

VALLEY ELDERBERRY LONGHORN BEETLE MANAGEMENT PLAN

BIG CREEK HYDROELECTRIC SYSTEM

**MAMMOTH POOL (FERC Project No. 2085)
BIG CREEK Nos. 1 AND 2 (FERC Project No. 2175)
BIG CREEK Nos. 2A, 8, AND EASTWOOD (FERC Project No. 67)
BIG CREEK No. 3 (FERC Project No. 120)**

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**SUBMITTED BY
SOUTHERN CALIFORNIA EDISON COMPANY**

TABLE OF CONTENTS

	Page
1.0 INTRODUCTION	1
1.1 Preparation of the VELB Management Plan	1
1.1.1 Location of VELB and Their Habitat	1
2.0 MANAGEMENT ACTIVITIES	2
2.1 Vegetation Management.....	2
2.1.1 Vegetation Trimming by Hand	2
2.1.2 Vegetation Trimming with Equipment	3
2.1.3 Herbicide Application	3
2.2 Road Maintenance.....	3
3.0 AVOIDANCE AND PROTECTION MEASURES	4
3.1 Measures	4
3.1.1 Protected Areas	4
3.1.2 Vegetation Control	4
3.1.3 Road Grading	5
3.2 SCE Programs.....	5
3.2.1 Endangered Species Alert Program	5
3.2.2 Northern Hydro Special-status Species Information Program.....	5
3.2.3 Environmental Training Program	5
3.2.4 Compliance Program	6
4.0 IMPACTS ANALYSIS	7
4.1 Methods	7
4.2 Results.....	8
5.0 MITIGATION AND MITIGATION/RESOURCE MONITORING.....	9

5.1	Mitigation	9
5.1.1	Proposed Mitigation	9
5.1.2	Mitigation/Resource Monitoring and Reporting	10
5.1.3	Success Criteria	10
5.1.4	Survival of Trimmed Shrubs	10
5.1.5	Implementation Schedule	11
6.0	AGENCY CONSULTATION	11
6.1	New Facilities.....	12
6.1.1	Identification of Need for Additional Surveys	12
7.0	LITERATURE CITED	12

List of Tables

Table 1.	Valley Elderberry Longhorn Beetle Habitat in the Vicinity of the Big Creek Projects
Table 2.	New Project Roads at or Below 3,000 Feet in Elevation
Table 3.	Herbicide and Other Agents Used at the Four Big Creek Projects
Table 4.	Elderberry Shrub Impact Analysis Results
Table 5.	Results Summary
Table 6.	Mitigation Summary

List of Figures

Figure 1	Elderberry Shrubs to be Trimmed within the Four Big Creek ALP Projects
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List of Attachments

- Attachment A Vegetation Management and Road Maintenance at Project Facilities and Roads that Support VELB Habitat
- Attachment B Vegetation Management and Road Maintenance at Project Roads Not Yet Surveyed for VELB Habitat
- Attachment C Material Safety Data Sheets for Herbicides and Other Agents
- C1 Garlon 4®
- C2 Pathfinder II®
- C3 Accord®
- C4 Velpar®
- C5 Hasten®
- C6 R-11®
- C7 In-Place®
- Attachment D USFWS Conservation Guidelines for the Valley Elderberry Longhorn Beetle

1.0 INTRODUCTION

This Valley Elderberry Longhorn Beetle (VELB) Management Plan (Plan) has been developed for four Southern California Edison (SCE) hydroelectric projects included in the Big Creek Hydroelectric System, which is located in the Upper San Joaquin River Watershed. The Big Creek Hydroelectric System is comprised of four FERC licenses: Mammoth Pool (FERC No. 2085), Big Creek Nos. 1 and 2 (FERC No. 2175), Big Creek Nos. 2A, 8, and Eastwood (FERC No. 67), and Big Creek No. 3 (FERC No. 120). These Projects consist of seven powerhouses and four major reservoirs, and have a combined dependable operating capacity of about 890 megawatts (MW).

1.1 PREPARATION OF THE VELB MANAGEMENT PLAN

SCE has prepared this Plan in consultation with the U.S. Fish and Wildlife Service (USFWS), United States Department of Agriculture-Forest Service (USDA-FS), California Department of Fish and Game (CDFG) and other stakeholders involved in the Big Creek Alternative Licensing Process (ALP). The Plan was developed to address VELB management during on-going operations and maintenance of all Project facilities, roads, trails and recreation features of the four Big Creek Projects. This Plan, including the specified avoidance, protection, and mitigation measures, will supersede all previous documents developed by SCE for the four Big Creek Projects. The Plan will become effective upon the Federal Energy Regulatory Commission (FERC or Commission) approval.

The Draft VELB Management Plan was submitted to agencies and stakeholders on August 29, 2005. Comments on the plan were received from USDA-FS and USFWS.

1.1.1 Location of VELB and Their Habitat

The presence of VELB and their habitat (defined as elderberry shrubs below 3,000 feet in elevation) within the Project area was determined based on extensive field surveys conducted in the vicinity of the four Big Creek Projects (SCE 2002a; SCE 2003; SCE 2004, and SCE 2005). A total of 572 elderberry shrubs have been identified in the vicinity of the four Projects, 42 shrubs in the Mammoth Pool Project vicinity, 515 in the Big Creek No. 3 Project vicinity, and 15 in the Big Creek Nos. 2A, 8, & Eastwood Project vicinity. Of these, only 10 shrubs show evidence of potential VELB occupancy, as determined by the presence of exit holes (SCE 2002a; SCE 2005). This includes two in the Mammoth Pool Project vicinity and eight in the Big Creek No. 3 Project vicinity. Table 1 contains a summary of the number of shrubs by project facility or road.

Following completion of the surveys, SCE and/or USDA-FS identified additional roads to be included as Project roads and/or added to the FERC Project boundaries under the new license. Table 2 provides a list of each of these additional roads occurring at or below 3,000 feet in elevation. SCE will survey these roads to determine the location of potential VELB habitat (i.e., elderberry shrubs) within one year of FERC approval of this Plan.

2.0 MANAGEMENT ACTIVITIES

The implementation of management activities, including vegetation control and road maintenance, may result in adverse effects to VELB by trimming or pruning habitat. A summary of vegetation management and road maintenance activities conducted in the vicinity of the Projects is provided below. Refer to Attachment A for a description of vegetation management and road maintenance that occur in the vicinity of the four Big Creek Projects where potential VELB habitat is present.

2.1 VEGETATION MANAGEMENT

Vegetation management occurs at various locations in the vicinity of the four Big Creek Projects (e.g., Project facilities, roads). SCE conducts vegetation management in the spring and summer in these areas in association with on-going operations and maintenance. Vegetation management includes trimming of vegetation by hand or equipment and the use of herbicides. Refer to Attachment A for a list of vegetation management activities that occur in areas that support potential VELB habitat. Attachment B provides a list of vegetation management activities that will be implemented on Project roads that have not yet been surveyed for potential VELB habitat. These matrices also provide the frequency at which the maintenance activity typically occurs at a specific location. A description of vegetation management activities is provided below. In general, vegetation management activities occur during the spring and early summer to avoid work during high fire danger periods. Vegetation management implemented on a regular basis typically occurs one or more times in a five-year period. Activities implemented on an infrequent basis tend to occur at least once during a 20-year period, but less than once every five years.

The area where vegetation management occurs around Project facilities and along roads is limited to the area necessary to reduce fire hazard and to provide for worker/public health and safety. Vegetation management generally occurs within 150 feet of Project facilities (dams, small and moderate diversions, gaging stations, powerhouses, transmission lines) and within 10 feet on either side of roads.

SCE implements a combination of manual, mechanical, and chemical methods to control vegetation in the vicinity of the Big Creek Projects. Selection of an appropriate control method is based on an evaluation of worker/public health and safety, potential environmental effects, effectiveness of methods based on site characteristics, and economics. Each control method is summarized below.

2.1.1 Vegetation Trimming by Hand

One of the methods used to trim vegetation in the vicinity of the Big Creek Projects is with hand tools. This includes trimming of grasses and forbs with a string trimmer, as well as removing or trimming of overhanging shrubs and trees with a chain saw or other handheld saw. This maintenance activity is implemented on an as-needed basis in conjunction with facility inspections.

2.1.2 Vegetation Trimming with Equipment

Vegetation in the vicinity of the Projects is also trimmed using mechanical equipment, including a flail-type mower. A flail mower is a cutting device attached to a tractor that is used to cut brush along roadsides. As with trimming of vegetation by hand, this activity is implemented on an as-needed basis.

2.1.3 Herbicide Application

After vegetation has been trimmed by hand or mechanical methods, herbicides may also be applied. Two methods of herbicide application are utilized; these include basal and foliar application techniques. Basal application is used for shrub species and includes cutting of a shrub and applying an oil-based herbicide directly to the stump. Foliar application techniques include hand spraying of an herbicide, with an additive or other agent, to control overspray. The herbicides and other agents used in the vicinity of the four Big Creek Projects are listed in Table 3. The label or Material Safety Datasheet (MSDS) for each herbicide or other agent is provided as Attachment C. If more effective herbicides become available in the future, SCE will consult with USDA-FS and USFWS to obtain permission to substitute the use of herbicides listed in Table 3. The application of all herbicides is completed or supervised by a certified pesticide applicator in compliance with the specified herbicide application prescription.

Herbicides and other chemical agents used in the vicinity of the four Projects are as follows:

- Garlon 4® and Hasten® (a vegetable oil-based additive) are combined and applied using a basal bark application technique.
- Garlon 4® and Accord® are combined and applied using a foliar application technique.
- Accord® is used by itself or combined with either R-11® or In-Place® and applied using basal bark and foliar techniques.
- Pathfinder® is used as a spot treatment of individual plants.
- Velpar® is used as a pre-emergent and is applied directly to moist soil to treat grasses and broad-leaved plants.

2.2 ROAD MAINTENANCE

Road maintenance, including road grading, graveling and paving, occurs along Project roads at all four Big Creek Projects. Road maintenance activities typically occur during the spring and summer on a regular or infrequent basis. As with vegetation management, road maintenance is conducted on a regular basis and typically occurs one or more times in a five year period, while maintenance implemented on an infrequent basis will occur during a 20 year period, but less than once every five years. These road maintenance activities are conducted primarily for improved visibility and

therefore, increase safety on narrow mountain roads, and decrease the chance of brush fires being accidentally ignited.

3.0 AVOIDANCE AND PROTECTION MEASURES

The following measures will be implemented to avoid and protect VELB and their habitat. Measures apply only to areas where elderberry shrubs are present below 3,000 feet in elevation.

3.1 MEASURES

3.1.1 Protected Areas

- Each elderberry shrub, or group of shrubs, potentially affected by Project operation or maintenance activities, with one or more stems measuring 1 inch in diameter or greater (≥ 1) at ground level, will be flagged prior to implementation of management activities.
- Signage will be installed in areas where elderberry shrubs are known to occur.

3.1.2 Vegetation Control

- No elderberry shrub with one or more stems ≥ 1 inch in diameter at ground level will be removed.
- No elderberry shrub stems or branches ≥ 1 inch in diameter will be trimmed.
- Annual and biannual vegetation control will only be conducted July through April in areas within 100 feet of elderberry shrubs.
- No flail-type mower will be used within an elderberry shrub dripline with one or more stems measuring ≥ 1 inch in diameter at ground level.
- Basal bark or foliar techniques will be utilized when herbicide application must occur within 100 feet of the dripline of an elderberry shrub with one or more stems measuring ≥ 1 in diameter or greater at ground level. Basal application techniques include cutting of a non-elderberry shrub and applying an oil-based herbicide directly to the stump. Foliar application techniques include hand spraying of an herbicide, with a deposition/retention additive, to control overspray. The application of herbicides will be completed or supervised by a certified pesticide applicator in compliance with the herbicide application prescription. Herbicide application will occur from July through April on an as-needed basis.

3.1.3 Road Grading

- Non-emergency road grading will be conducted July through April and the use of a grader will be restricted to the road surface and adjacent berms to remove any eroded material and to maintain roadside berms.

3.2 SCE PROGRAMS

In addition to the above avoidance and protection measures, SCE also has established several programs to train personnel on the recognition and avoidance of special-status resources, including VELB and their habitat, in the vicinity of the four Big Creek Projects. These programs will continue to be implemented during the term of the license. Each program is described below.

3.2.1 Endangered Species Alert Program

The Endangered Species Alert Program (ESAP) was developed to provide SCE personnel with a means for identifying when they may be working within an area with the potential for occurrence of legally protected plants and animal species in the SCE Service Territory. This training is conducted on an annual basis. For each of these species within the SCE Service Territory, the ESAP Manual (SCE 2006a) includes a photograph, description, natural history information, and map showing the species' distribution in relation to SCE facilities. This manual and maps (or Geographic Information System (GIS) database) are reviewed prior to implementing any project that involves ground disturbing activities within the Project area. Should a proposed activity have the potential to conflict with a known sensitive species population, SCE's Northern Hydro Division Environmental Manager, SES, or other qualified personnel will be notified to evaluate the situation and, if needed, coordinate with and obtain appropriate permits from regulatory agencies.

3.2.2 Northern Hydro Special-status Species Information Program

SCE's Northern Hydro Division has developed a Special-status Species Information Program (NHSSIP) to provide SCE personnel with a means of identifying when they may be working within an area that could support a Forest Service Sensitive (FSS) species. This Program will require the use of the Environmental Compliance Program described below and will enhance the ESAP described above. This program includes a photograph or line drawing, description, natural history information, and map showing the species' distribution in relation to SCE facilities for all FSS species potentially occurring in the Project vicinity (SCE 2006b).

3.2.3 Environmental Training Program

SCE employees attend environmental training sessions on a regular basis, as well as on an as-needed basis. These training sessions include a review of background material, permit conditions, and instructions on how to avoid impacts to biological resources. Project-specific meetings may also be conducted in the field on a job-

specific or activity-specific basis to review appropriate maintenance protocols (A/P measures) in environmentally sensitive areas.

3.2.4 Compliance Program

SCE will develop a compliance program that includes a process that must be followed prior to implementation of specific O/M activities. This is a program designed to track O/M activities implemented, update resource information, and guide personnel in implementation of O/M activities in compliance with A/P measures developed for the Big Creek Hydroelectric System. The compliance program consists of three components, the Northern Hydroelectric Environmental Compliance Database, GIS Database, and the Compliance Process, as described below.

Northern Hydroelectric Environmental Compliance Database

The Northern Hydroelectric Environmental Compliance Database (Compliance Database) will be developed and integrated with SCE's existing databases. A component of the database will be designed for tracking the training records of SCE personnel, O/M activities that have been planned and completed, and noxious weed populations that have been identified and treated. The database will also include all A/P measures associated with this Plan. This database will be queried prior to implementation of specified O/M activities.

Geographic Information System Database

Several studies have been conducted for the Big Creek Hydroelectric System. The results of these studies, data obtained from the USDA-FS Special-status Species Database, the CNDDDB, and other biological studies were incorporated into a GIS database. This information includes the locations of special-status species and their habitats, noxious weed population, and cultural resources in the vicinity of the Project. Because of the sensitive nature of the locations of some special-status species and cultural resources, some GIS data layers are confidential. Therefore, access to these layers will be limited to SCE employees who are trained in the sensitivity and proper use of the information.

Updating GIS Database

The GIS database will be evaluated annually during the term of the license to determine if updates are needed. Prior to updating the database, SCE will contact USDA-FS for the most recent version of its Special-status Species Database. SCE will also contact the USFWS for the current list of Threatened and Endangered Species and obtain any new versions of the CNDDDB when they become available. Any new data on the location of resources (i.e., special-status species, cultural resources, and noxious weed populations) in the vicinity of the Project that are obtained during implementation of O/M activities or required monitoring will also be incorporated into the database on a regular basis. SCE will contact the agencies and obtain approval to use the newest available data sources if they become available.

Compliance Process

SCE will review all O/M work activity requests that are determined to be subject to environmental regulation. They will use the Database to determine which A/P measures are appropriate, given the timing and nature of the work to be conducted, and the proximity of special-status biological resources and/or cultural resources to the work location. SCE will require that contractors comply with all applicable A/P measures.

4.0 IMPACTS ANALYSIS

The following describes the approach for the assessment of potential impacts from O/M activities implemented over the term of the FERC license to elderberry shrubs. It is assumed in the impact analysis that the avoidance and protection measures, as described in Section 3.0, would be implemented at Project facilities and roads, and that non-compliance with measures in Section 3.0 would result in impacts to VELB. Operations and maintenance activities are conducted primarily to improve visibility and therefore increase safety on narrow mountain roads, and decrease the chance of brush fires being accidentally ignited. It is probable that these maintenance activities, which necessitate the reduction of a small fraction of existing habitat along roads, reduce the potential for widespread catastrophic adverse effects of brush fires on VELB habitat. This is an important part of the impact analysis. Assuming, therefore, that these activities protect the larger existing habitat, a further step in the impact analysis was to determine the most appropriate method of performing these activities with minimal adverse effects, and to mitigate for any unavoidable adverse effects.

Potential Project impacts on VELB were determined based on the protocols established by SCE as part of the Lower Tule Hydroelectric Project (SCE 2002b) and approved by USFWS in the Biological Opinion for the Lower Tule Hydroelectric Project (USFWS 2002) and Big Creek No. 4 VELB Management Plan and Draft Supplemental Report (SCE 2005b). Based on the location of plants in relation to Project facilities and roads and SCE's maintenance practices, it was determined that additional field surveys were needed to collect data on stems and branches to more adequately identify potential Project impacts. The following describes the methods of the impact analysis for the necessary O/M activities.

4.1 METHODS

SCE evaluated a total of 572 elderberry shrubs in the vicinity of Project facilities and roads to determine potential Project impacts from vegetation management and road maintenance. Analysis methods were based on an evaluation of the type of vegetation management and road maintenance activities that occur at each facility or road, the distance of the shrub from the facility, the presence of stems greater than or equal to 1 inch (≥ 1), and the ability to implement the activity in compliance with avoidance and protection measure defined in Section 3.0. Maintenance activities completed at each facility or road with elderberry plants in the vicinity are described in Section 2.0.

Surveys were completed by Janelle Nolan-Summers of Robertson-Bryan, Inc. (RBI), Joe Tanski of SCE, and Ed Bianchi of ENTRIX on June 28 and 29, 2005.

Table 2 of this Plan contains a list of additional Project roads occurring at or below 3,000 feet in elevation that have not yet been surveyed. SCE will survey these roads to determine the location of potential VELB habitat (i.e., elderberry shrubs) within one year of FERC approval of this Plan. Additionally, SCE will evaluate any elderberry shrubs identified during these surveys to determine potential Project impacts from vegetation management and road maintenance using the methods detailed below.

For those elderberry shrubs that were determined to be potentially trimmed, the number of stems and branches—by size class (<1 , ≥ 1 & ≤ 3 , >3 & < 5 , ≥ 5)—that would be trimmed during maintenance activities was determined. For the purposes of this report, stems are defined as the main stalk or stalks of the plant and branches are defined as woody extensions from the main stems or stalks. The diagram below shows stems and branches.



Shrub – a woody plant with several stems and branches

Stem – the main stalk(s) of a plant

Branch – a woody extension from the stem or main stalk

4.2 RESULTS

It was determined that no shrubs would be removed over the term of the license for the four Big Creek Projects. Trimming would occur on 18 of the total 572 shrubs in the vicinity of the four Big Creek Projects. This includes trimming of shrubs in the vicinity of two Big Creek Projects, 13 in Big Creek No. 3, and 5 in Big Creek Nos. 2A, 8, and Eastwood. Table 4 lists the elderberry shrub number, distance of the shrub from the facility, stem diameter by size class, and number of stems and branches potentially trimmed by size class. None of the shrubs trimmed showed evidence of VELB occupancy. A total of 7 stems ≥ 1 & ≤ 3 , 27 branches <1 , and 1 branch ≥ 1 & ≤ 3 would be trimmed during the term of the license. Refer to Table 5 for a summary of survey results and to Figure 1 for the location of shrubs that would be trimmed by maintenance activities during the term of the license.

