



## Department of Energy

Bonneville Power Administration  
P.O. Box 3621  
Portland, Oregon 97208-3621

PUBLIC AFFAIRS

November 23, 2011

In reply refer to: DK-7

Richard van Dijk

Ex 6

### FOIA #BPA-2011-02027-F

Dear Mr. van Dijk:

This is a final response to your request for information that you made to the Bonneville Power Administration (BPA) under the Freedom of Information Act (FOIA), 5 U.S.C. 552.

#### You requested the following:

Copies of all documentation that was given to PacifiCorp about the I-5 being routed through PacifiCorp lands along or near the Lewis River. Included in this request are all emails, both internal and external to BPA, meeting minutes and handwritten notes. This data is being requested from January 2010 through to the date of this request. This request may exclude previously provided data under FOIA 1632-F with the date range of May 11, 2011 through July 31, 2011.

#### Response:

BPA is providing the enclosed responsive documents either in their entirety or with information redacted that was non-responsive to your request.

Pursuant to 10 CFR 1004.8, if you are dissatisfied with this determination, or the adequacy of the search, you may appeal in writing within 30 calendar days of receipt of a final response letter. The appeal should be made to the Director, Office of Hearings and Appeals, HG-1, Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585-1615. The written appeal, including the envelope, must clearly indicate that a FOIA Appeal is being made.

I appreciate the opportunity to assist you. Please contact Laura M. Atterbury, FOIA/Privacy Act Specialist, at (503) 230-7305 with any questions about this letter.

Sincerely,

*for*   
Christina J. Munro  
Freedom of Information Act/Privacy Act Officer

Enclosure(s): Responsive Documents

*Non-responsive*

**From:** Wittpenn,Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]  
**Sent:** Thursday, April 14, 2011 9:36 AM  
**To:** 'Justin Moffett'; Naylor, Kirk  
**Cc:** 'Jennifer Stebbings'; 'Christine Maynard'; Driessen,Laurens C  
**Subject:** RE: Revised I-5 corridor Vegetation Report

Looks fine by me. Just want to point out that the 150 foot corridor does not show up on the general veg. maps 1A and .1B. Kirk, do you want that added to these maps. Easy to do so up to you.

*Non-responsive*

**From:** Wittpenn, Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]  
**Sent:** Wednesday, April 06, 2011 8:42 AM  
**To:** Justin Moffett; 'Naylor, Kirk'  
**Cc:** Jennifer Stebbings; Christine Maynard; Driessen, Laurens C  
**Subject:** RE: Revised I-5 corridor Vegetation Report  
Thank you everyone!

*Non-responsive*

**From:** Wittpenn, Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]  
**Sent:** Tuesday, April 05, 2011 12:06 PM  
**To:** Justin Moffett; Naylor, Kirk  
**Cc:** Jennifer Stebbings; Christine Maynard; Driessen, Laurens C  
**Subject:** RE: Revised I-5 corridor Vegetation Report  
I think we also discussed showing the 150 foot ROW on all the maps along with the survey boundary.

*Non-responsive*

*Non-responsive*

**From:** Wittpenn, Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]  
**Sent:** Monday, April 04, 2011 12:47 PM  
**To:** Justin Moffett; 'Naylor, Kirk'

**Cc:** Jennifer Stebbings; Christine Maynard; Driessen,Laurens C

**Subject:** RE: Revised I-5 corridor Vegetation Report

What is the possibility of two reports? Basically address the remaining comments and final the report for BPA use and then make the changes needed to focus on the 150 foot corridor for PAC? Or, stick the 150 foot focus in an appendix to the main report? Let me know what might work. Thanks, Nancy

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**From:** Wittpenn,Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]

**Sent:** Monday, April 04, 2011 10:44 AM

**To:** 'Naylor, Kirk'; Justin Moffett

**Cc:** Jennifer Stebbings; Christine Maynard; Driessen,Laurens C

**Subject:** RE: Revised I-5 corridor Vegetation Report

OK, sounds good. Just wanted to make sure that everyone understands that clearing can occur beyond the 150 feet. Clearing is very much dependent on varying factors as you know and there is no definite proposal at this time for PAC lands or others. Clearing requirements become more "clear" as project designs move forward, as well as as more field work occurs and more discussion with the landowner occurs. Clearing for danger trees and/or a partial or full safe backline are part of BPA's tools for clearing in general though and should be options that are made aware to and discussed with all involved. Thanks Kirk. Nancy

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**From:** Wittpenn,Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]

**Sent:** Thursday, March 31, 2011 4:39 PM

**To:** 'Justin Moffett'; Naylor, Kirk

**Cc:** Jennifer Stebbings; Christine Maynard

**Subject:** RE: Revised I-5 corridor Vegetation Report

Kirk, regarding item 2. The report states clearly that the numbers in the tables reflect the survey area. (which is 600 feet across and more in some areas b/c of roads). Are you requesting another set of tables that just reflect the 150 foot corridor? That's OK, but just want to make sure that the TCC and others will understand that clearing would likely take place along roads if they are not wide enough and beyond the 150 feet if there are danger trees or if we clear for a full safe backline.

Justin, we do have a few comments. Doug is hoping to get to review again as I write this or tomorrow.

