Exhibit Number:	:	SED-51
CPUC Proceeding	:	H.25-07-005
Sponsor	:	SED
Witness	:	SED
Date Ident.	:	
Recd.	:	
Admin. Law Judge	:	Gerald F. Kelly

SAFETY ENFORCEMENT DIVISION
California Public Utilities Commission

PacifiCorp Vegetation Management SOP

San Francisco, California
May 2026

PACIFICORP

A BERKSHIRE HATHAWAY ENERGY COMPANY

Transmission & Distribution
Vegetation Management Program
Standard Operating Procedures

Mission Statement:

Manage trees and vegetation around PacifiCorp's transmission and distribution facilities in a professional, cost effective and environmentally conscientious manner to provide safe, reliable and outstanding service to our customers.

Approval: Chris Spencer, Managing Director, T&D Support Services Date: 08/19/2019

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1. PROGRAM OVERVIEW

PacifiCorp has an extensive vegetation management program, for both its transmission and distribution systems. Trees growing into or near power lines can create safety and service reliability risks, and PacifiCorp's vegetation management program seeks to minimize such risks, primarily by pruning trees, Scientifically-based arboricultural practice of removing tree parts, or removing trees which could grow into power lines.

The risks of unchecked vegetation growth are well known. Close growing branches can provide access for children and others to high-voltage lines, exposing them to the potential danger of serious injury or death due to electric contact. Branches touching power lines can spark and start fires and cause interruptions in electric supply. Trees whipped by winds or weighed down by rain or snow can interrupt power, which disrupts businesses, homes, and compromises critical community infrastructure, such as hospitals and emergency services. Three major electric grid failures, including the catastrophic blackout on August 14, 2003, were initiated by tree-caused outages on transmission lines (Cieslewicz and Novembri 2004). For these reasons and others, the National Electrical Safety Code (American National Standards Institute 2016). Section 2l8-A-l, states:

Trees which may damage ungrounded supply conductors should be pruned or removed. Normal tree growth, the combined movement of trees and conductors under adverse weather conditions, voltage and sagging of conductors at elevated temperatures are among the factors considered in determining clearance specifications.

Particularly in the case of transmission lines, PacifiCorp favors the removal of tall-growing trees in favor of low-growing species that will never interfere with the high-voltage lines. In giving consideration to the interests of property owners and other land use objectives, however, it is not always possible to remove conflicting trees. Thus, tall-growing trees that cannot be removed must be pruned to keep power lines clear. To this end, PacifiCorp uses modern, arboriculturally-sound pruning practices.

PacifiCorp's vegetation management program is modeled on the industry's best practices, including systematic maintenance, scientifically-based pruning, tree removal, tree replacement, cover type conversion, herbicide use and tree growth regulator applications, and the use of specialized tools and equipment. PacifiCorp is progressive in trying innovative methods, products, and equipment to improve safety and productivity. These standard operating procedures cover the vegetation management program for both distribution and transmission facilities. These procedures also include program descriptions, specifications and protocols for customer relations. In addition to providing direction for PacifiCorp's professional Foresters, these standard operating procedures are binding on all contractors performing vegetation management on PacifiCorp's system.

1.1 Applicable References

The following standards and best practices should be followed:

- *American National Standard for Tree Care Operations: ANSI A300 (Part 1) Pruning*
- *American National Standard for Tree Care Operations: ANSI A300 (Part 7) Integrated Vegetation Management*
- *American National Standard for Tree Care Operations: ANSI A300 (Part 9) Tree Risk Assessment.*
- *American National Standard for Arboricultural Operations ANSI Z133 Safety Requirements*

The following best practices should be followed:

- International Society of Arboriculture: *Best Management Practices, Utility Pruning of Trees*
- International Society of Arboriculture: *Best Management Practices, Integrated Vegetation Management*
- International Society of Arboriculture: *Best Management Practices, Tree Risk Assessment*
- Utility Arborist Association Best Management Practices: *Field Guide to Closed Chain of Custody for Herbicides in the Utility*

1.2 Professionalism

PacifiCorp employs a staff of professional Foresters ("Foresters") to manage its vegetation program. All Foresters on PacifiCorp's system are to be International Society of Arboriculture (ISA). Certified Arborists and Certified Utility Specialists. PacifiCorp also encourages ISA Board Certified Master Arborist credentials among its staff Foresters.

1.2.1 Required Qualifications for Independent Contractors

PacifiCorp also has required certifications for the independent contractors who perform vegetation management services for PacifiCorp.

Front line managers for the independent contractors retained by PacifiCorp must be ISA Certified Arborists and ISA Certified Utility Specialists. These front line managers are often called supervisors or general foremen in the field and are referred to as "Supervisors" in these standard operating procedures.

Forest technicians working on PacifiCorp projects are required to have certain levels of experience, certifications, and professional qualifications. On a temporary basis for no more than 90 days, PacifiCorp will allow a forest technician with Forest Technician I classification. In all other circumstances, a forest technician must have a Forest Technician II classification or higher.

- Forest Technician I —No certifications, qualifications or experience required.
- Forest Technician II—Minimum of 3 years arboriculture-related experience. ISA Arborist certification and certified pesticide applicator license required.
- Forest Technician III—Minimum of 5 years arborculture-related experience or 3 years plus an associate's degree in a related field. ISA Arborist and Utility Specialist certifications and certified pesticide applicator license required.

- Forest Technician IV—Minimum of 8 years arboriculture related experience or 4 years plus a Bachelor of Science degree in a related field. ISA Arborist and Utility Specialist certifications, certified pesticide applicator license, and ISA Tree Risk Qualification required.

For additional certifications related to safety, for all personnel including forest technicians see Section 2.1 below.

1.3 Tree Line USA

PacifiCorp has been a Tree Line USA recipient utility every year since 2002. Tree Line USA is an award from the National Arbor Day Foundation, which recognizes utilities for utilizing practices that protect America's urban forests. To qualify, utilities must apply scientifically-based tree care, conduct annual worker training, plant trees, and conduct public education, including participating in Arbor Day celebrations. Contract employees should participate in annual worker training to cooperate with and help PacifiCorp continue to merit this award.

2. GENERAL PROCEDURES

This chapter sets forth many general procedures for vegetation management work, whether on distribution lines (see Chapter 5) or on transmission lines (see Chapter 6).

2.1 Safety

Federal and state OSHA requirements governing vegetation management activities shall be followed at all times. ANSI Z133 (American National Standards Institute 2017) and OSHA 1910.269, are examples of these requirements. Activities shall be conducted in a manner that minimizes both tree crew and public safety risks. Crews shall have functional radio or telephone communication on the job site at all times.

PacifiCorp's electrical system will continue in normal operations during routine vegetation management work. Contract employees shall be aware of the potential dangers and qualified to work in the vicinity of energized facilities. Contract personnel performing line clearance work shall hold one of the following designations as defined by ANSI Z133:

- Qualified Line Clearance Arborist
- Qualified Line Clearance Arborist Trainee

2.1.1 Holds and Clearances

Minimum approach distances for qualified line clearance arborists specified in ANSI Z133 or PacifiCorp's Accident Prevention Manual (Joint APM Safety Committee 2017) should not be compromised. If there is a difference in the distances required in the two standards, the greater of the two is operative. If work requires violating minimum approach distances, or if a crew leader determines conditions to be unsafe, crew leaders should contact their Supervisor before proceeding. The Supervisor should determine whether or not a clearance or Hold is necessary at that work site.

A "**Hold**" means deactivating automatic line reclosers on a circuit. A Hold is intended to protect PacifiCorp facilities and should not be considered a safety measure. If, in the judgment of the crew leader, an energized line cannot be worked safely, the Supervisor should arrange a Clearance. A "**Clearance**" is de-energizing a line for safety purposes. (Note: a Clearance, as defined here and capitalized as a defined term should not be confused with the use of the word clearance in describing vegetation management work designed to maintain clearances between vegetation and conductors.)

PacifiCorp does not issue Holds or Clearances to tree crews. Rather, if warranted, PacifiCorp will issue Holds or Clearances to a journeyman lineman, who shall be present at the site during work. Holds require at least 48 hours' notice to the Control Center, vegetation management and the district operations manager. Customers who will be affected by planned power outages associated with Clearances must also receive 48 hours notice, except during emergency situations such as storm restoration work. In some cases, a Clearances on transmission lines must

be requested weeks or even months in advance. Customers do not need to be notified if a Clearances is necessary to safely work trees from lines in an emergency.

De-energized lines, whether due to a planned outage, wind or storm damage, or some other reason, must be worked as if they are energized. If an energized line cannot be worked safely, it must be grounded. Linemen must set the grounds and be present during work and give approval prior to tree crew members breaching minimum approach distances to ensure safety.

Unless a lineman has given approval to tree crew members to breach minimum approach distances, the following minimum approach distances much be maintained by qualified line-clearance arborists and line-clearance arborist trainees at all time.

Table 2.1. Minimum approach distances for qualified line-clearance arborists and line-clearance arborist trainees.

Voltage (kV)	Minimum Approach Distance			
(Phase-to-Phase)	Sea Level to 5000 ft.	5000 to 10000 ft	10000 to 14000	Source
0.05-0.300	Avoid contact	Avoid contact	Avoid contact	APM/Z133
0.301-0.750	1’ 6”	1’ 7”	1’ 7”	APM/Z133
0.751-15.0	2’ 6”	2’ 7”	2’ 10	APM/Z133
15.1-46	3’ 6”	3’ 7”	3’ 8”	APM/Z133
46.1-72.5	3’ 6”	4’ 0”	4’ 4”	Z133
72-121.0	3’ 11”	4’ 6”	4’ 10”	Z133
121.1-145.0	4’ 6”	5’ 2”	5’ 7”	Z133
145.1-169.0	5’ 1”	5’ 9”	6’ 3”	Z133
169.1-242.0	7’ 0”	7’ 11”	8’ 7”	Z133
242.1-362.0	11’ 9”	13’ 6”	14’ 7”	Z133
362.1-420.0	14’ 8”	16’ 9”	18” 2”	Z133
420.1-550.0	17’ 6”	20’ 0”	21’ 8”	Z133
550.1-800.0	23’ 9”	27’ 2”	29’ 5”	Z133

APM is Pacificorp’s Accident Prevention Manual (Joint APM Safety Committee 2017).
ANSI Z133 is the American National Standard for Tree Care Operations.

2.1.2 Emergencies

An emergency is major storm (as declared by PacifiCorp), or situation where vegetation has either caused or presents a clear, imminent threat of causing an outage, fire or public electric contact.

2.1.2.1 Whistles

Every crew member, Supervisor and Forester shall carry a whistle at all times while on work sites. A whistle shall be used as an alarm, commanding all crew members to immediately stop work and respond to the emergency. Whistle blasts should also be used to initiate aerial rescue drills. Whistles are not to be used for non-emergency situations, such as getting another crew member’s attention.

2.1.2.2 Tree on Line

If a tree or tree part accidentally falls onto an energized line, work shall stop immediately. If emergency services are required, 911 should be called. The incident should also be reported to the applicable PacifiCorp Control Center (Table 2.2).

Table 2.2. Control center numbers

Control Center	Phone Number	Service Areas
PP North	(503) 408-3623	Astoria/Clatsop, OR; Bend, OR; Hood River, OR; Pendleton, OR; Portland, OR; Walla Walla, WA; Yakima, WA
PP Central	(503) 408-3626	Albany, OR; Lincoln City, OR; Casper, WY; Cody, WY; Douglas, WY; Laramie, WY; Rawlins, WY; Riverton, WY; Rock Springs, WY; Worland, WY
PP South	(503) 408-3629	Coos Bay, OR; Crescent City, OR; Grants Pass, OR; Kalamath Falls, OR; Medford, OR; Mount Shasta, CA; Roseburg, OR; Yreka, CA
RMP North	(801)220-6930	Entire service territory

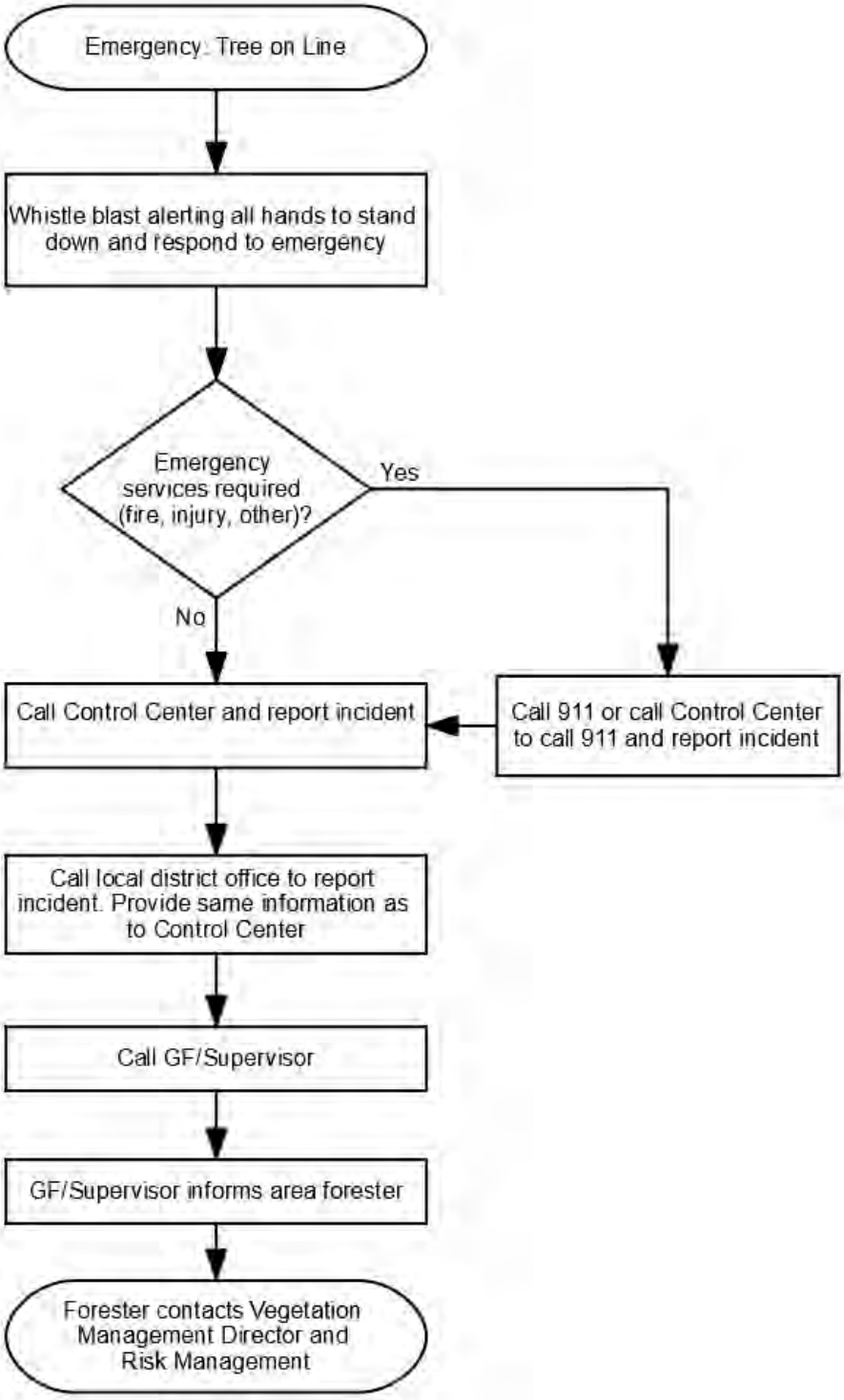

Figure 2.1. Emergency procedure for tree-on-line incident.

2.1.3 Readily Climbable Trees

Readily climbable trees have low limbs that are accessible from the ground and sufficiently strong and close together to support a child or average person and can be accessed by climbing from the ground (without using a ladder, vehicle, or special equipment). Readily climbable trees are typically located near homes, schools, parks, businesses or other locations where people (particularly children) frequent.

Readily climbable trees pose an extremely high risk when a trunk or main stem would allow a child or average person to climb within arm's reach of an uninsulated, energized electric line. If a readily climbable tree has grown within such an area, the tree shall be immediately removed or pruned consistent with the process set forth in Chapter 8. If possible, branches should also be removed to at least 8 feet above the ground (to discourage climbing on the tree generally).

2.1.4 Tree Houses

Tree houses built in trees growing near power lines present possible electric safety risks. Children or others may contact the line, either directly or indirectly, if a tree house is built too close to conductors. Indirect contact may occur through any conductive object, including a tree or tree parts that are contacting power lines. Minimum tree house distances are set at twice the minimum approach distance to energized conductors for arborists not qualified by training and experience to work within 10 feet of electrical conductors (ANSI Z133, Table 1).

Tree houses built in trees growing in proximity to power lines must meet two criteria in order to remain where they are located. First, no part of the structure may be any closer than the distance specified in Table 2.3. Second, the tree must be pruned sufficiently to maintain the clearance distances specified in Table 2.3 throughout the time period prior to the next scheduled work. Maximum line sag and sway must also be taken into consideration. If these conditions cannot be met, tree houses shall be removed promptly, consistent with the process set forth in Chapter 8. As an alternative to removal, facility reconfiguration may be done at a property owner's request and expense.

2.1.5 Fire Protection

Federal, state and local fire protection laws and regulations shall be followed, and the contractor performing the work must obtain necessary work permits. Crews shall have all firefighting tools and equipment required by the responsible governmental agency. Contractors shall also adhere to fire restrictions concerning work hours, fire watch following work and other policies of the pertinent jurisdiction. Contractors with crews working in fire-prone rural areas are expected to provide basic fire prevention and suppression training to their crews.

Table 2.3. Tree house clearances

Voltage Phase to Phase (kV)	Minimum Tree House Distance From Conductors (Ft-In)	Tree Clearance (Ft-In)
≤ 50	20-00	10-00
50.1-72.5	22-00	11-00
72.6-121.0	25-04	12-08
138.0-145.0	26-08	13-04
161.0-169.0	28-00	14-00
230.0-242.0	33-04	16-08
345.0-362.0	41-04	20-08
500.0-550.0	53-04	26-08
785.0-800.0	70-00	35-00

2.1.6 At-Fault Tree Crew Caused Outages

Primary distribution and transmission outages caused by tree crews shall be assessed by a committee made up of the managing director of distribution and transmission support, director of vegetation management, business analyst and two contract representatives. The conduct of the subject crew during the incident will be compared to requirements in ANSI Z133, OSHA 1610.269, contractor safety rules and the PacifiCorp Accident Prevention Manual. Outages determined to be "at fault" by the majority of committee members will result in a credit to PacifiCorp from the contractor in an amount specified contractually.

2.2 Environment

Environmental respect is a core value of PacifiCorp, as well as Berkshire Hathaway Energy, the parent company of PacifiCorp. Contractors are required to strictly adhere to all environmental rules and regulations. Moreover, contractors are also required to conform to the additional environmental protections contained in these standard operating procedures.

2.2.1 Species of Concern

Tree work should not disturb or harm any rare, threatened, endangered, or protected plant or animal species. Nesting season work restrictions are examples of important scheduling considerations necessary to accommodate protected species. Prior to beginning projects on

federal and state lands, PacifiCorp Foresters will contact the responsible agency to determine whether or not such species are present on the right-of-way. If there are such species present, Foresters should contact PacifiCorp environmental services for support.

All tree and brush work shall conform to guidelines of the responsible governing agency. Field data inventories of threatened or endangered species may be on file in PacifiCorp district offices. PacifiCorp environmental services should be contacted whenever threatened and endangered species are identified.

2.2.2 Wetlands

Wetlands are lands where water saturation is the dominant factor determining the nature of soil development and the types of plant and animal communities present living in and on the soil (US EPA 2015). Wetlands shall be worked by hand. Federal, State and local laws and regulations concerning wetlands shall be followed.

2.2.3 Stream Protection

Work shall not pollute water. Trees shall not be felled into streams or drainage ditches in a way that could obstruct or impair the flow of water, unless instructed otherwise by the responsible governing agency. Machine work shall not be performed within fifty feet of a stream. Soil or debris shall not be placed below the high water mark of streams, unless instructed otherwise by a responsible authority. Equipment shall use existing or designated stream crossings. State forestry or fish and wildlife agencies shall be contacted if tree removal in and around streams could cause erosion or if resulting exposure could increase water temperature. Federal and state laws and regulations shall be followed concerning stream protection.

2.2.4 Bird Protection

Migratory birds are protected by the Migratory Bird Treaty Act of 1918 (16 USC 703-712). Most bird species are protected under the Act; therefore, in an abundance of caution, all bird species should be considered subject to the law's provisions. Contractors are expected to provide whatever training is necessary to ensure that their crews comply with the Act and adhere to these standard operating procedures.

The Migratory Bird Treaty Act prohibits removal of bird nests that have eggs or chicks and killing any birds which are members of any protected species. Active nests may be disturbed only in rare cases of urgent fire or electrical safety risk (in the judgment of the responsible Forester). If tree crews identify a possible immediate risk, they should contact the regional Forester for authorization. Foresters should consult PacifiCorp environmental services regarding whether or not work may be approved. If it may not, work should be postponed until after young have left the nest.

The nests of eagles, threatened and endangered species, and colonial water bird nests (such as those of cormorants and herons) may not be disturbed regardless of whether or not they are active. Eagles are subject to additional protection insofar as it is illegal to disturb them near their nests or winter roosting sites.

Raptors (birds of prey) and herons require buffers (Table 2.4) around active nests to prevent them from being disturbed, unless instructed otherwise by competent environmental or fish and wildlife authorities.

Table 2.4. Work buffers around active nests of eagles, hawks, and herons.

Species	Work Buffer
Herons	1000 feet
Owls	¼-mile
Hawks, ospreys, golden eagles	½-mile
Bald eagles	1 mile

In general, if a bird leaves a nest and does not return within an hour, it is being disturbed and the buffer should be increased. In these cases, environmental services should be contacted within 24 hours to monitor the nest and respond appropriately if the adults fail to return.

Active bird nests and inactive eagle nests should be reported to the appropriate Forester and environmental services using the procedure outlined in Figure 2.2.