5.0 MITIGATION AND MITIGATION/RESOURCE MONITORING

This section outlines mitigation, mitigation/resource monitoring, and reporting procedures to be implemented during the term of the license.

5.1 MITIGATION

The USFWS has developed and approved the Conservation Guidelines for the Valley Elderberry Longhorn Beetle (July 9, 1999; Guidelines; Attachment D) to assist federal agencies and non-federal project applicants in obtaining incidental take authorizations through Endangered Species Act (ESA) consultation or permit processes. The Guidelines provide measures to avoid, minimize, and mitigate adverse effects on VELB. Although USFWS recommends that these Guidelines be used for all projects, they were primarily developed for construction-type projects that would result in ground disturbance and removal of shrubs. Because suitable habitat for VELB is defined as any live branch that is one inch (2.5 cm) or greater in diameter that occurs within 6 feet from the ground, (USFWS 1999) no mitigation is proposed for trimming of branches <1 inch in diameter. Maintenance of Project facilities and roads will result in trimming of stems and branches >1 inch in diameter from a small number of shrubs and mechanical vegetation control and herbicide application up to the dripline of an unspecified number of elderberry shrubs, but not in ground disturbance or removal of shrubs. This mitigation proposal is based on the USFWS (1999) guidance, with modifications developed cooperatively by SCE and the USFWS to address the specific requirements of the Project.

Table 2 of this Plan contains a list of additional Project roads occurring at or below 3,000 feet in elevation that have not yet been surveyed. SCE will survey these roads to determine the location of potential VELB habitat (i.e., elderberry shrubs) within one year of FERC approval of this Plan. If it is determined that potential VELB habitat is present along these additional roads that may potentially be affected by Project maintenance activities, SCE will follow the mitigation approach included in this Plan. SCE will seek approval from USFWS on mitigation for any potential impacts to VELB or their habitat from maintenance of Project roads identified in Table 2.

5.1.1 Proposed Mitigation

A total of 572 elderberry shrubs are present in the vicinity of the four Big Creek Projects. Maintenance activities will result in trimming of stems or branches ≥ 1 inch in diameter on six of these shrubs. That is, only approximately 1% of the total number of shrubs will be impacted. Additionally, the 572 shrubs in the Project area support a total of 1,511 stems ≥ 1 inch in diameter. Maintenance activities will result in the trimming of seven stems and one branch ≥ 1 inch in diameter. That is, less than 1% (0.53%) of the total number of the stems present in the vicinity of the four Projects will be trimmed. None of the shrubs to be trimmed are in riparian habitat. To compensate for trimming seven elderberry stems and one branch ≥ 1 & ≤ 3 inches in diameter, SCE proposes to plant a total of eight seedlings. Refer to Table 6 for a summary of the proposed mitigation. Planting eight local native seedlings would provide additional habitat for VELB and more

than adequately mitigate for trimming of seven stems and one branch during the term of the license.

SCE proposes to plant the seedlings on USDA-FS property in the Project vicinity adjacent to other elderberry shrubs. The specific locations of the seedlings to be planted will be agreed upon by SCE, USFWS, and USDA-FS, and will be in an area that will not be affected by future maintenance activities. SCE will plant seedlings in areas supporting native plant species; thus SCE does not propose to plant associated native plant species.

5.1.2 Mitigation/Resource Monitoring and Reporting

Monitoring of the mitigation site will be implemented following planting of the seedlings. This includes monitoring the general condition of the mitigation site and the condition of the elderberry plantings. SCE will monitor the site seven times over a 15 year period. SCE does not, however, propose to monitor for VELB occupancy at the proposed mitigation site because the Guidelines do not specify a threshold for VELB occupancy of planted cuttings/seedlings. SCE will conduct surveys and prepare monitoring reports for years 1, 2, 3, 5, 7, 10, and 15, with the first year beginning one year after the seedlings have been planted.

5.1.3 Success Criteria

A minimum survival rate of at least 60% of the elderberry shrubs will be maintained throughout the monitoring period. Within one year of discovery that survival is less than 60%, SCE will replace failed plantings to bring the survival rate above the minimum level. If SCE determines that the success criteria at the monitoring site cannot be met for reasons beyond their control (e.g., vandalism, fire, flood), SCE will provide USFWS with a letter report summarizing the reasons and, if possible, photographs that support the determination.

5.1.4 Survival of Trimmed Shrubs

As requested by USFWS, SCE will monitor the survival of the six shrubs with stems or branches ≥ 1 inch in diameter that will be trimmed. SCE will monitor these shrubs plus 12 adjacent untrimmed shrubs (two shrubs adjacent to each trimmed shrub) during the term of the license. The 12 shrubs that will not be trimmed will serve as a control group representing the natural survival of elderberry shrubs in the Project area. Data that will be collected for the six trimmed and 12 control shrubs will include shrub height, overall health of the shrub, the number of stems by size class, and the presence of dead stems by size class. SCE will include the results of the survival of trimmed shrubs compared with the survival of control shrubs in the mitigation monitoring reports described in Subsection 5.1.2. Monitoring will be conducted seven times over a 15 year period, as described in Subsection 5.1.2.

5.1.5 Implementation Schedule

Within one year of FERC approval of this Plan, SCE will complete planting of the seedlings. The first monitoring report will be submitted to the Commission, USDA-FS, and USFWS within three months after the surveys of the seedlings have been completed. Additional monitoring reports will be submitted within three months of the surveys to be conducted after years 2, 3, 5, 7, 10, and 15 following planting of the seedlings.

SCE will complete VELB and VELB habitat surveys at roads identified in Table 2 within one year of FERC approval of this Plan. Following completion of surveys, SCE will submit a report to USFWS that includes results of surveys, potential Project impacts, and appropriate mitigation measures, if necessary.

6.0 AGENCY CONSULTATION

Agency consultation has been ongoing during the Big Creek ALP. This includes consultation as part of the study plan development, technical studies, Preliminary Administrative Draft Biological Assessment/Biological Evaluation (BA/BE), and development of this Plan. Descriptions of consultation completed during the study plan development and during completion of technical studies are provided in the *Final Technical Study Plan Package for the Big Creek Hydroelectric System Alternative Licensing Process* (SCE 2001) and in the 2002 and 2003 *Technical Study Report Package for the Big Creek Hydroelectric System Alternative Licensing Process* (SCE 2003; SCE 2004).

Additionally, a complete summary of consultation and copies of correspondence completed to date for the four Big Creek Projects is provided in the BA/BE. Consultation completed with USFWS for development of this Plan consisted of three meetings and correspondence (i.e., letter, e-mail). This included meetings on February 17, 2005; June 20, 2005; and October 13, 2005. During these meetings, proposed avoidance and protection measures were discussed and revised, and the impact and mitigation approaches were evaluated. On June 23, 2005, USFWS requested additional information on the herbicides used in the vicinity of the four Big Creek Projects, a copy of the Holyoak (2005c) report, and information on roads. SCE provided the requested information on July 19, 2005. During the October 13, 2005 meeting USFWS and SCE tentatively agreed that planting of eight seedlings would adequately mitigate for impacts to VELB in the vicinity of the four Big Creek Projects and that implementing avoidance and protection measures in this Plan would provide protection for VELB habitat during the term of the license. Following completion of this meeting, USFWS provided tentative agreement on the VELB Management Plan after incorporation of revisions to the mitigation as agreed upon during the meeting.

Since this time, SCE and/or USDA-FS have identified additional roads to be included as Project roads and/or added to FERC Project boundaries that have not been surveyed for the presence of VELB or their habitat. SCE will complete surveys at these roads

and develop a report for USFWS review that includes survey results, potential Project impacts and proposed mitigation. SCE will follow the impacts analysis methods and mitigation approaches described in this Plan, and already approved by USFWS and other resource agencies. SCE will seek approval from USFWS on mitigation for any potential impacts to VELB or their habitat on Project roads identified in Table 2.

6.1 NEW FACILITIES

During the term of the license, SCE will notify FERC and the USFWS within 60 days if any new facilities are proposed that require ground-disturbing activities that have the potential to affect VELB. USDA-FS and CDFG will also be provided notification. The determination will be based on the known occurrence of VELB and their habitat in the vicinity of the Projects and the associated proposed activities. No new facilities are proposed at this time.

6.1.1 Identification of Need for Additional Surveys

The protocol-level surveys completed by SCE included all areas where Project-related ground-disturbance activities and/or maintenance activities occur within the vicinity of the four Projects. However, additional surveys will be completed by SCE if new facilities are proposed in areas not previously surveyed as part of implementing the terms and conditions of the new license order that may result in adverse effects on VELB or their habitat.

7.0 LITERATURE CITED

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TABLES

Table 1. Valley Elderberry Longhorn Beetle Habitat in the Vicinity of the Big Creek Projects.

Project Facility or Road	Number of Shrubs	Number of Shrubs with Exit Holes
Mammoth Pool Project Vicinity (FERC Project No. 2085)		
2002 Survey Results		
9S42, Mammoth Pool Powerhouse transmission line access road from gate near County Road 225, Italian Bar Road to 8S44 (#18)	32	2
8S03 (from Powerhouse No. 8 to Mammoth Pool Powerhouse) (#33)	10	0
Project Total	42	2
Big Creek Nos. 2A, 8 & Eastwood Project Vicinity (FERC Project No. 67)		
2002 Survey Results		
Powerhouse No. 8, Tunnel 8	4	0
Access Road to Powerhouse No. 8 from 8S03 (#166)	11	0
Project Total	15	0
Big Creek No. 3 Project Vicinity (FERC Project No. 120)		
2002 Survey Results		
Powerhouse No. 3 (penstocks)	5	5
Powerhouse No. 3 (rock/sand trap)	6	3
Powerhouse No. 3 (surge chamber)	10	0
8S05, Canyon Road (from junction with 8S03 to junction with Italian Bar Road) (#21)	484	0
9S89, Access road to Big Creek Powerhouse No. 3 and administrative buildings from Italian Bar Road (#61)	5	0
2004 Survey Results		
Miscellaneous Powerhouse No. 3 roads (i.e., water tank access road and shop) (#5, #13, #127, 215, #256 and #257)	5	0
Project Total	515	8
Grand Total	572	10

Table 2. New Project Roads at or Below 3,000 Feet in Elevation.

Mammoth Pool (FERC Project No. 2085)
7S47B Access road to Rock Creek Tunnel Muck Pile (#102)
8S03B Access road from 8S03 to Mammoth Pool penstock (#80)
8S03CA, spur road to Mammoth Pool Transmission Line (#144)
Big Creek Nos. 1 and 2 (FERC Project No. 2175)
8S05CA Access to Big Creek No. 2 switchyard (#160)
8S13K Access road to Powerhouse No. 2 penstock (#168)
Big Creek Nos. 2A, 8 and Eastwood (FERC Project No. 67)
8S03A Access road to Powerhouse No. 8 from 8S03 (#166)
8S05L Road to communication line near Powerhouse No. 8 (#167)
Big Creek No. 3 (FERC Project No. 120)
8S05B Access road to Powerhouse No. 3 penstock from 8S05 Canyon Road (#217)
8S05T Access to tailings (#24)
8S05TA Access to tailings (#29)
9S20 Access to Carpenter shop (#216)
9S20B Access road to carpenter shop from Italian Bar Road (#62)
9S20BA (#85)
9S20BC Connector road between 9S20B loop (#64)
9S20D Access to Carpenter Shop (#13)
9S20DA Access to garage and shops (#257)
9S20E (#52)
9S20F Connector road between 9S20 loop (#87)
9S88A Access to old company housing (#5)
9S88XA Access road to old company housing from 9S88X (#215)
9S89BA Access road to PH 3 and switchyard (#59)

Table 3. Herbicides and Other Agents Used at the Four Big Creek Projects.

	Garlon 4® at 0.6-1.5 lbs/ acre¹	Pathfinder II®	Accord® at 0.6-1.0 lbs/acre²	Velpar® at 2 lbs/acre
Active Ingredient	triclopyr	triclopyr	glyphosate	Hexazinone
Other Agents				
	Hasten®	R-11®	In-Place®	
Properties	Spray Adjuvant Nonionic surfactant and esterified vegetable oils	Wetting Agent Nonionic surfactant Spreader Activator	Deposition and Retention Agent	

¹These rates represent average coverage (20%) to maximum expected coverage (50%) using a 3.0 lbs. per acre mixture.

²These rates represent average coverage (30%) to maximum expected coverage (50%) using a 2.0 lbs. per acre mixture.

Table 4. Elderberry Shrub Impact Analysis Results.

						Impacts					
Shrub to be Affected	Facility or Road	Distance of Shrub from Facility (feet)	All Stems/Shrubs are Non-Riparian			Stems Trimmed			Branches Trimmed		
			Stem Diameter (inches)	Total Number of Stems	Exit Holes (Yes/No)	Stem size (at point to be trimmed)	No. of stems estimated to be trimmed over the license term	Total no. of stems to be trimmed over the license term	Number of stems and size class from which branches originate	Branches <1 at point to be trimmed	Branches ≥ 1 & ≤3 at point to be trimmed
Big Creek Nos. 2A, 8, and Eastwood (FERC Project No. 67)											
14	Access road to Powerhouse No. 8 from 8S03	3	< 1	n/a	No	0	0	0	1 (≥ 1 & ≤ 3)	1	0
			≥ 1 & ≤ 3	3	No	0	0	0		0	0
			> 3 & < 5	0	No	0	0	0		0	0
			≥ 5	0	No	0	0	0		0	0
15	Powerhouse No. 8, Tunnel 8	0	< 1	n/a	No	0	0	0	1 (> 3 & < 5)	0	0
			≥ 1 & ≤ 3	0	No	0	0	0		1	1
			> 3 & < 5	2	No	0	0	0		0	0
			≥ 5	0	No	0	0	0		0	0
16	Powerhouse No. 8, Tunnel 8	0	< 1	n/a	No	0	0	0	1 (≥ 1 & ≤ 3)	3	0
			≥ 1 & ≤ 3	1	No	0	0	0		0	0
			> 3 & < 5	1	No	0	0	0		0	0
			≥ 5	0	No	0	0	0		0	0
17	Powerhouse No. 8, Tunnel 8	0	< 1	n/a	No	0	0	0	1 (≥ 1 & ≤ 3)	3	0
			≥ 1 & ≤ 3	1	No	0	0	0		0	0
			> 3 & < 5	0	No	0	0	0		0	0
			≥ 5	0	No	0	0	0		0	0
18	Powerhouse No. 8, Tunnel 8	1	< 1	n/a	No	0	0	0		0	0
			≥ 1 & ≤ 3	1	No	1	1	1		0	0
			> 3 & < 5	0	No	0	0	0		0	0
			≥ 5	0	No	0	0	0		0	0
Total							1	1		8	1

Table 4. Elderberry Shrub Impact Analysis Results (continued).

Shrub to be Affected	Facility or Road	Distance of Shrub from Facility (feet)	All Stems/Shrubs are Non-Riparian			Impacts					
						Stems Trimmed			Branches Trimmed		
						Stem size (at point to be trimmed)	No. of stems estimated to be trimmed over the license term	Total no. of stems to be trimmed over the license term	Number of stems and size class from which branches originate	Branches <1 at point to be trimmed	Branches ≥ 1 & ≤3 at point to be trimmed
Big Creek No. 3 (FERC Project No. 120)											
1	Powerhouse No. 3 (Surge Chamber)	3	< 1	n/a ¹	No	0	0	0	1 (> 3 & < 5)	4	0
			≥ 1 & ≤ 3	0	No	0	0	0		0	0
			> 3 & < 5	1	No	0	0	0		0	0
			≥ 5	0	No	0	0	0		0	0
2	8S05, Canyon Road (from Powerhouse No. 8 to junction with Italian Bar Road)	5	< 1	n/a	No	0	0	0	1 (≥ 1 & ≤ 3)	1	0
			≥ 1 & ≤ 3	3	No	0	0	0		0	0
			> 3 & < 5	0	No	0	0	0		0	0
			≥ 5	2	No	0	0	0		0	0
3	8S05, Canyon Road (from Powerhouse No. 8 to junction with Italian Bar Road)	6	< 1	n/a	No	0	0	0	1 (≥ 1 & ≤ 3)	1	0
			≥ 1 & ≤ 3	3	No	0	0	0		0	0
			> 3 & < 5	1	No	0	0	0		0	0
			≥ 5		No	0	0	0		0	0
4	8S05, Canyon Road (from Powerhouse No. 8 to junction with Italian Bar Road)	3	< 1	n/a	No	0	0	0	3 (≥ 1 & ≤ 3)	5	0
			≥ 1 & ≤ 3	3	No	0	0	0		0	0
			> 3 & < 5	1	No	0	0	0		0	0
			≥ 5	0	No	0	0	0		0	0
5	8S05, Canyon Road (from Powerhouse No. 8 to junction with Italian Bar Road)	5	< 1	n/a	No	0	0	0	1 (> 3 & < 5)	1	0
			≥ 1 & ≤ 3	2	No	0	0	0		0	0
			> 3 & < 5	1	No	0	0	0		0	0
			≥ 5	0	No	0	0	0		0	0

Table 4. Elderberry Shrub Impact Analysis Results (continued).

Shrub to be Affected	Facility or Road	Distance of Shrub from Facility (feet)	All Stems/Shrubs are Non-Riparian			Impacts					
			Stem Diameter (inches)	Total Number of Stems	Exit Holes (Yes/No)	Stems Trimmed			Branches Trimmed		
						Stem size (at point to be trimmed)	No. of stems estimated to be trimmed over the license term	Total no. of stems to be trimmed over the license term	Number of stems and size class from which branches originate	Branches <1 at point to be trimmed	Branches ≥ 1 & ≤3 at point to be trimmed
Big Creek No. 3 (FERC Project No. 120) (continued)											
6	8S05, Canyon Road (from Powerhouse No. 8 to junction with Italian Bar Road)	3	< 1	n/a	No	0	0	0	1 (≥ 1 & ≤ 3)	1	0
			≥ 1 & ≤ 3	2	No	0	0	0		0	0
			> 3 & < 5		No	0	0	0		0	0
			≥ 5		No	0	0	0		0	0
7	8S05, Canyon Road (from Powerhouse No. 8 to junction with Italian Bar Road)	4	< 1	n/a	No					0	0
			≥ 1 & ≤ 3	2	No	1	1	1		0	0
			> 3 & < 5	0	No	0	0	0		0	0
			≥ 5	0	No	0	0	0		0	0
8	8S05, Canyon Road (from Powerhouse No. 8 to junction with Italian Bar Road)	5	< 1	n/a	No	0	0	0	3 (≥ 1 & ≤ 3)	3	0
			≥ 1 & ≤ 3	5	No	0	0	0		0	0
			> 3 & < 5	0	No	0	0	0		0	0
			≥ 5	0	No	0	0	0		0	0
9	8S05, Canyon Road (from Powerhouse No. 8 to junction with Italian Bar Road)	2	< 1	n/a	No	0	0	0	1 (≥ 1 & ≤ 3)	2	0
			≥ 1 & ≤ 3	1	No	0	0	0		0	0
			> 3 & < 5	0	No	0	0	0		0	0
			≥ 5	0	No	0	0	0		0	0
10	8S05, Canyon Road (from Powerhouse No. 8 to junction with Italian Bar Road)	4	< 1	n/a	No	0	0	0		0	0
			≥ 1 & ≤ 3	3	No	3 ³	3	3		0	0
			> 3 & < 5	0	No	0	0	0		0	0
			≥ 5	0	No	0	0	0		0	0

Table 4. Elderberry Shrub Impact Analysis Results (continued).