*Non-responsive*

\*\*\*\*\*  
Justin T. Moffett, PWS  
Mason, Bruce & Girard, Inc.  
707 SW Washington Street, Suite 1300  
Portland, OR 97205  
Voice: (503) 224-3445  
Cell: (971) 645-9941  
Fax: (503) 224-6524  
Email: [jmoffett@masonbruce.com](mailto:jmoffett@masonbruce.com)  
\*\*\*\*\*

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Justin, we do have a few comments. Doug is hoping to get to review again as I write this or tomorrow.

*Non-responsive*

**Bennett,Michelle L - KEC-4**

---

**From:** Wittpenn,Nancy A - KEC-4  
**Sent:** Thursday, October 06, 2011 9:37 AM  
**To:** Bennett,Michelle L - KEC-4  
**Subject:** FOIA request 02027-F

Please print.

**From:** Wittpenn,Nancy A - KEC-4  
**Sent:** Tuesday, August 23, 2011 1:39 PM  
**To:** 'Naylor, Kirk'; Korsness,Mark A - TEP-TPP-3; Corkran,Douglas F - KEC-4; Driessen,Laurens C; Johns,Michael C - TEP-TPP-1; Emmerson, Kendel  
**Subject:** RE: PAC Mitigation Land Goshawk Surveys - Round 1, Phase 1

thanks Kirk. I'll send the report to review at some point after we receive.

Non-responsive

**From:** Wittpenn,Nancy A - KEC-4 [<mailto:nawittpenn@bpa.gov>]  
**Sent:** Tuesday, August 23, 2011 9:55 AM  
**To:** Korsness,Mark A - TEP-TPP-3; Corkran,Douglas F - KEC-4; Driessen,Laurens C; Johns,Michael C - TEP-TPP-1; Naylor, Kirk; Emmerson, Kendel  
**Subject:** FW: PAC Mitigation Land Goshawk Surveys - Round 1, Phase 1

See below for update. Since there were no observations or responses, do we need a meeting?

Non-responsive

Non-responsive

**From:** Wittpenn, Nancy A - KEC-4 [<mailto:nawittpenn@bpa.gov>]  
**Sent:** Thursday, August 18, 2011 6:11 PM  
**To:** Christine Maynard  
**Subject:** RE: PAC Mitigation Land Goshawk Surveys - Round 1, Phase 1

Hey Christine, just checking in. All OK, assume yes. Please respond with update, no rush.

Non-responsive

**Bennett,Michelle L - KEC-4**

---

**From:** Wittpenn,Nancy A - KEC-4  
**Sent:** Thursday, October 06, 2011 10:06 AM  
**To:** Bennett,Michelle L - KEC-4  
**Subject:** FOIA 02027-F

Non-responsive

**From:** Wittpenn,Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]  
**Sent:** Monday, March 15, 2010 7:25 AM  
**To:** Naylor, Kirk  
**Subject:** RE: PacifiCorp GIS data

What is NERC CIPS data layers?

Non-responsive

Non-responsive

**From:** Wittpenn, Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]  
**Sent:** Friday, March 12, 2010 12:17 PM  
**To:** Naylor, Kirk  
**Subject:** RE: PacifiCorp GIS data

Thanks Kirk. Can you let us know what the "certain protected files" might be so that when we look at the data and use the documents to help us, we aren't confused and searching for data that we didn't get. Also, if its resource data, and we're trying to position a t-line, I'm worried that w/o the data, we might be trying to position the line in an area we shouldn't. With biologists and archaeologists on staff, we are sensitive to data handling and are familiar with non-disclosure agreements, etc. We are happy to sign anything like that if that would be helpful. We also return data after using.

Non-responsive

**From:** Wittpenn, Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]  
**Sent:** Friday, March 12, 2010 12:02 PM  
**To:** Naylor, Kirk  
**Subject:** RE: PacifiCorp GIS data

Good news? Just don't want to let another week go by.....

Non-responsive

**Zehntbauer,Nicole R - TERG-3**

---

**From:** Zehntbauer,Nicole R - TERG-3  
**Sent:** Tuesday, May 04, 2010 1:57 PM  
**To:** 'Palmberg, Lindy'  
**Cc:** Wittpenn,Nancy A - KEC-4; Johns,Michael C - TEP-TPP-1; Korsness,Mark A - TEP-TPP-3; Driessen,Laurens C; Naylor, Kirk  
**Subject:** RE: GIS files for transmission alignment  
**Follow Up Flag:** Follow up  
**Flag Status:** Red  
**Attachments:** I5Project\_Segmentsgdb.zip

Hi Lindy,

I've been asked to provide you the newest I5 Project Segment data. Attached is a zipped geodatabase with the I5Segments05042010 feature class. Please note that this is for internal use only and should not be distributed. Please let me know if you have any questions. Thanks...

Nicole Z.

Non-responsive

10/5/2011

Non-responsive

**Zehntbauer,Nicole R - TERG-3**

---

Non-responsive

10/5/2011

---

**From:** Wittpenn, Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]

**Sent:** Tuesday, April 05, 2011 12:06 PM

**To:** Justin Moffett; Naylor, Kirk

**Cc:** Jennifer Stebbings; Christine Maynard; Driessen, Laurens C

**Subject:** RE: Revised I-5 corridor Vegetation Report

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10/5/2011

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10/5/2011

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**To:** 'Justin Moffett'; Naylor, Kirk

**Cc:** Jennifer Stebbings; Christine Maynard

**Subject:** RE: Revised I-5 corridor Vegetation Report

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Justin, we do have a few comments. Doug is hoping to get to review again as I write this or tomorrow.