Anyone working in vegetation management encountering a dead bird should report it to environmental services

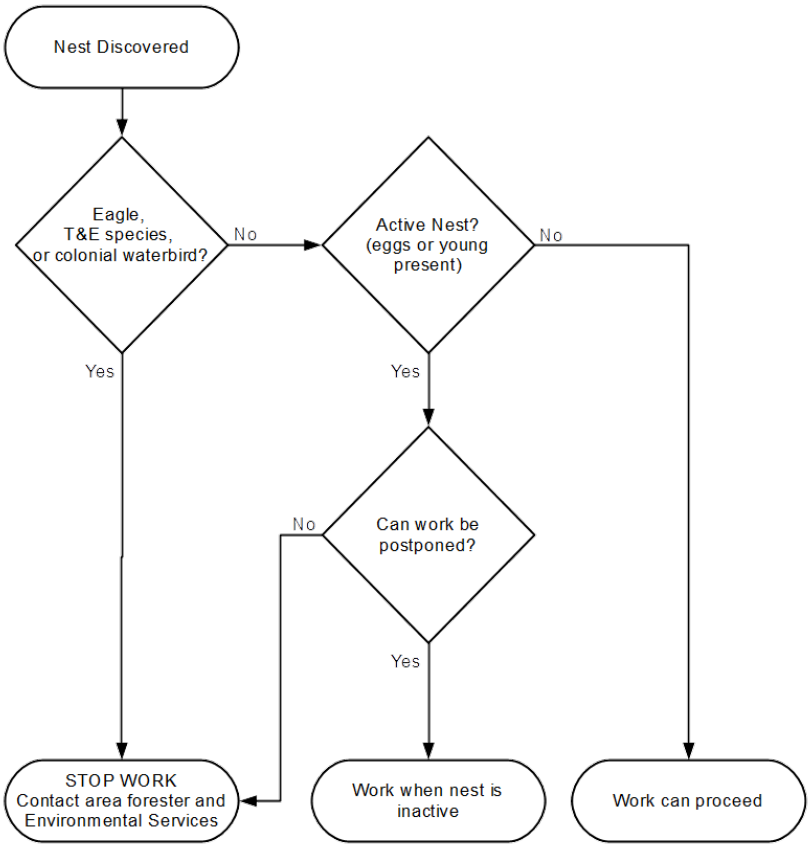

Figure 2.2. Bird nest procedure

2.2.5 Spills

To prepare for accidental spills, absorptive material shall be available. Mixing, loading and cleaning equipment are critical activities that present the greatest exposure to accidents or spills.

In the event of a spill or herbicide misapplication:

- STOP, CONTAIN, ISOLATE
  - Stop the source of the spill
  - Contain the spill (it is especially important to prevent the spill from entering waterways)
  - Isolate the area – prevent people or vehicles from passing through the area.
- Report the spill to the Spill Hotline: 800.94.SPILL and provide:
  - Caller and manager's name
  - Date and time spill was discovered
  - Location (address or longitude and latitude)
  - Manufacturer name and serial number
  - Cause of spill
  - Amount of spill
  - Types of surfaces contaminated

    - Containment and/or clean-up activities performed so far
- Request the help of and notify Supervisor and PacifiCorp Forester and environmental services.
- Remediate the spill
    - Clean up the spill or have it cleaned up, following directives from the Spill Hotline
    - Wash equipment and vehicles.
    - Properly dispose of cleanup materials
    - Follow up with appropriate cleanup documentation.
- Clean-up at or near PacifiCorp generating sites or substations must comply with site specific spill prevention and remediation plans.

2.3 Archaeological Sites

Vegetation management activities shall not disturb archeological sites. Known archaeological sites shall be identified on the process checklist described in Chapter 4. If a forest technician or tree crew identifies something that might have archeological significance, they should move off site and contact the appropriate Forester. The Forester should contact environmental services for advice on whether or not to continue. Work should not proceed without authorization from environmental services.

2.4 Communication

Communication should be open and interactive. It should include everyone involved: management, planners, vegetation management crews, property owners, public land managers, appropriate governmental officials, members of organizations dedicated to related causes and others.

2.4.1 Internal Communication

Communication within the vegetation management department needs to be clear and concise to ensure everyone involved understands the desired outcome. Decision making authority should be delegated throughout the organization, as appropriate.

2.4.1.1 Communication of Vegetation Conditions That Are Imminently Likely to Cause an Outage

Members of the vegetation management team must comply with *Transmission Grid Operations Operating Procedure PCC-215,* which is designed to meet Requirement 4 of the *NERC Transmission Vegetation Management Program* standard FAC-003-4. Requirement 4 instructs utilities to notify Control center with switching authority for the applicable line of vegetation conditions that is likely to cause a fault at any moment. PacifiCorp may implement temporary action, such as rating reductions or taking transmission lines out of service until vegetation can be cleared. Inspectors should report the exact location of the subject trees (providing longitude and latitude if possible) as part of the process.

2.4.1.2 Media

Requests from media (print, electronic, radio or television) shall be referred to PacifiCorp Media Relations and the community relations manager responsible for the area in which the request was made. Media Relations can be reached for each business unit at:

- Pacific Power: 800.570.5838
- Rocky Mountain Power: 800.775.7950

Vegetation management personnel and contractors shall not speak to media representatives without prior authorization from PacifiCorp Media Relations.

2.4.1.3 Legal

No response shall be made to an attorney unless through PacifiCorp's General Counsel's office.

2.4.2 Communication with External Stakeholders

Public land managers, property owners, regulators, and civic organizations have interests in utility vegetation management activities. Educating potentially affected parties about the need for, benefits of and science behind vegetation management can clarify expectations. Members of the vegetation management team, including crewmembers, should know the facts about the program, be prepared to answer basic questions and refer more complex issues through to their Supervisor.

Communication should begin well in advance of work and involve listening to and understanding people's concerns. Work on governmentally-managed property can involve administrative procedures that take months of advance work, including navigating through permit processes and the concerns of specialists who have responsibility for stewardship over public lands. It is not always clear to lands specialists how vegetation management helps balance their (the land manager's) responsibilities against the public's need for a safe and reliable electric grid. A memorandum of understanding among Edison Electric Institute (EEI) member utilities and federal land management agencies (Edison Electric Institute et al. 2016) established a framework for developing cooperative rights-of-way integrated vegetation management (IVM) practices among EEI shareholder-owned electric companies, federal land management agencies and the Environmental protection agencies.

2.5 Tree Growth Rate Definitions

Slow-growing trees grow vertically less than one-foot a year. Moderate growing trees grow vertically between one and three feet a year. Fast-growing trees grow vertically more than three feet a year. While trees exhibit species-specific growth rates, they can also be affected by short term weather events and local site conditions. Professional judgement and experience should be exercised when classifying tree growth by species.

2.6 Tree Removal

In certain circumstances, it is necessary or appropriate to remove trees. Recognizing the special interests of property owners in maintaining trees on their properties, PacifiCorp goes to great lengths to make sure these interests are balanced against the need to maintain safe and reliable service. When a tree is removed, the stumps shall be cut to within six inches of the ground or as close to it as practical (for example, at the top of a barbed wire fence that has become imbedded in the trunk). Stumps of all deciduous trees, brush and vines that are removed shall be treated with an approved herbicide, where permitted. When trees are removed, work shall be performed in a manner that neither damages trunks nor disturbs root systems of adjacent trees. Federal and state agencies sometimes request that trees subject to removal be topped to create "wildlife trees." PacifiCorp may honor such requests, provided the safety of the tree workers or the integrity of facilities are not compromised. Any trees which are removed along these lines should be topped at a height so that the topped tree would never contact any PacifiCorp facilities should it fall.

High Risk Trees. High risk trees are structurally unsound and could strike electric facilities when they fail. "High Risk Trees" are defined as dead, dying, diseased, deformed, or unstable trees which have a high probability of falling and contacting a substation, distribution conductor, transmission conductor, structure, guys, or other electric facility. High Risk Trees pose a safety and reliability risk and must be removed.

Discretionary Tree Removal. Discretionary tree removal is also an important component of PacifiCorp's vegetation management program. Tree removal can reduce safety risks; improve access to facilities, clear lines of sight, and moderate future workloads. Tree conditions are site and tree specific. In general, removals are encouraged in a distribution right of way when trees are not part of landscaping. On a transmission right of way, removal is encouraged and often mandated for all trees which could grow tall enough to strike the subject transmission line. The specific scope of discretionary tree removals is discussed in Chapter 5 (Distribution) and Chapter 6 (Transmission) and may be further defined in a particular work release.

2.7 Mechanized Vegetation Control

Slashbusters, mowers, jarraffs, helicopter cutters, etc. have the potential to increase productivity and reduce costs in rural, densely vegetated areas and should be used wherever practical.

Mowers and Slashbusters. Mowers and slashbusters are often more cost effective than manual methods of tree removal and should be used where terrain and vegetation conditions warrant. Mowing should be limited to fifteen feet either side of distribution primary wires, within transmission rights-of-way and along access roads serving PacifiCorp facilities.

Helicopter and Other Mechanized Cutters. Helicopter and other mechanized cutters can improve productivity in rural, densely vegetated areas. Mechanical cutting shall comply with ANSI A300 (Part 1) section 8.5. Mechanical cutting is typically limited to rural or

remote locations, and contractors may use mechanical cutting only upon specific written instruction from PacifiCorp. When mechanical cutting is employed, cuts should be made close to the main stem, outside of the Branch Bark Ridge and branch collar. Precautions are taken to avoid stripping or tearing of bark or excessive wounding.

2.8 Slash Disposal

Tree stems and tree limbs greater than six-inches in diameter should be left on site. Other materials require disposal. "**Slash**" is brush, and tree limbs or shrubs less than six inches in diameter, removed during tree operations. At the end of the work day or upon leaving a particular worksite all Slash must be brought to ground and no severed limbs are to be left in the tree canopy (hangers). Work locations shall be left in a safe and orderly condition.

Developed Areas. In developed areas, Slash should be chipped and removed from the site unless an agreement has been reached with the property owner to leave it. Slash may be left temporarily, provided the crew has notified the property owner or tenant, and arrangements made to clean it up to the property owner's reasonable satisfaction within two business days.

Rural Areas. In rural, off-road areas, Slash can be disposed of on-site. All Slash should be lopped into maximum lengths of three feet and scattered in piles no more than two-feet high. Limbs greater than six-inches in diameter and brush should be piled separately. Piles should be made at the sides of distribution rights-of-way and outside the wire zone of transmission rights-of-way, unless specified otherwise by the regional Forester. If brush is chipped, it may be broadcast on site, provided that resulting chip piles are no higher than two-feet. Debris piles should not limit or block access to the right-of-way or create fire risk.

2.9 Emergency Response

Tree work will be required from time to time on emergency storm restoration. Crews shall be properly equipped to perform the work. PacifiCorp will be the sole determiner of equipment appropriateness. Travel and lodging during the storm is billable. Double occupancy is expected for crew members.

Contractor should provide a designated contact person for each region. Requests for crews should be routed through that contact. Contractor shall be responsible for dispatching crews whenever emergency restoration services are needed.

Crew rosters shall be provided by the contractor and maintained during restoration efforts. At a minimum, rosters shall include: crew member names and position, location, contact information, equipment and identification number.

Debris from storm work is left on site and not chipped or cleaned up, so chippers should not be taken into the field during restoration work. Notification is not required during emergency restoration work, but crews should conduct themselves respectfully.

Emergency work shall be reported on a *Weekly Time and Vegetation Report* (Figure A.1). Emergency work is done under the authority of the district operations managers in cooperation with PacifiCorp Foresters. Tree crews and forest technicians assigned to storms should work under the direction of circuit captains assigned by operations. Tree crews should report their progress at least daily to both the circuit captain and their Supervisor. The supervisor should report crew progress to the appropriate Forester. All storm work must be conducted as if the line is energized. If the line cannot be worked safely under the assumption it is energized, it must be grounded in accordance with section 2.1.1. In general, PacifiCorp does not dispose of Slash or debris resulting from storm damage. Trees that fall during storms would do so regardless of whether or not the lines are present. It should not be PacifiCorp's responsibility to clear the debris simply because the tree or trees from which it originated damaged PacifiCorp facilities on the way down. However, if an outage is preventable, Slash may be cleaned-up and removed from a property at the Forester's discretion.

2.10 Pronounced Facility Conditions

While tree crew members are not facility inspectors, they can be helpful in identifying pronounced conditions, such as cracked poles, broken cross arms or insulators, loose guy wires, and other problems. Tree crew members should report the condition on the *Maintenance Condition Report Form*, (Figure A.2) and the Supervisor or forest technician should promptly forward the completed Maintenance Condition Report Form.

2.11 Property Damage

Contractor shall be responsible for property damage arising out of or related to work. Restoration of surfaces and repair of property damage in the execution of the Contract shall be part of the work. Such restoration shall include, but is not limited to, ruts, disturbed drainage ditches, broken drain tiles, cut fences and damaged fence posts.

Contractor shall inform PacifiCorp of claims within 24 hours of damaging the property. Contractor has 15 business days to resolve any damages or PacifiCorp will settle the claim and bill the contractor. Contractor must inform PacifiCorp personnel and get permission for an extension if the time frame cannot be met.

Contractor shall be responsible for any damage or claims against PacifiCorp resulting in violations of conservation measures as a consequence of Contractors actions.

2.12 Freelance Work

No one employed in PacifiCorp's vegetation management department may solicit or perform arboricultural-consulting or tree work (pruning, removal, insect or disease control, fertilization etc.) for interests outside of officially authorized PacifiCorp projects on open feeders, grids, transmission projects, tickets, storm orders, work orders or other PacifiCorp assigned project. Outside projects may include side jobs for cash, work for private arboricultural firms (whether or not they are owned by the tree crew members doing the work), consulting or any other enterprise engaged arboricultural work.

2.13 Fences and Gates

Gates should be left open or closed as they were found, or as the property owner instructs. Damage to fences or gates shall be reported to the property owner and repaired as soon as possible.

2.14 Climbing Spurs

Climbing spurs shall not be used when climbing to prune trees.

Exceptions:

- when limbs are more than throw line distance apart and there is no other safe means of climbing the tree.
- when the bark is sufficiently thick to prevent spur damage to the Cambium.
- when working High Risk Trees that are to be reduced in height and left for wildlife.

2.15 Winching Vehicles

Winch cables or ropes should not be wrapped directly around anchor trees. Doing so damages a tree's bark and Cambium and cannot only reduce its health and value, but also eventually create high risk to overhead lines. If the need arises to winch a vehicle (including an all-terrain vehicle), a nylon strap (or equivalent) at least 2-inches wide shall be used around the tree, and cables or ropes attached to the strap. Utility poles or towers shall not be used as winch anchors.

3. TREE BIOLOGY AND PRUNING

Understanding fundamental tree biology is essential to understanding the impacts of pruning on tree health and growth (Gilman 2012). Trees in proximity to electrical conductors should be pruned for clearance in a manner that minimizes residual harm to the tree and directs future growth away from the conductors.

3.1 Tree Biology

Understanding fundamental tree biology is essential to understanding the impacts of pruning on tree health and growth (Gilman 2012; Lilly 2010). Trees in proximity to electrical conductors should be pruned for clearance in a manner that minimizes residual harm to the tree and directs future growth away from the conductors.

3.1.1 Foliage

Tree survival depends on an adequate supply of carbohydrates produced by the leaves. If a tree abruptly loses a large portion of its foliage, as can happen with over-pruning, it could lack the energy resources to meet its needs. Trees with insufficient foliage could be weakened to the point where they become subject to attack by opportunistic insect and disease pests and sun damage (Shigo 1986; Gilman 2012).

3.1.2 Stems

Trunks and branches are tree stems. Stems make up the bulk of the mass of a tree. Their function is support, energy storage, and water, mineral, carbohydrate and growth regulator transport. A developmental process unique to tree stems is their ability to compartmentalize or "wall off" injury and decay (Harris, Clark, and Matheny 2004). Understanding the anatomy of tree stems is critical in achieving the pruning objective while minimizing damage to the tree.

3.1.2.1 Xylem

Xylem is wood tissue. Sapwood is young, living xylem that stores carbohydrates, provides support, and conducts water and essential elements. Heartwood is older, dead xylem that provides support, and often contains anti-microbial compounds.

Long, hollow conducting cells (trachieds or vessels) predominate xylem structure. While trees need this vascular structure to conduct water and essential elements, it can be exploited by pathogens to spread up and down the stem. Trees attempt to block or "wall" off disease spread by plugging cells in the xylem in a process known as tylosis (Shigo 1986).

3.1.2.2 Cambium

The tree's "**Cambium**" consists of a thin layer of rapidly dividing cells around the outside of the sapwood. Its primary function is to produce wood to its inside, creating diameter growth. This is

the only source of wood production in the tree system, and the tree has no ability to replace damaged or decayed wood.

Pathogens gain access to wood through wounds. In response to wounding, the Cambium generates a "barrier zone" containing antimicrobial compounds. It protects new wood by separating it from potentially infected wood that existed at the time of wounding (Figure 3.1).

Figure 3.1. The Cambium creates a barrier zone that contains discoloration and decay in the old wood.

3.1.2.3 Branch Collars

Branch collars are a combination of parent stem and branch tissue generated through coordinated growth around the branch attachment (Figure 3.2). In the spring of the year, diameter growth begins at branch tips, and works toward the base. When new branch wood meets the branch base, it grows around the juncture. Later in the growing season, wood from the parent stem envelops branch wood laid down earlier. The "**Branch Bark Ridge**" is area of raised bark where branch wood meets stem wood, pushing the bark outward, forming a layer of raised bark which is often a sign of a strong branch attachment. The abundance of metabolically active tissue at the branch collar can be made to produce antimicrobial compounds in response to infection. (Shigo1986). This area is known as the "**Branch Protection Zone**," which is an area of chemically and physically modified tissue within the base of the branch that retards the spread of decay from the branch to the parent stem.

Figure 3.2. Branch collars form at the base of branches.

3.1.2.4 Codominant Stems

Codominant stems are stems that are at least half the diameter of their parent stem and compete for dominance in the tree crown (Gilman 2012). They are similar to branches but have no branch collars or Branch Protection Zones making them more prone to decay if one of the stems is removed. Codominant stems are often problematic because as the two crowded branches grow in diameter, they push against each other and undermine the structural integrity of the union, making them prone to stem failure (Lilly 2010).

3.2 Utility Line Clearance Pruning

The primary purpose of utility line clearance work is to minimize safety and service reliability risks caused by tree-power line conflicts. Pruning is primarily performed on distribution facilities, although it can have application to transmission lines in some cases.

Pruning to clear conductors shall adhere to the principles of modern arboriculture. The *American National Standard for Tree Care Operations* A300 (American National Standards Institute 2006, 2008), International Society of Arboriculture (ISA) *Best Management Practices: Tree Pruning* (Gilman and Lilly 2002), *Best Management Practices: Utility Pruning of Trees* (Kempter 2004) and *An Illustrated Guide to Pruning* (Gilman 2012), among other references, convey those principles.

While proper utility line clearance work should be consistent with practices that promote tree health, utilities cannot place tree health over public welfare. Sometimes, there is no way to obtain proper clearance in a manner that ensures the health of a tree (Lilly 2010). This is particularly true regarding foliage retention. In cases were the tree cannot be pruned without harming its health, tree removal is often best for the tree, tree owner and utility. If a property owner does not allow tree removal, the tree should be pruned to specification clearances in all circumstances, even if that pruning work is against a customer's wishes or could harm the tree.

3.2.1. Natural Target Pruning

Natural targets are proper final pruning cut locations at strong points in the tree's disease defense system. Natural targets are branch collars and proper laterals. Removing branches at natural targets rarely damages the joining trunk or limb (Gilman 2012). The ISA *Best Management Practices: Tree Pruning* (Gilman and Lilly 2002) and *ANSI A300* (American National Standards Institute 2008) describe the technique. Targets vary depending on whether a branch is removed or reduced.

3.2.2 Directional Pruning

Directional pruning is natural target pruning applied to redirect tree growth away from utility lines (Gilman 2012). ANSI A300 and ISA's Best Management Practices (Kempter 2004) instruct that pruning to clear the utility space involves thinning cuts: removing at natural targets entire branches that are growing toward (or once cut will produce sprouts that will grow toward) the power lines.

While Heading Cuts produce sprouts that grow quickly back into the power lines, branch removal and reduction promotes growth away from conductors. Since the point of utility pruning is to train trees away from power lines wherever practical, branches growing away from the electric facility should not be pruned. Instead, these stems should be allowed to develop to their natural height or length, provided that growth does not create unreasonable safety risks. This cannot be accomplished with strongly excurrent trees trapped directly beneath conductors.

Topping, round-overs, flush cuts, branch tipping and rip cuts are improper because they damage trees. Directional pruning is consistent with natural tree structure. Remaining branches retain their taper, strong attachments, growth regulators and spacing. They continue to grow and function normally, allowing the tree to reach to its natural height.

"V" shapes often result on properly pruned trees growing under power lines particularly on decurrent, deciduous trees (Gilman 2012; Kempter 2004; Miller 1998; Shigo 1990). Limbs growing upward and toward the facility should be cut back to the trunk or to limbs growing away from the conductors (Figure 3.3). Remaining branches should have sufficient clearance so they do not damage the conductors in inclement weather common for the locality (high wind, freezing rain, snow or other conditions). Excurrent trees (such as many conifers) are more problematic but should be reduced to appropriate laterals or whorls. "L" or one-sided shapes often result on properly pruned trees to the side of conductors (Shigo 1990; Gilman 2012). Limbs on the wire

side of trees located adjacent to facilities should be cut back to the trunk; or to limbs growing vertically, sideways or downward; depending on the distance to the line or available natural target.

Figure 3.3 "V" or "L" shapes can develop from crown reductions on trees growing in close proximity to power lines. The ultimate objective is to train the tree up and away from the conductor whenever possible, so the facility is cleared while minimizing health risks to the tree.

3.2.3 Collar Cuts

Branches should be removed at the collar (Figure 3.4). Cutting into the collar, known as flush cutting, compromises the Branch Protection Zone and creates a direct port of disease entry into the parent stem. Flush cuts are damaging and inappropriate.

Disease can weaken stems, potentially creating safety risks. On the other hand, proper branch removal does not leave stubs that pathogens can use as an energy source to overcome the tree's defense system and spread into the trunk. If the branch is removed correctly, only the Branch Protection Zone is exposed, giving an advantage to trees in keeping out disease. As a result, collar cuts virtually prevent decay from entering the parent stem (Gilman 2012).