Shrub to be Affected	Facility or Road	Distance of Shrub from Facility (feet)	All Stems/Shrubs are Non-Riparian			Impacts					
			Stem Diameter (inches)	Total Number of Stems	Exit Holes (Yes/No)	Stems Trimmed			Branches Trimmed		
						Stem size (at point to be trimmed)	No. of stems estimated to be trimmed over the license term	Total no. of stems to be trimmed over the license term	Number of stems and size class from which branches originate	Branches <1 at point to be trimmed	Branches ≥ 1 & ≤3 at point to be trimmed
Big Creek No. 3 (FERC Project No. 120) (continued)											
11	8S05, Canyon Road (from Powerhouse No. 8 to junction with Italian Bar Road)	4	< 1	n/a	No	0	0	0		0	0
			≥ 1 & ≤ 3	6	No	1	1	1		0	0
			> 3 & < 5	0	No	0	0	0		0	0
			≥ 5	0	No	0	0	0		0	0
12	8S05, Canyon Road (from Powerhouse No. 8 to junction with Italian Bar Road)	6	< 1	n/a	No	0	0	0	1 (≥ 1 & ≤ 3)	0	0
			≥ 1 & ≤ 3	1	No	0	0	0		1	0
			> 3 & < 5	0	No	0	0	0		0	0
			≥ 5	0	No	0	0	0		0	0
13	8S05, Canyon Road (from Powerhouse No. 8 to junction with Italian Bar Road)	5	< 1	n/a	No	0	0	0		0	0
			≥ 1 & ≤ 3	3	No	1	1	1		0	0
			> 3 & < 5	0	No	0	0	0		0	0
			≥ 5	0	No	0	0	0		0	0
Total						6	6		19	0	
Grand Total						7	7		27	1	

¹Not Applicable - USFWS Guidelines do not require specific data on stems <1 inch in diameter. Specific data was not collected on these stems.

²Assumes a 50 year license term.

³This shrub supports 3 stems ≥1 inch in diameter. Other stems <1 inch are also present, but specific data was not collected on these stems.

Table 5. Results Summary.

Total Number of Shrubs Trimmed	Total Number of <u>Stems</u> to be Trimmed (≥ 1 & ≤ 3)	Total Number of <u>Branches</u> to be Trimmed (< 1)	Total Number of <u>Branches</u> to be Trimmed (≥ 1 & ≤ 3)
18	7	27	1

Table 6. Mitigation Summary.

	Number of Stems or Branches to be Trimmed	Number of Seedlings to be Planted
Stems to be Trimmed (≥ 1 & ≤ 3)	7	7
Branches to be Trimmed (≥ 1 & ≤ 3)	1	1
Total	8	8

FIGURE

Placeholder for

Figure 1. Elderberry Shrubs to be Trimmed within the Four Big Creek ALP Projects

Non-Internet Public Information

This Figure has been removed in accordance with the Commission regulations at 18 CFR Section 388.112.

This Figure is considered Non-Internet Public information and should not be posted on the Internet. This information is provided in Book 24 of the Application for New License and is identified as “Non-Internet Public” information. This information may be accessed from the FERC’s Public Reference Room, but is not expected to be posted on the Commission’s electronic library, except as an indexed item.

ATTACHMENT A

**VEGETATION MANAGEMENT AND ROAD MAINTENANCE
AT PROJECT FACILITIES AND ROADS
THAT SUPPORT VELB HABITAT**

Attachment A

Vegetation Management and Road Maintenance at Project Facilities and Roads that Support VELB Habitat

Road or Facility Name	Trimming			Roads Repair/Clearing			
	Hand	Equipment	Herbicides	Grading	Gravel/Paving	Snow Removal / Sanding	Culverts/Ditches/Water Bars
Mammoth Pool Project Vicinity							
8S03 (from Powerhouse No. 8 to Mammoth Pool Powerhouse) (#33)	R	R	R	I	I	A	R
9S42, Mammoth Pool Powerhouse transmission line access road from gate near County Road 225, Italian Bar Road, to 8S44 (#18)	R	R		R	I		R
Big Creek Nos. 2A, 8 and Eastwood							
Powerhouse No. 8, Tunnel 8	R		R				
Access road to Powerhouse 8 from 8S03 (#166)	R	R	R	I	I	A	R
Big Creek No. 3 Project Vicinity							
Powerhouse No. 3 (penstocks)	R		R				
Powerhouse No. 3 (rock/sand trap)	R		R				
Powerhouse No. 3 (surge chamber)	R		R				
Road 8S05, Canyon Road (from junction with 8S03 to junction with Italian Bar Road) (#21)	R	R	R	I	I	A	R
9S89 Access road to Powerhouse No. 3 and administrative building from Italian Bar Road (#61)	R	R	R	I	I		R
Miscellaneous Powerhouse No. 3 roads (i.e. water tank access road and shop) (#5, 13, 127, 215, 256, 257)	R		R	R	I		R

ATTACHMENT B

VEGETATION MANAGEMENT AND ROAD MAINTENANCE AT PROJECT ROADS NOT YET SURVEYED FOR VELB HABITAT

Attachment B
Vegetation Management and Road Maintenance at Project Roads
Not Yet Surveyed for VELB Habitat

	Vegetation Management			Roads Repair / Clearing			
	Trimming		Herbicides	Grading	Gravel / Paving	Snow Removal / Sanding	Culverts/Ditches/Water Bars
	Hand	Equipment					
Mammoth Pool (FERC Project No. 2085)							
7S47B Access road to Rock Creek Tunnel Muck Pile (#102)	R	R	I	R	I		R
8S03B Access road from 8S03 to Mammoth Pool penstock (#80)	R	R	R	R	I		R
8S03CA, spur road to Mammoth Pool Transmission Line (#144)	R	R	I	R	I		R
Big Creek Nos. 1 and 2 (FERC Project No. 2175)							
8S05CA Access to Big Creek No. 2 switchyard (#160)	R	R	R	I	I	A	R
8S13K Access road to Powerhouse No. 2 penstock (#168)	R	R	R	I	I	I	R
Big Creek Nos. 2A, 8, and Eastwood (FERC Project No. 67)							
8S03A Access road to Powerhouse No. 8 from 8S03 (#166)	R	R	R	I	I	A	R
8S05L Road to communication line near Powerhouse No. 8 (#167)	I	I	I	I	I		i
Big Creek No. 3 (FERC Project No. 120)							
9S88A Access to old company housing (#5)	R		R	R	I		R
9S20D Access to Carpenter Shop (#13)	R		R	R	I		R
8S05T Access to tailings (#24)		I		R	I		R
8S05TA Access to tailings (#29)		I		R	I		R
9S20B Access road to carpenter shop from Italian Bar Road (#62)	R		R	I	I		R
9S20C Connector road between 9S20B loop (#64)	R		R	R	I		R
9S20A (#85)	R		R	I	I		R
9S88XA Access road to old company housing from 9S88X (#215)	R		R	R			R
9S20 Access to Carpenter shop (#216)	R		R		I		I
8S05B Access road to Powerhouse No. 3 penstock from 8S05 Canyon Road (#217)	R	R	R	R			R
9S20E (#52)	R		R	R	I		R
9S20DA Access to Garage and Shops (#257)	R		R	R	I		R
9S20F Connector Road Between 9S20 Loop (#87)	R		R	I	I		R
9S89BA Access road to Powerhouse No. 3 and Switchyard (#59)	R		R	I	I		R

ATTACHMENT C

**MATERIAL SAFETY DATA SHEETS
FOR HERBICIDES AND OTHER AGENTS**

ATTACHMENT C1

GARLON 4®

Specimen Label



Garlon^{*} 4

Specialty Herbicide

*Trademark of Dow AgroSciences LLC

For the control of woody plants and broadleaf weeds on rights-of-way, industrial sites, non-crop areas, non-irrigation ditch banks, forests, and wildlife openings, including grazed areas on these sites.

Active Ingredient:

triclopyr: 3,5,6-trichloro-2-pyridinyloxyacetic acid, butoxyethyl ester 61.6%

Inert Ingredients 38.4%
Total 100.0%

Contains petroleum distillates

Acid Equivalent:

triclopyr - 44.3% - 4 lb/gal

EPA Reg. No. 62719-40

Precautionary Statements

Hazards to Humans and Domestic Animals

Keep Out of Reach of Children

CAUTION PRECAUCION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

Harmful If Swallowed, Inhaled, Or Absorbed Through Skin

Avoid contact with eyes, skin, or clothing. Avoid breathing mists or vapors. Avoid contamination of food.

Personal Protective Equipment (PPE)

Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category E on an EPA chemical resistance category selections chart.

WPS Uses: Applicators and other handlers who handle this pesticide for any use covered by the Worker Protection Standard (40 CFR Part 170) – in general, agricultural-plant uses are covered – must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves such as Barrier Laminate, Nitrile Rubber, Neoprene Rubber, or Viton
- Shoes plus socks

Non-WPS Uses: Applicators and other handlers who handle this pesticide for any use NOT covered by the Worker Protection Standard (40 CFR Part 170) – in general, only agricultural-plant uses are covered by the WPS – must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

First Aid

If on skin: Flush skin with plenty of water. Get medical attention if irritation persists.

If swallowed: Do not induce vomiting. Call a physician.

Environmental Hazards

This pesticide is toxic to fish. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters.

Physical or Chemical Hazards

Do not use or store near heat or open flame. Do not cut or weld container.

Notice: Read the entire label. Use only according to label directions.

Before buying or using this product, read "Warranty Disclaimer" and "Limitation of Remedies" elsewhere on this label.

In case of emergency endangering health or the environment involving this product, call 1-800-992-5994. If you wish to obtain additional product information, visit our web site at www.dowagro.com.

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

Directions for Use

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

Read all Directions for Use carefully before applying.

Do not use for manufacturing or formulating.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Chemical-resistant gloves such as Barrier Laminate, Nitrile Rubber, Neoprene Rubber, or Viton
- Shoes plus socks

Storage and Disposal

Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited.

Storage: Store above 28°F or agitate before use.

Pesticide Disposal: Pesticide, spray mixture, or rinse water that cannot be used according to label instructions must be disposed of according to applicable federal, state, or local procedures.

Plastic Container Disposal: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

Metal Container Disposal: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

Container Disposal for Refillable Containers: Replace the dry disconnect cap, if applicable, and seal all openings which have been opened during use. Return the empty container to a collection site designated by Dow AgroSciences. If the container has been damaged and cannot be returned according to the recommended procedures, contact the Dow AgroSciences Customer Service Center at 1-800-258-1470 to obtain proper handling instructions.

General: Consult federal, state, or local disposal authorities for approved alternative procedures.

General Information

Garlon® 4 herbicide is recommended for the control of unwanted woody plants and annual and perennial broadleaf weeds in forests, and on non-crop areas including industrial manufacturing and storage sites, rights-of-way such as electrical power lines, communication lines, pipelines, roadsides and railroads, fence rows, non-irrigation ditch banks, and around farm buildings. Use on these sites may include application to grazed areas as well as establishment and maintenance of wildlife openings.

General Use Precautions

Agricultural Use Requirements for Forestry Uses: For use of this product on forestry sites, follow PPE and Reentry restrictions in the Agricultural Use Requirements section of this label.
Use Requirements for Non-cropland Areas: No Worker Protection Standard worker entry restrictions or worker notification requirements apply when this product is applied to non-cropland.

In Arizona: The state of Arizona has not approved Garlon 4 for use on plants grown for commercial production; specifically forests grown for commercial timber production, or on designated grazing areas.

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

Other Precautions:

- When applying this product in tank mix combination, follow all applicable use directions and precautions on each manufacturer's label.
- Do not apply on ditches used to transport irrigation water. Do not apply where runoff or irrigation water may flow onto agricultural land as injury to crops may result.
- Do not apply this product using mist blowers unless a drift control additive, high viscosity inverting system, or equivalent is used to control spray drift.
- Sprays applied directly to Christmas trees may result in conifer injury. When treating unwanted vegetation in Christmas tree plantations, care should be taken to direct sprays away from conifers.
- Do not apply Garlon 4 directly to, or otherwise permit it to come into direct contact with grapes, tobacco, vegetable crops, flowers, or other desirable broadleaf plants and do not permit spray mists containing it to drift onto them.
- It is permissible to treat non-irrigation ditch banks, seasonally dry wetlands, flood plains, deltas, marshes, swamps, bogs, and transitional areas between upland and lowland sites. Do not apply to open water such as lakes, reservoirs, rivers, streams, creeks, salt water bays, or estuaries.

Avoid Injurious Spray Drift

Applications should be made only when there is little or no hazard from spray drift. Very small quantities of spray, which may not be visible may seriously injure susceptible plants. Do not spray when wind is blowing toward susceptible crops or ornamental plants near enough to be injured. It is suggested that a continuous smoke column at or near the spray site or a smoke generator on the spray equipment be used to detect air movement, lapse conditions, or temperature inversions (stable air). If the smoke layers or indicates a potential of hazardous spray drift, do not spray.

Aerial Application (Helicopter Only): For aerial application on rights-of-way or other areas near susceptible crops, use an agriculturally registered spray thickening drift control additive as recommended by the manufacturer or apply through the Microfoil™ boom, Thru-Valve boom, or equivalent drift control system. Thickened sprays prepared by using high viscosity invert systems or other drift reducing systems may be utilized if they are made as drift-free as are mixtures containing an agriculturally registered thickening agent or applications made with the Microfoil boom or Thru Valve boom. If a spray thickening agent is used, follow all use recommendations and precautions on the product label. Do not use a thickening agent with the Microfoil boom, Thru Valve boom, or other systems that cannot accommodate thick sprays.

†Reference within this label to a particular piece of equipment produced by or available from other parties is provided without consideration for use by the reader at its discretion and subject to the reader's independent circumstances, evaluation, and expertise. Such reference by Dow AgroSciences is not intended as an endorsement of such equipment, shall not constitute a warranty (express or implied) of such equipment, and is not intended to imply that other equipment is not available and equally suitable. Any discussion of methods of use of such equipment does not imply that the reader should use the equipment other than is advised in directions available from the equipment's manufacturer. The reader is responsible for exercising its own judgment and expertise, or consulting with sources other than Dow AgroSciences, in selecting and determining how to use its equipment.

With aircraft, drift can be lessened by applying a coarse spray; by using a spray boom no longer than 3/4 the rotor length; by spraying only when wind velocities are low; or by using an approved drift control system. Keep operating spray pressures at the lower end of the manufacturer's recommended pressures for the specific nozzle type used. Low pressure nozzles are available from spray equipment manufacturers. Select nozzles and pressures which provide adequate plant coverage, but minimize the production of fine spray particles.

Ground Equipment: To aid in reducing spray drift potential when making ground applications near susceptible crops or other desirable broadleaf plants, Garlon 4 should be applied through large droplet producing equipment, such as the Radiarc sprayer or in thickened spray mixtures using an agriculturally registered drift control additive, or high viscosity invert systems. When using a spray thickening or inverting additive, follow all use directions and precautions on the product label. With ground equipment, spray drift can be reduced by keeping the spray boom as low as possible; by applying 20 gallons or more of spray per acre; and by spraying when wind velocity is low. Do not apply with nozzles that produce a fine droplet spray. Keep operating spray pressures at the lower end of the manufacturer's recommended pressures for the specific nozzle type used. Low pressure nozzles are available from spray equipment manufacturers. Select nozzles and pressures which provide adequate plant coverage, but minimize the production of fine spray particles.

High Volume Leaf-Stem Treatment: To minimize spray drift, keep sprays no higher than brush tops and keep spray pressures low enough to provide coarse spray droplets. A spray thickening agent may be used to reduce spray drift.

Grazing and Haying Restrictions

Grazing or harvesting green forage:

- 1) Lactating dairy animals
Two quarts per acre or less: Do not graze or harvest green forage from treated area for 14 days after treatment.
Greater than 2 to 6 quarts per acre: Do not graze or harvest green forage until the next growing season.
- 2) Other Livestock
Two quarts per acre or less: No grazing restrictions.
Greater than 2 to 6 quarts per acre: Do not graze or harvest green forage from treated area for 14 days after treatment. **Note:** If less than 25% of a grazed area is treated, there is no grazing restriction.

Haying (harvesting of dried forage):

- 1) Lactating dairy animals
Do not harvest hay until the next growing season.
- 2) Other Livestock
Two quarts per acre or less: Do not harvest hay for 7 days after treatment.

Greater than 2 to 4 quarts per acre: Do not harvest hay for 14 days after treatment.

Greater than 4 quarts per acre: Do not harvest hay until the next growing season.

Slaughter Restrictions:

Withdraw livestock from grazing treated grass or consumption of treated hay at least 3 days before slaughter. This restriction applies to grazing during the season following treatment or hay harvested during the season following treatment.

Plants Controlled by Garlon 4

Woody Plants Controlled

alder	chinquapin	madrone	scotch broom
arrowwood	choke cherry	maples	sumac
ash	cottonwood	mulberry	sweetbay
			magnolia
aspen	Crataegus (hawthorn)	oaks	sweetgum
bear clover (bearmat)	dogwood	persimmon	sycamore
beech	Douglas-fir	pine	tanoak
birch	elderberry	poison ivy	thimbleberry
blackberry	elm	poison oak	tree-of-heaven
blackgum	gallberry	poplar	(<i>Ailanthus</i>)†
boxelder†	gorse	salmonberry	tulip poplar
Brazilian pepper	hazel	salt-bush	wax myrtle
buckthorn	hickory	(<i>Braccharis</i> spp.)	wild rose
		salt-cedar†	willow
casacara	hornbeam	sassafras	winged elm
Ceanothus	kudzu††		
cherry	locust		

†For best control, use either a basal bark or cut stump treatment.

††For complete control, retreatment may be necessary.

Annual and Perennial Broadleaf Weeds Controlled

black medic	curly dock	matchweed	sweet clover
bull thistle	dandelion	mustard	vetch
burdock	field bindweed	Oxalis	wild carrot
Canada thistle	goldenrod	plantain	(Queen Anne's lace)
chicory	ground ivy	purple loosestrife	wild lettuce
clover	lambsquarters	ragweed	wild violet
creeping beggarweed	lespedeza	smartweed	yarrow

Table 1 (Maximum Application Rate): The following table is provided as a guide to the user to achieve the proper rate of Garlon 4 without exceeding the maximum use rate of 8 quarts per acre:

Spray Volume Per Acre	Quarts of Garlon 4 Per 100 Gallons of Spray (Not to Exceed 8 qt/Acre)
400	2
300	2.7
200	4
100	8
50	16
20	40
10	80

Approved Uses

Foliar Applications

Use Garlon 4 at rates of 1 to 8 quarts per acre to control broadleaf weeds and woody plants. In all cases use the amount specified in enough water to give uniform and complete coverage of the plants to be controlled. The recommended order of addition to the spray tank is water, spray thickening agent (if used), surfactant (if used), additional herbicide (if used), and Garlon 4. If a standard agricultural surfactant is used, use at a rate of 1 to 2 quarts per acre. Use continuous adequate agitation.

Before using any recommended tank mixtures, read the directions and all precautions on both labels.

For best results applications should be made when woody plants and weeds are actively growing. When hard-to-control species such as ash, blackgum, choke cherry, elm, maples (other than vine or big leaf), oaks, pines, or winged elm are prevalent, and during applications made during late summer when the plants are mature, or during drought conditions, use the higher rates of Garlon 4 alone or in combination with Tordon* 101 Mixture herbicide.

