.

G.2.2 Chlorsulfuron

Three commercial formulations of chlorsulfuron that are most commonly used for preemergent and early postemergent control of many annual, biennial and perennial broadleaf weeds are Telar®DF, Glean® produced by Dupont, and Corsair™ produced by Riverdale. The primary method of application for Telar®DF and Corsair™ is backpack (selective foliar) and boom spray (broadcast foliar). Boom spray is the application used in rights-of-way management. Glean® is the only formulation of chlorosulfuron registered for aerial application; however, the Forest Service does not use aerial application of chlorosulfuron.

All formulations of chlorosulfuron are labeled for the control of many annual, biennial, and perennial broadleaf weeds. None of the formulations are specifically registered for forestry use. Additionally, Telar®DF and Corsair™ are labeled specifically for noncrop, industrial site use and Glean® is labeled for agricultural use (C&P Press 2003). For Telar®DF there is a label specifically for use in California (DuPont 1998a). All formulations are recommended to have a non-ionic surfactant added as an adjuvant for postemergence applications. Chlorsulfuron is formulated as a dry flowable granule.

Chlorsulfuron is an effective and potent herbicide and could have adverse effects on some nontarget plant species, both terrestrial and aquatic, unless measures are taken to limit exposure. Damage to nontarget plant species after ground broadcast applications could extend to distances of greater than 900 feet from the application site; however, when used in backpack (directed foliar) application offsite drift could be reduced substantially. The acetolactate synthase (an enzyme that catalyzes the biosynthesis of three branched-chain amino acids), which is essential for plant growth, is inhibited by chlorsulfuron and effects plant growth. Under conditions that favor runoff, the offsite movement of chlorsulfuron via runoff could be substantial. Chlorsulfuron has limited water solubility; however, like many other herbicides, chlorsulfuron is much more toxic to aquatic plants than to aquatic animals. Thus, if chlorsulfuron is applied in areas where transport to water containing aquatic macrophytes is likely, it would be plausible that detectable damage could be observed.

Chlorsulfuron used in Telar®DF has a practically nontoxic classification in microorganisms, aquatic vertebrates, freshwater invertebrates, aquatic estuarine/marine

invertebrates, and terrestrial animals. Application of chlorsulfuron should only be applied under calm conditions and drift should not be allowed from the treatment area. Chlorsulfuron should be kept out of lakes, ponds, streams, and other bodies of water.

G.2.3 Dicamba

Two commercial formulations of dicamba are used for the control of a variety of broadleaf weeds and woody vegetation, Banvel, the dimethylamine salt of dicamb, and Vanquish, the diglycolamine (DGA) salt of dicamba. Both products are recommended for the control of a variety of broadleaf weeds and woody vegetation (C&P Press 2003). Western would use Vanquish, a liquid herbacide. The primary application methods of Vanquish are roadside hydraulic spraying (primarily used for right-or-way management), cut-surface treatments and directed foliar treatments; however, aerial and broadcast foliar applications could be used as well.

Dicamba is relatively nontoxic by oral administration. Dicamba is an effective auxin herbicide and acts by mimicking the plant hormone indole-3-acestic acid inducing uncontrolled growth; however, this hormonal mode of action is specific to plants and does not affect animals. At normal application rates even tolerant plants that are directly sprayed with Dicamba are likely to be damaged. Although it risk of using Dicamba is site specific, some sensitive plant species could be affected by runoff in areas in which runoff is favored – clay soil and surface conditions that are conducive to runoff. Damage associated with off-site drift of Dicamba would also depend on local site-specific conditions but would most likely occur within a relatively small distance from the application site – i.e., up to about 100 feet. Additionally, vapor exposures to offsite vegetation could also cause damage, although this cannot be well quantified. At the typical application rate, adverse effects in aquatic plants are not likely, however, at the maximum application rate, peak concentrations in water could be associated with transient effects in sensitive species of algae as well as macrophytes. Additionally, members of the general public could be at some risk at the typical application rate only in the event of worst-case exposure assumptions for two accidental exposures involving children.

Vanquish is practically nontoxic in microorganisms, aquatic vertebrates, aquatic estuarine/marine invertebrates and slightly toxic in aquatic freshwater invertebrates as well as terrestrial animals. Vanquish is classified as slightly toxic in oral, dermal and inhalation of mammals (rat) and moderately irritating to eye contact (rabbit). Additionally, there is a slight potential for bioaccumulation potential of Vanquish although it is not persistent in soil (highly mobile), is stable in water (sinks in water) and degrades rapidly.

G.2.4 Glyphosate

The herbicide Glyphosate is used primarily in conifer release, noxious weed control, and site preparation. The most common commercial glyphosate products used by Western are Accord, Rodeo, and Roundup which use the isopropylamine salt of glyphosate.

Technical grade glyphosate contains an impurity, N-nitrosoglyphosate, but the amount of this impurity in glyphosate has been classified as toxicologically insignificant by the U.S. EPA.