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Non-responsive

10/5/2011

Non-responsive

Non-responsive

<b>Veg Type Code</b>	<b>Veg Type</b>	<b>Acres</b>	<b>Proposed BPA Line</b>
DV	DEVELOPED	0.001	L
DV	DEVELOPED	0.726	L
OG	Old Growth	2.730	L
UM	UPLAND MIXED	0.458	L
UM	UPLAND MIXED	3.959	L
UD	UPLAND DECIDUOUS	0.001	L
UD	UPLAND DECIDUOUS	1.473	L
M	MATURE CONIFER	0.245	L
UM	UPLAND MIXED	1.219	L
SS	SEEDLING / SAPLING	0.166	L
UD	UPLAND DECIDUOUS	0.723	L
RD	RIPARIAN DECIDUOUS	0.028	M
ROW	RIGHT-OF-WAY	0.329	L
P-T	POLE CONIFER (THINNED)	1.393	L
ROW	RIGHT-OF-WAY	0.902	L
RM	RIPARIAN MIXED	0.515	L
UM	UPLAND MIXED	2.737	L
UD	UPLAND DECIDUOUS	0.922	L
RD	RIPARIAN DECIDUOUS	0.337	M
UM	UPLAND MIXED	0.640	M
OG	OLD GROWTH	2.547	M
RD	RIPARIAN DECIDUOUS	0.320	M
RUB	RIVERINE UNCONSOLIDATED BOTTOM	0.171	M
		22.546	

**Bennett,Michelle L - KEC-4**

---

**From:** Wittpenn,Nancy A - KEC-4  
**Sent:** Thursday, October 06, 2011 10:08 AM  
**To:** Bennett,Michelle L - KEC-4  
**Subject:** FOIA-02027-F

Non-responsive

**From:** Corkran,Douglas F - KEC-4 [mailto:dfcorkran@bpa.gov]  
**Sent:** Wednesday, September 22, 2010 4:11 PM  
**To:** Emmerson, Kendel  
**Cc:** Naylor, Kirk; Wittpenn,Nancy A - KEC-4  
**Subject:** RE: BPA-PAC Field Trip Yesterday  
**Importance:** High

Thanks Kendel. I'll have a look at it soon. Since its a password protected document, can I forward this email to Kris Lepine (the bio from Herrera who attended the trip the other day)?

Let me know if this is ok. I can also do hard copies of you prefer. Regardless we'll let it be known that this is confidential information.

Thanks,

Doug

Non-responsive

Non-responsive

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**From:** Corkran,Douglas F - KEC-4 [mailto:dfcorkran@bpa.gov]  
**Sent:** Tuesday, September 21, 2010 2:03 PM  
**To:** Naylor, Kirk; Emmerson, Kendel  
**Cc:** Wittpenn,Nancy A - KEC-4; Johns,Michael C - TEP-TPP-1; 'Hillis, Judith'; 'Kris Lepine'; Driessen,Laurens C  
**Subject:** BPA-PAC Field Trip Yesterday

Hi Kirk and Kendel- Thanks so much for taking the time to show us around the mitigation lands and discuss some of the issues. I was hoping we could catch up to you guys on the way back to PDX to recap and ask one additional question, but no trouble I'll ask over email.

So here are the main points I took away yesterday for routing consideration:

We need to do everything we possibly can to avoid lands that are considered (or will be when you re-categorize them) old growth.

If we can't achieve this 100% we would have to come to an agreement with the TCC as to whether that would be acceptable or not, and if it is, what type of mitigation would be possible.

Avoid to the extent we possibly can removing any cedar trees.

Same as above if we can't meet this goal, we would have to come to an agreement with the TCC on acceptability and mitigation.

Conduct eagle roost surveys for two seasons to identify use patterns and extent, and ensure that we include the area that wraps around to the south up the mouth of Canyon Creek.

I guess after the first season of surveys we would have to determine risk of potential line placement, and confirm in the second season.

What I had also meant to ask you about was any other types of data collection that might have long lead times like the eagle surveys. Obviously if one of the routes through mitigation lands is chosen as a preferred route, we would conduct the full suite of resource surveys- botanical, weeds, wetlands, wildlife, etc., etc. But we need to know if there are any other items of specific concern to the mitigation lands that we are not considering at this time that might require more than one field season of data collection or would require a lengthy approval period.

Thanks again.

Doug

Douglas F. Corkran  
Fish and Wildlife Biologist  
Bonneville Power Administration  
Environmental Compliance KEC-4  
905 NE 11th Avenue  
Portland, OR 97232-4169  
(503) 230-7646  
[dfcorkran@bpa.gov](mailto:dfcorkran@bpa.gov)

## **Bennett,Michelle L - KEC-4**

---

**From:** Wittpenn,Nancy A - KEC-4  
**Sent:** Thursday, October 06, 2011 10:08 AM  
**To:** Bennett,Michelle L - KEC-4  
**Subject:** FOIA 0202-F

**From:** Corkran,Douglas F - KEC-4  
**Sent:** Thursday, October 21, 2010 3:46 PM  
**To:** 'Emmerson, Kendel'  
**Cc:** Wittpenn,Nancy A - KEC-4; 'Naylor, Kirk'; Duncan,Stephen C - TERS-3  
**Subject:** RE: Vegetation Mapping SOW for your review

Hey Kendel- Thanks for the comments on the vegetation mapping SOW. We had a question about the cedar and cottonwood tree identification and location.