When using Garlon 4 in combination with 3.8 pounds per gallon 2,4-D low volatile ester herbicide generally the higher rates should be used for satisfactory brush control.

Use the higher dosage rates when brush approaches an average of 15 feet in height or when the brush covers more than 60% of the area to be treated. If lower rates are used on hard-to-control species, resprouting may occur the year following treatment.

On sites where easy to control brush species dominate, rates less than those recommended may be effective. Consult state or local extension personnel for such information.

Foliar Treatment With Ground Equipment

High Volume Foliar Treatment

For control of woody plants, use Garlon 4 at the rate of 1 to 3 quarts per 100 gallons of spray mixture, or Garlon 4 at 1 to 3 quarts may be tank mixed with labeled rates of 2,4-D low volatile ester herbicide, Tordon 101 Mixture herbicide, or Tordon K herbicide and diluted to make 100 gallons of spray. Apply at a volume of 100 to 400 gallons of total spray per acre depending on size and density of woody plants. Coverage should be thorough to wet all leaves, stems, and root collars. See Table 1 for relationship between spray volume and maximum application rate. When tank mixing, follow applicable use directions and precautions on each manufacturer's label.

Low Volume Foliar Treatment

To control susceptible woody plants, mix up to 20 quarts of Garlon 4 in 10 to 100 gallons of finished spray. The spray concentration of Garlon 4 and total spray volume per acre should be adjusted according to the size and density of target woody plants and kind of spray equipment used. With low volume sprays, use sufficient spray volume to obtain uniform coverage of target plants including the surfaces of all foliage, stems, and root collars (See General Use Precautions). For best results, a surfactant should be added to all spray mixtures. Match equipment and delivery rate of spray nozzles to height and density of woody plants. When treating tall, dense brush, a truck mounted spray gun with spray tips that deliver up to 2 gallons per minute at 40 to 60 psi may be required. Backpack or other types of specialized spray equipment with spray tips that deliver less than 1 gallon of spray per minute may be appropriate for short, low to moderate density brush. See Table 1 for relationship between mixing rate, spray volume and maximum application rate.

Tank Mixing: As a low volume foliar spray, up to 12 quarts of Garlon 4 may be applied in tank mix combination with labeled rates of Tordon K or Tordon 101 Mixture in 10 to 100 gallons of finished spray.

Broadcast Applications With Ground Equipment

Make application using equipment that will assure thorough and uniform coverage at spray volumes applied.

Woody Plant Control

Foliage Treatment: Use 4 to 8 quarts of Garlon 4 in enough water to make 5 or more gallons per acre of total spray, or Garlon 4 at 1 1/2 to 3 quarts may be combined with labeled rates of 2,4-D low volatile ester, Tordon 101 Mixture, or Tordon K in sufficient water to make 5 or more gallons per acre of total spray.

Broadleaf Weed Control

Use Garlon 4 at rates of 1 to 4 quarts in a total volume of 5 or more gallons per acre as a water spray mixture. Apply at any time weeds are actively growing. Garlon 4 at 0.25 to 3 quarts may be tank mixed with labeled rates of 2,4-D amine or low volatile ester, Tordon K, or Tordon 101 Mixture to improve the spectrum of activity. For thickened (high viscosity) spray mixtures, Garlon 4 can be mixed with diesel oil or other inverting agent. When using an inverting agent, read and follow the use directions and precautions on the product label.

Aerial Application (Helicopter Only)

Aerial sprays should be applied using suitable drift control (See "General Use Precautions").

Foliage Treatment (Utility and Pipeline Rights-of-Way)

Use 4 to 8 quarts of Garlon 4 alone, or 3 to 4 quarts Garlon 4 in a tank mix combination with labeled rates of 2,4-D low volatile ester Tordon 101 Mixture or Tordon K and apply in a total spray volume of 10 to 30 gallons per acre. Use the higher rates and volumes when plants are dense or under drought conditions.

Basal Bark and Dormant Brush Treatments

To control susceptible woody plants in rights-of-way, and other non-crop areas, and in forests, use Garlon 4 in oil or oil-water mixtures prepared and applied as described below. When preparing mixtures, use as oils either a commercially available basal oil, diesel fuel, No. 1 or No. 2 fuel oil, or kerosene. Substitute other oils or diluents only as recommended by the oil or diluent's manufacturer. When mixing with a basal oil or other oils or diluents, read and follow the use directions and precautions on the product label prepared by the oil or diluent's manufacturer.

Oil Mixture Sprays

Add Garlon 4 to the required amount of oil in the spray tank or mixing tank and mix thoroughly. If the mixture stands over 4 hours, reagitiation is required.

Oil Mixtures of Garlon 4 and Tordon K: Tordon K and Garlon 4 may be used in tank mix combination for basal bark treatment of woody plants. These herbicides are incompatible and will not form a stable mixture when mixed together directly in oil. Stable tank mixtures for basal bark application can be made if each product is first combined with a compatibility agent prior to final mixing in the desired ratio. (See product bulletin for mixing instructions.)

Oil-Water Mixture Sprays

First, premix the Garlon 4, oil and surfactant in a separate container. Do not allow any water or mixtures containing water to get into the Garlon 4 or the premix. Fill the spray tank about half full with water, then slowly add the premix with continuous agitation and complete filling the tank with water. Continue moderate agitation.

Note: If the premix is put in the tank without any water, the first water added may form a thick "invert" (water in oil) emulsion which will be hard to break.

Basal Bark Treatment

To control susceptible woody plants with stems less than 6 inches in basal diameter, mix 1 to 5 gallons of Garlon 4 in enough oil to make 100 gallons of spray mixture. Apply with knapsack sprayer or power spraying equipment using low pressure (20-40 psi). Spray the basal parts of brush and tree trunks to a height of 12 to 15 inches from the ground. Thorough wetting of the indicated area is necessary for good control. Spray until runoff at the ground line is noticeable. Old or rough bark requires more spray than smooth young bark. Apply at any time, including the winter months, except when snow or water prevent spraying to the ground line.

Low Volume Basal Bark Treatment

To control susceptible woody plants with stems less than 6 inches in basal diameter, mix 20 to 30 gallons of Garlon 4 in enough oil to make 100 gallons of spray mixture. Apply with a backpack or knapsack sprayer using low pressure and a solid cone or flat fan nozzle. Spray the basal parts of brush and tree trunks in a manner which thoroughly wets the lower stems, including the root collar area, but not to the point of runoff. Herbicide concentration should vary with size and susceptibility of species treated. Apply at any time, including the winter months, except when snow or water prevent spraying to the ground line or when stem surfaces are saturated with water.

Garlon 4 Plus Tordon K in Oil Tank Mix: Garlon 4 and Tordon K may be applied as a low volume basal bark treatment to improve control of certain woody species such as ash, elm, maple, poplar, aspen, hackberry, oak, oceanspray, birch, hickory, pine, tanoak, cherry, locust, sassafras, and multiflora rose. (See product bulletin for mixing instructions.)

Streamline Basal Bark Treatment (Southern States)

To control or suppress susceptible woody plants for conifer release, mix 20 to 30 gallons of Garlon 4 in enough oil to make 100 gallons of spray mixture. Apply with a backpack or knapsack sprayer using equipment which provides a directed straight stream spray. Apply sufficient spray to one side of stems less than 3 inches in basal diameter to form a treated zone that is 6 inches in height. When the optimum amount of spray mixture is applied, the treated zone should widen to encircle the stem within approximately 30 minutes. Treat both sides of stems which are 3 to 4 inches in basal diameter. Direct the spray at bark that is approximately 12 to 24 inches above ground. Pines (loblolly, slash, shortleaf, and Virginia) up to 2 inches in diameter breast height (dbh) can be controlled by directing the spray at a point approximately 4 feet above ground. Vary spray mixture concentration with size and susceptibility of the species being treated. Best results are achieved when

applications are made to young vigorously growing stems which have not developed the thicker bark characteristic of slower growing, understory trees in older stands. This technique is not recommended for scrub and live oak species, including blackjack, turkey, post, live, bluejack and laurel oaks, or bigleaf maple. Apply from approximately 6 weeks prior to hardwood leaf expansion in the spring until approximately 2 months after leaf expansion is completed. Do not apply when snow or water prevent spraying at the desired height above ground level.

Low Volume Stem Bark Band Treatment (North Central and Lake States)

To control susceptible woody plants with stems less than 6 inches in basal diameter, mix 20 to 30 gallons of Garlon 4 in enough oil to make 100 gallons of spray mixture. Apply with a backpack or knapsack sprayer using low pressure and a solid cone or flat fan nozzle. Apply the spray in a 6 to 10 inch wide band that completely encircles the stem. Spray in a manner that completely wets the bark, but not to the point of runoff. The treatment band may be positioned at any height up to the first major branch. For best results apply the band as low as possible. Spray mixture concentration should vary with size and susceptibility of species to be treated. Applications may be made at any time, including winter months.

Thinline Basal Bark Treatment

To control susceptible woody plants with stems less than 6 inches in diameter, apply Garlon 4 either undiluted or mixed at 50-75% v/v with oil in a thin stream to all sides of the lower stems. The stream should be directed horizontally to apply a narrow band around each stem or clump. Use a minimum of 2 to 15 milliliters of Garlon 4 or oil mixture with Garlon 4 to treat single stems and from 25 to 100 milliliters to treat clumps of stems. Use an applicator metered or calibrated to deliver the small amounts required.

Dormant Stem Treatment

Dormant stem treatments will control susceptible woody plants and vines with stems less than 2 inches in diameter. Plants with stems greater than 2 inches in diameter may not be controlled and resprouting may occur. This treatment method is best suited for sites with dense, small diameter brush. Dormant stem treatments of Garlon 4 can also be used as a chemical side-trim for controlling lateral branches of larger trees that encroach onto roadside, utility, or other rights-of-way.

Mix 4 to 8 quarts of Garlon 4 in 2 to 3 gallons of crop oil concentrate or other recommended oil and add this mixture to enough water to make 100 gallons of spray solution. Use continuous adequate agitation. Apply with Radiarc, OC or equivalent nozzles, or handgun using 70 to 100 gallons of spray per acre to ensure uniform coverage of stems. Garlon 4 may be mixed with 4 quarts of Weedone 170 herbicide to improve the control of black cherry and broaden the spectrum of herbicidal activity. In western states, apply anytime after woody plants are dormant. In other areas apply anytime within 10 weeks of budbreak, generally February through April. Do not apply to wet or saturated bark as poor control may result.

Cut Stump Treatment

To control resprouting of cut stumps of susceptible species, mix 20 to 30 gallons of Garlon 4 in enough oil to make 100 gallons of spray mixture. Apply with a backpack or knapsack sprayer using low pressures and a solid cone or flat fan nozzle. Spray the root collar area, sides of the stump, and the outer portion of the cut surface including the cambium until thoroughly wet, but not to the point of runoff. Spray mixture concentration should vary with size and susceptibility of species treated. Apply at any time, including in winter months, except when snow or water prevent spraying to the ground line.

Treatment of Cut Stumps in Western States

To control resprouting of salt-cedar and other *Tamarix* species, bigleaf maple, tanoak, Oregon myrtle, and other susceptible species, apply undiluted

Garlon 4 to wet the cambium and adjacent wood around the entire circumference of the cut stump. Treatments may be applied throughout the year; however, control may be reduced with treatment during periods of moisture stress as in late summer. Use an applicator which can be calibrated to deliver the small amounts of material required.

Note: All basal bark and dormant brush treatment methods may be used to treat susceptible woody species on range and permanent pasture land provided that no more than 1.5 quarts of Garlon 4 are applied per acre. Large plants or species requiring higher rates of Garlon 4 may not be completely controlled.

Forest Management Applications

For broadcast applications apply the recommended rate of Garlon 4 in a total spray volume of 5 to 25 gallons per acre by air or 10 to 100 gallons per acre by ground. Use spray volumes sufficient to provide thorough coverage of treated foliage. Use application systems designed to prevent spray drift to off-target sites. Nozzles or additives that produce larger droplets may require higher spray volumes to provide adequate coverage.

Plant Back Interval for Conifers: Conifers planted sooner than 1 month after treatment with Garlon 4 at less than 4 quarts per acre or sooner than 2 months after treatment at 4 to 8 quarts per acre may be injured. When tank mixtures of herbicides are used for forest site preparation, labels for all products in the mixture should be consulted and the longest recommended waiting period observed.

Broadcast Treatments for Forest Site Preparation (Not For Conifer Release)

Southern States Including Alabama, Arkansas, Delaware, Florida, Georgia, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia: To control susceptible woody plants and broadleaf weeds, apply Garlon 4 at a rate of 4 to 8 quarts per acre. To broaden the spectrum of woody plants and broadleaf weeds controlled, apply 2 to 4 quarts per acre of Garlon 4 in tank mix combination with labeled rates of Tordon 101 Mixture or Tordon K. Tordon 101 Mixture and Tordon K are not registered for use in the states of California and Florida. Where grass control is also desired, Garlon 4, alone or in combination with Tordon K or Tordon 101 Mixture, may be tank mixed with labeled rates of other herbicides registered for grass control in forests. Use of tank mix products must be in accordance with the most restrictive of label limitations and precautions. No label application rates should be exceeded. Garlon 4 cannot be tank mixed with any product containing a label prohibition against such mixing.

In Western, Northeastern, North Central, and Lake States (States Not Listed Above As Southern States): To control susceptible woody plants and broadleaf weeds, apply Garlon 4 at a rate of 3 to 6 quarts per acre. To broaden the spectrum of woody plants and broadleaf weeds controlled, apply 1.5 to 3.0 quarts per acre of Garlon 4 in tank mix combination with labeled rates of Tordon 101 Mixture, Tordon K, or 2,4-D low volatile ester. Tordon 101 Mixture and Tordon K are not registered for use in the states of California and Florida. Where grass control is also desired, Garlon 4, alone or in tank mix combination with Tordon 101 Mixture or Tordon K, may be applied with labeled rates of other herbicides registered for grass control in forests. When applying tank mixes, follow applicable use directions and precautions on each product label.

Applications for Site Preparation in Southern Coastal Flatwoods: To control susceptible broadleaf weeds and woody species such as gallberry and wax-myrtle, and for partial control of saw-palmetto, apply 2 to 4 quarts per acre of Garlon 4. To broaden the spectrum of species controlled to include fetterbush, staggerbush, titi, and grasses, apply 2 to 3 quarts per acre of Garlon 4 in tank mix combination with labeled rates of Arsenal Applicator's Concentrate herbicide. Where control of gallberry, wax-myrtle,

broadleaf weeds, and grasses is desired, 2 to 3 quarts per acre of Garlon 4 may be applied in tank mix combination with labeled rates of Accord herbicide.

These treatments may be broadcast during site preparation of flat planted or bedded sites or, on bedded sites, applied in bands over the top of beds. For best results, make applications in late summer or fall. Efficacy may not be satisfactory when applications are made in early season prior to August.

Note: Do not apply after planting pines.

Applications for Conifer Release

Note: Applications for conifer release may cause temporary damage and growth suppression where contact with conifers occurs; however, injured conifers should recover and grow normally. Over-the-top spray applications can kill pines.

Directed Sprays

To release conifers from competing hardwoods and brush such as red maple, sugar maple, striped maple, sweetgum, red and white oaks, ash, hickory, alder, birch, aspen, pin cherry, *Ceanothus* spp., blackberry, chinquapin, and poison oak, mix 4 to 20 quarts of Garlon 4 in enough water to make 100 gallons of spray mixture. This spray should be directed onto foliage of competitive hardwoods using knapsack or backpack sprayers with flat fan nozzles or equivalent any time after the hardwoods and brush have reached full leaf size, but before autumn coloration. The majority of treated hardwoods and brush should be less than 6 feet in height to ensure adequate spray coverage. Care should be taken to direct spray solutions away from conifer foliage, particularly foliage of desirable pines. See Table 1 for relationship between mixing rate, spray volume and maximum application rate.

Broadcast Applications for Mid-Rotation Understory Brush Control in Southern Coastal Flatwoods Pine Stands (Ground Equipment Only)

For control of susceptible species such as gallberry and wax-myrtle and broadleaf weeds, apply 2 to 4 quarts per acre of Garlon 4. To broaden the spectrum of woody plants controlled to include fetterbush, staggerbush, and titi, apply 2 to 3 quarts per acre of Garlon 4 in tank mix combination with labeled rates of Arsenal Applicator's Concentrate. Saw-palmetto will be partially controlled by use of Garlon 4 at 4 quarts per acre or by mixtures of Garlon 4 at 2 to 3 quarts per acre in tank mix combination with either Arsenal Applicator's Concentrate or Escort herbicide.

These mixtures should be broadcast applied over target understory brush species, **but to prevent injury to pines, make applications underneath the foliage of pines.** It is recommended that sprays be applied in 30 or more gallons per acre of total volume. For best results, make applications in late summer or fall. Efficacy may not be satisfactory when applications are made in early season prior to August.

Broadcast Applications for Conifer Release in the Pacific Northwest and California

On Dormant Conifers Before Bud Swell (Excluding Pines): To control or suppress deciduous hardwoods such as vine maple, bigleaf maple, alder, scotch broom, or willow **before leaf-out** or evergreen hardwoods such as madrone, chinquapin, and *Ceanothus* spp., use Garlon 4 at 1 to 2 quarts per acre. Diluents used may be diesel or fuel oil. Or, water plus 1 to 2 gallons per acre of diesel oil or a suitable surfactant or oil substitute at manufacturer's recommended rates may be used.

On Conifer Plantations (Excluding Pines) After Hardwoods Begin Growth and Before Conifer Bud Break ("Early Foliar" Hardwood Stage): Use Garlon 4 at 1.0 to 1.5 quarts alone or plus 2,4-D low volatile ester herbicide in water carrier to provide no more than 3 pounds acid

equivalent per acre from both products. After conifer bud break, these sprays may cause more serious injury to the crop trees. Use of a surfactant may cause unacceptable injury to conifers especially after bud break.

On Conifer Plantations (Excluding Pines) After Conifers Harden Off In Late Summer and While Hardwoods Are Still Growing Actively: Use Garlon 4 at rates of 1.0 to 1.5 quarts per acre alone or plus 2,4-D low volatile ester to provide no more than 3 pounds acid equivalent per acre from both products. Treat as soon after conifer bud hardening as possible so that hardwoods and brush are actively growing. Use of oil, oil substitute, or surfactant may cause unacceptable injury to the conifers.

Broadcast Applications for Conifer Release in the Eastern United States

To release spruce, fir, red pine, and white pine from competing hardwoods such as red maple, sugar maple, striped maple, alder, birch (white, yellow, and grey), aspen, ash, pin cherry, and *Rubus* spp. and perennial and annual broadleaf weeds, use Garlon 4 at rates of 1.5 to 3.0 quarts per acre alone or plus 2,4-D amine or low volatile ester to provide no more than 4 pounds acid equivalent per acre from both products. Applications should be made in late summer or early fall after conifers have formed their overwintering buds and hardwoods are in full leaf and prior to autumn coloration.

Broadcast Applications for Conifer Release in the Lake States Region

To release spruce, fir, and red pine from competing hardwoods such as aspen, birch, maple, cherry, willow, oak, hazel, and *Rubus* spp. and perennial and annual broadleaf weeds, use Garlon 4 at rates of 1.5 to 3.0 quarts per acre. Applications should be made in late summer or early fall after conifers have formed their overwintering buds and hardwoods are in full leaf and prior to autumn coloration.

Warranty Disclaimer

Dow AgroSciences warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. Dow AgroSciences MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

Inherent Risks of Use

It is impossible to eliminate all risks associated with use of this product. Plant injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label, such as unfavorable temperature, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of Dow AgroSciences or the seller. All such risks shall be assumed by buyer.