The most common method of application for glyphosate in Forest Service programs involves backpack applied directed foliar sprays; however, Glyphosate is applied in hack and squirt applications (the bark and cambium of a standing tree is cut with a hatchet and the herbicide is then applied to the cut using a squirt bottle) for tree removal maintenance of right-of-ways, during site preparation, and conifer release operations.

The herbicidal activity of glyphosate is due primarily to the inhibition of the shikimate pathway which is involved in the synthesis of aromatic amino acids in plants and microorganisms (the metabolic pathway does not occur in humans or other animals). The two specific biochemical mechanisms of action for glyphosate are uncoupling of oxidative phosphorylation and inhibition of hepativ mixed function oxidases. It should be noted that the U.S. EPA indicates that glyphosate is classified as Group E: Evidence of non-carcinogenicity for humans (although this assessment has been challenged).

Some formulations of glyphosate recommend the use of a surfactant to improve the efficacy of glyphosate and some surfactants may be more toxic than the herbicides with which they are used. A risk of using a surfactant is that they may play a substantial role in the interpretation of a large number of suicides and attempted suicides involving the ingestion of glyphosate formulations, primarily Roundup, the acute mammalian toxicity of different glyphosate formulation does not appear to differ substantially. On the other hand, the risk characterization for both workers and members of the public in contact with glyphosate indicates that there is very little potential risk at the typical application rate of 2 lbs a.e./acre. However, glyphosate and glyphosate formulations are skin and eye irritants.

Available toxicity studies suggest potential effects of glyphosate in mammals and birds to inhibit oxidative phosphorylation and consequently reduce food conversion efficiency as well as the apparent lack of teratogenic activity. In soil microorganisms, under field conditions, there is very little information suggesting that glyphosate will be harmful. However, glyphosate has a variety of toxic effects in plants, including the inhibition of photosynthesis as well as inhibition of respiration and nucleic acid syntheses in plants and microorganisms. In higher plants, inhibition of the shikimic acid pathway leads to an inhibition or cessation of growth, cellular disruption, and, at sufficiently high levels of exposure, plant death. Unintended drift as well as unintended direct deposition are the more plausible exposure scenarios for nontarget terrestrial plant species which could induce plant death in nontarget species. For sensitive nontarget species of plants the upper range of application rate of glyphosate could affect plants as much as 100 feet from the application site. Some fish species such as salmonids are more sensitive to glyphosate than other species of fish. Yet, amphibians are generally no more sensitive to glyphosate than fish. Thus, the use of glyphosate near bodies of water where sensitive species of fish may be found (i.e., salmonids) should be conducted with substantial care to avoid contamination of surface water. It is worth noting that aquatic

plants appear to be somewhat less sensitive to glyphosate than the most sensitive aquatic animals.

G.2.5 Imazapyr

The herbicide imazapyr is used in the control of a variety of grasses, broadleaf weeds, vines, and brush species, site preparation, wildlife habitat improvement and conifer or hardwood release, and right-of-way maintenance. While imazapyr formulations can be used in pre-emergence applications, the most common and effective applications are post-emergent when the vegetation to be controlled is growing vigorously. The most common application of imazapyr for right-of-way maintenance is boom spray. However, the commercial formulation of imazapyr, Stalker and Arsenal AC, are commonly applied with cut surface treatment methods while Arsenal and Chopper formulations involve backpack (selective foliar) and boom spray (broadcast foliar) operations.

Imazapyr is an effective herbicide, one in which even tolerant plants that are directly sprayed with imazapyr at normal application rates are likely to be damaged. However, imazapyr is practically non-toxic to conifers, but is toxic to many other non-target plants. Some sensitive plant species could be affected by the off-site drift or by off-site movement in runoff of imazapyr depending on local site-specific conditions. Imazapyr inhibits acetolactate synthase (ALS), an enzyme that catalyzes the biosynthesis of three branched-chain amino acids, all of which are essential for plant growth. Imazapyr is not metabolized extensively in plants but is transported rapidly from treated leaves to root systems and may be exuded into the soil from the roots of treated plants. Therefore, post-emergence application method is more effective than the pre-emergence application method.

Where runoff is prevalent, damage from runoff appears to poise a greater hazard than drift. Residual soil contamination with imazapyr could be prolonged in some areas. Some effects are also plausible in aquatic plants. Aquatic macrophytes appear to be more sensitive to imazapyr than unicellular algae. Peak concentrations of imazapyr in surface water could be associated with adverse effects in some aquatic macrophytes.

Adverse effects in workers, members of the general public, as well as terrestrial or aquatic animals do not appear to be likely. Imazapyr is relatively non-toxic to soil microorganisms, aquatic invertebrates, and fish and is not expected to bioaccumulation in the food chain. Additionally, imazapyr is practically non-toxic in terrestrial animals and birds. The most sensitive species appears to be aquatic macrophytes, *Lemna minor* and *Myrophyllium sibiricum;* however, some aquatic algae appear to be substantially less sensitive.