Occasionally, branch collars are not readily evident and the collar must be approximated using the Branch Bark Ridge. The cut should start in the branch crotch, just outside the Branch Bark

Ridge, and follow an outward angle that mirrors the inward angle the Branch Bark Ridge makes with the trunk or parent stem. The cut should end roughly opposite the bottom of the Branch Bark Ridge (Figure 3.4).

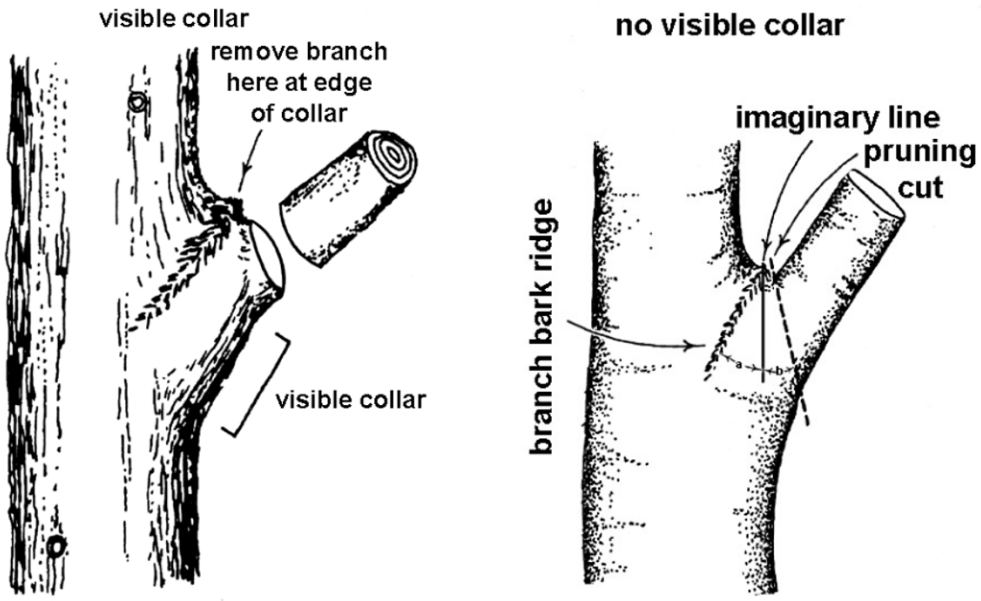

Figure 3.4. A proper collar cut, on a tree with and without a visible branch collar (Gillman 2015)

3.2.4 Reduction Cuts

Reduction is selective pruning applied to reduce the top or side of a tree or individual limb (American National Standards Institute 2008). In a utility context, the goal of reduction is to promote future tree growth away from the conductors, at least on decurrent trees. Reduction cuts shorten leads to appropriate laterals (Figure 3.5). An appropriate lateral is no less than one-third the diameter of the original limb and retains at least three-quarters of the lead's foliage (American National Standards Institute 2008). Individual branches are autonomous in their energy requirements. Removing too much foliage from a limb could deprive it of sufficient energy to establish apical dominance, maintain its taper, close the wound, and compartmentalize disease which will enter the wound.

A lateral that is too small will not develop into a structurally viable leader. Moreover, shortening a lead removes apical meristems and other points of growth regulator production, which can disrupt orderly growth. If, for example, auxin concentrations are insufficient, on some species a crowded mass of upright, rapidly growing, poorly attached shoots can sprout from the cut and grow directly back into the lines.

Removing more than 25% of foliage from a limb has the same damaging result as internodal topping cut, regardless of whether or not the cut is made to a proper-sized lateral. Even under the best circumstances, reduction cuts are potentially harmful, acting more like a heading than a thinning cut (Gilman 2012). Consequently, if a lead cannot be shortened to a limb at least one-third the diameter of the original lead, or if a cut removes more than 25% of the foliage, that limb should be either targeted for removal, or not pruned.

Figure 3.5. A proper crown reduction cut.

3.2.5 Large Branches

Large branches (those 3-inches in diameter or greater) can seldom, if ever, be removed without harming the tree, particularly if they are codominant stems. Yet, large branches must be prevented from growing toward the utility space, and that can mean heading or removing them entirely. Both options can be harmful to the tree, and heading large branches often fails in effectively clearing the conductors (Figure 3.6).

Removal of large branches should be done based on a measured approach. For example, one or two large limbs might be removed out of three that are growing toward the conductors, and the remaining limb(s) subordinated and targeted for removal on subsequent cycles, so long as the required specification clearances are accomplished.

Figure 3.6. Old Heading Cut. Shoots that proliferate from these cuts often dominate the tree's crown, and gaps result when branches containing these shoot clusters are removed.

Large branches selected for later removal can be subordinated or removed gradually over subsequent cycles (either interim or cycle). Subordination thins a portion of a limb's foliage. Reducing a fraction of the foliage in this way suppresses the stem's growth and allows the remaining tree parts to adjust and develop. In some cases, subordination can allow a codominant stem to develop into a branch over time, enabling a Branch Protection Zone to form so a limb can be removed without unnecessarily subjecting a tree to disease (Gilman 2012). Using subordination over multiple cycles to remove large branches can reduce the effect of structural limb removal on tree health, while ultimately circumventing the permanent problems Heading Cuts can cause, even if that means temporarily heading the branch.

3.2.6 Heading Cuts

A heading cut is an internodal cut on a stem, or a cut made to a lateral too small to assume dominance and should be considered a “cut of last resort”. Removing large stems that have been headed often leaves wide gaps in the tree, because shoots that proliferate from the old Heading Cuts often dominate the crown, and gaps result when branches containing these shoot clusters are removed. Moreover, previously headed branches usually lack natural targets. When such branches are growing toward the conductors, there might be no alternative but to remove them entirely. However, in some cases, headed limbs may be left as a temporary measure. Such headed branches should be removed on subsequent cycles.

Headed branches growing away from the facility space should not be pruned as a matter of standard practice. However, shoots growing from the old Heading Cuts should be inspected for structural integrity during subsequent visits. Corrective action, such as crown restoration (Gilman 2012), could be necessary if these sprouts are found to be structurally weak. Crown restoration involves restoring a previously headed stem’s natural structure by thinning sprouts emanating from the old wound. Crown restoration should be done incrementally over the course of several cycles. In some cases, structural defects resulting from heading cuts are so severe that

they cannot be corrected (Dahle et al. 2006). In these cases, the customer should be contacted about removing the entire tree, or at least the subject branch or branches. If tree or branch removal is not possible, there could be no choice but to remove the weak growth with a new Heading Cut. This should be done only when extensive decay or hollow exists in the remaining branch, with the approval of the Forester or Supervisor, for safety (not aesthetic) purposes.

3.2.7 Deciduous Trees

The "V" in many crown-reduced deciduous trees quickly fills in with shoots. These shoots eventually require pruning to prevent them from interfering with the lines. In subsequent cycles, it is important not to strip all these sprouts away, since that practice contributes to lion's tailing and can stimulate resurgent growth in many species. Rather, about half of the shoots should be removed, and the other half retained providing adequate clearance is maintained (Figure 3.7).

Figure 3.7. On return visits to "V-Outs", under pruning should leave the smaller, suppressed shoots to retain foliage and soften the visual effect of crown reduction.

Shoots selected for removal should be the largest and most vigorous, leaving smaller sprouts behind. Growth selected for retention should be pencil-thin at the point of attachment. If need be, these remaining shoots may be headed back to obtain specification clearances. In this way, a rotation can be established where the largest, most vigorous shoots are removed each cycle, but smaller, suppressed shoots are left to soften the negative visual effect that many customers find objectionable.

Leaving shoots in the interior of a "V" provides shade and retains auxin production, both of which suppress vigorous sprouting, and helps the trees hold clearance. Eventually the sides of the tree will exceed wire height, resulting in more of a "U," and shade the interior of the tree,

suppressing shoot growth even more. In time, this top growth decreases the proportion of the crown occupied by the cleared utility space and softens the negative aesthetics.

Figure 3.8. Crown reduction on a conifer.

3.2.8 Conifers

Many conifers; such as pine (*Pinus spp.*), spruce (*Picea spp.*) and Douglas-fir (*Pseudotsuga menziesii*) have strong central leaders (excurrent form). When these types of trees grow directly under the lines, they should be reduced to the whorl or largest available lateral that provides specification clearance. Cuts made to conifer whorls are typically flat-topped in order not to damage any branches in the whorl (Figure 3.8). Laterals should be tipped on conifers, which prevents them from bending up toward the conductor.

4. PLANNING, SCHEDULING AND REPORTING WORK

Scheduled work involves systematic cycle or interim projects on both distribution and transmission lines. Transmission overbuilt on distribution lines should be worked in conjunction with distribution feeder or grid projects. Schedules should be based on the time elapsed since the last scheduled work, compliance, voltage (particularly for transmission lines), the frequency of tree-caused outages, customer count, the existence of important accounts (hospitals, factories, mines or other high demand facilities), tree conditions, the number of customer complaints, the growth rate of predominant tree species, geography, customer density, rainfall and other environmental factors.

4.1 Process Checklist

For all scheduled distribution and transmission work, Foresters and Supervisors utilize the *PacifiCorp Vegetation Management Process Checklist* (Figure A.3) to facilitate systematic project management.

4.1.1 Authorize Project Work

No work may begin on any project until a Forester has authorized such work in writing. The contract with an independent contractor specifies the specific manner by which work is authorized; typically work is authorized through issuance of a *Work Release* (Figure A.4). A work release authorizes a contractor to proceed with a specific project and provides additional written instructions for the completion of the work. Contractors will not be compensated for any work performed on projects that have not been authorized through a work release or similar written instruction, if contemplated in the contract.

For internal tracking purposes, the Forester should also forward a copy of any issued work release to the PacifiCorp business specialist and director of vegetation management. The Forester should also notify internal stakeholders of a project prior to beginning work. Internal stakeholders include operations managers, customer-community managers, line patrolmen, hydro facility site managers and other personnel. PacifiCorp tariff policy should be notified if work will be conducted in a location where either past or current state public utility commission complaints have been received. PacifiCorp communications department should be informed if work will be conducted in the vicinity where public relations issues have surfaced in the past or could be reasonably expected to arise during currently planned work.

The work release specifies the project type and provides instructions on discretionary tree removals, tree replacements, use of chemical treatments, and other particulars. It also assigns required completion dates. Before work begins, the Supervisor shall distribute copies of the work release to each crew assigned to the project, and review instructions for proceeding.

After the project is finished, the Supervisor shall sign the work release to certify the project is completed and closed. The signed work release shall specify the actual starting and completion dates and any pertinent comments, including notation of any work that is either incomplete or has been excused from meeting specifications by the Forester. By signing off on a project, the contractor guarantees that the work required under the work release has been completed to

PacifiCorp's specifications, and assumes responsibility for any failures to meet PacifiCorp requirements, outside of exceptions noted in the comments.

PacifiCorp maintains a database of historic data on work performed by vegetation management contractors, including information on the type of work performed, and the person-hours charged to complete these tasks. Historic information about a location may be provided to independent contractors released to perform work at such a location.

4.1.2 Project Planning

The contractor performing the work is responsible for developing the project plan and deciding how work will be completed. In developing the project plan, the supervisor and forest technician typically coordinate with each other and should factor certain issues that may be implicated in the project plan and performance of work.

- *Federal Lands*. PacifiCorp facilities that cross federally-managed lands are in place under the authority of special use permits. Supervisors and forest technicians must ensure the conditions in the pertinent special use permits are satisfied. Any concerns about the potential of not complying with provisions in special use permits shall be communicated to the Forester.

- *Chemical Permits*. Herbicide or pesticide use permits are required in certain jurisdictions, particularly on federally-managed land. If a permit is required, Supervisors and forest technicians must confirm that the permit has been acquired before herbicide application may proceed.

- *Other Permits*. Other permits may also be required. Examples may include projects along state road rights-of-way, in some communities, county or state forests or riparian areas. All required permits shall be obtained by the contractor before work may proceed.

- *Ticket Work*. PacifiCorp will provide a contractor with past ticket work requests associated with a feeder or grid, representing instances that customers had called in work requests which were not an immediate threat to safety or electric service and could wait until regularly scheduled work. Forest technicians shall ensure that such work is performed or explain to the customer the reasons why the work does not need be done.

- *Flagging*. Many areas require flaggers and traffic control. Supervisors and forest technicians shall identify areas where flagging support is necessary, on both the *Activity Report* and a map.

- *Uniground Construction*. The overwhelming majority of PacifiCorp distribution circuits are built with wye configuration, which includes a neutral wire. However, uniground construction, which does not have a neutral wire, is found in some areas. The difference is of little consequence on wires attached to cross arms, as all cross arm-mounted wires should be cleared to primary specifications (see section 5.6.5). However, there is a

significant distinction on lines without cross arms. Wye construction has a low neutral, while the low wire on uniground construction carries primary voltage. This could lead to safety and clearance risks if the low primary is mistakenly identified as a neutral. Contractors are responsible to protect the safety of their employees. If a circuit is uniground construction, Supervisors and forest technicians are responsible to alert tree crews of the potential of a low-mounted primary, so safe work practices can be conducted and proper clearances obtained.

- *Special Request Property Owners*. PacifiCorp provides contractors with notes identifying customers who previously requested that the contractor (i) make personal contact prior to performing work , (ii) comply with special access restrictions (i.e., property owners who have requested tree crews not use a particular gate or drive), or perform work consistent with time sensitive instructions (i.e. to refrain from work prior to a hay harvest).

- *Hostile Property Owners*. Certain property owners may be hostile to vegetation work on or near their property. PacifiCorp often provides contractors with some historical notes related to property owners who have exhibited opposition to work in the past, but PacifiCorp cannot guarantee that every hostile property is identified in such notes. Forest technicians are responsible to be proactive in working with all property owners, especially those who have been identified as hostile in the past. Supervisor and forest technicians should develop a strategy for working with hostile customers which minimizes any direct adversarial exchanges.

- *Hydroelectric Facilities*. PacifiCorp hydroelectric facilities and adjacent rights-of-way could have restrictions on vegetation management activities. PacifiCorp's hydro operations and implementation (compliance group), PacifiCorp right-of-way services, or PacifiCorp environmental services shall be contacted before activities on or adjacent to hydroelectric facilities begin. Herbicide use on or adjacent to PacifiCorp hydroelectric facilities shall be reported to the plant manager weekly. Tree crews working on property that is part of a hydroelectric project site should check in with the plant office before beginning work and check out after work each day.

- *Schools*. School main or administrative offices should be notified of work to be done within school grounds or on property adjacent to schools. An effort should be made to schedule work without children present or specific accommodations made for pupils' safety. Particular effort should be made to identify targets within drop zones, climbable trees, access issues and other safety matters on site.

- *Mobile Home Parks and Apartment Complexes*. Mobile home park and apartment complex managers should be notified in advance of planned work. Managers could be aware of tenants with specific concerns. Mobile home park and apartment managers should be encouraged to communicate with affected renters. Individual units may still need notification of impending work.

- *Archeological Sites*. Archeological sites should be located and marked. Work must conform to guidelines of the responsible governing agency. If archaeological artifacts are located on private lands, the finding shall be reported to PacifiCorp environmental services. Field data inventories of sites known to PacifiCorp are on file in PacifiCorp district offices.

- *Environmentally or Culturally Sensitive Areas.* Governmental, tribal and environmentally sensitive lands present particular demands. Lands under governmental or tribal management and environmentally sensitive areas should be identified early to allow time to work through the required processes. The contractor will identify federal, state, county, city and pertinent non-governmental organizations potentially affected by the project. The appropriate entity should be notified of the impending project and asked whether or not they have any concerns.

  Before any field work begins, a meeting should be conducted with appropriate governmental agencies that have interest in the project. This is especially important for federal land managers and tribal leaders. In particular, no work may begin on Bureau of Land Management or Forest Service managed lands without a pre-work coordination among federal officials and vegetation management. Multiple projects and multiple agencies may be covered by a single meeting. The meeting(s) should be organized by the Forester, and PacifiCorp's environmental services should be notified and invited to attend. The meeting may be held either in person or through a conference call. Work shall not begin until vegetation management receives written notice to proceed from the appropriate agency.

  If environmentally or culturally sensitive areas are identified on governmentally-managed lands, a contractor with appropriate expertise should be retained to delineate subject sites or areas. Target locations should be marked on maps and on site. Care should be taken with field marking to ensure it is sufficiently clear to alert crews, while at the same time being sufficiently discreet to avoid casual detection.

  Foresters maintain the single master version of any PacifiCorp mapping resources. Effort should be made to work off of digitized maps wherever possible. Forest technicians should work with the GIS department to secure digital maps and communicate with the PacifiCorp Forester responsible for the region. Foresters should ensure that there is a digital master with all pertinent information. If paper map copies are necessary, the Forester will check out copies of the master version, which should include sensitive environmental or cultural sites.

4.1.3 Work Identification

Prior to any tree crew work, forest technicians should attempt to contact the property owner or tenant on whose property the work will occur, consistent with the procedures outlined in Section 8.2. Forest technicians shall document their contact with property owners or land managers, and organize work for tree crews on an *Activity Report* (Figure A.5).

The Activity Report should identify the district in which work is to be conducted, the project number (the discrete number assigned to the district), the contractor assigned to the job and the feeder or grid number for distribution or plant locality number for transmission.

4.1.4 Work Assignments to Project Crews

Work assignments are the responsibility of the contractor performing the work. Tree crew members should be supplied with copies of work releases and permits, so that crew members are able to produce required documentation to the appropriate authorities on demand.

4.2 Reporting Work

After completing work, the contractor (i.e., the crew leader) shall document tree work on weekly and daily reports.

4.2.1 Daily Report

The *Vegetation Management Daily Report* (Figure A.6) shall be used by an independent contractor to keep detailed records of productivity, tree location, and chemical use.

4.2.2 Weekly Report

Tree work shall be reported accurately on the *Weekly Time & Vegetation Report* (Figure A.1). The back of the report provides instructions and definitions for each cell. Weekly Reports, along with the corresponding invoice should be submitted to the Forester responsible for the area in which the report was completed.

Most of the items on the Weekly Report are self-explanatory. A few cells warrant clarification:

- **Item 27**. General Work Location: The general location should be the approximate address. For example, the 4000 block of Dead Elm Memorial Road. Note that for audit purposes, crew leaders will be responsible to find and identify all the trees they worked over the course of a week. Consequently, more detailed information should be kept in the daily report (Figure A.6).
- **Items 32, 33**. Woody plants (including vines) less than 6-inches in diameter at breast height are classified as saplings. The actual square footage occupied by the above ground portion of the plant should be measured and recorded, with a 100 ft^2 maximum per plant for both pruned and removed vegetation. Note that multi-stemmed woody plants where no single stem is over 6-inches in diameter are classified as saplings, with a maximum of 100 square feet per plant.

- **Item 37**. Stump Spraying: Document the time spent treating stumps of trees and brush feet that have been removed during the day. Use quarter-hour increments.
- **Items 43-45**. To obtain the diameters of multi-stemmed trees, add the diameters at breast height of individual stems. For example, if a tree has three stems of 8, 4 and 3- inches in diameter, the tree would be 15 inches in diameter and reported as a 12 to 24-inch removal. An exception would be if no stems on the plant are over 6 inches in diameter at breast height, in which case the plant should be classified as a sapling.
- **Item 47 and 48**. Saplings pruned and removed. Saplings are trees under six-inches in diameter at breast height. Report area covered by the crown of the plant, with a 100 ft2 maximum for each plant. There must be six inches of soil between stems of the same species to count as multiple plants.
- **Items 54 and 55**. For transmission cycle work, capture the number of acres cleared or sprayed respectively using linear feet.

4.3 Tree Crew Audits

A PacifiCorp will occasionally perform a tree crew audit. The primary purpose is to provide a quick assessment of quality assurance. Crew audits benefit both PacifiCorp and the Contractor and are considered a best management practice (American National Standards Institute 2006). Completion of an audit does not constitute acceptance of work, which must still be validated by the submission of a complete work release. But catching exceptions and identifying the crew behaviors that produce such exceptions early will very likely reduce the number of exceptions found on post-audit. Exceptions found during post-audits after crews have left the area can be costly for the contractor to remedy and can incur additional PacifiCorp staff time to follow-up and ensure their correction.

Crew audits will be done at the Forester's discretion. All work including work identification, transmission, TGR, post-inspection, and pole-clearing will be subject to audit at any time.

Each audit should include the Forester, the crew-leader, and optionally, the Supervisor. The tree crew shall be allowed to bill their time at time & equipment (T&E) rates for the duration of the audit.

During an audit when an exception is noted it will be recorded on the *Tree Crew Field Audit Form* **(**Figure A.7**)** along with the location, comments on the nature of the exception, and if correction is required. Contractor shall remedy any exceptions noted on the Tree Crew Audit Form.

4.3.1 Extreme Exceptions

If during the course of an audit the Forester identifies an exception that is in violation of federal or state law, or witnesses an egregious safety violation, the crew may be shut down (at the Forester's discretion) until the exception is corrected.

4.4 Worksite Inspection

PacifiCorp Foresters will also conduct worksite inspections, at the Forester's discretion. The Forester should use the *Worksite Inspection Form* (Figure A.8), to record the findings of these inspections. The form provides a general checklist of inspection items like use of personal protective equipment, tailboard, equipment condition, vehicle set up, herbicide labeling, and other safety items.

4.5 Contractor Project Completion

Contractors performing work are always responsible for ensuring that all work on a project is completed to PacifiCorp specifications, consistent with these standard operating procedures. Supervisors (or a delegate) should inspect all work for compliance with these specifications and any additional instructions provided in the work release. Any exceptions to specifications, for any reason, must be noted on the work release.

Contractors are responsible to collect and submit to the Forester:

- PDF copies of all maps that have been marked by tree crews;
- PDF copies of *Vegetation Management Daily Reports* (Figure A.6);
- PDF copies of *Weekly Time & Vegetation Reports* (Figure A.1);
- PDF copies of any signed *Property Owner Refusal Complaint* forms (Figure A.9)
- customer information that might require follow-up the next time a project is worked, including customers who refuse to allow work or access, customers who express concerns about work, or customers or property owners who threaten vegetation management employees;
- PDF copies of tree replacement vouchers issued
- a PDF copy of the signed work release.

4.6 Project Closure

Foresters should inventory maps and collect daily logs, tree replacement vouchers, hazard forms as well as concerned customer, dangerous customer and refusal information received from the Supervisor. Foresters should file this information digitally, so it can be retrieved when work is conducted the next time through.