Limitation of Remedies

The exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories), shall be limited to, at Dow AgroSciences' election, one of the following:

1. Refund of purchase price paid by buyer or user for product bought, or
2. Replacement of amount of product used

Dow AgroSciences shall not be liable for losses or damages resulting from handling or use of this product unless Dow AgroSciences is promptly notified of such loss or damage in writing. In no case shall Dow AgroSciences be liable for consequential or incidental damages or losses.

The terms of the "Warranty Disclaimer" above and this "Limitation of Remedies" cannot be varied by any written or verbal statements or agreements. No employee or sales agent of Dow AgroSciences or the seller is authorized to vary or exceed the terms of the "Warranty Disclaimer" or this "Limitation of Remedies" in any manner.

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Label Code: D02-102-023
Replaces Label: D02-102-022

EPA-Accepted 07/22/97

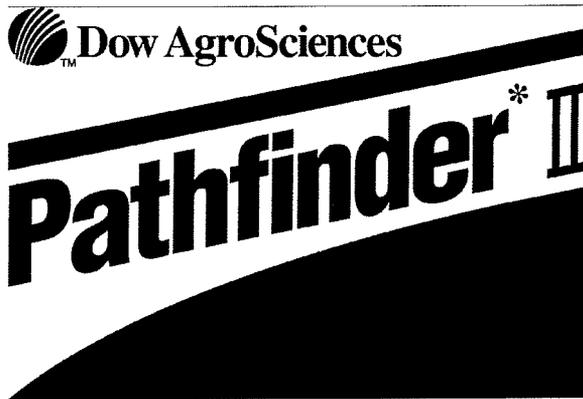
Revisions:

Minor corrections to EPA accepted text dated 7-22-97

ATTACHMENT C2

PATHFINDER II®

Specimen Label



Specialty Herbicide

*Trademark of Dow AgroSciences LLC

A ready-to-use herbicide for the control of woody plants on:

- Forests
- Non-crop areas including: Industrial manufacturing and storage sites, rights-of-way, non-irrigation ditch banks
- Rangeland and permanent pastures
- Grazed areas and maintenance of wildlife openings on those sites

Active Ingredient:

triclopyr: 3,5,6-trichloro-2-pyridinyloxyacetic acid, butoxyethyl ester 13.6%

Inert Ingredients 86.4%

Total 100.0%

Acid Equivalent: triclopyr – 9.81% – 0.75 lb/gal

EPA Reg. No. 62719-176

Keep Out of Reach of Children

CAUTION PRECAUCION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

Precautionary Statements

Hazards to Humans and Domestic Animals

Harmful If Swallowed, Inhaled Or Absorbed Through The Skin

Avoid contact with skin, eyes or clothing. Avoid breathing vapor or spray mist. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

Personal Protective Equipment (PPE)

Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category E on an EPA chemical resistance category selections chart.

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves such as Barrier Laminate, Nitrile Rubber, Neoprene Rubber, or Viton
- Shoes plus socks

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

First Aid

If on skin: Wash with plenty of soap and water. Get medical attention.

If inhaled: Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.

If swallowed: Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious person.

Environmental Hazards

This pesticide is toxic to fish. Keep out of lakes, ponds or streams. Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters.

Physical or Chemical Hazards

Combustible - Do not use or store near heat or open flame. Do not cut or weld container.

Notice: Read the entire label. Use only according to label directions. Before buying or using this product, read "Warranty Disclaimer" and "Limitation of Remedies" elsewhere on this label.

In case of emergency endangering health or the environment involving this product, call 1-800-992-5994. If you wish to obtain additional product information, visit our web site at www.dowagro.com.

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

Directions for Use

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

Read all Directions for Use carefully before applying.

Ready-To-Use, No Mixing Required.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Chemical-resistant gloves such as Barrier Laminate, Nitrile Rubber, Neoprene Rubber, or Viton
- Shoes plus socks

Storage and Disposal

Do not contaminate water, food or feed by storage or disposal. Open dumping is prohibited.

Storage: Store above 28°F or agitate before use.

Pesticide Disposal: Pesticide, spray mixture, or rinsate that cannot be used according to label instructions must be disposed of according to applicable federal, state, or local procedures.

Container Disposal: Triple rinse (or equivalent) with 10 drops or more of a liquid hand soap and water or an oil based product such as kerosene or diesel fuel and spray rinsate on undesirable vegetation, in target area. Offer containers for recycling or reconditioning where allowed, or puncture and dispose of in a sanitary landfill, or by incineration if approved by state and local procedures.

Container Disposal for Refillable Containers: Close all openings which have been opened during use and replace all caps. Return the empty container to a collection site designated by Dow AgroSciences. If the container has been damaged and cannot be returned according to the recommended procedures, contact the Dow AgroSciences Customer Service Center at 1-800-258-1470 to obtain proper handling instructions.

General: Consult federal, state, or local disposal authorities for approved alternative procedures.

General Information

Pathfinder II herbicide is a ready-to-use product which is recommended for the control of unwanted woody plants through the use of basal bark application techniques in forests, rangeland and permanent pastures, and on non-crop areas including industrial manufacturing and storage sites, rights-of-way such as electrical power lines, communication lines, pipelines, road sides and railroads, fence rows, non-irrigation ditch banks and around farm buildings. Use on these sites may include application to grazed areas as well as establishment and maintenance of wildlife openings.

General Use Precautions

The state of Arizona has not approved Pathfinder II for use on plants grown for commercial production; specifically forests grown for commercial timber production, or on designated grazing areas.

Apply this product only as specified on this label.

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

It is permissible to treat non-irrigation ditch banks, seasonally dry wetlands, flood plains, deltas, marshes, swamps, bogs, and transitional areas between upland and lowland sites. Do not apply to open water (such as lakes, reservoirs, rivers, streams, creeks, salt water bays or estuaries) nor to water present in fresh water wetlands, deltas, marshes, swamps, bogs or potholes, or to salt water marshes below the mean high water mark.

Do not apply Pathfinder II herbicide directly to, or otherwise permit it to come into direct contact with grapes, tobacco, vegetable crops, flowers or other desirable broadleaf plants, and do not permit spray mists containing it to drift onto them.

Avoid Injurious Spray Drift: Applications should be made only when there is little or no hazard from spray drift. Very small quantities of spray, which may not be visible, may seriously injure susceptible plants. Do not spray when wind is blowing toward susceptible crops or ornamental plants near enough to be injured.

With ground equipment, spray drift can be reduced by using spray pressures no greater than are required to obtain adequate coverage; by using large droplet producing nozzle tips; and by spraying when wind velocity is low. Do not apply with nozzles that produce a fine droplet spray. Do not apply with an orchard type mist blower.

Do not apply on snow or frozen ground.

Untreated trees occasionally can be affected by movement of the herbicide through root grafting with the treated trees.

Since this herbicide moves within the treated plant, do not use Pathfinder II on parts of a multiple stem plant if injury to the untreated portions (cut or standing stems) cannot be tolerated.

Do not apply on ditches used to transport irrigation water. Do not apply where runoff or irrigation water may flow onto agricultural land as injury to crops may result.

Be sure that use of this product conforms to all applicable regulations.

Grazing and Haying Restrictions

Grazing or harvesting green forage:

- 1) Lactating dairy animals
 - 2.5 gallons/acre or less: Do not graze or harvest green forage from treated area for 14 days after treatment.
 - Greater than 2.5 gallons/acre: Do not graze or harvest green forage until the next growing season.
- 2) Other Livestock
 - 2.5 gallons/acre or less: No grazing restrictions.
 - Greater than 2.5 to 7.5 gallons/acre: Do not graze or harvest green forage from treated area for 14 days after treatment.
 - Note:** If less than 25% of a grazed area is treated, there is no grazing restriction.

Haying (harvesting of dried forage):

- 1) Lactating dairy animals
 - Do not harvest hay until the next growing season.
- 2) Other Livestock
 - 2.5 gallons/acre or less: Do not harvest hay for 7 days after treatment.
 - Greater than 2.5 to 5 gallons/acre: Do not harvest hay for 14 days after treatment.
 - Greater than 5 gallons/acre: Do not harvest hay until the next growing season.

Slaughter Restrictions: Withdraw livestock from grazing treated grass or consumption of treated hay at least 3 days before slaughter. This restriction applies to grazing during the season following treatment or hay harvested during the season following treatment.

Among The Woody Plant Species Controlled Are:

ailanthus	hackberry	oak, water
alder, red	hazel	oak, white
alder, speckled	hercules club	olive, autumn
ash, green	hickory, mockernut	olive, Russian
ash, white	hickory, pignut	persimmon, common
aspen [†]	honeylocust	pine, jack
Australian pine	hornbeam (blue beach)	pine, loblolly
basswood	locust, black [†]	pine, ponderosa
beech, American	madrone, Pacific	pine, red
birch, black	manzanita, greenleaf	pine, white
birch, gray	maple, bigleaf [†]	poison ivy
birch, paper	maple, mountain	poison oak
blackberry	maple, red	poplar, balsam
black locust	maple, silver	redcedar, eastern
blackgum	maple, striped	salt cedar [†]
boxelder	maple, sugar	sassafras [†]
Brazilian pepper	maple, vine	sumac, smooth [†]
cherry, black [†]	mesquite ^{†/††}	sumac, staghorn [†]
cherry, choke	mountain-laurel	sweetgum
cherry, pin	oak, black ^{††}	sycamore
cottonwood	oak, blackjack ^{††}	tamarack
dogwood, flowering	oak, chestnut	tanoak
dogwood, red-osier	oak, post ^{††}	walnut
elm, American	tanoak	waxmyrtle
elm, winged [†]	walnut	willow
gallberry	oak, red	yaupon
guava	oak, scarlet	yellow poplar

[†] Some resprouting may occur.

^{††} Not recommended for streamline basal treatment.

^{†††} Suppression only with streamline basal bark treatment.

Approved Uses

Forest Uses

Agricultural Use Requirements for Forest Use: For the following crop and forestry uses, follow PPE and Reentry instructions in the "Agricultural Use Requirements" section of this label.

Non-crop Uses Such As Rights-of-Way, Industrial Sites, Rangeland and Permanent Pastures, Non-irrigation Ditch Banks and Wildlife Openings.

Use Requirements for Non-cropland Areas: No Worker Protection Standard worker entry restrictions or worker notification requirements apply when this product is applied to non-cropland areas.

Low Volume Basal Bark Treatment

To control susceptible woody plants with stems less than 6 inches in basal diameter, apply Pathfinder II with a backpack or knapsack sprayer using low pressure and a solid cone or flat fan nozzle. Spray the basal parts of brush and tree trunks in a manner which thoroughly wets the lower 12 to 15 inches of stems, including the root collar area, but not to the point of runoff. Herbicide concentration should vary with size and susceptibility of species treated. Apply at any time, including the winter months, except when snow or water prevent spraying to the ground line.

Treatment of Cut Stumps

To control resprouting, apply undiluted Pathfinder II to wet the area adjacent to the cambium and bark around the entire circumference and the sides of cut stumps. Sides of stumps should be thoroughly wetted down to the root collar area, but not to the point of runoff. Treatments may be applied throughout the year, except when snow or water prevent spraying to the ground line. Control may be reduced with treatment during periods of moisture stress as in late summer.

Streamline Basal Bark Treatment (Southern States)

To control or suppress susceptible woody plants for conifer release or in rangeland and pasture, apply Pathfinder II with a backpack or knapsack sprayer using equipment which provides a directed straight-stream spray. Apply sufficient spray to one side of stems less than 3 inches in basal diameter to form a treated zone that is 6 inches in height. When the optimum amount of spray mixture is applied, the treated zone should widen to encircle the stem within approximately 30 minutes. Treat both sides of stems which are 3 to 4 inches in basal diameter. Direct the spray at bark that is approximately 12 to 24 inches above ground. Pines (loblolly, slash, shortleaf, and Virginia) up to 2 inches in diameter breast height (dbh) can be controlled by directing the spray at the point approximately 4 feet above ground. Best results are achieved when applications are made to young vigorously growing stems which have not developed the thicker bark characteristic of slower growing, understory trees in older stands. This technique is not recommended for scrub and live oak species, including blackjack, turkey, post, live, bluejack and laurel oaks. Apply from approximately 6 weeks prior to hardwood leaf expansion in the spring until approximately 2 months after leaf expansion is completed. Do not apply when snow or water prevent spraying at the desired height above ground level.

Warranty Disclaimer

Dow AgroSciences warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. Dow AgroSciences MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

Inherent Risks of Use

It is impossible to eliminate all risks associated with use of this product. Plant injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label, such as unfavorable temperature, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of Dow AgroSciences or the seller. All such risks shall be assumed by buyer.

Limitation of Remedies

The exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories), shall be limited to, at Dow AgroSciences' election, one of the following:

1. Refund of purchase price paid by buyer or user for product bought, or
2. Replacement of amount of product used

Dow AgroSciences shall not be liable for losses or damages resulting from handling or use of this product unless Dow AgroSciences is promptly notified of such loss or damage in writing. In no case shall Dow AgroSciences be liable for consequential or incidental damages or losses.

The terms of the "Warranty Disclaimer" above and this "Limitation of Remedies" cannot be varied by any written or verbal statements or agreements. No employee or sales agent of Dow AgroSciences or the seller is authorized to vary or exceed the terms of the "Warranty Disclaimer" or this "Limitation of Remedies" in any manner.

*Trademark of Dow AgroSciences LLC
Dow AgroSciences LLC • Indianapolis, IN 46268 U.S.A.

Label Code: D02-104-007
Replaces Label: D02-104-006

EPA Accepted 05/17/94

Revisions:

1. General Use Precautions (The following statement was deleted from this section): "Do not use for manufacturing or formulating."

ATTACHMENT C3

ACCORD®

MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

Effective Date: 3/23/04
Product Code: 84820
MSDS: 006694

ACCORD* CONCENTRATE HERBICIDE

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Accord* Concentrate Herbicide

COMPANY IDENTIFICATION:

Dow AgroSciences LLC
9330 Zionsville Road
Indianapolis, IN 46268-1189

2. COMPOSITION/INFORMATION ON INGREDIENTS:

Glyphosate IPA: N-(phosphono-methyl) glycine, Isopropylamine Salt	CAS # 038641-94-0	53.8%
Balance, Total		46.2%

3. HAZARDOUS IDENTIFICATIONS:

EMERGENCY OVERVIEW

Clear, pale yellow liquid. May cause eye irritation. Slightly toxic to aquatic organisms.

EMERGENCY PHONE NUMBER: 800-992-5994

4. FIRST AID:

EYE: Flush eyes thoroughly with water for several minutes. Remove contact lenses after initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

SKIN: Wash skin with plenty of water.

INGESTION: No emergency medical treatment necessary.

INHALATION: Remove person to fresh air; if effects occur, consult a physician.

NOTE TO PHYSICIAN: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE FIGHTING MEASURES:

FLASH POINT: >214°F (>101°C)

METHOD USED: Setaflash

FLAMMABLE LIMITS:

LFL: Not applicable

UFL: Not applicable

EXTINGUISHING MEDIA: Foam, CO₂, Dry Chemical

FIRE AND EXPLOSION HAZARDS: Foam fire extinguishing system is preferred because uncontrolled water can spread possible contamination. Toxic irritating gases may be formed under fire conditions.

FIRE-FIGHTING EQUIPMENT: Use positive-pressure, self-contained breathing apparatus and full protective equipment.

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS: Absorb small spills with an inert absorbent material such as Hazorb, Zorbball, sand, or dirt. Report large spills to Dow AgroSciences on 800-992-5994.

7. HANDLING AND STORAGE:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Keep out of reach of children. Do not swallow. Avoid contact with eyes, skin, and clothing. Avoid breathing vapors and spray mist. Handle concentrate in ventilated area. Wash thoroughly with soap and water after handling and before eating, chewing gum, using tobacco, using the toilet or smoking. Keep away from food, feedstuffs, and water supplies. Store in original container with the lid tightly closed. Store above 10°F (-12°C) to keep from crystallizing.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

These precautions are suggested for conditions where the potential for exposure exists. Emergency conditions may require additional precautions.

EXPOSURE GUIDELINES: None established

ENGINEERING CONTROLS: Good general ventilation should be sufficient for most conditions. Local exhaust ventilation may be necessary for some operations.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

EYE/FACE PROTECTION: Use safety glasses.

SKIN PROTECTION: No precautions other than clean body-covering clothing should be needed.

MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

ACCORD* CONCENTRATE HERBICIDE

Effective Date: 3/23/04
Product Code: 84820
MSDS: 006694

RESPIRATORY PROTECTION: For most conditions, no respiratory protection should be needed; however, if discomfort is experienced, use a NIOSH approved air-purifying respirator.

APPLICATIONS AND ALL OTHER HANDLERS: Please refer to the product label for personal protective clothing and equipment.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE: Clear, pale yellow liquid
DENSITY: 10.0 - 10.5 lbs/gal
pH: 4.8 - 5.0
ODOR: None
SOLUBILITY IN WATER: Miscible
SPECIFIC GRAVITY: 1.21 gm/L
FREEZING POINT: -7°F - -10°F (-21°C - -25°C)

10. STABILITY AND REACTIVITY:

STABILITY: (CONDITIONS TO AVOID) Stable under normal storage conditions.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Galvanized or unlined steel (except stainless steel) containers or spray tanks may produce hydrogen gas which may form a highly combustible gas mixture.

HAZARDOUS DECOMPOSITION PRODUCTS: None known.

HAZARDOUS POLYMERIZATION: Not known to occur.

11. TOXICOLOGICAL INFORMATION:

EYE: May cause slight temporary eye irritation. Corneal injury is unlikely.

SKIN: Essentially non-irritating to skin. Prolonged skin contact is unlikely to result in absorption of harmful amounts. The LD₅₀ for skin absorption in rabbits is >5000 mg/kg. Did not cause allergic skin reactions when tested in guinea pigs.

INGESTION: Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts. The oral LD₅₀ for rats is >5000 mg/kg.

INHALATION: Brief exposure (minutes) is not likely to cause adverse effects. The aerosol LC₅₀ for rats is >6.37 mg/L for 4 hours.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: For a similar material, glyphosate, in animals, effects have been reported on the following organ: liver.

CANCER INFORMATION: A similar material, glyphosate, did not cause cancer in laboratory animals.

TERATOLOGY (BIRTH DEFECTS): For glyphosate IPA, available data are inadequate for evaluation of potential to cause birth defects.

REPRODUCTIVE EFFECTS: For glyphosate IPA, available data are inadequate to determine effects on reproduction.

MUTAGENICITY: For a similar material, glyphosate, in-vitro and animal genetic toxicity studies were negative.

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL DATA:

ECOTOXICOLOGY:

Material is practically non-toxic to aquatic organisms on an acute basis (LC₅₀ or EC₅₀ is >100 mg/L in most sensitive species tested).

Acute LC₅₀ for rainbow trout (*Oncorhynchus mykiss*) is >2500 mg/L.

Acute immobilization EC₅₀ in water flea (*Daphnia magna*) is 918 mg/L.

Material is practically non-toxic to birds on an acute basis (LD₅₀ is >2000 mg/kg).

Acute oral LD₅₀ in bobwhite (*Colinus virginianus*) is >2000 mg/kg.

The LC₅₀ in earthworm *Eisenia foetida* is >1000 mg/kg.

Acute contact LD₅₀ in honey bee (*Apis mellifera*) is >100 µg/bee.

Acute oral LD₅₀ in honey bee (*Apis mellifera*) is >100 µg/bee.

Growth inhibition EC₅₀ in green alga (*Selenastrum capricornutum*) is 127 mg/L.

Growth inhibition EC₅₀ in duckweed (*Lemna sp.*) is 24.4 mg/L.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHOD: If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities.

MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

ACCORD* CONCENTRATE HERBICIDE

Effective Date: 3/23/04
Product Code: 84820
MSDS: 006694

This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

If the material as supplied becomes a waste, follow all applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION:

U.S. DEPARTMENT OF TRANSPORTATION (DOT) INFORMATION:

For all package sizes and modes of transportation:
This material is not regulated for transport.

15. REGULATORY INFORMATION:

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations.

U.S. REGULATIONS

SARA 313 INFORMATION: To the best of our knowledge, this product contains no chemical subject to SARA Title III Section 313 supplier notification requirements.

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Not to have met any hazard category

TOXIC SUBSTANCES CONTROL ACT (TSCA): All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

STATE RIGHT-TO-KNOW: This product is not known to contain any substances subject to the disclosure requirements of

New Jersey
Pennsylvania

OSHA HAZARD COMMUNICATION STANDARD: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND): To the best of our knowledge, this product contains no chemical subject to reporting under CERCLA.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:

<u>CATEGORY</u>	<u>RATING</u>
Health	1
Flammability	1
Reactivity	0

16. OTHER INFORMATION:

MSDS STATUS: Revised Sections: 3,4,11,12,13,14 & 15
Reference: DR-0361-8028
Replaces MSDS Dated: 1/12/00
Document Code: D03-145-002
Replaces Document Code: D03-145-001

The Information Herein Is Given In Good Faith, But No Warranty, Express Or Implied, Is Made. Consult Dow AgroSciences For Further Information.

ATTACHMENT C4

VELPAR®



The MSDS format adheres to the standards and regulatory requirements of the United States and may not meet regulatory requirements in other countries.

DuPont
Material Safety Data Sheet

Page 1

"DuPont" "VELPAR" DF HERBICIDE
M0000325 Revised 25-JUN-2003

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

VELPAR is a registered trademark of DuPont.

"DuPont" is a trademark of DuPont.

Corporate MSDS Number : DU008210

Tradenames and Synonyms

"Velpar" F
"VELPAR" 75WG
DUPONT VELPAR 75WG

Company Identification

MANUFACTURER/DISTRIBUTOR
DuPont
1007 Market Street
Wilmington, DE 19898

PHONE NUMBERS

Product Information : 1-800-441-7515 (outside the U.S.
302-774-1000)
Transport Emergency : CHEMTREC 1-800-424-9300(outside U.S.
703-527-3887)
Medical Emergency : 1-800-441-3637 (outside the U.S.
302-774-1000)

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
*HEXAZINONE (3-cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5- triazine-2,4(1H,3H)-dione)	51235-04-2	75
INERT INGREDIENTS		25

* Disclosure as a toxic chemical is required under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

HAZARDS IDENTIFICATION

Emergency Overview

DANGER Corrosive, causes irreversible eye damage.
Harmful if swallowed. Do not get in eyes or on
clothing. Avoid contact with skin. Wash thoroughly with soap
and water after handling.

Potential Health Effects

HUMAN HEALTH EFFECTS OF OVEREXPOSURE TO HEXAZINONE:

Overexposure to hexazinone by eye contact may initially
include eye irritation with discomfort, tearing, or blurring
of vision.

Ingestion may include abnormal liver function as detected by
laboratory tests.

Significant skin permeation and systemic toxicity after
contact appears unlikely. Individuals with preexisting
diseases of the liver may have increased susceptibility to
the toxicity of excessive exposures.

Carcinogenicity Information

None of the components present in this material at concentrations
equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH
as a carcinogen.

FIRST AID MEASURES

First Aid

IF IN EYES: Hold eye open and rinse slowly and gently with
water for 15-20 minutes. Remove contact lenses, if present,
after the first 5 minutes, then continue rinsing eye. Call
a poison control center or doctor for treatment advice.

IF ON SKIN OR CLOTHING: Take off contaminated clothing.
Rinse skin immediately with plenty of water for 15-20
minutes. Call a poison control center or doctor for
treatment advice.

IF SWALLOWED: Call a poison control center or doctor
immediately for treatment advice. Have person sip a glass
of water if able to swallow. Do not induce vomiting unless
told to do so by the poison control center or doctor. Do
not give anything by mouth to an unconscious person.

INHALATION: No specific intervention is indicated, as the
compound is not likely to be hazardous by inhalation.
Consult a physician if necessary.

(FIRST AID MEASURES - Continued)

Notes to Physicians

Probable mucosal damage may contraindicate the use of gastric lavage.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-441-3637 for emergency medical treatment information.

FIRE FIGHTING MEASURES

Flammable Properties

Not a fire or explosion hazard.

Extinguishing Media

Use media appropriate for surrounding material.

Fire Fighting Instructions

Keep personnel removed and upwind of fire. Wear self-contained breathing apparatus. Wear full protective equipment.

If area is exposed to fire and conditions permit, let fire burn itself out. Burning chemicals may produce by-products more toxic than the original material. If product is on fire, wear self-contained breathing apparatus and full protective equipment. Use water spray. Control runoff.

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Emergency Response - Chemical resistant coveralls, waterproof gloves, waterproof boots and face/eye protection. If dusting occurs, use NIOSH approved respirator protection.

Initial Containment

Dike spill. Prevent material from entering sewers, waterways, or low areas.

Spill Clean Up

Shovel or sweep up.

HANDLING AND STORAGE

Handling (Personnel)

Do not get in eyes. Avoid breathing dust. Avoid contact with skin. Avoid contact with clothing.

USERS SHOULD: Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.

Storage

Store product in original container only. Do not contaminate water, other pesticides, fertilizer, food or feed in storage.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

Use only with adequate ventilation.

Personal Protective Equipment

Applicators and other handlers must wear:

Long-sleeved shirt and long pants.
Shoes plus socks.
Protective eye wear

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them.

Follow manufacturer instructions for cleaning and maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water is:

,Coveralls.
,Chemical resistant gloves in Category A (such as
,butyl rubber, natural rubber, neoprene rubber, or
,Nitrile rubber) all greater than or equal to 14
,mils.
,Shoes plus socks.
,Protective eyewear.

Exposure Guidelines

Applicable Exposure Limits

HEXAZINONE

PEL (OSHA) : None Established
TLV (ACGIH) : None Established
AEL * (DuPont) : 10 mg/m³, 8 Hr. TWA

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Odor : Acrid (slight).
Form : Dry Flowable Granules.
Color : Tan (light).
pH : 8.4 (1% wt/wt in water)
Density : 0.58 g/mL

Solubility in Water, : Water Dispersible

STABILITY AND REACTIVITY

Chemical Stability

Stable at normal temperatures and storage conditions.

Incompatibility with Other Materials

Incompatible or can react with strong bases.

Decomposition

Decomposition will not occur.

Polymerization

Polymerization will not occur.

TOXICOLOGICAL INFORMATION

Animal Data

Acute Oral LD50, : calculated to be 1310 mg/kg in rats.

Acute Dermal LD50, : > 5000 mg/kg in rabbits.

Inhalation 4 hour LC50, : > 5.2 mg/L in rats.

Eye Irritation: In tests with rabbits, product caused conjunctival chemosis, conjunctival redness, and corneal opacity. Positive irritant effects were present in 1 rabbit

(TOXICOLOGICAL INFORMATION - Continued)

21 days after treatment.

Skin irritation and Sensitization: According to criteria established by the U.S. EPA this product is considered to be a moderate skin irritant. According to criteria established by EEC Directive 93/21 this product can be classified a non-irritant. Product is not a skin sensitizer in tests on guinea pigs.

OTHER STUDIES - Hexazinone

Oral (rat): In a 2-year feeding study with the 90% powder, the no-observable-effect level (NOEL) was 200 ppm a.i.; nutritional and body weight effects were seen in females at 1000 ppm a.i. and in both sexes at 2500 ppm a.i. Biochemical effects were noted in both sexes at 2500 ppm a.i.

Oral (mouse): In a 2-year feeding study with technical material, the no-observable-effect level (NOEL) was 200 ppm. Decreased body weight gain was observed in both sexes at 2500 ppm and 10000 ppm. This effect was severe at 10000 ppm, the highest level tested. Non-neoplastic liver effects were noted in males at 2500 ppm and in both sexes at 10000 ppm. Based on recent pathology review, hyperplastic liver nodules diagnosed at 10000 ppm when this study was initially conducted have been reclassified as liver adenomas. This effect was only significant among female mice in this dose group. This change reflects the current scientific consensus regarding the classification of this benign lesion in the mouse liver.

Oral (dog): In a 1-year feeding study with technical material, the NOEL was 200 ppm. Reduced food consumption and body weight gains were significant at the high dose, 6000 ppm. These nutritional effects were associated with mild but reversible changes in hematological parameters at the high dose. Increased liver weights and other non-neoplastic liver effects as indicated by histopathology and changes in clinical chemical parameters were observed at 1500 and/or 60000 ppm.

Reproduction (rat): In a 3-generation, 3-litter study with 90% powder, no adverse reproduction or lactation effects were seen at any level; slightly depressed average weanling weights were noted in the second and third litters at the high dose, 2500 ppm. A second rat reproduction study (2-generation, 3-litter study) was conducted at dietary doses from 200 to 5000 ppm. There were no adverse effects on fertility. The NOEL was 200 ppm. Decreased food consumption, parental body weight gain and decreased offspring weights were observed at the higher doses.

Teratogenicity: Not teratogenic or embryo-fetal toxic to

(TOXICOLOGICAL INFORMATION - Continued)

rats by dietary administration at levels as high as 5000 ppm, the highest dose tested. Administration to rats by oral intubation resulted in a NOEL for maternal and fetal effects of 100 mg/kg body wt./day. Maternal toxicity (reduced food consumption and lower body weights) was observed at 400 and 900 mg/kg. Lower fetal weights and indications of general delayed development associated with maternal toxicity were also observed at these doses. When hexazinone was administered to rabbits via oral intubation, there were no teratogenic or embryo-fetal toxic effects at the highest dose tested, 125 mg/kg/day. Only a transient reduction in maternal food consumption was observed at the high dose. The maternal and fetal NOELs are considered to be 125 mg/kg.

Mutagenicity: Not mutagenic in Ames bacterial assay, Chinese hamster ovary cell point mutation assay, or rat liver DNA repair assay; positive in the in vitro Chinese hamster ovary cell cytogenetic assay but negative in the in vivo rat bone marrow cytogenetic assay.

ECOLOGICAL INFORMATION

Ecotoxicological Information

Aquatic Toxicity

For the active ingredient hexazinone:

.96 Hour LC50, bluegill sunfish: >370 ppm
96 Hour LC50, rainbow trout : >320 ppm
.96 hour LC50, fathead minnow : 274 ppm

DISPOSAL CONSIDERATIONS

Waste Disposal

Do not contaminate water, food, or feed by disposal. Waste resulting from the use of this product may be disposed of on the site or at an approved waste disposal facility.

Environmental Hazards

Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters.

The active ingredient, hexazinone, in this product is known to leach through soil into ground water under certain conditions as a result of agricultural use. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in ground-water

(DISPOSAL CONSIDERATIONS - Continued)

contamination.

Container Disposal

For Plastic Containers: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

For Fiber Sacks: Completely empty fiber sack by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into manufacturing or application equipment. Then dispose of sack in a sanitary landfill or by incineration if allowed by State and local authorities.

For Fiber Drums with Liners: Completely empty liners by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into manufacturing or application equipment. Then dispose of liner in a sanitary landfill or by incineration if allowed by State and local authorities. If the drum is contaminated and cannot be reused, dispose of in the same manner.

For Paper and Plastic Bags: Completely empty bag into application equipment. Then dispose of empty bag in a sanitary landfill or by incineration or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

TRANSPORTATION INFORMATION

Shipping Information

DOT/IMO
Proper Shipping Name : Not Regulated

REGULATORY INFORMATION

U.S. Federal Regulations

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : Yes
Chronic : No
Fire : No
Reactivity : No
Pressure : No

(REGULATORY INFORMATION - Continued)

In the United States this product is regulated by the US Environmental Protection Agency under the Federal Insecticide, Fungicide and Rodenticide Act. It is a violation of federal law to use this product in a manner inconsistent with its labeling.

EPA Reg. No. 352-581

OTHER INFORMATION

NFPA, NPCA-HMIS

NFPA Rating
Health : 2
Flammability : 1
Reactivity : 0

NPCA-HMIS Rating
Health : 2
Flammability : 1
Reactivity : 0

Personal Protection rating to be supplied by user depending on use conditions.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS : DuPont Crop Protection
Address : Wilmington, DE 19898
Telephone : 1-888-638-7668

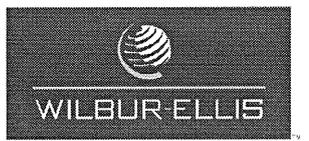
Indicates updated section.

This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience is gained.

End of MSDS

ATTACHMENT C5

HASTEN®



PO BOX 16458 • FRESNO CA 93755

MATERIAL SAFETY DATA SHEET

PRODUCT/TRADE NAME:

HASTEN

I. NAME

PRODUCT/TRADE NAME: HASTEN
EPA REGISTRATION #: NONE
CHEMICAL NAME/Common Name:
Nonionic Surfactant/Nonionic Surfactant

II. HAZARDOUS INGREDIENTS

	CAS#	OSHA PEL	ACGIH TLV
Nonionic Surfactant	Mixture	NE	NE

III. PHYSICAL DATA

SPECIFIC GRAVITY (H2O = 1): .9
MELTING POINT: NA
VAPOR DENSITY (AIR = 1): NE
% VOLATILES BY VOL.: NE
ODOR: Fatty
APPEARANCE: Amber Liquid
FLASH POINT/METHOD: >150 Deg. C
VAPOR PRESSURE (mmHg): NE
SOLUBILITY IN H2O: Emulsifiable

IV. FIRE & EXPLOSION HAZARD

EXTINGUISHING MEDIA: Water Fog Foam Alcohol Foam
 CO2 Dry Chemical Other

FIRE FIGHTING PRECAUTIONS & HAZARDS:

Fight fire upwind. Wear positive pressure self-contained breathing apparatus and full protective clothing. Do not breathe smoke or spray mist. Avoid fallout and runoff. Dike to prevent entering drains, sewers, or water courses. Evacuate people downwind from fire.

V. CARCINOGEN STATUS

OSHA NTP IARC No Listing Type

VI. REACTIVITY

Stable HAZARDOUS POLYMERIZATION
 Unstable May Occur Will Not Occur
AVOID: Strong oxidizers, organic material
HAZARDOUS DECOMPOSITION PRODUCTS: COx

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE OF SPILL: Absorb with inert material and sweep or vacuum into disposal container.

DECONTAMINATION: Treat spill area with detergent and water. Absorb with inert material. Place in disposal container and repeat procedure as necessary until area is clean.

ENVIRONMENTAL HAZARDS: Dike to prevent entering drains, sewers or water courses.

DISPOSAL: Dispose of in accordance with Federal, State and local regulations.

VIII. HEALTH PRECAUTION DATA

INGESTION: Do not ingest. Acute Oral LD50 (Rat) >5000 mg/kg (WECCO). Wash thoroughly before eating, drinking or smoking.

INHALATION: No PEL/TLV established for this product. Do not inhale mist. Use proper respiratory protective equipment for the exposures encountered.

SKIN ABSORPTION: Acute Dermal LD50 (Rabbit) >2000 mg/kg (WECCO). May cause slight skin irritation. Wear proper personal protective equipment to reduce skin exposure.

EYE EXPOSURE: Keep out of eyes. Minimally irritating to the eyes. If exposed, flush eyes for a minimum of 15 minutes with water. Wear proper eye protection to reduce splash exposure.

EFFECTS OF OVEREXPOSURE: Material is not toxic or irritating to the skin. No known chronic effects. No known preexisting medical conditions will be aggravated by exposure.

FIRST AID: In all cases, get prompt medical attention. If ingested, give several glasses of water and induce vomiting. Do not induce vomiting if person is unconscious. For skin exposure, remove contaminated clothing and wash with soap and water. For eye contact, irrigate for a minimum of 15 minutes with water. If inhaled, remove victim to fresh air, and administer CPR if necessary.

IX. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Use NIOSH/MSHA - approved respirator for organic vapors for the exposures encountered. Positive pressure self-contained breathing apparatus should be used for confined space entry and excessive exposures.

PERSONAL PROTECTIVE EQUIPMENT: Neoprene or rubber gloves and safety goggles.

VENTILATION: General ventilation.

X. SPECIAL PRECAUTIONS

Keep out of the reach of children. Read and follow all label instructions.

XI. REGULATORY DATA

SARA HAZARD CLASS: Acute Chronic Flammable
 Pressure Reactive None

SARA 313: Yes No Chemical:

SARA 302: Yes No Chemical:

TPQ:

CERCLA: Yes No Chemical:

RQ:

RCRA: Yes No

NFPA HAZARD RATING:

Health: [1]

Fire: [1]

Reactivity: [0]

Special: []

HMS CODES:

Health: [1]

Fire: [1]

Reactivity: [0]

NFPA HAZARD RATING SCALE:

0 = Minimal 3 = Serious

1 = Slight 4 = Severe

2 = Moderate

HMS HAZARD RATING SCALE:

0 = Minimal 3 = Serious

1 = Slight 4 = Severe

2 = Moderate

DATE PREPARED: March 22, 1994

REVISED DATE: July 22, 2005

Notice: This information was developed from information on the constituent materials. No warranty is expressed or implied regarding the completeness or continuing accuracy of the information contained herein, and Wilbur-Ellis disclaims all liability for reliance thereon. The user should satisfy himself that he has all current data relevant to his particular use.

*Technical Material NE - Not Established NA - Not Applicable

24 Hour Emergency Phone Number
CHEMTREC: (800) 424-9300



ATTACHMENT C6

R-11®



PO BOX 16458 • FRESNO CA 93755

MATERIAL SAFETY DATA SHEET

PRODUCT/TRADE NAME:

R-11

I. NAME

PRODUCT/TRADE NAME: R-11
EPA REGISTRATION #: NONE
CHEMICAL NAME/COMMON NAME:
1-Butanol/Butyl Alcohol
Octyl Phenoxy Polyethoxy Ethanol/Nonionic Surfactants

II. HAZARDOUS INGREDIENTS

	CAS#	OSHA PEL	ACGIH TLV
Butyl Alcohol	71-36-3	50 ppm c	50 ppm c
Nonionic Surfactants	Mixture	NE	NE

III. PHYSICAL DATA

SPECIFIC GRAVITY (H2O = 1): 1.02
MELTING POINT: NA
VAPOR DENSITY (AIR = 1): NE
% VOLATILES BY VOL.: NE
ODOR: Alcohol
APPEARANCE: Clear Liquid
FLASH POINT/METHOD: 130 Deg. F TCC
VAPOR PRESSURE (mmHg): NE
SOLUBILITY IN H2O: 10%

IV. FIRE & EXPLOSION HAZARD

EXTINGUISHING MEDIA: Water Fog Foam Alcohol Foam
 CO2 Dry Chemical Other

FIRE FIGHTING PRECAUTIONS & HAZARDS:

Fight fire upwind. Wear positive pressure self-contained breathing apparatus and full personal protective equipment. Cool exposed containers with water. Dike area to prevent entering drains, sewers or water courses. Evacuate people downwind from fire.

V. CARCINOGEN STATUS

OSHA NTP IARC No Listing Type

VI. REACTIVITY

Stable HAZARDOUS POLYMERIZATION
 Unstable May Occur Will Not Occur

AVOID: Oxidizers, Liquid chlorine and Concentrated O2

HAZARDOUS DECOMPOSITION PRODUCTS: COx

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE OF SPILL: Wear appropriate respiratory and personal protective equipment. Absorb with inert material and sweep or vacuum into approved disposal container.