It sounds like from your comment that we only need to identify and locate cedars larger than 20" dbh and we can ignore all others. Is that correct? Also, you mentioned cottonwoods need to be looked for as well. Is there a minimum dbh for cottonwoods that we need to consider? What are the management guidelines for cottonwoods?

Also, we are thinking of having several teams that would each include a biologist and a forester each with a minimum 4 year degree and 5 years work experience in their respective fields to do this work. Does this sound reasonable?

As for field forms, we have not developed any forms. I figured I would leave this up to the contractor. Do you have any forms that you like to use for this purpose that we should use to be consistent with your needs?

Thanks,

Doug

Douglas F. Corkran  
Bonneville Power Administration  
(503) 230-7646  
[dfcorkran@bpa.gov](mailto:dfcorkran@bpa.gov)

Non-responsive

**From:** Corkran,Douglas F - KEC-4 [<mailto:dfcorkran@bpa.gov>]  
**Sent:** Thursday, October 14, 2010 10:17 AM  
**To:** Emmerson, Kendel

**Cc:** Wittpenn, Nancy A - KEC-4

**Subject:** Vegetation Mapping SOW for your review

Hi Kendel- Could you please review this SOW and make sure that it will enable us to hire someone who will collect the correct information to meet PAC vegetation classification requirements?

Thanks!

Doug

Douglas F. Corkran  
Fish and Wildlife Biologist  
Bonneville Power Administration  
Environmental Compliance KEC-4  
905 NE 11th Avenue  
Portland, OR 97232-4169  
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**Bennett,Michelle L - KEC-4**

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**Subject:** FOIA 02027-F

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**From:** Wittpenn,Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]  
**Sent:** Friday, November 12, 2010 3:46 PM  
**To:** Corkran,Douglas F - KEC-4; Bingaman,Claire D - KEC-4; Naylor, Kirk  
**Subject:** FW: I5 corridor: PAC- Yale area proposed alignment flagging completed

FYI

Non-responsive

Non-responsive

Non-Responsive

**Bennett,Michelle L - KEC-4**

---

**From:** Wittpenn,Nancy A - KEC-4  
**Sent:** Thursday, October 06, 2011 10:12 AM  
**To:** Bennett,Michelle L - KEC-4  
**Subject:** FOIA 02027-F

non-responsive

**From:** Wittpenn,Nancy A - KEC-4 [<mailto:nawittpenn@bpa.gov>]  
**Sent:** Friday, December 10, 2010 3:21 PM  
**To:** Corkran,Douglas F - KEC-4; Driessen,Laurens C; Naylor, Kirk; Emmerson, Kendel  
**Cc:** Bingaman,Claire D - KEC-4; Korsness,Mark A - TEP-TPP-3  
**Subject:** FW: BPA Eagle Roost Survey Update

Monday and Wed. am are good for me. Tues. later afternoon and Thursday are somewhat open. Thank you!

Non-responsive

Non-responsive

**Bennett,Michelle L - KEC-4**

---

**From:** Wittpenn,Nancy A - KEC-4  
**Sent:** Thursday, October 06, 2011 10:15 AM  
**To:** Bennett,Michelle L - KEC-4  
**Subject:** FOIA 02027-F

**From:** Driessen,Laurens C  
**Sent:** Tuesday, January 18, 2011 7:48 PM  
**To:** Wittpenn,Nancy A - KEC-4; 'Justin Moffett'; 'Naylor, Kirk'; 'kendel.emmerson@pacificorp.com'  
**Cc:** Corkran,Douglas F - KEC-4; 'Jennifer Stebbings'; Korsness,Mark A - TEP-TPP-3; Johns,Michael C - TEP-TPP-1  
**Subject:** RE: I-5 Corridor Reinforcement Project- Vegetation Cover type survey report

I agree that safety always comes first. It would be great to get what ever information could be obtained in the remaining unsurveyed area. The centerline also has not been surveyed in this relatively small area. If the information could only be obtained from a distance, then those cedar trees identified could be more accurately located after BPA get the LIDAR data.

Concerning the need to do any surveying for trees on the Longview Timber lands that PAC has just purchased, I had talked to Kirk before and he indicated BPA did not need to do any surveying for trees on those just purchased lands. We will be doing some on the ground surveying to establish center line through the recently purchased lands so that people will be able to see where the line segment might go.

Lou

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**From:** Wittpenn,Nancy A - KEC-4  
**Sent:** Tuesday, January 18, 2011 1:03 PM  
**To:** 'Justin Moffett'; 'Naylor, Kirk'; 'kendel.emmerson@pacificorp.com'  
**Cc:** Corkran,Douglas F - KEC-4; 'Jennifer Stebbings'; Korsness,Mark A - TEP-TPP-3; Driessen,Laurens C; Johns,Michael C - TEP-TPP-1  
**Subject:** RE: I-5 Corridor Reinforcement Project- Vegetation Cover type survey report

As always, safety comes first. Kirk and Kendel, could you consider the information below and respond. With the heavy rainfall and dam operation, it sounds like we won't be continuing this work tomorrow so there is time to think about this and discuss with the group if need be. Let us know how you would like to proceed.