Foresters must confirm receipt and filing of a signed work release from the contractor for each job. Foresters must examine the comment section for any work that was not completed to specification, and if necessary, make provisions to correct those outstanding conditions.

The Forester should close the work release and inform the business specialist and director of vegetation management of the closure by electronic mail within 30 days.

5. DISTRIBUTION PROCEDURES

Distribution lines are overhead facilities that are energized less at below 46 kV (except that there are some legacy 34.5 kV transmission lines in certain areas). Distribution primary voltage ranges from 600 to 45,000 volts, while lines energized below 600 volts are secondary.

5.1 Distribution New Construction Clearing

Every effort should be made by the PacifiCorp not to build new line over or through trees that will need to be cleared from the facilities in the future. New distribution rights-of-way should be cleared to specification before the lines are energized. Initial clearing is important because it reduces the need for future planned outages to clear the line after conductors are installed and sets customer expectations for future work.

5.2 Distribution Cycle Maintenance

Trees and vegetation shall be cleared from distribution facilities on scheduled cycles. Facilities shall be worked systematically, either by feeder or grid map. The duration of a cycle is dependent on local conditions, as determined by PacifiCorp. Cycles at PacifiCorp are typically 4 years in California, Oregon, and Wyoming, and 3 years in Idaho, Utah, and Washington.

In performing vegetation management distribution cycle work, contractors are required to:

- Systematically clear trees and other vegetation a specified distance from all primary conductors, consistent with Sections 5.2 through 5.5 depending on the type of project specified in any particular work release;
- Remove dead wood from crowns at risk of falling or being blown into the conductors; Identify and correct readily climbable trees which are too close to power lines, consistent with Section 2.1.3;
- Identify and remedy or remove tree houses violating the criteria specified in Section 2.1.4;
- Identify and remove High Risk Trees, consistent with Section 2.6;
- Remove or apply herbicide (presuming the property owner has not expressed objection to herbicide application) to all volunteer trees (naturally seeded non-landscaped trees) which are 6-inch or less diameter at breast height (**DBH**) and have potential to grow into the conductors;
- Maintain compliance with state regulatory rules, laws or regulations.

Other work requirements may be specified in a work release for a particular project. For example, a work release may have specific instructions regarding the application of tree growth regulator ("**TGR**") to fast-growing tree species.

5.2.1 Specified Vegetation Clearance Distances – Primary

Each work cycle, trees and other vegetation are cleared to a specified clearance distance from conductors, as set forth in Tables 5.1 and 5.2. Specified clearance distances are absolute minimums which dictate when pruning work must be performed. Because of the application of natural target pruning techniques described in Section 3.2.1, the actual distances achieved after work is performed will almost always exceed the distances specified. Specified vegetation clearance distances from primary conductors in the distribution system are designed to allow sufficient space to prevent any contact with primary conductors throughout the entire pruning cycle. Any trees or vegetation identified within the specified clearance distance to a primary distribution conductor must be pruned (if not otherwise removed). Neutral conductors in a raised (primary) position are treated as primary conductors for purposes of this section.

Table 5.1. Normal primary specified vegetation clearance distances.

	Three-year Cycle			Four-year Cycle		
	Slow Growing (< 1ft./yr.)	**Moderate Growing (1-3 ft./yr.)**	**Fast Growing (>3ft./yr.)**	**Slow Growing (< 1ft./yr.)**	**Moderate Growing (1-3 ft./yr.)**	**Fast Growing (>3ft./yr.)**
Side Clearance	8 ft.	10 ft.	12 ft.	8 ft.	10 ft.	14 ft.
Under Clearance	10 ft.	12 ft.	14 ft.	10 ft.	14 ft.	16 ft.
Overhang Clearance	12 ft.	12 ft.	12 ft.	12 ft.	14 ft.	14 ft.

Table 5.2. Primary specified vegetation clearance distances for work in California and areas of elevated risk, as specifically designated on a particular Release or Scope of Work.

	Slow Growing (< 1ft./yr.)	**Moderate Growing (1-3 ft./yr.)**	**Fast Growing (>3ft./yr.)**
Side Clearance	12 ft.	12 ft.	14 ft.
Under Clearance	12 ft.	14 ft.	16 ft.
Overhang Clearance	12 ft.	14 ft.	14 ft.

5.2.2 Specified Vegetation Clearance Distances – Secondary

A secondary line is a line energized to less than 600 volts. A service line is a secondary line that runs between the electric supply and the customer. Specified distances from secondary conductors in the distribution system are designed to allow sufficient space to prevent limbs deflecting secondary or service conductors through the entire pruning cycle. Any trees or vegetation within the specified distance (Table 5.3) to a secondary or service conductor must be pruned (if not otherwise removed); provided, however, that if a work threshold is specified, then pruning need not be completed unless the work threshold requirement is met.

Table 5.3 Non-primary wire vegetation clearance distances

Line Type	Work Threshold	Specification Clearance
Non-insulated wire pole-to-pole secondary		3 ft.
Neutral low position		2 ft.
Neutral on cross arm		Treated as Primary – see Section 5.3.1
Insulated pole-to-pole secondary		2 ft.
Non-insulated wire service/street light		1 ft.
Insulated service/streetlight	Deflection/abrasion	1 ft.
Guy wire	2-inch or greater diameter limb applying pressure	Relieve pressure

In addition to the specification clearances (Table 5.3), the following requirements also apply.

- **Non-Insulated Wire Pole-to-Pole Secondary**: any tree limbs between a primary conductor and a non-insulated wire pole-to-pole secondary conductor shall be removed or pruned. Side clearances may be reduced to one foot for structurally sound limbs greater than 6-inches in diameter at wire height.

- **Any Neutral**: any tree limbs between a primary conductor and a neutral or insulated secondary conductor should be removed or pruned.

- **Insulated Pole-to-Pole Secondary Clearance**: any tree limbs between a primary conductor and an insulated pole-to-pole secondary conductor should be removed or pruned.

- **Non-Insulated Service or Street Light**: If the customer desires to remove other limbs or trees around these lines, in addition to the minimum one foot clearance, forest technicians or crew leaders should inform the customer to call the customer service line to arrange for a temporary disconnection of the facilities to allow safe completion of the desired tree work, as required by law.

- **Insulated Service Streetlight**: Limbs that are causing strain to the point of deflection or that are abrading the insulation to the extent they could cause an outage before the next scheduled cycle should be pruned to relieve the pressure. If pruning or removal is not practical, arrangements should be made with operations to have the facility re-routed or have suitable material or devices installed to avoid insulation damage by abrasion. If the customer desires to remove other limbs or trees around these lines, they must arrange for a temporary disconnection to allow the desired work to be done safely. PacifiCorp does not clear trees for street light illumination, unless required to by specific language in a franchise agreement.

5.2.3 Other Facility Clearances

Trees or branches two-inches or more in diameter applying direct pressure to or threatening to fall on or through poles or guy wires shall be removed or pruned on cycle (Table 5.3).

One-third of the circumference around poles shall be cleared of vegetation to a distance of 5-feet to allow linemen a climbing path. The remaining two-thirds of the pole circumference should be cleared of all vegetation to a distance of one foot from the pole.

Vines shall be removed on cycle from poles and guys, cut at ground level, and treated with an approved herbicide. They shall be reported as brush (< 6-in. dbh) or tree (>6-in. dbh) removed. Vines clearly part of a landscape and rooted well away from the pole may be pruned and reported as saplings pruned. Vines shall be pulled off the bottom 5-ft. of poles after they have been cut. The facility point shall be documented by the tree crew and given to their supervisor, who shall report it to operations to clear the remainder of the pole.

Trees should not be pruned or removed expressly to provide clearance for television cable, telephone lines or private electrical facilities unless authorized in advance by the appropriate forester.

5.3 Distribution Interim Maintenance

In certain locations, where and when circumstances warrant, interim work may be performed half way through a four-year cycle period, to address any trees which are likely to exceed minimum clearance requirements prior to the next scheduled work. Interim work is focused on the fastest growing trees, referred to as "cycle-busters", which may not hold for an entire cycle. When an interim project is performed, the distances in Table 5.4 and dictate if a tree must be pruned. Whenever a tree is pruned, pruning should always accomplish the specified vegetation clearance distances set forth in Section 5.2 (using Table 5.1 or Table 5.2 as applicable.

Table 5.4. Normal distribution interim work thresholds.

	Slow Growing (< 1ft./yr.)	Moderate Growing (1-3 ft./yr.)	Fast Growing (>3ft./yr.)
Side Clearance	3 ft.	3 ft.	8 ft.
Under Clearance	3 ft.	5 ft.	9 ft.
Overhang Clearance	3 ft.	3 ft.	8 ft.

Table 5.5. Distribution interim work thresholds for work in California and areas of elevated wildfire risk, as specifically designated on a particular Release or Scope of Work.

	Slow Growing (< 1ft./yr.)	Moderate Growing (1-3 ft./yr.)	Fast Growing (>3ft./yr.)
Side Clearance	6 ft.	10 ft.	12 ft.
Under Clearance	6 ft.	10 ft.	13 ft.
Overhang Clearance	10 ft.	10 ft.	10 ft.

5.4 Distribution Annual Maintenance

In certain locations, where and when circumstances warrant, annual work may be performed. All general provisions of these standard operating procedures apply for distribution annual maintenance, including the identification and removal of High Risk Trees under Section 2.6. Similar to an interim project, annual work is designed to address clearances on any trees which

are likely to exceed minimum clearance requirements prior to the next scheduled work. Annual maintenance focuses not only on extremely fast growing trees but also on identifying and remediating rapidly developing hazard situations like storm, fire, and construction damage to trees near the line. Trees reaching the threshold distances outlined in Table 5.5 will be removed or pruned to specification clearances as set forth in Section 5.3.

5.5 Distribution Ticket Maintenance

Customers, district operations staff, governmental bodies, regulatory agencies or others alert vegetation management to real or perceived conflicts between trees and power lines from time to time. All regular work is performed as part of the scheduled cycle maintenance (including interim and annual) described above. The intent of ticket maintenance is to correct immediate and unreasonable safety or electrical service risks. Foresters are responsible to determine whether a reported condition presents an immediate and unreasonable safety or electrical service risk.

Condition which present an immediate and unreasonable safety or electrical service risk include:

- Trees representing an unreasonable safety risk as determined by the responsible forest technician;
- Trees that have caused an outage;
- Trees violating specific state regulatory regulations;
- Limbs that are deflecting secondary conductors to the extent they present a high probability of tearing down the wire before the next scheduled cycle work;
- Trees that are likely to start a fire;
- Readily climbable trees;
- Trees where the property owner requires clearance so non-utility line clearance workers may work the tree (which complies with various state line safety laws and may be billed to the requesting party).

If a report of a vegetation condition is readily discernable as an emergency situation, the Forester should arrange for correction within 24 hours. Critical conditions reported by regulatory agencies and other urgent situations should be inspected within 48 hours and corrected within 7 days. Other tickets should be inspected within 10 business days from the date of request, and a determination made regarding whether or not the reported condition warrants work.

All ticket maintenance work should be completed consistent with these standard operating procedures. Non-critical conditions should be monitored and corrected on the next scheduled maintenance work. The concerned party shall be contacted regarding the inspection determination. This contact may be face to face if the customer is present, or by door hanger, letter, or telephone if they are not present.

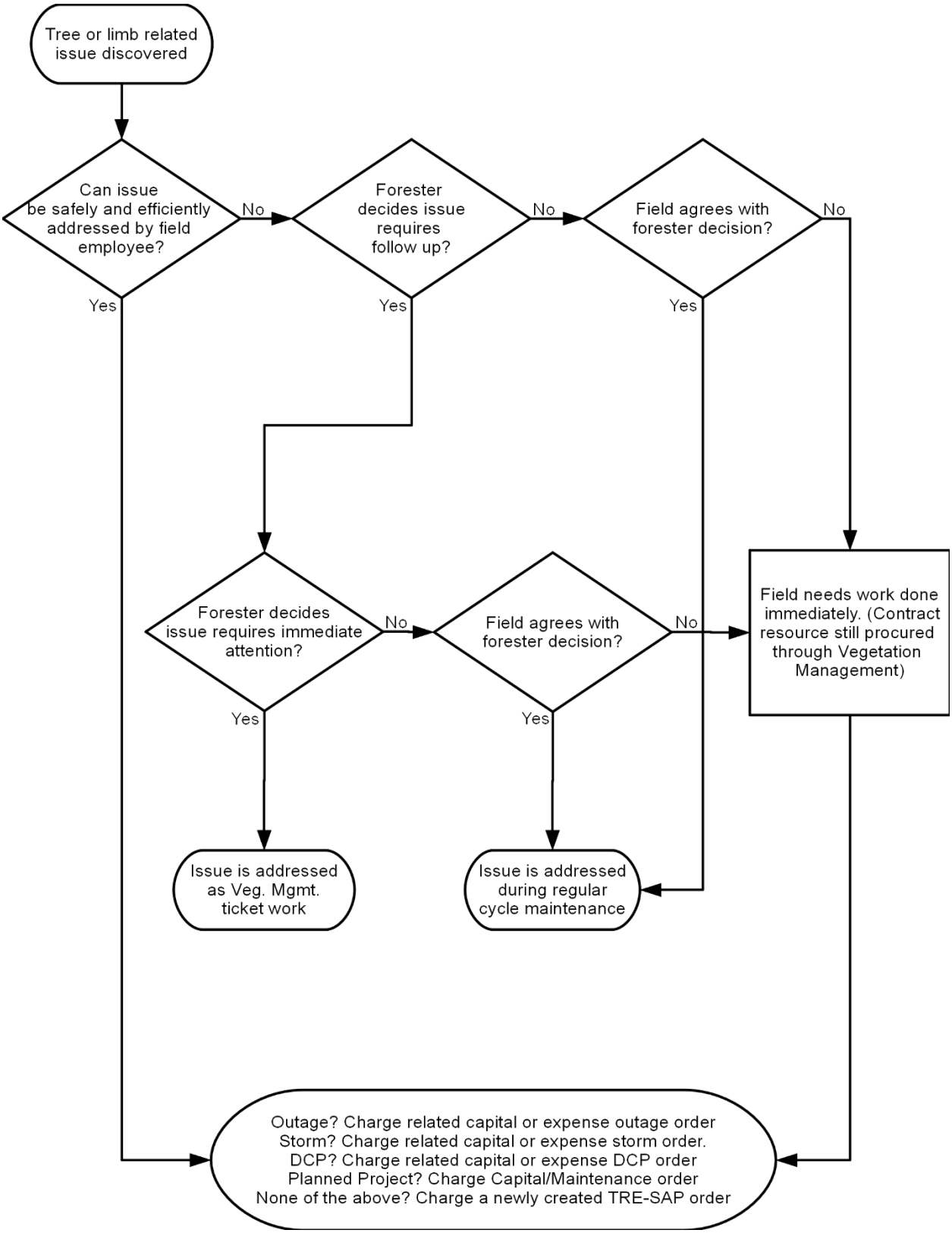

Figure 5.1. Distribution ticket maintenance procedure.

5.6 Side Clearance Exception

Side clearances from conductors may be reduced to 20-inches for structurally sound limbs greater than 6-inches in diameter at wire height, provided the tree is not readily climbable and the tree shows no evidence of conductor contact due to wire or tree sway. High Risk Trees should be removed or pruned to reduce the potential threat they pose.

5.7 Increased Overhang Clearance Alternative

Increased overhang clearance, in excess of the minimum distances specified in Table 5.1 and Table 5.2, may be implemented by the contract supervisor or may be required by the responsible forester. Increased overhang clearance should be considered by the forester or supervisor under the following types of circumstances: three-phase lines (particularly to the first protective device), rural or difficult to access areas, weak-wooded or fast-growing tree species, poorly-structured trees, and/or foreseeable weather conditions, such as frequent high wind, heavy rains, ice and snow. In some cases, such as three phase lines or remote areas, all overhanging branches may be removed. Overhang may be tapered, with the greatest side clearance at minimum clearance height, with gradually more overhang higher in the tree.

5.8 Pole-Clearing

PacifiCorp performs pole clearing in areas of elevated wildfire risk. (Figure 5.2). After removing herbaceous and volunteer woody vegetation to bare ground for a 10-foot radius around subject poles, herbicides, including soil sterilants, should be applied, unless expressly prohibited or it is against the customer's wishes. When pole-clearing is performed, trees or saplings with trunks within the clearance zone should have eight feet of vertical clearance from the ground to the highest limb. In California and consistent with California Resource Code 4292, Pole Clearing is performed around subject poles in delineated resource areas during designated fire season. Subject poles have fuses, air switches, clamps or other devices that could create sparks and start fires (Nichols et al. 1995). This cleared space should be established and maintained by pruning and removing above ground branches and plant parts. In other states, PacifiCorp performs pole clearing on identified equipment poles in areas of elevated wildfire risk.

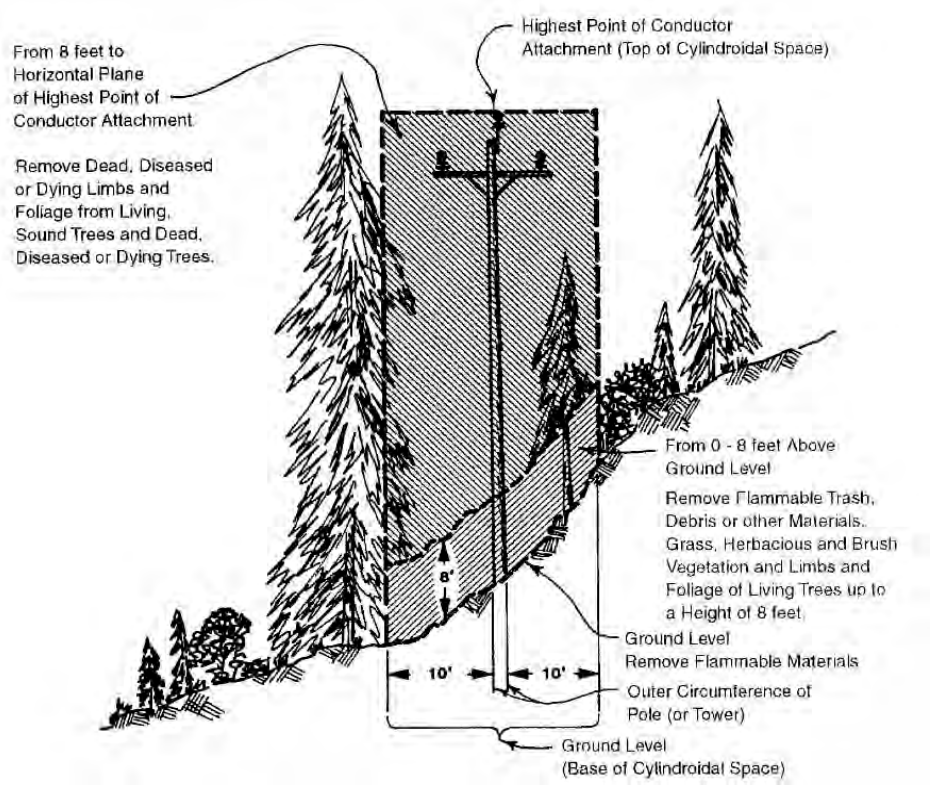

Figure 5.2. Illustration of pole-clearing requirements (California Department of Forestry & Fire Protection 2008, Figure 3, PRC 4292, 14 CCR 1254, Fire Break Clearance Requirement Around Poles and Towers)

5.9 Padmount Transformers

Padmount transformers should not be cleared as part of normal distribution cycle or interim maintenance. They may be cleared in response to facility point inspection requests should operations require access and a work order is provided. Qualified line clearance tree workers are not required to clear padmount transformers, so contractors responsible for landscape maintenance around substations may be assigned to remove shrubs and other low-growing vegetation that is interfering with padmount transformers.

6. TRANSMISSION PROCEDURES

Transmission facilities are overhead lines energized to greater than 34.5kV. Typical transmission voltages on PacifiCorp's system are 46kV, 69kV, 115kV, 138kV, 161kV, 230kV, 345kV and 500kV. Facility voltage and type determine the amount of transmission clearance needed. Table 6.1 provides specification clearances for transmission rights-of-way.

Transmission work shall comply with the ANSI A300 American National Standard for Tree Care Operations (American National Standards Institute 2006, 2011) and should follow Best Management Practices (Miller 2014; Smiley, Matheny, and Lilly 2011)

Transmission work on lines at or above 200 kV and those designated by the Western Electricity Coordinating Council as an element of the major transfer path in the bulk electric system, including those that extend greater than one mile beyond the fenced area of the generating station switchyard to the point of interconnection with a PacifiCorp facility or do not have a clear line of site form the generating station switchyard fence to the point of interconnection with a PacifiCorp facility shall also conform to the North American Electric Reliability Corporation's (NERC) Reliability Standard FAC-003(North American Electric Reliability Corporation 2009).

PacifiCorp's vegetation management philosophy for transmission lines is to utilize integrated vegetation management best practices wherever possible to conduct cover type conversion and to cultivate stable, low-growing plant communities comprised of plants that will never interfere with transmission lines in their lifetime. Reliability and safety are most effectively protected through establishing and maintaining a right-of-way consistent with the wire-border zone concept (W C Bramble et al. 1991). When the line is less than 50 feet off the ground, the wire-border zone should be cleared of all incompatible vegetation unless an easement fails to provide appropriate authority or there are legal impediments preventing it.

6.1 Initial Clearing and Construction

Newly constructed transmission lines should be cleared to full specifications prior to being energized. In densely vegetated areas, rights-of-way usually have to be completely cleared, (ground to sky) to the full width of the right-of-way as the initial stage in establishing a wire-border zone (Figure 6.1).

6.2 Transmission Clearances

The objective of systematic transmission work is to safeguard the reliability of PacifiCorp's transmission system by preventing outages from contact with vegetation. Clearance work on a transmission line is guided by three concepts: Minimum Vegetation Clearance Distances, Action Thresholds, and Minimum Clearances Following Work (Table 6.1)

Figure 6.1. In densely vegetated areas, rights-of-way usually have to be completely cleared initially to establish a wire-border zone.

Minimum Vegetation Clearance Distance (MVCD) represent radial distances from the conductors inside of which trees shall not encroach. These distances are established in FAC-003-4 (National Electric Reliability Corporation 2016) and must be maintained at all times.