DECONTAMINATION: Treat area with detergent and water. Absorb with inert material and place in approved container. Repeat as necessary until area is clean.

ENVIRONMENTAL HAZARDS: Dike to prevent entering drains, sewers or water courses.

DISPOSAL: Place in DOT-approved container and dispose of in an approved disposal site.

VIII. HEALTH PRECAUTION DATA

INGESTION: Acute oral LD50 (rat) Butyl Alcohol 790 mg/kg (SAX*). Wash thoroughly before eating, drinking or smoking. Do not ingest. Do not store near food or feed.

INHALATION: PEL/TLV Butyl Alcohol 100 ppm. Can cause respiratory irritation in high concentrations. Wear appropriate respiratory protection for exposures above the PEL/TLV.

SKIN ABSORPTION: Acute dermal LD50 (rabbit) for Butyl Alcohol 4200 mg/kg (SAX*). Can cause mild skin irritation or dermatitis. Wear proper personal protective equipment to reduce exposure.

EYE EXPOSURE: May be mildly irritating to the eyes. If exposed, flush eyes a minimum of 15 minutes with water. Wear proper eye protection to reduce splash exposure.

EFFECTS OF OVEREXPOSURE: May cause eye irritation and corneal inflammation. High concentrations can cause respiratory irritation. May cause skin irritation, scaling or dermatitis. No known chronic effects. Preexisting medical conditions involving the above symptoms may be aggravated by exposure.

FIRST AID: In all cases, get prompt medical attention. If ingested, give several glasses of water. Do not induce vomiting. For skin exposure, remove contaminated clothing and wash with soap and water. For eye contact, irrigate eyes a minimum of 15 minutes with water. For inhalation, remove victim to fresh air, and administer CPR if necessary.

IX. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Use only NIOSH/MSHA - approved respiratory protection for organic vapors up to 10 times the PEL/TLV. Positive pressure self-contained breathing apparatus should be used for confined space entry and high exposures above 10 times the PEL/TLV.

PERSONAL PROTECTIVE EQUIPMENT: Not normally required for this product. Recommend chemical goggles, long-sleeved coveralls and rubber or neoprene boots, Nitrile gloves.

VENTILATION: Local exhaust ventilation recommended for manufacture and formulation operations.

X. SPECIAL PRECAUTIONS

Keep out of the reach of children. Read and follow all label instructions. Keep away from open flame, heat or ignition sources.

XI. REGULATORY DATA

SARA HAZARD CLASS: Acute Chronic Flammable
 Pressure Reactive None

SARA 313: Yes No Chemical: Butyl Alcohol

SARA 302: Yes No Chemical:

TPQ:

CERCLA: Yes No Chemical: Butyl Alcohol

RQ: 1*

RCRA: Yes No

NFPA HAZARD RATING:

Health: [1]
Fire: [2]
Reactivity: [0]
Special: [0]

NFPA HAZARD RATING SCALE:

0 = Minimal 3 = Serious
1 = Slight 4 = Severe
2 = Moderate

HMS CODES:

Health: [1]
Fire: [2]
Reactivity: [0]

HMS HAZARD RATING SCALE:

0 = Minimal 3 = Serious
1 = Slight 4 = Severe
2 = Moderate

DATE PREPARED: May 8, 1985

REVISED DATE: July 21, 2005

Notice: This information was developed from information on the constituent materials. No warranty is expressed or implied regarding the completeness or continuing accuracy of the information contained herein, and Wilbur-Ellis disclaims all liability for reliance thereon. The user should satisfy himself that he has all current data relevant to his particular use.

*Technical Material NE - Not Established NA - Not Applicable

24 Hour Emergency Phone Number

CHEMTREC: (800) 424-9300



ATTACHMENT C7

IN-PLACE®

PRECAUTIONARY STATEMENTS

Causes eye irritation. In case of contact with eyes, immediately flush with water for at least 15 minutes. If irritation persists, get medical attention. May cause skin irritation. Harmful if swallowed. **COMBUSTIBLE LIQUID.** Keep away from heat, sparks and fire.

Do not cut or weld this container of IN-PLACE™. Combustible. Do not use this container or equipment contaminated with this product as a container for water to be used for domestic purposes, feed or food stuff.

NOTE: When using chemical mixture that has not been used before with IN-PLACE™ always try a small sample mix before making a full batch. Different adjuvants in the chemicals and salt in some water can cause flocking or excess thickening. If this occurs, add ammonia.

Follow mixing procedures, dose rates and cautions on all chemical labels.

Wilbur-Ellis Company warrants that this material conforms to the chemical description on the label and is reasonably fit for use as directed herein.

The use of this product is beyond the control of Wilbur-Ellis Company, therefore, Wilbur-Ellis Company urges that all chemicals be checked with insist^o before full scale use.

Buyer assumes all risks of use, storage and handling of this material not in strict accordance with directions given herewith. Buyer further agrees in event of damage arising from the use of this product to accept a replacement of the product or a refund of the purchase price of the product, at buyer's option, as full discharge of seller's liability.

NOTICE

U.S. Patent numbers, 3, 479, 176 and 4, 115, 098 covers use, other patent pending.

STORAGE AND DISPOSAL

- PROHIBITIONS:** Do not contaminate water, food or feed by storage, disposal or cleaning of equipment.
- STORAGE:** Store in original container only and keep sealed. Store in closed storage areas. Use caution when moving, opening, closing or pouring.
- PESTICIDE DISPOSAL:** Improper disposal of excess spray mixtures outdoors is a violation of Federal Law. Wastes resulting from use of this product should be disposed of through on-site spray application or at an approved waste disposal facility.
- CONTAINER DISPOSAL:** Triple rinse (or equivalent), then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or other procedures approved by State and local authorities.

CONTENTS 1 U.S. GALLON (3.75 Liters)



DEPOSITION AND RETENTION AGENT

HERBICIDES, INSECTICIDES, FUNGICIDES
AND HARVEST AIDS

*DRIFT RETARDANT

PRINCIPAL FUNCTIONING AGENTS.....100%

Amine salts of organic acids
Aromatic Acid
Aromatic and Aliphatic petroleum distillate

KEEP OUT OF REACH OF CHILDREN
CAUTION

CA Reg No. 2935-50169 - WA Reg. No. AW2935-01003

WARRANTY STATEMENT

WILBUR-ELLIS COMPANY warrants that this product conforms to the chemical description on the label thereof and is reasonably fit for purposes stated on such label only when used in accordance with directions under normal use conditions. It is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials or the manner of use or application, all of which are beyond the control of WILBUR-ELLIS COMPANY. In no case shall WILBUR-ELLIS COMPANY be liable for consequential, special or indirect damages resulting from the use or handling of this product. All such risks shall be assumed by the Buyer. The exclusive remedy of any buyer or user of this product for any and all losses, injuries, or damages resulting from or in any way arising from the use, handling or application of this product, whether in contract, warranty, tort, negligence, strict liability or otherwise, shall not exceed the purchase price paid for this product or at WILBUR-ELLIS COMPANY'S election, the replacement of this product. WILBUR-ELLIS COMPANY MAKES NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE NOR ANY OTHER EXPRESS OR IMPLIED WARRANTY EXCEPT AS STATED ABOVE.

GENERAL INFORMATION

IN-PLACE™ is specially formulated for use with conventional spray mixtures. IN-PLACE™ is a deposition and retention agent which reduces evaporation and drift of chemicals while increasing coverage and adherence on the target area.

GENERAL MIXING PROCEDURE

Mix the IN-PLACE™ and EMULSIFIABLE CONCENTRATE or AQUEOUS SOLUTION together; 1 part IN-PLACE™ to 4 parts chemical. Add to the total volume of water. (If some water is required for mixing with the emulsifiable concentrate or aqueous solution, DO NOT USE OVER 1 quart of water on a per acre basis.)

Mix the WETTABLE POWDER, SOLUBLE POWDER, FLOWABLE or SOLUBLE BAG in the total volume of WATER. Add the IN-PLACE™ last; 2 ozs. IN-PLACE™ to 1 pound or 1 quart of chemical.

Combinations of Emulsifiable Concentrates and/or Aqueous Solutions with Wettable Powders, Soluble Powders, Flowables, and/or Soluble Bags - should be added to the water first and mixed. Mix the IN-PLACE™ and the Emulsifiable Concentrate and/or Aqueous Solution together. Add to the total volume of water and powders. Always try a small sample mix before making a full batch.

When mixing multiple-loads at one time, RE-BLEND BEFORE EACH LOAD IS DRAWN OFF.

Small mixes in closed-systems: Put required IN-PLACE™ in can open-portion. Add emulsifiable concentrate or aqueous solution to IN-PLACE™ and flush into closed mixing tank.

Large or multiple loads in closed-systems: Keep the initial water to a maximum of 1 quart on a per acre basis in the closed mixing tank. Add all of the emulsifiable concentrates or aqueous solutions to the closed mixing tank, followed by the required IN-PLACE™. BLEND VERY LIGHTLY, and add to the total volume of water. If a thick or lumpy load occurs from over-agitation or the wrong rate of IN-PLACE™, add HOUSEHOLD AMMONIA through the agitation system to break the condition and continue with normal spray activities.

FOR PESTICIDES/HERBICIDES THAT PERMIT USE OF AN ADJUVANT AT A HIGHER RATE, FOLLOW INSTRUCTIONS ON THAT PESTICIDE/HERBICIDE LABEL. HOWEVER, DO NOT ADD THIS PRODUCT AT A RATE WHICH EXCEEDS 5% OF THE FINISHED SPRAY VOLUME.

Use caution at the higher application rates. When applying to a sensitive crop, first treat a small area to determine if there may be adverse effects on the crop.

FOR AQUATIC USE: (EXCEPT IN WASHINGTON) Can be used with labeled aquatic products. Not to exceed 1 quart per surface acre of water.

STANDARD MIXING RATES

(Those not available as Wettable Powders)
Liquid Chemicals - Emulsifiable Concentrates - EC

Chemical Quarts	1	2	3	4	5	6	7	8	9	10	Example 4 Parts Chemical
Ounces IN-PLACE™	8	16	24	32	40	48	56	64	72	80	1 Part IN-PLACE™

Mix E.C. and IN-PLACE™ together. Add to water

(Those not available as Wettable Powders)
Liquid Chemicals - Flowables

Chemical Quarts	1	2	3	4	5	6	7	8	9	10	Example 1 Gallon (128 oz.) Chemical
Ounces IN-PLACE™	2	4	6	8	10	12	14	16	18	20	1/2 Pint (8 oz.) IN-PLACE™

Mix Flowables in the water. Add IN-PLACE™ last

Wettable Powders

Chemical Pounds	1	2	3	4	5	6	7	8	9	10	Example 8 Pounds Chemical
Ounces IN-PLACE™	2	4	6	8	10	12	14	16	18	20	1 Pint (16 oz.) IN-PLACE™

Mix Wettable Powders in water. Add IN-PLACE™ last

RATE EXCEPTIONS

ROUNDUP®

Roundup Quarts	1	2	3	4	5	6	7	8	9	10	Example 4 Quarts (128 oz.) Roundup
Ounces IN-PLACE™	16	32	48	64	80	96	112	128	144	160	2 Quarts (64 oz.) IN-PLACE™

Pyrethroids (Ambush®, Pounce®, Ammo®, Etc.)

Pyrethroids Pints	1	2	3	4	5	6	7	8	9	10	Example 1 Pint (16 oz.) Pyrethroids
Pints IN-PLACE™	1	2	3	4	5	6	7	8	9	10	1 Pint (16 oz.) IN-PLACE™

Asulox®

Asulox Gallons	1	2	3	4	5	6	7	8	9	10	Example 1 Gallon (128 oz.) Asulox
Ounces IN-PLACE™	5	10	15	20	25	30	35	40	45	50	5 Ounces IN-PLACE™

Liquid Foliar Fertilizer

Liquid Fertilizer Quarts	1	2	3	4	5	6	7	8	9	10	Example 8 Quarts (256 oz.) Liquid Fertilizer
Ounces IN-PLACE™	2	4	6	8	10	12	14	16	18	20	1 Pint (16 oz.) IN-PLACE™

Dipel-4L, Thuricide

Chemical Quarts	1	2	3	4	5	6	7	8	9	10	Example 4 Quarts (128 oz.) Chemical
Ounces IN-PLACE™	8	16	24	32	40	48	56	64	72	80	1 Quart (32 oz.) IN-PLACE™

Dimilin®

Dimilin Ounces	1	2	3	4	5	6	7	8	9	10	Example Premix 2 oz. Dimilin per 16 oz. water. Then add proper rate of IN-PLACE™. Add premix to tank or total volume of water.
Ounces IN-PLACE™	1	2	3	4	5	6	7	8	9	10	

Granular Foliar Fertilizer

Granular Fertilizer Pounds	1	2	3	4	5	6	7	8	9	10	Example 8 Pounds Granular Fertilizer
Ounces IN-PLACE™	2	4	6	8	10	12	14	16	18	20	1 Pint (16 oz.) IN-PLACE™

Zorial®

Zorial Pounds	1	2	3	4	5	6	7	8	9	10	Example 16 Pounds Zorial
Ounces IN-PLACE™	1	2	3	4	5	6	7	8	9	10	1 Pint (16 oz.) IN-PLACE™

Sulfur Compounds

Sulfur Compounds Pounds	5	10	15	20	25	30	35	40	45	50	Example 20 Pounds Sulfur
Ounces IN-PLACE™	4	8	12	16	20	24	28	32	36	40	1 Pint (16 oz.) IN-PLACE™

Propanil

Propanil Quarts	1	2	3	4	5	6	7	8	9	10	Example 4 Quarts (128 oz.) Propanil
Ounces IN-PLACE™	4	8	12	16	20	24	28	32	36	40	1 Pint (16 oz.) IN-PLACE™

Furadan-4F®

Furadan-4F Pints	1	2	3	4	5	6	7	8	9	10	Example 1 Pint (16 oz.) Furadan-4F
Pints IN-PLACE™	1	2	3	4	5	6	7	8	9	10	1 Pint (16 oz.) IN-PLACE™

Phenoxy Herbicides

Phenoxy Herbicides Pounds	1	2	3	4	5	6	7	8	9	10	Example 4 Pounds Herbicide
Ounces IN-PLACE™	16	32	48	64	80	96	112	128	144	160	2 Quarts (64 oz.) IN-PLACE™

F-1003

Combinations:

Mix all Flowables and Wettable Powders in the water first.
Mix E.C.'s and IN-PLACE™ together. Add last.

1 Gallon = 4 Quarts = 8 Pints = 128 Fluid Ounces = 3.785 Liters
2 Tablespoons = 1 Fluid Ounce
1 U.S. Pound = 16 Ounces = .454 Kilograms

For more IN-PLACE™ Information Call
1-800-221-6580

Manufactured in the USA by:
WILBUR-ELLIS COMPANY
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ATTACHMENT D

USFWS Conservation Guidelines for the Valley Elderberry Longhorn Beetle

United States Department of the Interior

Fish and Wildlife Service
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

Conservation Guidelines for the Valley Elderberry Longhorn Beetle

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The following guidelines have been issued by the U.S. Fish and Wildlife Service (Service) to assist Federal agencies and non-federal project applicants needing incidental take authorization through a section 7 consultation or a section 10(a)(1)(B) permit in developing measures to avoid and minimize adverse effects on the valley elderberry longhorn beetle. The Service will revise these guidelines as needed in the future. The most recently issued version of these guidelines should be used in developing all projects and habitat restoration plans. The survey and monitoring procedures described below are designed to avoid any adverse effects to the valley elderberry longhorn beetle. Thus a recovery permit is not needed to survey for the beetle or its habitat or to monitor conservation areas. If you are interested in a recovery permit for research purposes please call the Service's Regional Office at (503) 231-2063.

Background Information

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), was listed as a threatened species on August 8, 1980 (Federal Register 45: 52803-52807). This animal is fully protected under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). The valley elderberry longhorn beetle (beetle) is completely dependent on its host plant, elderberry (*Sambucus* species), which is a common component of the remaining riparian forests and adjacent upland habitats of California's Central Valley. Use of the elderberry by the beetle, a wood borer, is rarely apparent. Frequently, the only exterior evidence of the elderberry's use by the beetle is an exit hole created by the larva just prior to the pupal stage. The life cycle takes one or two years to complete. The animal spends most of its life in the larval stage, living within the stems of an elderberry plant. Adult emergence is from late March through June, about the same time the elderberry produces flowers. The adult stage is short-lived. Further information on the life history, ecology, behavior, and distribution of the beetle can be found in a report by Barr (1991) and the recovery plan for the beetle (USFWS 1984).

Surveys

Proposed project sites within the range of the valley elderberry longhorn beetle should be surveyed for the presence of the beetle and its elderberry host plant by a qualified biologist. The beetle's range extends throughout California's Central Valley and associated foothills from about the 3,000-foot elevation contour on the

east and the watershed of the Central Valley on the west (Figure 1). All or portions of 31 counties are included: Alameda, Amador, Butte, Calaveras, Colusa, Contra Costa, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Madera, Mariposa, Merced, Napa, Nevada, Placer, Sacramento, San Benito, San Joaquin, San Luis Obispo, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba.

If elderberry plants with one or more stems measuring 1.0 inch or greater in diameter at ground level occur on or adjacent to the proposed project site, or are otherwise located where they may

be directly or indirectly affected by the proposed action, minimization measures which include planting replacement habitat (conservation planting) are required (Table 1).

All elderberry shrubs with one or more stems measuring 1.0 inch or greater in diameter at ground level that occur on or adjacent to a proposed project site must be thoroughly searched for beetle exit holes (external evidence of beetle presence). In addition, all elderberry stems one inch or greater in diameter at ground level must be tallied by diameter size class (Table 1). As outlined in Table 1, the numbers of elderberry seedlings/cuttings and associated riparian native trees/shrubs to be planted as replacement habitat are determined by stem size class of affected elderberry shrubs, presence or absence of exit holes, and whether a proposed project lies in a riparian or non-riparian area.

Elderberry plants with no stems measuring 1.0 inch or greater in diameter at ground level are unlikely to be habitat for the beetle because of their small size and/or immaturity. Therefore, no minimization measures are required for removal of elderberry plants with no stems measuring 1.0 inch or greater in diameter at ground level with no exit holes. Surveys are valid for a period of two years.

Avoid and Protect Habitat Whenever Possible

Project sites that do not contain beetle habitat are preferred. If suitable habitat for the beetle occurs on the project site, or within close proximity where beetles will be affected by the project, these areas must be designated as avoidance areas and must be protected from disturbance during the construction and operation of the project. When possible, projects should be designed such that avoidance areas are connected with adjacent habitat to prevent fragmentation and isolation of beetle populations. Any beetle habitat that cannot be avoided as described below should be considered impacted and appropriate minimization measures should be proposed as described below.

Avoidance: Establishment and Maintenance of a Buffer Zone

Complete avoidance (i.e., no adverse effects) may be assumed when a 100-foot (or wider) buffer is established and maintained around elderberry plants containing stems measuring 1.0 inch or greater in diameter at ground level. Firebreaks may not be included in the buffer zone. In buffer areas construction-

related disturbance should be minimized, and any damaged area should be promptly restored following construction. The Service must be consulted before any disturbances within the buffer area are considered. In addition, the Service must be provided with a map identifying the avoidance area and written details describing avoidance measures.

Protective Measures

1. Fence and flag all areas to be avoided during construction activities. In areas where encroachment on the 100-foot buffer has been approved by the Service, provide a minimum setback of at least 20 feet from the dripline of each elderberry plant.
2. Brief contractors on the need to avoid damaging the elderberry plants and the possible penalties for not complying with these requirements.
3. Erect signs every 50 feet along the edge of the avoidance area with the following information: "This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." The signs should be clearly readable from a distance of 20 feet, and must be maintained for the duration of construction.
4. Instruct work crews about the status of the beetle and the need to protect its elderberry host plant.