Non-responsive

**From:** Wittpenn, Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]

**Sent:** Tuesday, January 18, 2011 8:40 AM

**To:** Justin Moffett; Naylor, Kirk; kendel.emmerson@pacificorp.com

**Cc:** Corkran, Douglas F - KEC-4; Jennifer Stebbings; Korsness, Mark A - TEP-TPP-3; Driessen, Laurens C; Johns, Michael C - TEP-TPP-1

**Subject:** RE: I-5 Corridor Reinforcement Project- Vegetation Cover type survey report

Did anyone have any comments for Justin?

Kirk and Kendel, any thoughts on further surveys of "inaccessible" portions of land? We had discussed access by boat or doing an initial helicopter flight to further decide if surveys were needed. I think the eagle folks could weight in on accessibility too?

Also, any further survey needed of recently acquired piece of land to the north? I think we left it as a no but you were to think on it some more.

Thank you!

Non-responsive

**Bennett,Michelle L - KEC-4**

---

**From:** Wittpenn,Nancy A - KEC-4  
**Sent:** Thursday, October 06, 2011 10:15 AM  
**To:** Bennett,Michelle L - KEC-4  
**Subject:** FOIA 02027-F

Non-responsive

**From:** Wittpenn,Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]  
**Sent:** Friday, February 18, 2011 11:04 AM  
**To:** 'Naylor, Kirk'; Justin Moffett  
**Subject:** RE: Update on Vegetation Surveys for I-5 Corridor project

If you can do it all in one trip and safely, then go ahead. Otherwise, we'll wait. Thanks and have a nice weekend.

Non-responsive

Non-responsive

**From:** Wittpenn, Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]  
**Sent:** Thursday, February 17, 2011 12:56 PM  
**To:** Naylor, Kirk  
**Cc:** 'Justin Moffett'  
**Subject:** RE: Update on Vegetation Surveys for I-5 Corridor project

Justin said his crews could start next Tuesday if needed. Keep us posted on boats and schedule.

Non-responsive

Non-responsive

**From:** Wittpenn, Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]

**Sent:** Friday, January 21, 2011 3:43 PM

**To:** Justin Moffett; Jennifer Stebbings; kendel.emmerson@pacificorp.com; Naylor, Kirk; Driessen, Laurens C; Korsness, Mark A - TEP-TPP-3; Johns, Michael C - TEP-TPP-1; Corkran, Douglas F - KEC-4; Duncan, Stephen C - TERS-3; Canaday, Harley E - TERS-3

**Subject:** Draft Vegetation Report

I've spoken with Justin and I propose that we keep the report in draft form until such time that MB&G is able to return to the field to further survey the final area south of the river.

From recent emails, we now have some options for surveying this particular area. I propose we wait to hear from Kirk for the OK to move ahead to survey once the area is safe to enter by boat. After we get the go-ahead, let's reconnect by email and determine the best way to survey and a new schedule.

After the remaining area is surveyed, MB&G will add the additional information and finalize the report.

Please only respond to the group if you want something different than what I have proposed above.

Thank you!

**Bennett,Michelle L - KEC-4**

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**From:** Wittpenn,Nancy A - KEC-4  
**Sent:** Thursday, October 06, 2011 10:20 AM  
**To:** Bennett,Michelle L - KEC-4  
**Subject:** FOIA 02027-F

Non-responsive

**From:** Wittpenn,Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]  
**Sent:** Wednesday, April 06, 2011 8:53 AM  
**To:** 'Justin Moffett'; Naylor, Kirk  
**Subject:** FW: Revised I-5 corridor Vegetation Report

Hello Kirk and Justin, just wanted to pass this clarification on to you so that the survey area is not misunderstood. We don't talk about the clearing or any type of clearing requirements in the report so I don't agree that we need any clarifying statements on the tables as Lou suggests below. The report just identifies the survey area as that area that could potentially be affected by the transmission corridor. That level of detail is fine with me for purposes of this report. But, in discussions with the TCC and others, the width may come up and it will be good to know the context for the 600 foot width and the information below. Thank you. Nancy

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**From:** Driessen,Laurens C  
**Sent:** Wednesday, April 06, 2011 6:34 AM

**To:** Wittpenn, Nancy A - KEC-4

**Subject:** RE: Revised I-5 corridor Vegetation Report

The 600 feet is very extreme. The area delineated for the survey was meant to be large/wide enough to make sure the safe backline was included. I think a statement ought to go with the wider width charts indicating: actual clearing depends on final tower/conductor design and actual tree heights and their health/condition.

Non-responsive

Non-responsive

**From:** Wittpenn,Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]

**Sent:** Monday, April 04, 2011 12:47 PM

**To:** Justin Moffett; 'Naylor, Kirk'

**Cc:** Jennifer Stebbings; Christine Maynard; Driessen,Laurens C

**Subject:** RE: Revised I-5 corridor Vegetation Report

What is the possibility of two reports? Basically address the remaining comments and final the report for BPA use and then make the changes needed to focus on the 150 foot corridor for PAC? Or, stick the 150 foot focus in an appendix to the main report? Let me know what might work. Thanks, Nancy

Non-responsive

**From:** Wittpenn,Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]

**Sent:** Monday, April 04, 2011 10:44 AM

**To:** 'Naylor, Kirk'; Justin Moffett

**Cc:** Jennifer Stebbings; Christine Maynard; Driessen,Laurens C

**Subject:** RE: Revised I-5 corridor Vegetation Report

OK, sounds good. Just wanted to make sure that everyone understands that clearing can occur beyond the 150 feet. Clearing is very much dependent on varying factors as you know and there is no definite proposal at this time for PAC lands or others. Clearing requirements become more "clear" as project designs move forward, as well as as more field work occurs and more discussion with the landowner occurs. Clearing for danger trees and/or a partial or full safe backline are part of BPA's tools for clearing in general though and should be options that are made aware to and discussed with all involved. Thanks Kirk. Nancy