Action Thresholds are designed to trigger vegetation management action and provide roughly a ten-foot buffer from the MVCD. Clearance work is performed, anytime vegetation is located within the Action Threshold distance from the conductor.

Minimum Clearances Following Work are designed to maintain the MVCD at all times. Trees are removed or pruned so as to establish clearance distances well in excess of Action Thresholds. Consistent with the general approach to maximize clearances on all transmission rights-of-way, however, a PacifiCorp Forester may also increase the Minimum Clearances Following Work, depending upon local conditions and the legal parameters of the right-of-way. Local conditions may include appropriate vegetation management techniques, fire risk, reasonably anticipated tree and conductor movement, species types and growth rates, species failure characteristics, local climate and rainfall patterns, line terrain and elevation, location of the vegetation within the span, worker approach distance requirements and other factors.

Table 6.1. Transmission clearance requirements (in feet).

	Line Voltage							
	500 kV	345 kV	230 kV	161 kV	138 kV	115 kV	69 kV	45 kV
Minimum Vegetation Clearance Distance (MVCD)	8.5	5.3	5.0	3.4	2.9	2.4	1.4	N/A
Action Thresholds	18.5	15.5	15.0	13.5	13.0	12.5	10.5	5
Minimum Clearances Following Work	50	40	30	30	30	30	25	20

6.2.1 MVCD Violations

Because of the buffers built into the Actions Thresholds and the Minimum Clearances Following Work, a violation of MVCD is extremely rare. If a violation is ever identified, trees that violate MVCD shall be corrected within 24 hrs., consistent with PacifiCorp Transmission Grid Operations Operating Procedure No. PCC-215 *Guidelines for Communication of Vegetation Conditions that Present an Imminent Threat of Transmission Line Outage*.

6.2.1.1 MVCD Calculation

The Minimum Vegetation Clearance Distance represents minimum clearances that should be maintained from conductors at all times, considering the effects of ambient temperature on conductor sag under maximum design loading, and the effects of wind velocities on conductor sway. MVCDs in Table 6.1 are for 10,000-11,000 feet above sea level (Table 2 of FAC-003-04) and apply across PacifiCorp's service territory regardless of elevation.

6.2.2 Structure Clearances

Trees and brush should be cleared within a twenty-five-foot radius of transmission "H" or metal structures, a ten-foot radius of single pole construction and a five-foot radius of guy anchors. Clearing activities shall not damage poles, structures, guys or anchors. Grasses, forbs, ferns and other herbaceous species may be left around structures and guys.

6.2.3 Guy Wires

Trees or branches two-inches or more in diameter applying direct pressure to or threatening to fall on or through poles or guy wires shall be removed or pruned.

6.3 Inspections

Vegetation management work on transmission lines is scheduled as needed, depending on the results of regular inspections.

6.3.1 Inspection Frequency

Main Grid Transmission. Transmission lines defined as "applicable lines" in FAC-003 are inspected at least annually, by ground or air, by Line Patrolmen who have responsibility for inspecting transmission lines subject to FAC-003 and reporting conditions to vegetation management. PacifiCorp Foresters coordinate with Line Patrolman to discuss vegetation conditions.

Local Transmission. Local transmission (non-FAC-003 lines) shall be inspected by the contractor in conjunction with distribution cycle work.

6.3.2 Line Patrolmen Responsibilities Under FAC-003

Line Patrolmen are responsible to comply with Requirement R4 of NERC Standard FAC-003 and shall do so by following the procedures set forth in PacifiCorp Transmission Grid Operations Operating Procedure No. PCC-215 *Guidelines for Communication of Vegetation Conditions that Present an Imminent Threat of Transmission Line Outage*. Line Patrolmen encountering a tree that poses a threat of causing a transmission outage at any moment must:

- Immediately notify the grid operator by phone and describe the nature and extent of the threat.
- Complete and process the Emergency Tree Action Form.
- Communicate the vegetation conditions to vegetation management for urgent attention.

Examples of tree conditions that pose a threat of causing a transmission outage at any moment include (but are not limited to) trees that violate or pose a risk within 72 hours of violating NERC Minimum Vegetation Clearance Distance (MVCD), uprooted trees that are leaning toward the line and pose a risk of immediate failure, and trees with structural failures that may cause them to break in part or whole onto the transmission facilities (Smiley, Matheny, and Lilly 2011).

6.3.3 Additional Inspection

In addition to the inspection performed by Line Patrolmen, Foresters may select lines among those subject to FAC-003 for additional inspection. These inspections supplement, rather than substitute for, those conducted by line patrolmen. Foresters should assign contract representatives to complete these inspections, using Level 1 assessments (American National Standards Institute 2011).

Such inspection should identify trees that pose a threat of causing an outage at any moment, and trees that could possibly violate work thresholds within the next year. PacifiCorp plan and profiles should be used in the field itemizing maximize sag and sway along with range finders to confirm the MVCD has not been violated. Locations should be noted on an activity report, and assigned to a tree crew for work, with the appropriate Forester's approval.

If the inspections discover a tree that poses a high likelihood of causing an outage at any moment, the inspector shall contact the appropriate Forester within three hours. Foresters shall

immediately request the appropriate line patrolman to inspect the line, consistent with the procedures set forth in Section 6.3.2.

6.4 Work Planning

The Vegetation Management A300 standard (American National Standards Institute 2006) and best management practice (Miller 2014) recommend against cycle-based transmission work thresholds. Rather, such standards recommend that work be scheduled based on a number of factors, including line voltage, line importance, vegetation conditions that violate the action thresholds in Table 6.1, location, predominant species' growth rates, threatened and endangered species, archeological sites, topography and other factors. Accordingly, PacifiCorp Foresters may consider any or all of these factors in scheduling work on transmission lines. A comprehensive approach that exercises the full extent of legal rights is superior to incremental management in the long term because it reduces overall encroachments, and it ensures that future planned work is sufficient at all locations on the right-of-way. In planning work, Foresters should consult with PacifiCorp Right-of-Way Services to determine the width of a right-of-way and the scope of the easement rights associated with a right-of-way. Foresters should generally plan work for the full extent of the easement; in all cases, except as otherwise directed by Right-of-Way Services, the width of planned work should be at least as wide as the typical widths for transmission rights-of-way, which are listed in Table 6.2.

Table 6.2. Typical transmission right-of-way widths.

Facility	Distance From Center (ft.)	Urban Width (ft.)	Rural Width (ft.)
46 kV Single Pole	25	50	50
69 kV Single Pole	25	50	50
115 kV Single Pole	30	60	60
138 kV Single Pole	30	60	60
161 kV Single Pole	40	80	80
230 kV Single Pole	40	80	80
69 H-Frame	40/50	80	100
115 H-Frame	40/50	80	100
138 H-Frame	40/50	80	100
161 H-Frame	40/50	80	100
230 H-Frame	62.5	125	125
345 H-Frame	75	150	150
345 Steel Tower	75	150	150
500 Steel Tower	87.5	175	175

6.4.1 Annual Work Plan

PacifiCorp performs vegetation management work in accordance with annual work plans prepared by a Forester, which details the circuits and facilities to be managed during a calendar year. Plans should include:

- a list of facilities subject to scheduled work (if only a portion of a line is scheduled, the line segment must be identified)
- dates when work is anticipated to start and end on each project (Gantt charts are recommended)
- a description of the type of control methods (cycle, herbicide, mowing, aerial, etc.).

The annual work plan may be adjusted during the year to account for changes in conditions that require a circuit, line segment or project to be moved into or out of the work plan. Examples of reasons for adjustments include, but are not limited to, vegetation growth in excess of anticipated levels, vegetation inspection results, new construction projects or removal of existing facilities. Adjustments to the annual work plan shall be documented as they occur and shall be authorized by the director of vegetation management.

6.5 Integrated Vegetation Management

Integrated vegetation management is a system of managing vegetation in which undesirable vegetation is identified, action thresholds are considered, all possible control options are evaluated, and selected control(s) are implemented (American National Standards Institute 2006). The purpose of vegetation management on utility rights-of-way is to establish sustainable plant communities that are compatible with the electric facilities, wherever possible. These communities are stable, low-growing, compatible with conductors, diverse, and establish a sustainable supply of forage, escape and nesting cover, movement corridors for wildlife, reduced fire risk, and more open access to the line (Yanner and Hutnik 2004). Ground disturbance shall also be minimized on all rights-of-way during vegetation management activities. By establishing and maintaining native vegetation the invasion of noxious weeds into the corridor will be minimized (Bonneville Power Administration 2000).

6.5.1 IVM Control Methods

Control methods are the processes used to achieve objectives. Control methods selection should be based on pre-control evaluations, expected growth rates, line priority, economics, regulations and specified objectives. Control method types include manual, mechanical, chemical, biological, and cultural.

Manual Control Methods. Manual methods involve workers using hand-carried tools, such as chainsaws, handsaws, pruning shears. Manual techniques are selective and can be used where others may not be appropriate, including urban or developed areas, environmentally sensitive locations (such as wetlands or places inhabited by sensitive species), in the vicinity of archeological sites and on steep terrain.

Mechanical Control Methods. Mechanical control may be efficient and cost effective, particularly for clearing dense vegetation during initial establishment, or reclaiming neglected or overgrown rights-of-way. Mechanical control methods, however, can also be non-selective and disturb sensitive sites, such as wetlands and culturally sensitive sites. Many machines are also not suitable for use on steep terrain.

Chemical Control Methods. Chemical control methods like herbicides are key to the success of IVM because they provide for cost-efficient cover type conversion (Yahner and Hutnik 2004). Herbicides must be used according to directives on their labels. Applicators are not only required to comply with label instructions, but also all other laws and regulations pertaining to their use (see Chapter 7).

Biological Control Methods. Biological control methods use plants, animals, insects or pathogens to control undesirable vegetation. Some plants, including certain grasses, release chemicals that suppress other species growing around them. Known as allelopathy, this characteristic can serve as a type of biological control against incompatible species. Promoting wildlife populations is also a form of biological control. Birds, rodents and other animals can encourage compatible plant communities by eating seeds or shoots of undesirable plants.

Cultural Control Methods. Cultural controls employ establishment of compatible stable plant communities or agricultural crops, pastures, mulching, or other managed landscapes to control undesirable vegetation. The wire zone—border zone concept is an example of a cultural control (Miller 2014).

6.5.2 Wire Zone—Border Zone

Properly managed, wire zone—border zone linear corridors not only effectively protect the electric facilities, but also can become an asset for forest ecology and forest management. (W C Bramble et al. 1991; Yahner and Hutnik 2004)

Flat Terrain. On flat terrain, the wire zone is the right-of-way portion directly under the wires and including roughly ten additional feet to the field side of the outside phases. (W C Bramble et al. 1991) The border zone is the area, on both sides of the line, from the edge of the wire zone to the edge of the right-of-way (Figure 6.2). Species of trees that could grow into the wires at any time in their lives should not be allowed in either the wire zone or the border zone.

Sloped Terrain. On slopes and adjacent to slopes, the wire zone and border must be adjusted according to the degree of the slope(s). The wire zone should be extended on the up-slope (and the border zone to the up-slope side should be reduced or eliminated), because of wire sag and sway. Consequently, the border zone on the down-slope side may be extended proportionately (Figure 6.3).

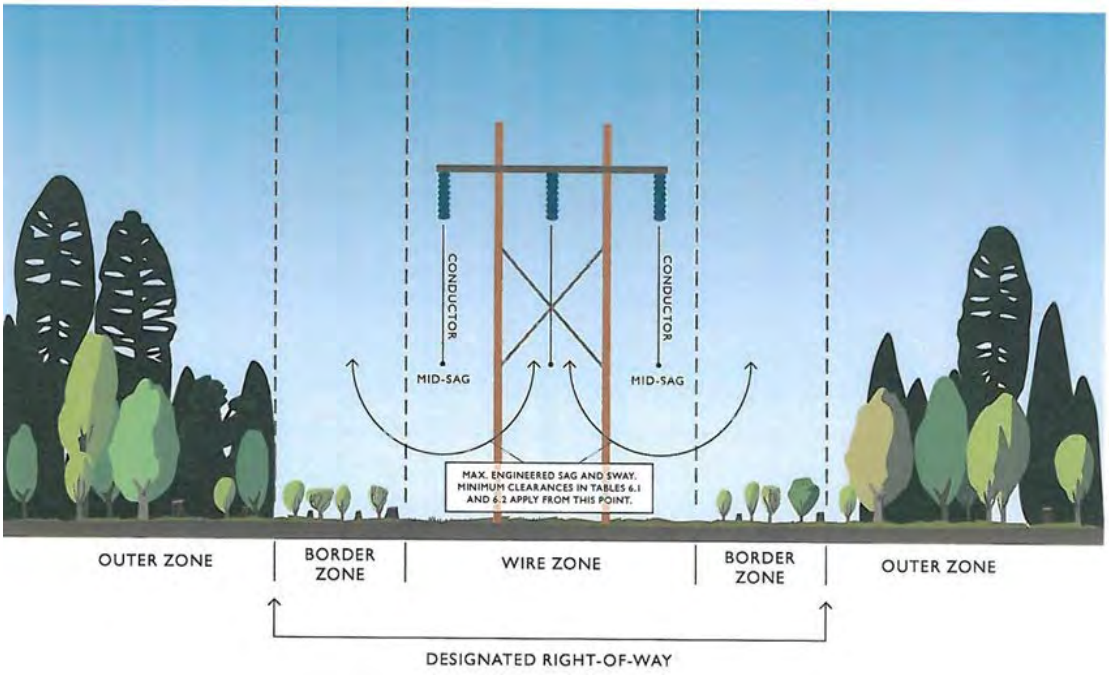

Figure 6.2. Bramble and Byrnes Wire Zone-Border Zone (adapted from Yahner, Bramble, and Byrnes 2001)

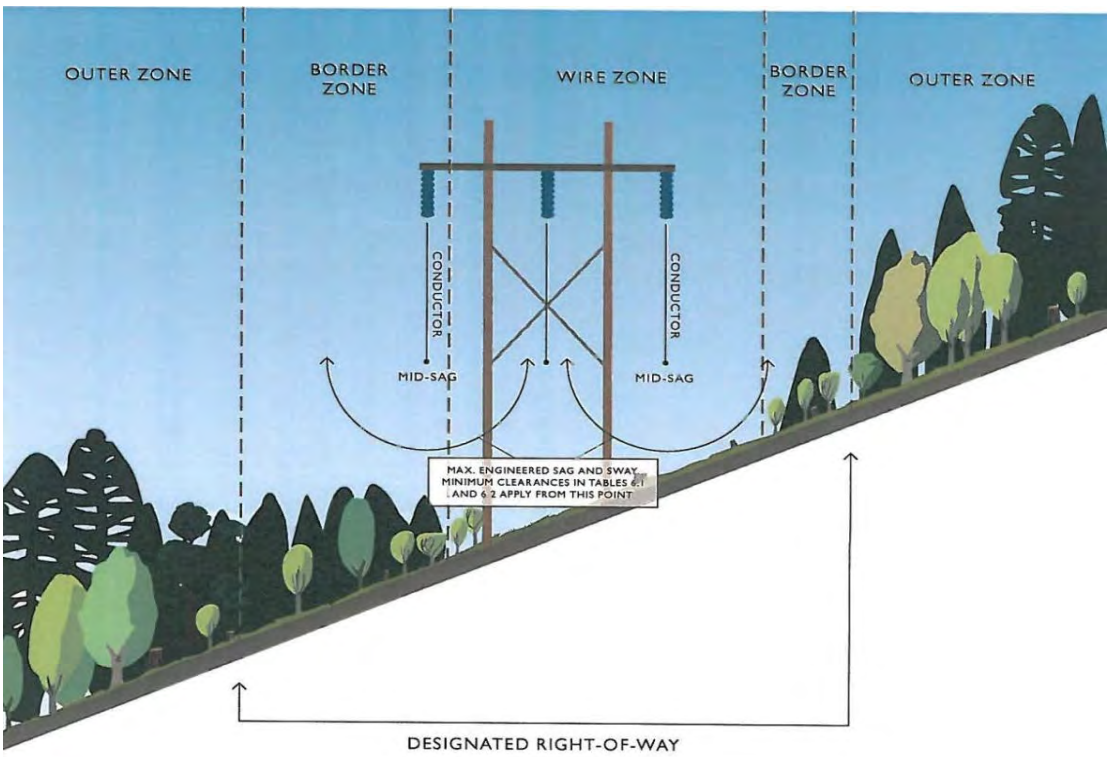

Figure 6.3. The border zone is condensed on up-slopes, where wire sag and sway could bring it into contact with trees, and is extended on down-slopes.

Varying Terrain. When the terrain varies, the wire zone—border zone concept adapts to the changes in elevation. The type of vegetation allowed in either the wire zone or the border zone is dependent on the height of the conductors, at maximum engineered sag and sway, relative to the ground, with attention to side slope. When a transmission line crosses areas of variable elevation between structures, there are additional clearance considerations. The right-of-way in each of Region A, B, and C, (Figure 6.4) should be cleared as follows:

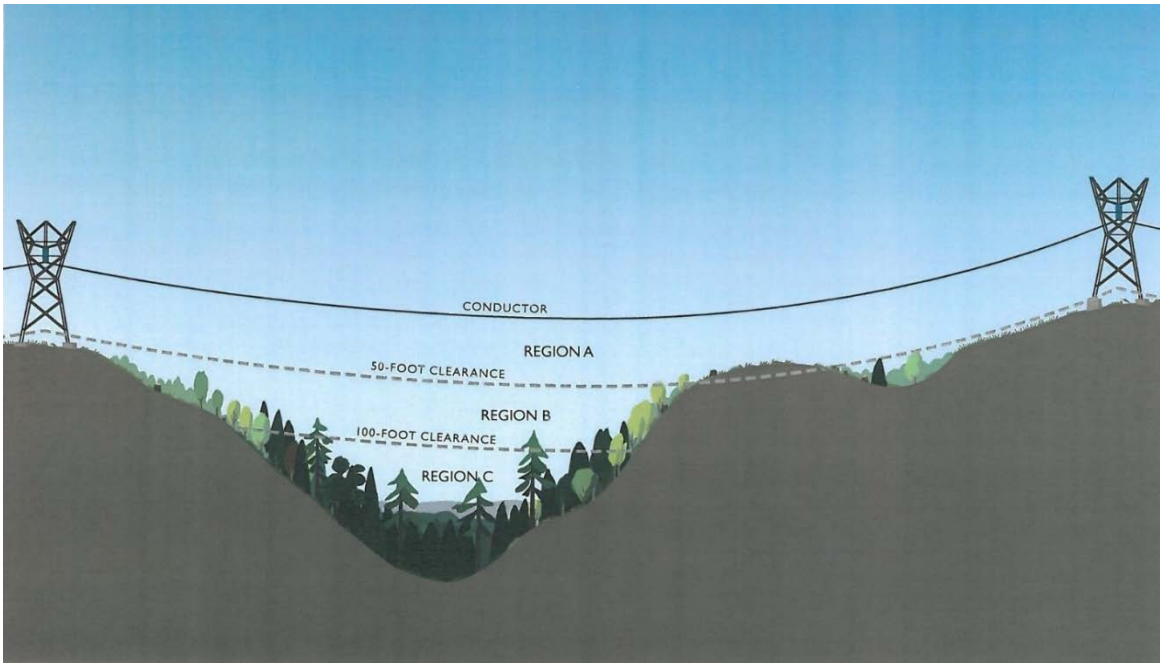

Figure 6.4. Transmission under-clearance regions

- Region A (Under 50 Feet). Region A is the area where lines are less than 50 feet off the ground. The 50-foot height should be from maximum engineered sag and sway. After clearing, the Region A wire zone should consist only of grasses, legumes, herbs, ferns and low-growing shrubs (under 5-feet at maturity). The Region A border zone should consist of tall shrubs or short trees (up to 25 feet in height at maturity), grasses and forbs. These cover types benefit the right-of-way by competing with and excluding undesirable woody species.

- Region B (50-100 Feet). Region B occurs where the lines are between 50 and 100 feet off the ground from maximum engineered sag and sway. In Region B, tall shrubs or short trees (up to 25 feet in height at maturity), grasses and forbs may be established throughout the right-of-way, including the Region B wire zone. Note that many transmission structures are tall enough that conductors are at over 50 feet high on and near the structures. In such cases, a border zone community may be maintained near structures, but care should be taken to maintain access to the structure as specified in Section 6.1.5.

- Region C (Over 100 Feet). Region C is where the lines are 100 feet or more off the ground. Tall-growing trees may be allowed in any zone in Region C, provided they have at least 50 feet of clearance. Trees with less than 50 feet of clearance in the Region C wire zone should be removed.

6.6 Tree Removals in Transmission Rights-of-Way

In performing vegetation management on transmission rights-of-way, removal of trees is generally superior to pruning. Removal minimizes the possibility of conflicts between energized conductors and vegetation. Contractors performing work in a transmission right-of-way must obtain specific permission from the responsible Forester to leave a tree within the widths described in the work plan, as follows: (i) all trees in Regions A wire zones should be removed; (ii) any trees species which would grow into the MVCD, in any border zone and in Region B wire zone, should be removed; and (iii) any tall-growing trees which have grown within 50 feet of the line in Region C should be removed.

Foresters may establish generalized exceptions to the requirement for tree removal in a work plan. For example, transmission lines may be constructed on the edge of dedicated road right-of-way where there may or may not be an easement or permit on the adjoining property allowing full tree removal.

6.7 Tree Removals Outside Transmission Rights-of-Way

Whenever vegetation management work is scheduled on transmission lines, High Risk Trees shall be identified and removed, consistent with Section 2.6.

6.8 Post-Work Assessment

Foresters should audit transmission work following procedures outlined in Section 4.3. The audits should document adherence to specifications. Moreover, audits should provide the tree crew leader with feedback on production, professionalism, equipment, safety and crew efficiency. Results shall be documented on an Audit Report (Figure A.7). Following systematic work, the entire length of completed line should be inspected to verify work complies with PacifiCorp specifications.

6.9 Mitigation Measures

NERC Requirement R5 directs transmission owners to develop mitigation measures to achieve sufficient clearances for protection of the transmission facilities when it identifies locations on the right-of-way where the transmission owner is restricted from performing work that may lead to a vegetation encroachment into the MVCD. Prior to the implementation of the next annual work plan, the owner shall take corrective action to ensure continued vegetation management to prevent encroachments.