G.2.6 Oxyfluorfen

Oxyfluorfen is used for the control of weeds around conifers and some deciduous trees. Oxyfluorfen is a diphenyl-ether herbicide that is used to control a large number of broadleaf and grassy weeds in both forestry and agriculture. Oxyfluorfen is known to

inhibit protoporphyrinogen oxidase (also known as “protoporphyrinogen IX oxidase” or “protox”), resulting in inhibition of heme biosynthesis, and induction of symptoms in rodents consistent with the expression of human variegate porphyria (i.e. effects on the liver, blood, blood-forming tissue.). Oxyfluorfen is relatively ineffective in inhibiting seed germination but is toxic after either direct spray or soil application. Oxyfluorfen is more toxic in pre-emergent soil applications than direct spray.

Adverse effects on populations of nontarget terrestrial plants, mammals, and birds are plausible following use of Oxyfluorfen at the typical and maximum application rates and methods. Adverse effects on aquatic life, especially plants and aquatic invertebrates, are virtually certain if steps are not taken to prevent contamination of nearby aquatic habitats; Oxyfluorfen is highly toxic to aquatic animals even though it is not very soluble in water. Aquatic algae are more sensitive than fish but are equal in sensitivity with aquatic invertebrates. Formulations of Oxyfluorfen appear to be more toxic than technical grade herbicide, regardless of purity. Aquatic macrophytes are equally sensitive to Oxyfluorfen with respect to algae.

It is plausible that Oxyfluorfen exposure resulting from typical and maximum application rates and methods could result in adverse health effects among workers who handle herbicides without extensive use of personal protective equipment, and among members of the general public who might consume vegetation contaminated with the herbicide primarily through spray drift. Oxyfluorfen is of a low order of acute oral toxicity, is a mild eye and skin irritant, and only causes reproductive/development effects in rodents and rabbits at doses/concentrations which cause toxicity in pregnant dams or does. Oxyfluorfen is classified as a Group C, possible human carcinogen by the U.S. EPA. Additionally, Oxyfluorfen inhibits protoporhpyrinogen oxidase, individuals who are innately deficient in protoporphyrinogen oxidase (i.e. have variegate porphyria) might be uniquely sensitive to Oxyfluorfen exposure.

Oxyfluorfen is practically non-toxic to mammals, birds, and honey bees; highly toxic to fish; and very highly toxic to aquatic invertebrates. This herbicide causes phyotoxicity in non-target plants at concentrations which are likely used under field conditions. A limited number of studies suggest that the effects of Oxyfluorfen on soil microorganisms are also likely to be transient, with measured variables in exposed populations ultimately rebounding above those of control levels.

G.2.7 Triclopyr

The herbicide triclopyr mimics auxin, a plant growth hormone, thus disrupting the normal growth and viability of plants. Triclopyr is used for wildlife habitat improvement, noxious weed control, conifer or hardwood release, and site preparation, among other uses such as right-of-way management, hardwood control, facilities maintenance, and seed orchard protection. Triclopyr has a low order of acute lethal potency, although, just like any chemical, Triclopyr at sufficiently high exposure levels can cause toxic effects, including death.

Although triclopyr causes developmental effects only at doses that cause maternal toxicity, reproductive effects are obviously an endpoint of concern to both the human health and ecological risk assessments and the quantitative risk assessment for mammalian wildlife is based on the same data as used in the human health risk assessment. The U.S. EPA /OPP (1998a) has classified triclopyr acid as being practically non-toxic to slightly toxic to birds and practically non-toxic to honey bees. Very high concentrations of triclopyr have been shown to cause growth inhibition in bacteria and fungi in laboratory bioassays. Some bryophytes and lichens may be sensitive to long term effects after triclopyr exposure. There is very little suggestion in any field studies that triclopyr had any direct adverse effects on both animal and plant terrestrial organisms and most reported effects may simply reflect changes in habitat secondary to vegetation management practices.

Fish tend to be lethargic to hyper sensitive to triclopyr. The environmental metabolite of tryclopyr (TCP) is substantially more toxic in fish than either triclopyr acid or triclopyr TEA. In free-living amphibians observations of hind limb deformities has been observed; however, Garlon 3A and Garlon 4 (commercial formulations of triclopyr) have been specifically tested for malformations in the frog embryo teratogensis assay and no statiscally significant effects were noted. Aquatic vertebrates appear to be about equally or somewhat less sensitive than fish to the various forms of triclopyr.

Although triclopyr BEE (butoxyethyl ester) is much more toxic to aquatic species than triclopyr TEA (triethylamine) or triclopyr acid, the projected levels of exposure are much less even for acute scenarios because of the rapid hydrolysis of triclopyr BEE to triclopyr acid as well as the lesser runoff of triclopyr BEE because of its lower water solubility and higher affinity for soils. Nonetheless, triclopyr BEE is projected to be somewhat more hazardous when used near bodies of water where runoff to open water may occur. If triclopyr is applied at high rates of exposure in areas where surface water contamination is plausible, site-specific modeling and/or environmental monitoring would be useful to ensure and verify that concentrations TCP do not reach harmful concentrations.

This page intentionally left blank.