Non-responsive

Non-responsive

**From:** Wittpenn, Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]

**Sent:** Thursday, March 31, 2011 4:39 PM

**To:** 'Justin Moffett'; Naylor, Kirk

**Cc:** Jennifer Stebbings; Christine Maynard

**Subject:** RE: Revised I-5 corridor Vegetation Report

Kirk, regarding item 2. The report states clearly that the numbers in the tables reflect the survey area. (which is 600 feet across and more in some areas b/c of roads). Are you requesting another set of tables that just reflect the 150 foot corridor? That's OK, but just want to make sure that the TCC and others will understand that clearing would likely take place along roads if they are not wide enough and beyond the 150 feet if there are danger trees or if we clear for a full safe backline.

Justin, we do have a few comments. Doug is hoping to get to review again as I write this or tomorrow.

Non-responsive

Non-responsive

**Bennett,Michelle L - KEC-4**

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**From:** Wittpenn,Nancy A - KEC-4  
**Sent:** Thursday, October 06, 2011 12:13 PM  
**To:** Bennett,Michelle L - KEC-4  
**Subject:** FOIA 02027-F  
**Attachments:** I5\_Veg\_Study\_MBG\_Data\_Updated\_041311.zip; Veg\_Type\_Acres\_150ftBuffer\_041311.xlsx

*Non-responsive*

**From:** Wittpenn,Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]  
**Sent:** Wednesday, April 06, 2011 8:42 AM  
**To:** Justin Moffett; 'Naylor, Kirk'  
**Cc:** Jennifer Stebbings; Christine Maynard; Driessen,Laurens C  
**Subject:** RE: Revised I-5 corridor Vegetation Report

Thank you everyone!

*Non-responsive*

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**From:** Naylor, Kirk [mailto:Kirk.Naylor@Pacifcorp.com]  
**Sent:** Wed 4/6/2011 7:13 AM  
**To:** Justin Moffett; Wittpenn,Nancy A - KEC-4  
**Cc:** Jennifer Stebbings; Christine Maynard; Driessen,Laurens C  
**Subject:** RE: Revised I-5 corridor Vegetation Report

All,

These changes will work. Thanks. I would like to received the updated GIS data as well for our internal use. Our TCC meeting is next Wednesday. If you can't make it by then, I understand and will discuss with them using the existing report and describe the changes.

Kirk

*Non-responsive*

**From:** Wittpenn, Nancy A - KEC-4 [mailto:nawittpenn@bpa.gov]  
**Sent:** Tuesday, April 05, 2011 12:06 PM  
**To:** Justin Moffett; Naylor, Kirk  
**Cc:** Jennifer Stebbings; Christine Maynard; Driessen, Laurens C  
**Subject:** RE: Revised I-5 corridor Vegetation Report

I think we also discussed showing the 150 foot ROW on all the maps along with the survey boundary.

*Non-responsive*

## **Bennett,Michelle L - KEC-4**

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**From:** Wittpenn,Nancy A - KEC-4  
**Sent:** Thursday, October 06, 2011 10:07 AM  
**To:** Bennett,Michelle L - KEC-4  
**Subject:** FOIA 02027-F

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**From:** Corkran,Douglas F - KEC-4  
**Sent:** Tuesday, September 21, 2010 2:03 PM  
**To:** 'Kirk.Naylor@Pacifcorp.com'; 'Kendel.Emmerson@Pacifcorp.com'  
**Cc:** Wittpenn,Nancy A - KEC-4; Johns,Michael C - TEP-TPP-1; 'Hillis, Judith'; 'Kris Lepine'; Driessen,Laurens C  
**Subject:** BPA-PAC Field Trip Yesterday

Hi Kirk and Kendel- Thanks so much for taking the time to show us around the mitigation lands and discuss some of the issues. I was hoping we could catch up to you guys on the way back to PDX to recap and ask one additional question, but no trouble I'll ask over email.

So here are the main points I took away yesterday for routing consideration:

We need to do everything we possibly can to avoid lands that are considered (or will be when you re-categorize them) old growth.

If we can't achieve this 100% we would have to come to an agreement with the TCC as to whether that would be acceptable or not, and if it is, what type of mitigation would be possible.

Avoid to the extent we possibly can removing any cedar trees.

Same as above if we can't meet this goal, we would have to come to an agreement with the TCC on acceptability and mitigation.

Conduct eagle roost surveys for two seasons to identify use patterns and extent, and ensure that we include the area that wraps around to the south up the mouth of Canyon Creek.

I guess after the first season of surveys we would have to determine risk of potential line placement, and confirm in the second season.

What I had also meant to ask you about was any other types of data collection that might have long lead times like the eagle surveys. Obviously if one of the routes through mitigation lands is chosen as a preferred route, we would conduct the full suite of resource surveys- botanical, weeds, wetlands, wildlife, etc., etc. But we need to know if there are any other items of specific concern to the mitigation lands that we are not considering at this time that might require more than one field season of data collection or would require a lengthy approval period.

Thanks again.