Whenever the restriction is caused by a landowner, the refusal process in Chapter 8 shall be followed. If the refusal process has been completed without attaining clearances that would prevent encroachment into the MVCD before the next scheduled work, such locations must be

documented on the *Work Release* (Figure A.4). These sites should be reported in writing to the appropriate line patrolmen within 30 days. The line patrolmen should report annually on these site's status. In addition, Foresters shall arrange to have the site inspected at least biannually.

6.10 Vegetation Screens

Vegetation screens may be required by federal or local authorities in some locations at high visibility areas such as major road crossings. Where these mandates exist, vegetation screens should consist of border zone communities and be located near structures (where the line is unlikely to sag), if possible. If no border zone species are present, tall-growing trees may be left provided they have at least the minimum clearances in Table 6.1 following scheduled work.

Leaving tall-growing trees in transmission rights-of-way should be discouraged because they impede cover type conversion. Vegetation screens should be no more than twenty-five feet from frequented vantage points into the right-of-way. Areas where tall-growing species are retained as screens shall be documented and monitored annually by line patrolmen. If remaining trees violate work thresholds specified in Table 6.1, line patrolmen should report them to Vegetation Management within 30 days for correction.

6.11 Merchantable Timber

Rights-of-way could contain merchantable timber. Merchantable timber is defined as trees with at least six-inch diameter at breast height (DBH) that are recoverable and have a market in the local area. Merchantable timber belongs to the property owner unless the easement or permit states otherwise. If merchantable timber needs to be felled, the property owner should be contacted regarding timber recovery.

After the merchantable timber is felled, it should be de-limbed and left in total tree length on the right-of-way for recovery by the owner. In limited cases, PacifiCorp may decide to purchase merchantable timber from the property owner and retain or transfer ownership to another party. A forest practice permit from the appropriate state department of forestry may be required for timber recovery.

6.12 Transmission Safety Procedures

The following safety procedures shall be followed by all tree crews on PacifiCorp transmission facilities.

6.12.1 Pre-work Communication with Control Center

Operative communication capability is mandatory at all times on transmission rights-of-way Communication with the Control Center is critical for tree crew safety. Every morning before starting transmission work, tree crews shall call the Control Center from the right-of-way by radio or telephone and provide the following information to comply with Power Delivery System Operations System policy SOP-152:

- Name of crew leader
- Name of company

- Contact information (radio or cell number)
- Name of transmission line
- Line section (substation names between which work is to occur, such as "Alvey to Dixonville," or "Ben Lomond to Terminal")
- Location of work (structure number, address or both)
- How long the crew will be working at that location
- Radio or cellular telephone number of the crew
- Name of Supervisor and their cellular telephone number

If radio or telephone contact cannot be made with the Control Center from the right-of-way, non-emergency work shall not be performed at that site. The crew should relocate to work where they can communicate with the Control Center. Satellite phones might be necessary in remote locations to provide the required communication.

6.12.2 Post-Work Communication with the Control Center

Each afternoon after completing transmission work for the day, tree crews shall call the Control Center and provide the following information:

- Name of crew foreman
- Name of company
- Contact information (radio or cell number)
- Name of transmission line
- Line section (substation names between which work occurred, such as "Alvey to Dixonville," or Ben Lomond to Terminal")
- Location where work was performed
- Notice that crew members and equipment are off the right-of-way or in the clear.

6.12.3 Safe Working Procedure

If a tree cannot be felled or pruned safely, work shall not proceed. If a tree or limb falls into the conductors, work shall stop immediately and emergency procedures followed (Figure 2.1). Minimum approach distances (Table 2.1) shall not be violated. Transmission conductors can sag considerably at mid-span during hot weather, ice buildup and heavy electrical loads. Trees that have safe clearance in the morning may not have safe clearance in the afternoon. Conditions could require a Hold or Clearances. Clearances on some transmission lines can take weeks or months to schedule. See Section 2.1.1 for Hold and Clearances instructions.

6.13 Monthly Progress Tracking

Progress on the annual work plan for NERC Transmission Lines shall be tracked on the *PacifiCorp Main Grid Transmission Progress Report* (Figure A.10) for lines under the auspices of NERC Standard FAC-003. Progress on the annual work plan for other transmission lines shall be tracked on the monthly *Local Transmission Progress Report*. Both reports track miles achieved against plan on a monthly basis (Figure A.11).

6.14 Quarterly WECC Audit Report

PacifiCorp is required to report outages on transmission lines subject to FAC-003.

7. CHEMICAL PROCEDURES

Herbicides and tree growth regulators are an integral part of PacifiCorp's Vegetation Management program. Tree Growth Regulators ("**TGR**") refers to chemicals that slow growth of some tree species. Chemical applications shall be performed according to federal, state and local regulations. Chemical use must comply with labeling. PacifiCorp's director of vegetation management shall approve all products and mixes.

7.1 Notification

Property owners shall be notified at least five days, but no more than six weeks in advance, whenever chemicals are to be used on their property. Property owner objection to herbicide use shall be honored.

7.2 Licensed Applicators

Crew leaders in all states except California shall hold a valid applicator's license. Applicators shall either hold that license, or work under the direct supervision of a certified applicator as required in the state in which they are working. Tree crews found working without a crew leader or applicator without a valid applicators license for the state in which they are working may be shut down at the Forester's discretion. Supervisors of qualified applicators shall hold a certified applicator's license in the state or states in which they supervise crews.

7.3 Closed Chain of Custody

The company making the application is responsible for chemical purchase and storage, record keeping as well as container disposal. Closed chain of custody best practices are encouraged (Goodfellow and Holt 2011). Closed chain of custody is a concept in which ready-to-use, diluted concentrate formulations are utilized in closed delivery systems. Closed chain of custody includes herbicide shipping, distribution, storage, and mixing, which includes returning empty containers for refilling and reuse.

7.4 Chemical Reporting

All chemical applications shall be documented in the *Daily Report* (Figure A.6), unless a different method is specifically approved in writing by the regional Forester. The company making the application shall be responsible for maintaining reports for review by the state departments of agriculture.

When chemical work is done on or adjacent to PacifiCorp Hydro properties, copies of chemical reports shall be provided to the plant manager weekly.

7.5 Herbicide Applications

Herbicides prevent sprouting from stumps of deciduous trees and should be used on saplings of tall-growing species to reduce future inventories. Herbicides are essential in cover type conversion necessary in establishing the wire zone-border zone method on transmission lines.

When properly used, herbicides are effective and efficient, minimize soil disturbance, and enhance plant and wildlife diversity. Herbicide application can benefit wildlife by improving forage as well as escape and nesting cover. In some instances, noxious weed control is a desirable objective on utility rights-of-way that can be accomplished through herbicide treatment.

Herbicide use can control individual plants that are prone to re-sprout or sucker after removal. When trees that re-sprout or sucker are removed without herbicide treatment, dense thickets develop, impeding access, swelling workloads, increasing costs, blocking lines-of-site, and deteriorating wildlife habitat (Yahner and Hutnik 2004). Treating suckering plants allows early successional, compatible species to dominate the right-of-way and out-compete incompatible species, ultimately reducing work.

Treatments include individual stem, broadcast and aerial treatments. Ninety-five percent control shall be assumed on all herbicide applications to be considered effective. Treatments exhibiting less than 95% control may need to be retreated at the contractor's expense.

7.5.1 Herbicide Best Management Practices

PacifiCorp is dedicated to ensuring proper application of approved herbicides to minimize the effects on non-target vegetation, human health, fish and wildlife species, and water quality (Childs 2005).

Herbicide applications shall:

- follow all product label mandatory provisions such as registered uses, maximum use rates, application restrictions, worker safety standards, restricted entry levels, environmental hazards, weather restrictions, and equipment cleansing.
- follow all product label advisory provisions such as mixing instructions, protective clothing and others matters.
- have on site a copy of the label and Safety Data Sheets (SDS); and
- be made in the presence of a licensed applicator valid for the state in which work is performed.

7.5.2 Wetlands and Waterbodies

Climate, geology and soil types should be considered when selecting the herbicide mix with the lowest relative risk of migrating to water resources (Childs 2005). The effects of herbicides on wetland and water resources should be minimized by utilizing buffer zones. Buffer zones reduce the movement of herbicides from the application site into adjoining water bodies. Buffer zones must be followed unless instructed otherwise by competent authorities.

7.5.3 Spills

Mixing, loading and cleaning equipment are critical activities that present the greatest exposure to accidents or spills. Spills can be avoided by using closed chain of custody best management practices. If any spill occurs, the procedures in Section 2.2.5 must be followed.

Table 7.1. Buffer widths to minimize impacts on non-target resources (adapted from Childs 2005).

Herbicide Ecological Toxicities and Characteristics	Buffer Width From Water Resource per Application Method			
	Spot	**Localized**	**Broadcast**	**Mixing, Loading, Cleaning**
Practically Non-toxic to Slightly Toxic	Up to the Edge	Up to the Edge	50 ft.	100 ft.
Moderately Toxic, or Label Advisory for Ground/Surface Water	25 ft.	35 ft.	300 ft.	250 ft.
Highly Toxic to Very Highly Toxic	35 ft.	100 ft.	Noxious weed control only. Buffers shall comply with local regulations	250 ft.

7.5.4 Inappropriate Applications

There are situations where herbicide applications are inappropriate. If any applicator is uncertain whether or not an application is appropriate, the applicator shall consult the regional Forester. Inappropriate applications include (but are not limited to) situations involving:

- areas where the property owner expresses objections to herbicide use
- areas where herbicide could drift or leach into organic farms
- governmental lands where herbicides are prohibited
- conditions of heavy precipitation or strong winds
- periods of high temperatures, which can cause product volatility and damage off-target plants
- trees that could be root grafted to desirable trees
- trees that are near desirable plants where the herbicide could move into contact with off target foliage or roots
- trees close to agricultural crops or harvestable, edible plants

Note that caution during periods of high temperatures can be particularly important for foliar applications and that vineyards can be especially sensitive to synthetic auxins. During periods of high temperatures, treatment can be deferred until weather cools. If there is any uncertainty regarding whether or not an application is appropriate, contact the regional Forester.

7.6 Approved Herbicides

A list of approved products appears in the following sections. PacifiCorp's director of vegetation management must authorize other chemicals.

- Stump Application
  - 2, 4-D
  - Glyphosate
  - Picloram
  - Triclopyr

- Low Volume Basal Application
  - Imazapyr
  - Triclopyr

- Foliar Application
  - 2, 4-D
  - Aminopyralid
  - Fosamine ammonium
  - Glyphosate
  - Imazapyr
  - Metasulfuron methyl
  - Picloram
  - Sulfometuron methyl
  - Triclopyr

- Soil Application
  - Diuron
  - Imazapyr
  - Picloram
  - Sulfentrazone
  - Tebuthiuron

7.7 Approved Tree Growth Regulators (TGR)

Tree Growth Regulator applications are intended to retard fast-growing trees so that they will not interfere with facilities or violate state regulatory agency tree policy before the next scheduled maintenance.

- Fluprimidol
- Paclobutrazol

8. CUSTOMER RELATIONS

Representatives of vegetation management interact with a significant number of customers. As a result, customers often develop an impression of PacifiCorp based on their experience with vegetation management. Particularly because vegetation management work is often controversial, excellent customer service is imperative for a successful program. PacifiCorp personnel must be professional, prompt, fair and courteous to customers. Contractor personnel are also required to be professional, prompt, fair and courteous to the property owners with whom they interact while performing work for PacifiCorp.

Independent contractors are responsible for managing communications with property owners in a manner consistent with this Chapter 8. Communications with customers should accurately describe the work to be performed, and any jargon should be avoided in the conversation.

8.1 Educational Information

PacifiCorp has a variety of educational materials about tree-power line conflicts and planting the right tree in the right place.

The *Trees and Power Lines* brochure explains the need for line clearance work, as well as natural target pruning. It also provides color pictures of how properly pruned trees could look following line clearance. (This brochure is used a companion to the "yellow door card" described in Section 8.2.1 below.)

The *Small Trees for Small Places* is a publication in PDF format available at www.PacificPower.net or www.RockyMountainPower.net. It provides tree selection tree planting and electrical safety information. It offers an easy-to-use chart on ornamental and adaptive characteristics of 100 different species that can be used adjacent to power lines. Not all these trees can be used everywhere in PacifiCorp's service territory. By providing a choice of 100 small-statured trees, however, there are several options appropriate for use in any given location around PacifiCorp's system.

The *Right Tree in the Right Place* poster provides illustrations and descriptions of small trees that are suitable across PacifiCorp's service territory. It also relates information about proper utility tree pruning and tree planting.

8.2 Notification for Tree Work

As a customer courtesy, prior to vegetation management work a reasonable attempt shall be made using the techniques specified in this Section 8.2, to notify the property owners (or tenants) of residential properties occupied year-round and occupied business properties. Forester authorization is required prior to performing work on such properties without such notice to owners and tenants. Some circumstances, such as work on historic, unique or unusual trees, could warrant personal contact with the customer.

School main or administrative offices should be notified of work to be done within school grounds or on property adjacent to schools. An effort should be made to schedule work without children present or specific accommodations made for pupils' safety. Particular effort should be

made to identify targets within drop zones, climbable trees, access issues and other safety matters on site.

In cases of municipal, county, state or federal properties, the proper agency representative shall be notified by the Forester or the contractor. The appropriate customer and community relations manager should be notified prior to meeting with governmental officials.

Notification should be given at least five business days, but no more than six weeks, prior to the crew arriving. Notification shall be documented on an *Activity Report* (Figure A.5).

8.2.1 Door Hangers

PacifiCorp employs a variety of door hangers. Pacific Power door hangers shall be used in California, Oregon and Washington, and Rocky Mountain Power door hangers shall be used in Idaho, Utah and Wyoming. Door hangers shall not be placed in U.S. Mail boxes but shall be placed at the entry way of a dwelling or business structure.

8.2.2 Personal Notification

When crews arrive for work at a residential site, a member of the crew should make a courtesy knock on the door to let the homeowner or tenant know that work is about to begin. So long as the homeowner or tenant does not articulate a protest or otherwise indicate that the owner refuses to allow work, the crew may proceed with the planned work. If no one is home, the crew may proceed with the planned work. On business property sites, prior notification is all that is necessary for crews to begin work.

8.3 Affirmative Customer Consent

As a courtesy and to avoid unnecessary disputes, PacifiCorp sometimes requires that an independent contractor make reasonable attempts to obtain and document "Affirmative Customer Consent" for:

- tree removal
- tree and brush disposal
- mowing
- herbicide application
- TGR application

Affirmative Customer Consent is documented with a property owner's signature on the *Property Owner Permission Form* (Figure A.12)

8.4 Property Owner Refusal Procedure

If a property owner refuses to allow work, the crew may not proceed with work, except as expressly allowed under the "Property Owner Refusal Process" described in this section. Detailed records should be kept of every conversation, including the date and time it occurred, and summary of the matters discussed.

Initial Refusal Stage. If a property owner refuses to give Affirmative Customer Consent and/or sign a *Property Owner Permission Form*, the contractor shall complete a *Property Owner Refusal/Complaint Report* and notify the Forester within two working days.

Intermediate Refusal Stage. After notifying the Forester, the contract Forest Technician shall research PacifiCorp's property rights for that location, in consultation with PacifiCorp right-of-way services. After researching PacifiCorp's property rights in the right-of-way, a representative of the contractor other than the Supervisor (e.g. the Forest Technician) will then contact the property owner, either by telephone or in-person, and re-attempt to obtain Affirmative Customer Consent for the work referring to the property rights at issue, as appropriate. If the property owner continues to refuse to allow the work to proceed, the Supervisor shall attempt to obtain Affirmative Customer Consent. After at least 24 hours have passed since the prior attempt to obtain consent, the Supervisor will contact the property owner, either by telephone or in-person, and re-attempt to obtain Affirmative Customer Consent. If the property owner continues to refuse to allow work to proceed, the Supervisor shall inform the Forester.

Final Refusal Stage. Within two weeks of being notified by the Supervisor that a property owner continues to refuse to allow work to proceed, the Forester shall attempt to obtain Affirmative Customer Consent for the work. If the Forester is unable to obtain Affirmative Customer Consent, the Forester shall determine whether to (i) instruct contractor to proceed with the work without affirmative consent or (ii) excuse contractor from performing the work to the specifications required under these standard operating procedures.

8.5 Work Completed Without Property Owner Consent

If PacifiCorp holds property interests entitling it maintain its facilities, work may proceed over a property owner's unfounded refusal. If the Forester decides to proceed with work, the Forester shall send the customer a letter by certified mail, notifying the property owner of (i) the work which be performed and summary of reasons for the work and (ii) the date and time that the tree(s) will be worked. If appropriate because of the nature of the property owner's refusal, an enclosure provided by PacifiCorp Right-of-Way Services (i.e. describing the legal authority under which the PacifiCorp is acting) may also be included. The date of work shall be at least five business days from the time the letter is postmarked. The Forester shall alert the director of vegetation management, as well as the appropriate operations manager, customer and community manager, wires director, and regulatory analyst about any work scheduled for completion after a property owner refusal. The regulatory analyst will inform the proper regulatory agency about the action. If it appears the media could become involved, the Media Hotline should be notified. Once the letter to the property owner is sent, tree crews shall be dispatched to work the site to specifications at the assigned date and time. The Forester or Supervisor should be on site during work. Before and after photos of the site should be taken. The scheduled work should be completed, regardless of any additional objection from the property owner, unless the property owner threatens the safety of the crew or bystanders. As always, safety is the highest priority. The Forester may contact local law enforcement to request a presence on the property while

work is performed. The Forester may seek assistance from PacifiCorp's legal department. If absolutely necessary to complete the work, PacifiCorp may obtain appropriate relief from a court of law.

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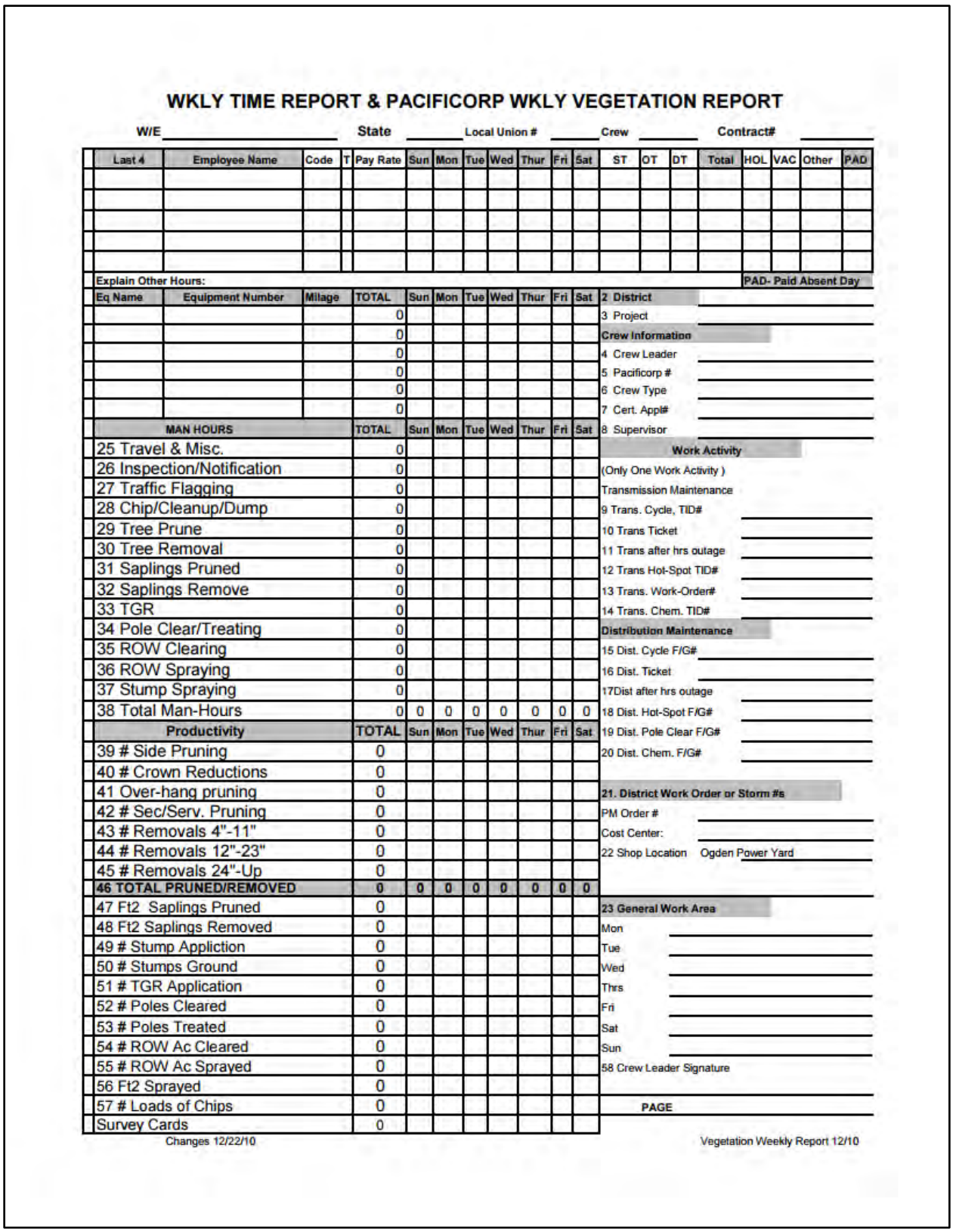
APPENDIX A
Vegetation Management work scheduling and reporting forms.