Restoration and Maintenance

Restore any damage done to the buffer area (area within 100 feet of elderberry plants) during construction. Provide erosion control and re-vegetate with appropriate native plants.

Buffer areas must continue to be protected after construction from adverse effects of the project. Measures such as fencing, signs, weeding, and trash removal are usually appropriate.

No insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant should be used in the buffer areas, or within 100 feet of any elderberry plant with one or more stems measuring 1.0 inch or greater in diameter at ground level.

The applicant must provide a written description of how the buffer areas are to be restored, protected, and maintained after construction is completed.

Mowing of grasses/ground cover may occur from July through April to reduce fire hazard. No mowing should occur within five (5) feet of elderberry plant stems. Mowing must be done in a manner that avoids damaging plants (e.g., stripping away bark through careless use of mowing/trimming equipment).

Transplant Elderberry Plants That Cannot Be Avoided

Elderberry plants must be transplanted if they can not be avoided by the proposed project. All elderberry plants with one or more stems measuring 1.0 inch or greater in diameter at ground level must be transplanted to a conservation area (see below). At the Service's discretion, a plant that is unlikely to survive transplantation because of poor condition or location, or a plant that would be extremely difficult to move because of access problems, may be exempted from transplantation. In cases where transplantation is not possible the minimization ratios in Table 1 may be increased to offset the additional habitat loss.

Trimming of elderberry plants (e.g., pruning along roadways, bike paths, or trails) with one or more stems 1.0 inch or greater in diameter at ground level, may result in take of beetles. Therefore, trimming is subject to appropriate minimization measures as outlined in Table 1.

1. Monitor. A qualified biologist (monitor) must be on-site for the duration of the transplanting of the elderberry plants to insure that no unauthorized take of the valley elderberry longhorn beetle occurs. If unauthorized take occurs, the monitor must have the authority to stop work until corrective measures have been completed. The monitor must immediately report any unauthorized take of the beetle or its habitat to the Service and to the California Department of Fish and Game.

2. Timing. Transplant elderberry plants when the plants are dormant, approximately November through the first two weeks in February, after they have lost their leaves. Transplanting during the non-growing season will reduce shock to the plant and increase transplantation success.

3. Transplanting Procedure.

- a. Cut the plant back 3 to 6 feet from the ground or to 50 percent of its height (whichever is taller) by removing branches and stems above this height. The trunk and all stems measuring 1.0 inch or greater in diameter at ground level should be replanted. Any leaves remaining on the plant should be removed.

- b. Excavate a hole of adequate size to receive the transplant.

- c. Excavate the plant using a Vemeer spade, backhoe, front end loader, or other suitable equipment, taking as much of the root ball as possible, and replant immediately at the conservation area. Move the plant only by the root ball. If the plant is to be moved and transplanted off site, secure the root ball with wire and wrap it with burlap. Dampen the burlap with water, as necessary, to keep the root ball wet. Do not let the roots dry out. Care should be taken to ensure that the soil is not dislodged from around the roots of the transplant. If the site receiving the transplant does not have

adequate soil moisture, pre-wet the soil a day or two before transplantation.

d. The planting area must be at least 1,800 square feet for each elderberry transplant. The root ball should be planted so that its top is level with the existing ground. Compact the soil sufficiently so that settlement does not occur. As many as five (5) additional elderberry plantings (cuttings or seedlings) and up to five (5) associated native species plantings (see below) may also be planted within the 1,800 square foot area with the transplant. The transplant and each new planting should have its own watering basin measuring at least three (3) feet in diameter. Watering basins should have a continuous berm measuring approximately eight (8) inches wide at the base and six (6) inches high.

e. Saturate the soil with water. Do not use fertilizers or other supplements or paint the tips of stems with pruning substances, as the effects of these compounds on the beetle are unknown.

f. Monitor to ascertain if additional watering is necessary. If the soil is sandy and well-drained, plants may need to be watered weekly or twice monthly. If the soil is clayey and poorly-drained, it may not be necessary to water after the initial saturation. However, most transplants require watering through the first summer. A drip watering system and timer is ideal. However, in situations where this is not possible, a water truck or other apparatus may be used.

Plant Additional Seedlings or Cuttings

Each elderberry stem measuring 1.0 inch or greater in diameter at ground level that is adversely affected (i.e., transplanted or destroyed) must be replaced, in the conservation area, with elderberry seedlings or cuttings at a ratio ranging from 1:1 to 8:1 (new plantings to affected stems). Minimization ratios are listed and explained in Table 1. Stock of either seedlings or cuttings should be obtained from local sources. Cuttings may be obtained from the plants to be transplanted if the project site is in the vicinity of the conservation area. If the Service determines that the elderberry plants on the proposed project site are unsuitable candidates for transplanting, the Service may allow the applicant to plant seedlings or cuttings at higher than the stated ratios in Table 1 for each elderberry plant that cannot be transplanted.

Plant Associated Native Species

Studies have found that the beetle is more abundant in dense native plant communities with a mature overstory and a mixed understory. Therefore, a mix of native plants associated with the elderberry plants at the project site or similar sites will be planted at ratios ranging from 1:1 to 2:1 [native tree/plant species to each elderberry seedling or cutting (see Table 1)]. These native plantings must be monitored with the same survival criteria used for the elderberry seedlings

(see below). Stock of saplings, cuttings, and seedlings should be obtained from local sources. If the parent stock is obtained from a distance greater than one mile from the conservation area, approval by the Service of the native plant donor sites must be obtained prior to initiation of the revegetation work. Planting or seeding the conservation area with native herbaceous species is encouraged. Establishing native grasses and forbs may discourage unwanted non-native species from becoming established or persisting at the conservation area. Only stock from local sources should be used.

Examples

Example 1

The project will adversely affect beetle habitat on a vacant lot on the land side of a river levee. This levee now separates beetle habitat on the vacant lot from extant Great Valley Mixed Riparian Forest (Holland 1986) adjacent to the river. However, it is clear that the beetle habitat located on the vacant lot was part of a more extensive mixed riparian forest ecosystem extending farther from the river's edge prior to agricultural development and levee construction. Therefore, the beetle habitat on site is considered riparian. A total of two elderberry plants with at least one stem measuring 1.0 inch or greater in diameter at ground level will be affected by the proposed action. The two plants have a total of 15 stems measuring over 1.0 inch. No exit holes were found on either plant. Ten of the stems are between 1.0 and 3.0 inches in diameter and five of the stems are greater than 5.0 inches in diameter. The conservation area is suited for riparian forest habitat. Associated natives adjacent to the conservation area are box elder (*Acer negundo californica*), walnut (*Juglans californica* var. *hindsii*), sycamore (*Platanus racemosa*), cottonwood (*Populus fremontii*), willow (*Salix gooddingii* and *S. laevigata*), white alder (*Alnus rhombifolia*), ash (*Fraxinus latifolia*), button willow (*Cephalanthus occidentalis*), and wild grape (*Vitis californica*).

Minimization (based on ratios in Table 1):

- Transplant the two elderberry plants that will be affected to the conservation area.
- Plant 40 elderberry rooted cuttings (10 affected stems compensated at 2:1 ratio and 5 affected stems compensated at 4:1 ratio, cuttings planted:stems affected)
- Plant 40 associated native species (ratio of associated natives to elderberry plantings is 1:1 in areas with no exit holes):
 - 5 saplings each of box elder, sycamore, and cottonwood
 - 5 willow seedlings
 - 5 white alder seedlings

5 saplings each of walnut and ash

3 California button willow

2 wild grape vines

Total: 40 associated native species

- Total area required is a minimum of 1,800 sq. ft. for one to five elderberry seedlings and up to 5 associated natives. Since, a total of 80 plants must be planted (40 elderberries and 40 associated natives), a total of 0.33 acre (14,400 square feet) will be required for conservation plantings. The conservation area will be seeded and planted with native grasses and forbs, and closely monitored and maintained throughout the monitoring period.

Example 2

The project will adversely affect beetle habitat in Blue Oak Woodland (Holland 1986). One elderberry plant with at least one stem measuring 1.0 inch or greater in diameter at ground level will be affected by the proposed action. The plant has a total of 10 stems measuring over 1.0 inch. Exit holes were found on the plant. Five of the stems are between 1.0 and 3.0 inches in diameter and five of the stems are between 3.0 and 5.0 inches in diameter. The conservation area is suited for elderberry savanna (non-riparian habitat). Associated natives adjacent to the conservation area are willow (*Salix* species), blue oak (*Quercus douglasii*), interior live oak (*Q. wislizenii*), sycamore, poison oak (*Toxicodendron diversilobum*), and wild grape.

Minimization (based on ratios in Table 1):

- Transplant the one elderberry plant that will be affected to the conservation area.
- Plant 30 elderberry seedlings (5 affected stems compensated at 2:1 ratio and 5 affected stems compensated at 4:1 ratio, cuttings planted:stems affected)
- Plant 60 associated native species (ratio of associated natives to elderberry plantings is 2:1 in areas with exit holes):
 - 20 saplings of blue oak, 20 saplings of sycamore, and 20 saplings of willow, and seed and plant with a mixture of native grasses and forbs
- Total area required is a minimum of 1,800 sq. ft. for one to five elderberry seedlings and up to 5 associated natives. Since, a total of 90 plants must be planted (30 elderberries and 60 associated natives), a total of 0.37 acre (16,200 square feet) will be required for conservation plantings. The

conservation area will be seeded and planted with native grasses and forbs, and closely monitored and maintained throughout the monitoring period.

Conservation Area—Provide Habitat for the Beetle in Perpetuity

The conservation area is distinct from the avoidance area (though the two may adjoin), and serves to receive and protect the transplanted elderberry plants and the elderberry and other native plantings. The Service may accept proposals for off-site conservation areas where appropriate.

1. Size. The conservation area must provide at least 1,800 square feet for each transplanted elderberry plant. As many as 10 conservation plantings (i.e., elderberry cuttings or seedlings and/or associated native plants) may be planted within the 1800 square foot area with each transplanted elderberry. An additional 1,800 square feet shall be provided for every additional 10 conservation plants. Each planting should have its own watering basin measuring approximately three feet in diameter. Watering basins should be constructed with a continuous berm measuring approximately eight inches wide at the base and six inches high.

The planting density specified above is primarily for riparian forest habitats or other habitats with naturally dense cover. If the conservation area is an open habitat (i.e., elderberry savanna, oak woodland) more area may be needed for the required plantings. Contact the Service for assistance if the above planting recommendations are not appropriate for the proposed conservation area.

No area to be maintained as a firebreak may be counted as conservation area. Like the avoidance area, the conservation area should connect with adjacent habitat wherever possible, to prevent isolation of beetle populations.

Depending on adjacent land use, a buffer area may also be needed between the conservation area and the adjacent lands. For example, herbicides and pesticides are often used on orchards or vineyards. These chemicals may drift or runoff onto the conservation area if an adequate buffer area is not provided.

2. Long-Term Protection. The conservation area must be protected in perpetuity as habitat for the valley elderberry longhorn beetle. A conservation easement or deed restrictions to protect the conservation area must be arranged. Conservation areas may be transferred to a resource agency or appropriate private organization for long-term management. The Service must be provided with a map and written details identifying the conservation area; and the applicant must receive approval from the Service that the conservation area is acceptable prior to initiating the conservation program. A true, recorded copy of the deed transfer, conservation easement, or deed restrictions protecting the

conservation area in perpetuity must be provided to the Service before project implementation.

Adequate funds must be provided to ensure that the conservation area is managed in perpetuity. The applicant must dedicate an endowment fund for this purpose, and designate the party or entity that will be responsible for long-term management of the conservation area. The Service must be provided with written documentation that funding and management of the conservation area (items 3-8 above) will be provided in perpetuity.

3. Weed Control. Weeds and other plants that are not native to the conservation area must be removed at least once a year, or at the discretion of the Service and the California Department of Fish and Game. Mechanical means should be used; herbicides are prohibited unless approved by the Service.

4. Pesticide and Toxicant Control. Measures must be taken to insure that no pesticides, herbicides, fertilizers, or other chemical agents enter the conservation area. No spraying of these agents must be done within one 100 feet of the area, or if they have the potential to drift, flow, or be washed into the area in the opinion of biologists or law enforcement personnel from the Service or the California Department of Fish and Game.

5. Litter Control. No dumping of trash or other material may occur within the conservation area. Any trash or other foreign material found deposited within the conservation area must be removed within 10 working days of discovery.

6. Fencing. Permanent fencing must be placed completely around the conservation area to prevent unauthorized entry by off-road vehicles, equestrians, and other parties that might damage or destroy the habitat of the beetle, unless approved by the Service. The applicant must receive written approval from the Service that the fencing is acceptable prior to initiation of the conservation program. The fence must be maintained in perpetuity, and must be repaired/replaced within 10 working days if it is found to be damaged. Some conservation areas may be made available to the public for appropriate recreational and educational opportunities with written approval from the Service. In these cases appropriate fencing and signs informing the public of the beetle's threatened status and its natural history and ecology should be used and maintained in perpetuity.

7. Signs. A minimum of two prominent signs must be placed and maintained in perpetuity at the conservation area, unless otherwise approved by the Service. The signs should note that the site is habitat of the federally threatened valley elderberry longhorn beetle and, if appropriate, include information on the beetle's natural history and ecology. The signs must be approved by the Service. The signs must be

repaired or replaced within 10 working days if they are found to be damaged or destroyed.

Monitoring

The population of valley elderberry longhorn beetles, the general condition of the conservation area, and the condition of the elderberry and associated native plantings in the conservation area must be monitored over a period of either ten (10) consecutive years or for seven (7) years over a 15-year period. The applicant may elect either 10 years of monitoring, with surveys and reports every year; or 15 years of monitoring, with surveys and reports on years 1, 2, 3, 5, 7, 10, and 15. The conservation plan provided by the applicant must state which monitoring schedule will be followed. No change in monitoring schedule will be accepted after the project is initiated. If conservation planting is done in stages (i.e., not all planting is implemented in the same time period), each stage of conservation planting will have a different start date for the required monitoring time.

Surveys. In any survey year, a minimum of two site visits between February 14 and June 30 of each year must be made by a qualified biologist. Surveys must include:

1. A population census of the adult beetles, including the number of beetles observed, their condition, behavior, and their precise locations. Visual counts must be used; mark-recapture or other methods involving handling or harassment must not be used.
2. A census of beetle exit holes in elderberry stems, noting their precise locations and estimated ages.
3. An evaluation of the elderberry plants and associated native plants on the site, and on the conservation area, if disjunct, including the number of plants, their size and condition.
4. An evaluation of the adequacy of the fencing, signs, and weed control efforts in the avoidance and conservation areas.
5. A general assessment of the habitat, including any real or potential threats to the beetle and its host plants, such as erosion, fire, excessive grazing, off-road vehicle use, vandalism, excessive weed growth, etc.

The materials and methods to be used in the monitoring studies must be reviewed and approved by the Service. All appropriate Federal permits must be obtained prior to initiating the field studies.

Reports. A written report, presenting and analyzing the data from the project monitoring, must be prepared by a qualified biologist in each of the years in which a monitoring survey is required. Copies of the report must be submitted by December 31 of the same year to the Service (Chief of Endangered Species, Sacramento Fish and Wildlife Office), and the Department of Fish and Game

(Supervisor, Environmental Services, Department of Fish and Game, 1416 Ninth Street, Sacramento, California 95814; and Staff Zoologist, California Natural Diversity Data Base, Department of Fish and Game, 1220 S Street, Sacramento, California 95814). The report must explicitly address the status and progress of the transplanted and planted elderberry and associated native plants and trees, as well as any failings of the conservation plan and the steps taken to correct them. Any observations of beetles or fresh exit holes must be noted. Copies of original field notes, raw data, and photographs of the conservation area must be included with the report. A vicinity map of the site and maps showing where the individual adult beetles and exit holes were observed must be included. For the elderberry and associated native plants, the survival rate, condition, and size of the plants must be analyzed. Real and likely future threats must be addressed along with suggested remedies and preventative measures (e.g. limiting public access, more frequent removal of invasive non-native vegetation, etc.).

A copy of each monitoring report, along with the original field notes, photographs, correspondence, and all other pertinent material, should be deposited at the California Academy of Sciences (Librarian, California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118) by December 31 of the year that monitoring is done and the report is prepared. The Service's Sacramento Fish and Wildlife Office should be provided with a copy of the receipt from the Academy library acknowledging receipt of the material, or the library catalog number assigned to it.

Access. Biologists and law enforcement personnel from the California Department of Fish and Game and the Service must be given complete access to the project site to monitor transplanting activities. Personnel from both these agencies must be given complete access to the project and the conservation area to monitor the beetle and its habitat in perpetuity.

Success Criteria

A minimum survival rate of at least 60 percent of the elderberry plants and 60 percent of the associated native plants must be maintained throughout the monitoring period. Within one year of discovery that survival has dropped below 60 percent, the applicant must replace failed plantings to bring survival above this level. The Service will make any determination as to the applicant's replacement responsibilities arising from circumstances beyond its control, such as plants damaged or killed as a result of severe flooding or vandalism.

Service Contact

These guidelines were prepared by the Endangered Species Division of the Service's Sacramento Fish and Wildlife Office. If you have questions regarding these guidelines or to request a copy of the most recent guidelines, telephone (916) 414-6600, or write to:

U.S. Fish and Wildlife Service
Ecological Services

2800 Cottage Way, W-2605
Sacramento, CA 95825

Literature Cited

Barr, C. B. 1991. The distribution, habitat, and status of the valley elderberry longhorn beetle *Desmocerus californicus dimorphus*. U.S. Fish and Wildlife Service; Sacramento, California.

Holland, R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. Unpublished Report. State of California, The Resources Agency, Department of Fish and Game, Natural Heritage Division, Sacramento, California.

USFWS. 1980. Listing the valley elderberry longhorn beetle as a threatened species with critical habitat. Federal Register 45:52803-52807.

USFWS. 1984. Recovery plan for the valley elderberry longhorn beetle. U.S. Fish and Wildlife Service, Endangered Species Program; Portland, Oregon.

Table 1: Minimization ratios based on location (riparian vs. non-riparian), stem diameter of affected elderberry plants at ground level, and presence or absence of exit holes.

Location	Stems (maximum diameter at ground level)	Exit Holes on Shrub Y/N (quantify) ¹	Elderberry Seedling Ratio ²	Associated Native Plant Ratio ³
non-riparian	stems ≥ 1 " & ≤ 3 "	No:	1:1	1:1
		Yes:	2:1	2:1
non-riparian	stems > 3 " & < 5 "	No:	2:1	1:1
		Yes:	4:1	2:1
non-riparian	stems ≥ 5 "	No:	3:1	1:1
		Yes:	6:1	2:1
riparian	stems ≥ 1 " & ≤ 3 "	No:	2:1	1:1
		Yes:	4:1	2:1
riparian	stems > 3 " & < 5 "	No:	3:1	1:1
		Yes:	6:1	2:1
riparian	stems ≥ 5 "	No:	4:1	1:1
		Yes:	8:1	2:1

1 All stems measuring one inch or greater in diameter at ground level on a single shrub are considered occupied when exit holes are present anywhere on the shrub.

2 Ratios in the Elderberry Seedling Ratio column correspond to the number of cuttings or seedlings to be planted per elderberry stem (one inch or greater in diameter at ground level) affected by a project.

3 Ratios in the Associated Native Plant Ratio column correspond to the number of associated native species to be planted per elderberry (seedling or cutting) planted.



Figure 1: Range of the Valley Elderberry Longhorn Beetle