Doug

Douglas F. Corkran  
Fish and Wildlife Biologist  
Bonneville Power Administration  
Environmental Compliance KEC-4  
905 NE 11th Avenue  
Portland, OR 97232-4169

**Bennett,Michelle L - KEC-4**

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**From:** Wittpenn,Nancy A - KEC-4  
**Sent:** Thursday, October 06, 2011 12:15 PM  
**To:** Bennett,Michelle L - KEC-4  
**Subject:** FOIA 02027-F

Non-responsive

**From:** Wittpenn,Nancy A - KEC-4 [<mailto:nawittpenn@bpa.gov>]  
**Sent:** Monday, November 15, 2010 5:43 PM  
**To:** Emmerson, Kendel; Naylor, Kirk  
**Subject:** FW: Roost Monitoring

Here's the original email you sent us regarding the management plan. Let us know how you'd like us to proceed with the bidding contractor.

Non-responsive

Non-responsive

**Grimm, Lydia T - KEC-4**

**From:** Grimm, Lydia T - KEC-4  
**Sent:** Wednesday, August 17, 2011 4:31 PM  
**To:** 'Sample, John'  
**Subject:** RE: BPA - PacifiCorp Mtg.

Hi John-

Yes, confirming that I'll see you August 23 at 1:30 at your offices. Thanks for the specific directions!

Lydia

Non-responsive

**I-5 Corridor Reinforcement Project  
Vegetation Cover Type Mapping Survey Report  
Clark and Cowlitz Counties, Washington**

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*Prepared for:*



Bonneville Power Administration  
905 NE 11th Avenue  
Portland, OR 97232

*Prepared by:*

**MB&G**

Mason, Bruce & Girard, Inc.  
707 SW Washington Street, Suite 1300  
Portland, Oregon 97205  
(503) 224-3445

April 13, 2011

MB&G Project No. 010633

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## APPENDICES

Appendix A	Maps of Survey Areas
Appendix B	Photos of Survey Areas
Appendix C	Resumes of Survey Staff

## 1.0 INTRODUCTION

This vegetation and cover type mapping report has been prepared to assist the Bonneville Power Administration (BPA) with the planning of the I-5 Corridor Reinforcement Project (Project). The Project is proposed by BPA to help ease transmission system congestion in southwest Washington and northwest Oregon. The survey documented in this report was conducted by Paul Stephens, Jennifer Stebbings and Brian Cook of Mason, Bruce and Girard, Inc. (MB&G) from December 6-17, 2010 and March 9-10, 2011.

The following sections of this report provide a discussion of the methodology employed during the survey fieldwork, the background research, results of the survey fieldwork and the biographies of the surveyors. Following the body of this report, several appendices detail MB&G's findings. Appendix A contains the maps showing the survey areas, vegetation cover type polygons and locations of western redcedar (*Thuja plicata*) and black cottonwood (*Populus balsamifera* ssp. *trichocarpa*) trees. Appendix B contains photographs documenting site conditions at the time of the survey fieldwork. Appendix C contains resumes of the MB&G staff that conducted the survey fieldwork.

## 2.0 PROJECT DESCRIPTION

The survey area discussed in this report consists of two separate sites located near Merwin and Yale Reservoirs along the Lewis River in Clark and Cowlitz Counties, Washington. According to PacifiCorp's Terrestrial Resources Report (PacifiCorp et al. 2004) most of this area is within the western hemlock vegetation zone; however, timber harvest and development have altered the vegetation communities. As part of a relicensing agreement between PacifiCorp and the Federal Energy Regulatory Commission (FERC) for the Yale Hydroelectric Project, vegetation cover types were mapped throughout the Yale region in 1996 (EDAW 1999) and updated for the entire region in 2001 (PacifiCorp et al. 2004). The cover type mapping was used to describe the distribution and abundance of all vegetation types located within a total of 16,074 acres, as well as to provide a basis for assessing wildlife habitat areas on PacifiCorp land (PacifiCorp et al. 2004).

A Wildlife Habitat Management Plan (WHMP) was created by PacifiCorp to offset habitat impacts and potential wildlife losses due to the continued operation of the Lewis River Hydroelectric Projects. This WHMP was designed to benefit a broad range of wildlife, fish and native plant species by protecting, mitigating and enhancing existing wildlife habitat on PacifiCorp lands (PacifiCorp 2008). Large western redcedar and black cottonwood are considered native species that promote forest habitat diversity for wildlife enhancement and the WHMP states that they shall be retained wherever possible (PacifiCorp 2008). In addition, old-growth conifer forests, as well as the oldest existing trees in younger forest blocks, shall be retained because they provide high-quality habitat for a multitude of valued wildlife species (e.g., Northern spotted owl [*Strix occidentalis caurina*], pileated woodpecker [*Dryocopus pileatus*]). Stands of mature forest are also to be maintained, when possible, in order to develop old-growth characteristics (PacifiCorp 2008).

BPA has developed five proposed route segments (K, L, M, N, W) for the Project that cross PacifiCorp land where mitigation has taken place to create and/or improve existing wildlife

habitat in accordance with the WHMP. MB&G conducted surveys in December 2010 and March 2011 to identify vegetation cover types potentially affected by the proposed alignments, as well as determine the presence, location, and quantity of western redcedar and black cottonwood within the survey area.

### **3.0 METHODS**

The following is a brief summary of the methodology used for identifying vegetation cover type polygon boundaries, as well as determining presence, location, and quantity of western redcedar and black cottonwood within the survey area.