WKLY TIME REPORT & PACIFICORP WKLY VEGETATION REPORT

W/E _____ State _____ Local Union # _____ Crew _____ Contract# _____

Last 4	Employee Name	Code	T	Pay Rate	Sun	Mon	Tue	Wed	Thur	Fri	Sat	ST	OT	DT	Total	HOL	VAC	Other	PAD

Explain Other Hours: PAD- Paid Absent Day

Eq Name	Equipment Number	Milage	TOTAL	Sun	Mon	Tue	Wed	Thur	Fri	Sat
			0							
			0							
			0							
			0							
			0							
			0							

MAN HOURS	TOTAL	Sun	Mon	Tue	Wed	Thur	Fri	Sat
25 Travel & Misc.	0							
26 Inspection/Notification	0							
27 Traffic Flagging	0							
28 Chip/Cleanup/Dump	0							
29 Tree Prune	0							
30 Tree Removal	0							
31 Saplings Pruned	0							
32 Saplings Remove	0							
33 TGR	0							
34 Pole Clear/Treating	0							
35 ROW Clearing	0							
36 ROW Spraying	0							
37 Stump Spraying	0							
38 Total Man-Hours	0	0	0	0	0	0	0	0

Productivity	TOTAL	Sun	Mon	Tue	Wed	Thur	Fri	Sat
39 # Side Pruning	0							
40 # Crown Reductions	0							
41 Over-hang pruning	0							
42 # Sec/Serv. Pruning	0							
43 # Removals 4"-11"	0							
44 # Removals 12"-23"	0							
45 # Removals 24"-Up	0							
46 TOTAL PRUNED/REMOVED	0	0	0	0	0	0	0	0
47 Ft2 Saplings Pruned	0							
48 Ft2 Saplings Removed	0							
49 # Stump Appliction	0							
50 # Stumps Ground	0							
51 # TGR Application	0							
52 # Poles Cleared	0							
53 # Poles Treated	0							
54 # ROW Ac Cleared	0							
55 # ROW Ac Sprayed	0							
56 Ft2 Sprayed	0							
57 # Loads of Chips	0							
Survey Cards	0							

Changes 12/22/10

2 District _____
3 Project _____

Crew Information

4 Crew Leader _____
5 Pacificorp # _____
6 Crew Type _____
7 Cert. Appl# _____
8 Supervisor _____

Work Activity

(Only One Work Activity)

Transmission Maintenance

9 Trans. Cycle, TID# _____
10 Trans Ticket _____
11 Trans after hrs outage _____
12 Trans Hot-Spot TID# _____
13 Trans. Work-Order# _____
14 Trans. Chem. TID# _____

Distribution Maintenance

15 Dist. Cycle F/G# _____
16 Dist. Ticket _____
17Dist after hrs outage _____
18 Dist. Hot-Spot F/G# _____
19 Dist. Pole Clear F/G# _____
20 Dist. Chem. F/G# _____

21. District Work Order or Storm #s

PM Order # _____
Cost Center: _____
22 Shop Location Ogden Power Yard

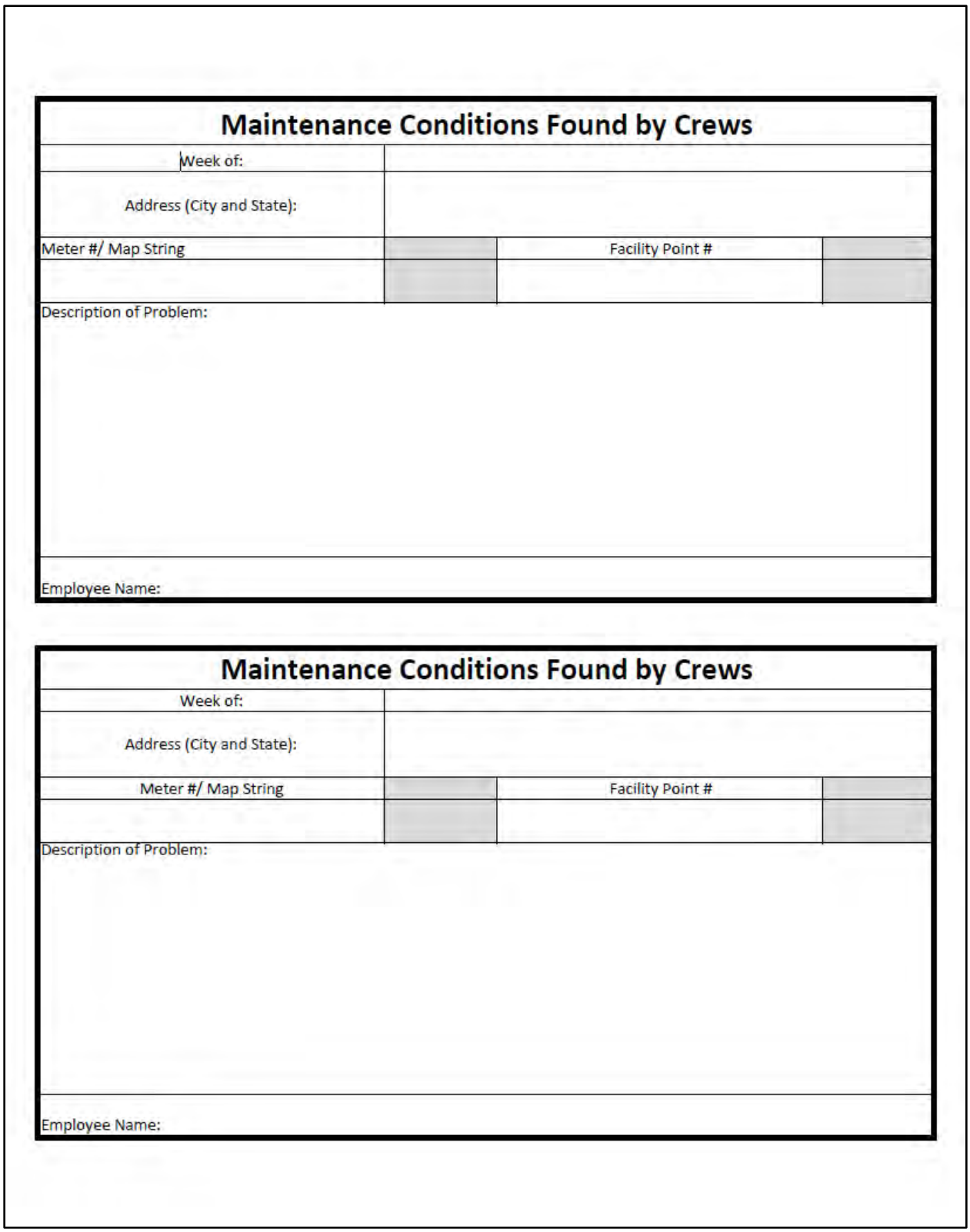
23 General Work Area

Mon _____
Tue _____
Wed _____
Thrs _____
Fri _____
Sat _____
Sun _____
58 Crew Leader Signature _____

PAGE _____

Vegetation Weekly Report 12/10

Figure A.1. Weekly Time and Vegetation Report form



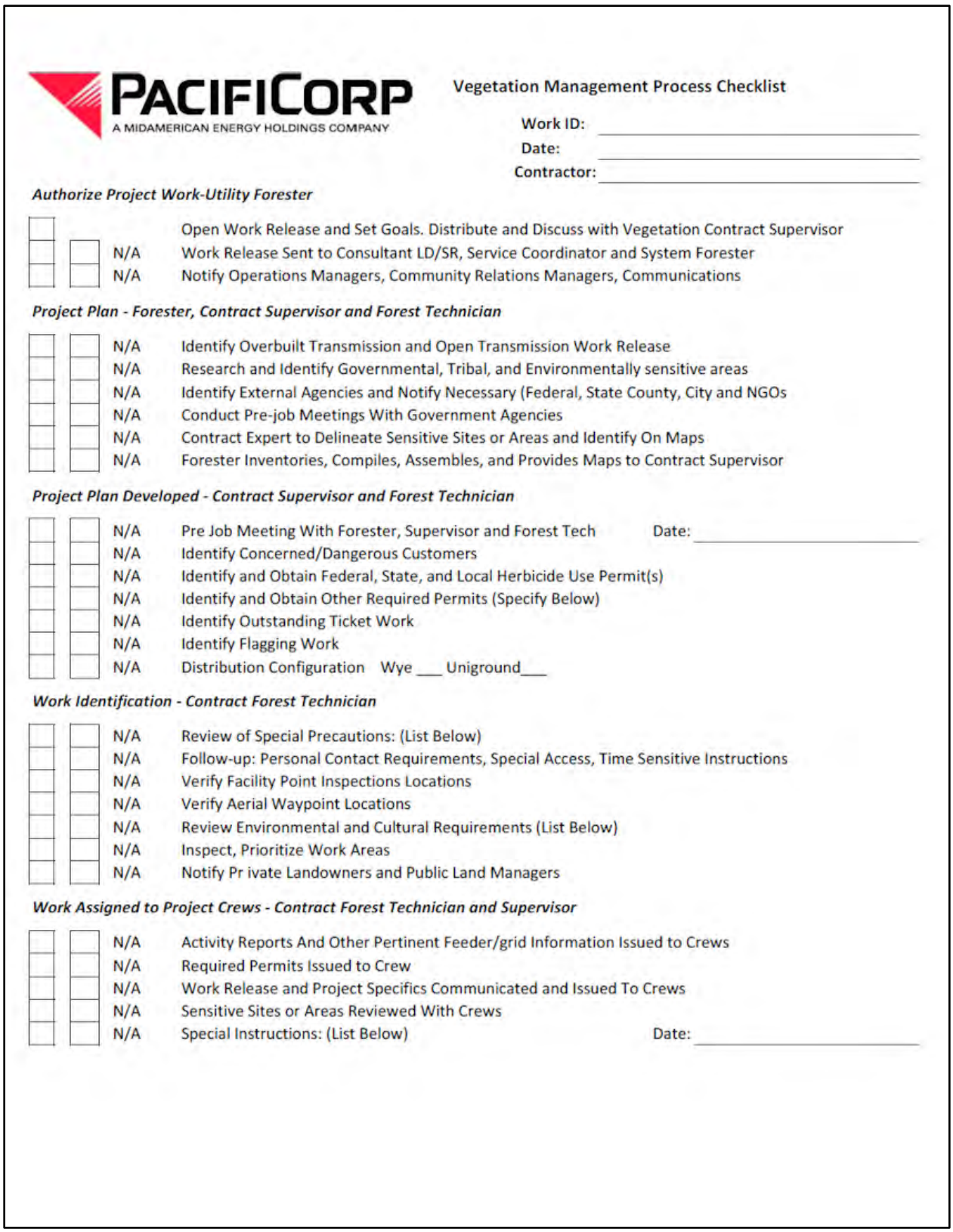
Maintenance Conditions Found by Crews

Week of:			
Address (City and State):			
Meter #/ Map String		Facility Point #	
Description of Problem:			
Employee Name:			

Maintenance Conditions Found by Crews

Week of:			
Address (City and State):			
Meter #/ Map String		Facility Point #	
Description of Problem:			
Employee Name:			

Figure A.2. Maintenance Condition Report form



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Vegetation Management Process Checklist

Work ID: _____
Date: _____
Contractor: _____

Authorize Project Work-Utility Forester

- ☐ Open Work Release and Set Goals. Distribute and Discuss with Vegetation Contract Supervisor
- ☐ ☐ N/A Work Release Sent to Consultant LD/SR, Service Coordinator and System Forester
- ☐ ☐ N/A Notify Operations Managers, Community Relations Managers, Communications

Project Plan - Forester, Contract Supervisor and Forest Technician

- ☐ ☐ N/A Identify Overbuilt Transmission and Open Transmission Work Release
- ☐ ☐ N/A Research and Identify Governmental, Tribal, and Environmentally sensitive areas
- ☐ ☐ N/A Identify External Agencies and Notify Necessary (Federal, State County, City and NGOs
- ☐ ☐ N/A Conduct Pre-job Meetings With Government Agencies
- ☐ ☐ N/A Contract Expert to Delineate Sensitive Sites or Areas and Identify On Maps
- ☐ ☐ N/A Forester Inventories, Compiles, Assembles, and Provides Maps to Contract Supervisor

Project Plan Developed - Contract Supervisor and Forest Technician

- ☐ ☐ N/A Pre Job Meeting With Forester, Supervisor and Forest Tech Date: _____
- ☐ ☐ N/A Identify Concerned/Dangerous Customers
- ☐ ☐ N/A Identify and Obtain Federal, State, and Local Herbicide Use Permit(s)
- ☐ ☐ N/A Identify and Obtain Other Required Permits (Specify Below)
- ☐ ☐ N/A Identify Outstanding Ticket Work
- ☐ ☐ N/A Identify Flagging Work
- ☐ ☐ N/A Distribution Configuration Wye ___ Uniground___

Work Identification - Contract Forest Technician

- ☐ ☐ N/A Review of Special Precautions: (List Below)
- ☐ ☐ N/A Follow-up: Personal Contact Requirements, Special Access, Time Sensitive Instructions
- ☐ ☐ N/A Verify Facility Point Inspections Locations
- ☐ ☐ N/A Verify Aerial Waypoint Locations
- ☐ ☐ N/A Review Environmental and Cultural Requirements (List Below)
- ☐ ☐ N/A Inspect, Prioritize Work Areas
- ☐ ☐ N/A Notify Pr ivate Landowners and Public Land Managers

Work Assigned to Project Crews - Contract Forest Technician and Supervisor

- ☐ ☐ N/A Activity Reports And Other Pertinent Feeder/grid Information Issued to Crews
- ☐ ☐ N/A Required Permits Issued to Crew
- ☐ ☐ N/A Work Release and Project Specifics Communicated and Issued To Crews
- ☐ ☐ N/A Sensitive Sites or Areas Reviewed With Crews
- ☐ ☐ N/A Special Instructions: (List Below) Date: _____

Figure A.3. Vegetation Management Process Checklist form (page 1of 2)

Project Completion - Contract Supervisor and Forest Technician

☐	☐	N/A	Post Inspection of Work to Verify Completion
☐	☐	N/A	Inventory and Check In Maps
☐	☐	N/A	Maps and Documentation Submitted
☐	☐	N/A	Concerned Customer Forms Submitted
☐	☐	N/A	Refusal Information Submitted
☐	☐	N/A	Dangerous Customer Information Submitted
☐	☐	N/A	Tree Replacement Voucher Copies Submitted
☐	☐	N/A	Hazard Forms - Copy in File and Copy to Utility General Foreman
☐	☐	N/A	Daily Logs for Project Sent to Utility Area Forester

Project Closure - Forester

☐	☐	N/A	Verify Receipt of Maps, Daily Logs, Activity Reports, Replacement Vouchers, and Hazard Forms
☐	☐	N/A	Verify Receipt of Refusal and Concerned/Dangerous Customer Information
☐	☐	N/A	Verify Receipt of Signed Work Release
☐	☐	N/A	Close Work Release (Send to Consultant LD/SR, Service Coordinator and System Forester)

X _____ **X** _____

Comments:

Figure A.3 (Continued)

Pacificorp Vegetation Management

Contractor Work Release

This work release authorizes the vegetation management contractor to proceed with the specified maintenance project. All work shall conform to Pacificorp's Vegetation Management Specifications. Following project completion, a contractor representatiive shall sign this work release and return it to PacifiCorp. Refusals, or any work performed that does not conform to PacifiCorp Specifications shall be noted.

District: Cody/Lovell **Project #:** 32685

Contractor: Trees Incorporated **Supervisor:** Meyer, William

Bid Structure Fixed Cost

Cody North Fork **(DST)** **WorkID:** CodyNFrk

Work according to PacifiCorp Specifications (Transmission & Distribution Vegetation Management Program Standard Operating Procedures, 6-19-2019). Limit removals to cases where removal time is less than twice the pruning time. Exceptions are danger and fast growing (>3 ft/yr) trees. Identify and correct all climbable tree and tree house hazards, and remove danger trees. Use tree coupons to pursue removals as needed. All deciduous trees removed should be treated with an approved herbicide, unless property owner disapproves, or area is landscaped, or irrigated. All volunteer trees should be removed. A volunteer is defined as a tree not planted as part of the landscape, establishing itself without the aid or knowledge of the landowner. Volunteers prominent in the landscape should only be removed after proper notification to the property owner has been made. This notification can be done by letter, door card, phone, or in person. All local transmission shall also be worked within the grid and the lines opened under separate work releases.

Special Instructions:

None.

Projected Start Date: 8/6/2019 **Projected Completion Date:** 9/21/2019

Area Forester Approval: Vanderhoof, Robert **Date:** 8/6/2019

Contractor Work Release Accepted: Meyer, William **Date:** 8/6/2019

To be completed by the contractor:

Start Date: _____ **Completion Date** _____

Comments:

Supervisor Signature: _____

Figure A.4. Vegetation Management Work Release

District : ______	**Cycle Maintenance**	**Interim Maintenance**	**Ticket Maintenance**	**Work Order**
Project #: ______	Trans. PL#: ______	Trans. PL#: ______	Trans. Ticket ______	W.O. #: ______ &
Inspected By: ______	Dist. F/G#: ______	Dist. F/G#: ______	Dist. Ticket ______	District CC #: ______

Date Inspect.	Detailed Location	Property Owner	Phone Number	Type of *Contact	^TGR s	Crew Type	Description of Work / Comments	Date Comp.	^Cst. Survey	Crew ID No.	Forem. Initials

*Type of Contact Legend: D-Door Hanger, L-Letter, N-None, P-Personal, T-Telephone

^TGRs and Customer Surveys: Check = yes, Blank = no

Figure A.5. Vegetation Management Activity Report

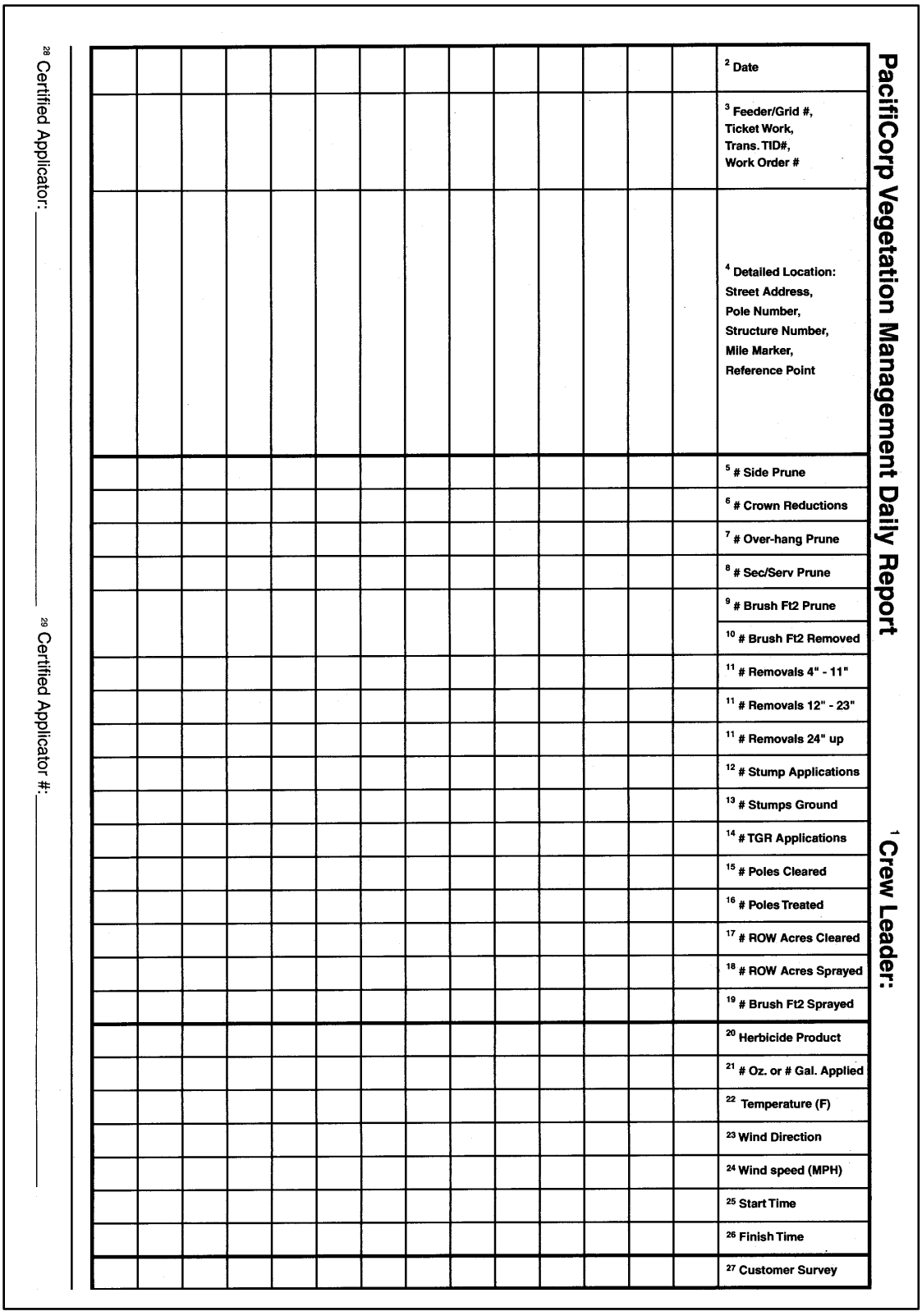

Figure A.6. Vegetation Management Daily Report

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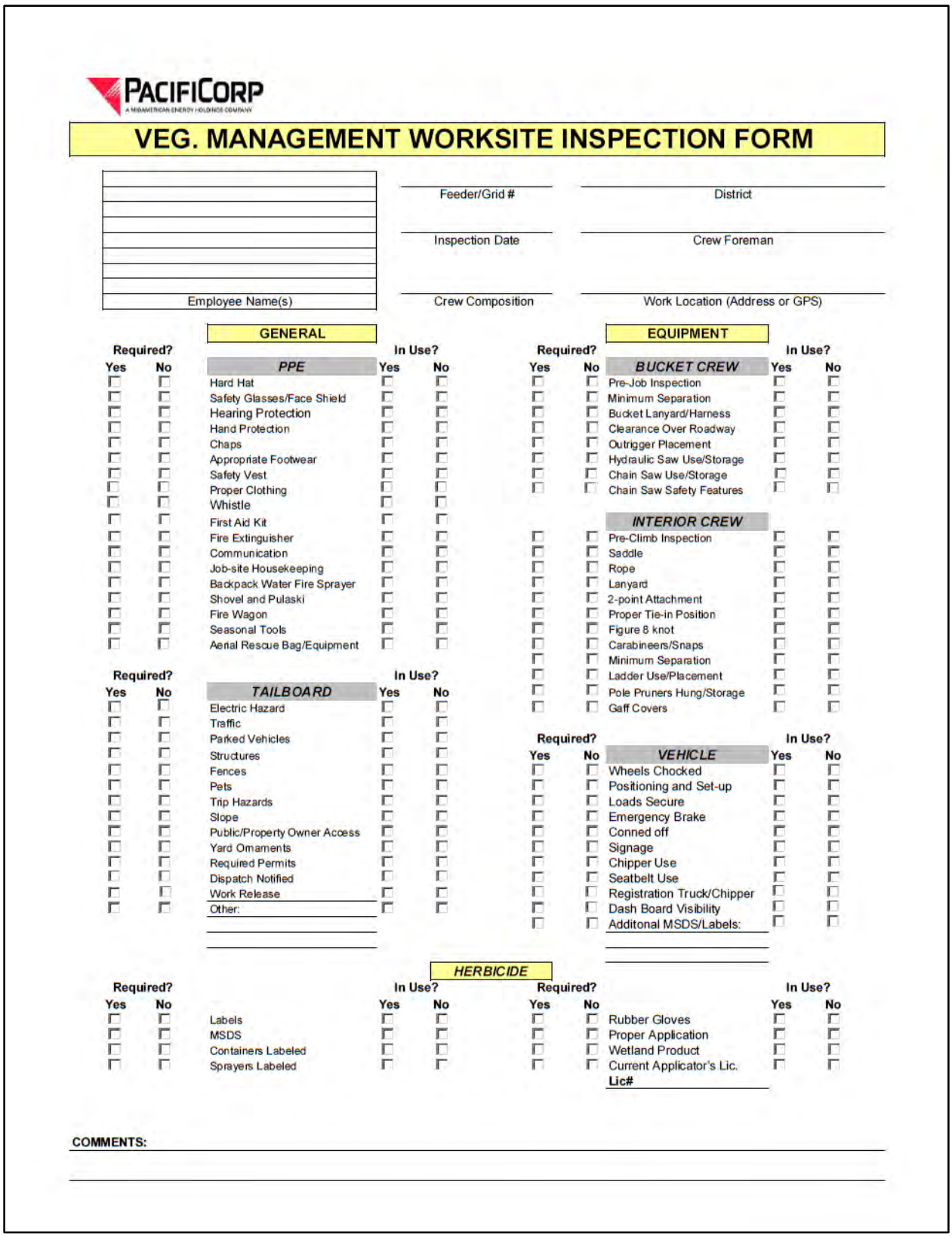
TREE CREW FIELD AUDIT FORM

DATE: _____ WORK ID: _____ FOREMAN: _____ CONTRACTOR: _____

WEEK ENDING DATE: _____ AUDIT DAYS: M T W Th F FORESTER: _____

Location	Exception	Comments	Number	Correction Required
TOTAL EXCEPTIONS				

Figure A.7. Tree Crew Field Audit Form



PACIFICORP
A MIDAMERICAN ENERGY HOLDINGS COMPANY

VEG. MANAGEMENT WORKSITE INSPECTION FORM

Employee Name(s)

Feeder/Grid #

Inspection Date

Crew Composition

District

Crew Foreman

Work Location (Address or GPS)

GENERAL

Required? Yes	Required? No	PPE	In Use? Yes	In Use? No
☐	☐	Hard Hat	☐	☐
☐	☐	Safety Glasses/Face Shield	☐	☐
☐	☐	Hearing Protection	☐	☐
☐	☐	Hand Protection	☐	☐
☐	☐	Chaps	☐	☐
☐	☐	Appropriate Footwear	☐	☐
☐	☐	Safety Vest	☐	☐
☐	☐	Proper Clothing	☐	☐
☐	☐	Whistle	☐	☐
☐	☐	First Aid Kit	☐	☐
☐	☐	Fire Extinguisher	☐	☐
☐	☐	Communication	☐	☐
☐	☐	Job-site Housekeeping	☐	☐
☐	☐	Backpack Water Fire Sprayer	☐	☐
☐	☐	Shovel and Pulaski	☐	☐
☐	☐	Fire Wagon	☐	☐
☐	☐	Seasonal Tools	☐	☐
☐	☐	Aerial Rescue Bag/Equipment	☐	☐

Required? Yes	Required? No	TAILBOARD	In Use? Yes	In Use? No
☐	☐	Electric Hazard	☐	☐
☐	☐	Traffic	☐	☐
☐	☐	Parked Vehicles	☐	☐
☐	☐	Structures	☐	☐
☐	☐	Fences	☐	☐
☐	☐	Pets	☐	☐
☐	☐	Trip Hazards	☐	☐
☐	☐	Slope	☐	☐
☐	☐	Public/Property Owner Access	☐	☐
☐	☐	Yard Ornaments	☐	☐
☐	☐	Required Permits	☐	☐
☐	☐	Dispatch Notified	☐	☐
☐	☐	Work Release	☐	☐
☐	☐	Other:	☐	☐

EQUIPMENT

Required? Yes	Required? No	BUCKET CREW	In Use? Yes	In Use? No
☐	☐	Pre-Job Inspection	☐	☐
☐	☐	Minimum Separation	☐	☐
☐	☐	Bucket Lanyard/Harness	☐	☐
☐	☐	Clearance Over Roadway	☐	☐
☐	☐	Outrigger Placement	☐	☐
☐	☐	Hydraulic Saw Use/Storage	☐	☐
☐	☐	Chain Saw Use/Storage	☐	☐
☐	☐	Chain Saw Safety Features	☐	☐
		INTERIOR CREW		
☐	☐	Pre-Climb Inspection	☐	☐
☐	☐	Saddle	☐	☐
☐	☐	Rope	☐	☐
☐	☐	Lanyard	☐	☐
☐	☐	2-point Attachment	☐	☐
☐	☐	Proper Tie-in Position	☐	☐
☐	☐	Figure 8 knot	☐	☐
☐	☐	Carabineers/Snaps	☐	☐
☐	☐	Minimum Separation	☐	☐
☐	☐	Ladder Use/Placement	☐	☐
☐	☐	Pole Pruners Hung/Storage	☐	☐
☐	☐	Gaff Covers	☐	☐

Required? Yes	Required? No	VEHICLE	In Use? Yes	In Use? No
☐	☐	Wheels Chocked	☐	☐
☐	☐	Positioning and Set-up	☐	☐
☐	☐	Loads Secure	☐	☐
☐	☐	Emergency Brake	☐	☐
☐	☐	Conned off	☐	☐
☐	☐	Signage	☐	☐
☐	☐	Chipper Use	☐	☐
☐	☐	Seatbelt Use	☐	☐
☐	☐	Registration Truck/Chipper	☐	☐
☐	☐	Dash Board Visibility	☐	☐
☐	☐	Additonal MSDS/Labels:	☐	☐

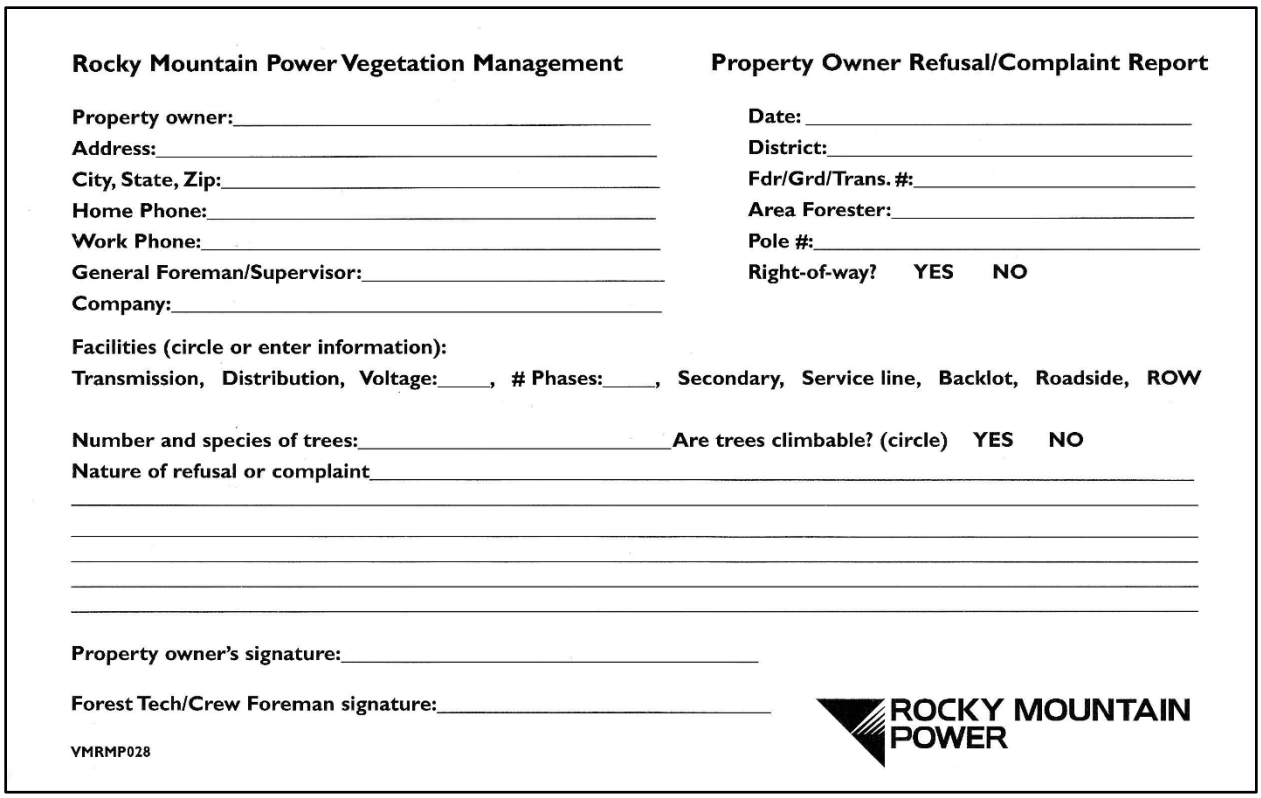
HERBICIDE

Required? Yes	Required? No		In Use? Yes	In Use? No
☐	☐	Labels	☐	☐
☐	☐	MSDS	☐	☐
☐	☐	Containers Labeled	☐	☐
☐	☐	Sprayers Labeled	☐	☐

Required? Yes	Required? No		In Use? Yes	In Use? No
☐	☐	Rubber Gloves	☐	☐
☐	☐	Proper Application	☐	☐
☐	☐	Wetland Product	☐	☐
☐	☐	Current Applicator's Lic.	☐	☐
		Lic#		

COMMENTS:

Figure A.8. Worksite Inspection Form



Rocky Mountain Power Vegetation Management **Property Owner Refusal/Complaint Report**

Property owner:_____ Date: _____
Address:_____ District:_____
City, State, Zip:_____ Fdr/Grd/Trans. #:_____
Home Phone:_____ Area Forester:_____
Work Phone:_____ Pole #:_____
General Foreman/Supervisor:_____ Right-of-way? YES NO
Company:_____

Facilities (circle or enter information):
Transmission, Distribution, Voltage:____, # Phases:____, Secondary, Service line, Backlot, Roadside, ROW

Number and species of trees:_____Are trees climbable? (circle) YES NO
Nature of refusal or complaint_____
_____
_____
_____
_____
_____

Property owner's signature:_____

Forest Tech/Crew Foreman signature:_____

VMRMP028

ROCKY MOUNTAIN POWER

Figure A.9. Property Owner Refusal/Complaint form

PACIFICORP VEGETATION MANAGEMENT					
2018 MAIN GRID TRANSMISSION PROGRESS REPORT					
Through April 28, 2018					
STATE SUMMARY					
Cycle Work					
	TOTAL	Line Miles	Line Miles	Line Miles	Line Miles
	Line Miles	Scheduled	Completed	Goal	Ahead/Behind
	7,595	**268**	**31**	**67**	**-36**
State					
California	129	7	3	2	1
Idaho	1,150	0	0	0	0
Misc States	70	0	0	0	0
Montana	137	0	0	0	0
Oregon	1,128	85	1	21	-20
Utah	2,621	166	14	42	-28
Washington	284	10	13	3	11
Wyoming	2,075	0	0	0	0
TOTAL	7,595	268	31	67	-36
FORESTER SUMMARY					
	TOTAL	Line Miles	Line Miles	Line Miles	Line Miles
	Line Miles	Scheduled	Completed	Goal	Ahead/Behind
	7,595	**268**	**31**	**67**	**-36**
Forester					
Armstrong	673	78	13	20	-7
Evans	2,115	17	2	4	-2
Jones	110	21	0	5	-5
Hooley	281	0	0	0	0
Phillips	517	22	4	5	-1
Vanderhoof	3,829	128	12	32	-20
Wolinski	71	2	0	1	-1
Total	7,595	268	31	67	-36

Figure A.10. Main Grid Transmission Report

PACIFICORP VEGETATION MANAGEMENT 2018 LOCAL TRANSMISSION PROGRESS REPORT

Summary

Through Apr 28, 2018

LOCAL TRANSMISSION WORK

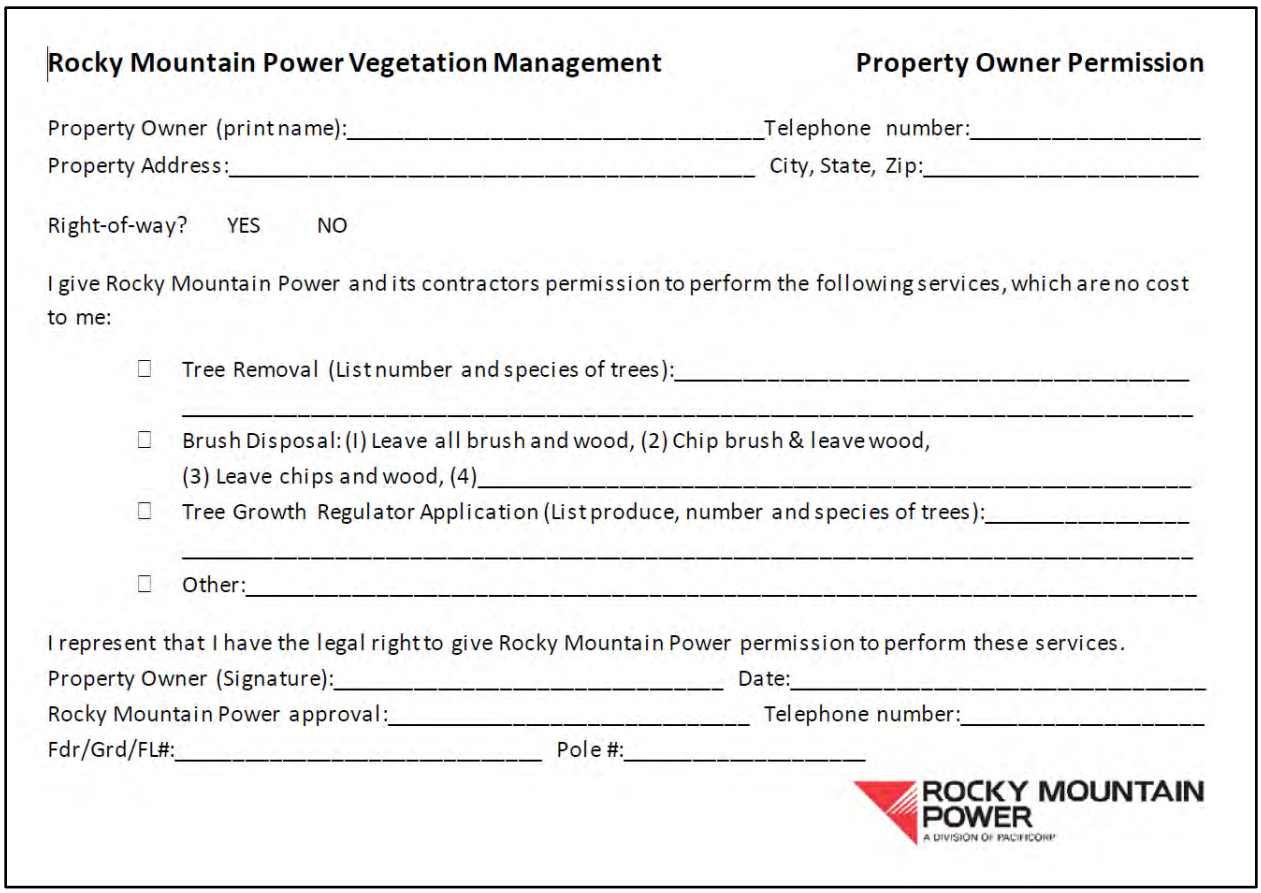
	CYCLE WORK					INTERIM WORK			
	Total Line Miles	Total Miles Scheduled	Line Miles Completed	Line Mile Completed Goal	Miles Ahead(Behind)	Line Miles Scheduled	Line Miles Completed	Line Miles Goal	Line Miles Ahead/Behind
State	**8,187**	**1,901**	**988**	**475**	**512**	**111**	**48**	**28**	**20**
California	572	8	2	2	0	20	0	5	-5
Idaho	835	293	46	73	-27	0	0	0	0
Oregon	1,820	9	1	2	-2	91	48	23	25
Utah	3,954	1,361	939	340	599	0	0	0	0
Washington	324	0	0	0	0	0	0	0	0
Wyoming	683	230	0	58	-58	0	0	0	0
Total	8,187	1,901	988	475	512	111	48	28	20

SUMMARY OF WORK BY FORESTER

	Total Line Miles	Total Miles Scheduled	Line Miles Completed	Line Mile Completed Goal	Miles Ahead(Behind)
	8,187	**2,012**	**995**	**503**	**492**
Forester					
Wolinski	356	25	15	6	9
Evans	2,544	895	780	224	556
Jones	731	240	119	60	59
Hooley	589	85	32	21	11
Phillips	1,038	18	3	4	-2
Vanderhoof	2,197	749	46	187	-101
Armstrong	732	0	0	0	0
Total	8,187	2,012	995	503	532

Weeks 13

Figure A.11. Local transmission progress report



Rocky Mountain Power Vegetation Management **Property Owner Permission**

Property Owner (print name):_____Telephone number:_____

Property Address:_____ City, State, Zip:_____

Right-of-way? YES NO

I give Rocky Mountain Power and its contractors permission to perform the following services, which are no cost to me:

- ☐ Tree Removal (List number and species of trees):_____
  _____
- ☐ Brush Disposal: (I) Leave all brush and wood, (2) Chip brush & leave wood, (3) Leave chips and wood, (4)_____
- ☐ Tree Growth Regulator Application (List produce, number and species of trees):_____
  _____
- ☐ Other:_____

I represent that I have the legal right to give Rocky Mountain Power permission to perform these services.

Property Owner (Signature):_____ Date:_____

Rocky Mountain Power approval:_____ Telephone number:_____

Fdr/Grd/FL#:_____ Pole #:_____

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

Figure A.12. Property Owner Permission Form

APPENDIX B
Revision History

Revision	Status	Date	Author	Change Tracking
00	Issued for implementation	12/15/2008	R. H. Miller	Manual created
01	Reviewed/Updated	06/15/2012	R. H. Miller	1. Clarified language throughout 2. Revised Chapter 4 to reflect a process checklist used for project management. 3. Modified Clearance 2 to strictly reflect table 5 in IEEE 516-2003 Table 5. 4. Section 6.4.1 changed so that if contract utility Foresters identify an imminent threat, they contact the appropriate line patrolmen to initiate the imminent threat procedure.
02	Reviewed/Updated	09/06/2013	R.H. Miller	1.Clarified language throughout. 2. Revised distribution action thresholds and clearance standards to accommodate three and four year cycles. 3. Modified transmission clearance requirements to accommodate FAC-003-02
03	Reviewed/Updated	06/24/2015	R.H. Miller	1. Clarified language 2. Brought specification manual into line with FAC-003-03
04	Reviewed/Updated	07/01/2015	R.H. Miller	1. Corrected Table of Contents 2. Updated Figures 2.1 and 6.6 with Rocky Mt. Power 3. Corrected reference to Table 2.2 4. Added substation inspection Section (2.6 and 4.2.4.6) 5. Clarified definition of interim work. 6. Clarified side work.
05	Reviewed/Updated`	06/01/2016	R.H. Miller	1. Changed document to “Standard Operating Procedures” 2. Clarified language 3. Chapter 2. a. Added “At Fault” tree crew caused outages language – Section 2.1.6 b. Added language to contact media – Section 2.4.2.1 c. Added language to contact legal – Section 2.4.2.2 d. Added language that mechanical cutting (Jarraff’s and helicopters) to comply with ANSI A300. e. Added language for storm emergency response 2.10. f. Added language assigning responsibility for property damage to contractors 2.12.

Revision	Status	Date	Author	Change Tracking
				4. Chapter 4 a. Added language to requiring rules be followed on hydroelectric facilities and communicate with plant manager – Section 4.2.4.7. b. Added language requiring limited visual hazard tree inspections around substations and transition stations – 4.2.4.8. c. Added language on working around schools – Section 4.2.7.1. d. Added language regarding working near mobile home parks and apartment complexes – Section 4.2.7.2. e. Simplified language on accounting for pruning in – Section 4.3.1 5. Chapter 5 a. Updated interim maintenance language – Section 5.3 b. Added a section on distribution herbicide maintenance – Section 5.5 c. Updated work thresholds and clearances – Table 5.1 d. Added table on interim work thresholds and clearances – Table 5.2 e. Added section on padmount transformers – Section 5.7. 6. Chapter 7 a. Added section on closed chain of custody – Section 7.1
06	Reviewed/Updated`	06/01/2017	R.H. Miller	1. Made style consistent for all the chapters 2. Changed figure presentation so they followed first mention sequentially. Updated section numbering accordingly 3. Clarified language throughout 4. Updated Table 6.1 to comport with FAC-003-4 MVCDs.
07		05/13/2019	R.E. Vanderhoof	1. Modified Forest Technician qualification requirements (Chapter 1) 2. Made style consistent across tables and figures, and eliminated extraneous figures 3. Eliminated two-column format to facilitate future revisions 4. Moved standard form objects to appendix. 5. Significantly condensed chapters 3, 4 and 8

Revision	Status	Date	Author	Change Tracking
				6. Modified Table 2.1 to reflect new edition of Z133 safety requirements 7. Removed threshold clearances and increased specification clearances for California (Tables 5.2) 8. Increased interim clearances for California (Table 5.5) 9. Increased transmission clearances for 161, 138, and 115 kV lines to comply with California Electric Tariff Rule 11(table 6.1) 10. Significantly simplified tree crew audit process (Chapter 4) 11. Introduced new distribution ticket maintenance procedure (Chapter 5) 12. Reclassified brush as < 6 in. dbh and trees as > 6in. dbh 13. Removed glossary and defined terms in text. 14. Changed side clearance major woody stem exemption (5.6) from 18 in. to 20 in.