Prior to conducting field surveys, MB&G reviewed existing cover type data and aerial photomaps provided by PacifiCorp and BPA. MB&G conducted field surveys from December 6-17, 2010 and March 9-10, 2011. During the surveys, the crew identified vegetation cover types and their boundaries, recorded wildlife sightings and high quality habitat, and documented all western redcedar and black cottonwood trees. All western redcedar or black cottonwood trees measuring  $\geq 1$  inch in diameter at breast height (DBH) were counted in the survey. MB&G recorded the location and DBH of the western redcedar and black cottonwood trees using a resource-grade Trimble GeoXT GPS unit. MB&G surveyors systematically traversed the survey area to ensure every individual western redcedar and black cottonwood tree was counted. Individual trees were temporarily flagged to eliminate double-counting. However, MB&G utilized alternate data collection methods in portions of the survey area where poor satellite reception, access restrictions, or steep terrain made collection of individual tree locations difficult and time consuming. For example, surveyors sometimes recorded tree locations using offset GPS points and a laser range finder. To increase efficiency, the crew often recorded a single GPS point representing multiple trees located in proximity to one another. In areas near Canyon Creek where steep terrain and poor GPS reception prevented the collection of tree locations directly or through use of offset points, the survey crew recorded polygons marking the approximate boundary of the cedar concentrations rather than recording the location of individual trees. Within these polygons, the surveyors tallied and recorded the DBH of every western redcedar (see Figures 2A and 2B, Appendix A). The survey crew recorded additional polygons in forested stands with high concentrations ( $\geq 70\%$ ) of western redcedar.

### **4.0 BACKGROUND RESEARCH**

MB&G surveyors conducted preliminary research prior to the field surveys using GIS layers of vegetation cover type polygons (PacifiCorp 2008) and the survey area boundaries (BPA 2010). These two datasets were overlaid on aerial photomaps to distinguish cover type polygons within the survey area. MB&G's forester (Paul Stephens) adjusted the cover type polygon boundaries to match the vegetation patterns on the photomaps. To remain consistent with PAC's 2004 TER 1 Vegetation Cover Type Mapping report, MB&G maintained a minimum mapping unit of one acre. The survey crew then created field maps using the adjusted polygon data to verify the polygon boundaries within the survey area during the field surveys.

In addition, MB&G conducted a site visit prior to initiating the field surveys to address any potential access issues, locate specific areas that had high concentrations of western redcedar and/or black cottonwood trees, and to note any significant deviations of cover type boundary

lines from the photomaps. This information was used to plan the field surveys and identify areas that could require more focused efforts.

## 5.0 SURVEY RESULTS

MB&G evaluated 253 acres for the transmission line alignments proposed by BPA. Prior to the field surveys, the data provided by PacifiCorp and BPA identified approximately 84 different polygons consisting of 18 different cover types within the survey area. Upon completing the field surveys, MB&G identified 90 polygons consisting of 17 different cover types within the survey area. Tables 1 and 2 list the different cover types MB&G identified within the survey area and the description used to characterize each cover type. These descriptions are based on the classification key in the Vegetation Cover Type Mapping (TER 1) document (PacifiCorp and Cowlitz PUD 2004).

**Table 1 Criteria for Classification of Vegetation Cover Type**

Cover Type Code	Cover Type Name	Classification Description
MD	Meadow	Less than 10% forested canopy cover; ground cover greater than 50% grass species.
SH	Shrubland	Less than 10% forested canopy cover; ground cover greater than 50% shrub species.
RM	Riparian Mixed	Greater than 30% but less than 70% conifer or deciduous canopy cover; trees greater than 10 inches (in.) DBH; not thinned <sup>1</sup> ; located within a riparian zone <sup>2</sup> .
RD	Riparian Deciduous	Greater than 70% deciduous canopy cover; trees greater than 10 in. DBH; not thinned <sup>1</sup> ; located within a riparian zone <sup>2</sup> .
UM	Upland Mixed	Greater than 30% but less than 70% conifer or deciduous canopy cover; trees greater than 10 in. DBH; not thinned <sup>1</sup> ; not located within a riparian zone <sup>2</sup> .
UD	Upland Deciduous	Greater than 70% deciduous canopy cover; trees greater than 10 in. DBH; not thinned <sup>1</sup> ; not located within a riparian zone <sup>2</sup> ; not oak dominated.
SS	Seedling/Sapling Conifer	Canopy composed of conifer species; trees less than 8 in. DBH; dense sapling cover; generally older than 10 years old.
P	Pole Conifer	Canopy composed of conifer species; trees 8 in. - 15 in. DBH; even-aged stands with relatively uniform structure; not thinned <sup>1</sup> .
P-T	Pole Conifer—Thinned <sup>1</sup>	Canopy composed of conifer species; trees 8 in. - 15 in. DBH; even-aged stands with relatively uniform structure; stand has been thinned since the late 1980s.
MS	Mid-Successional Conifer	Canopy composed of conifer species; trees 16 in. - 20 in. DBH; even-aged stands with relatively uniform structure; not thinned <sup>1</sup> .
M	Mature Conifer	Canopy composed of conifer species; trees 21 in. - 26 in. DBH; canopy structure has a relatively uniform vertical and horizontal texture; not thinned <sup>1</sup> .
OG	Old-Growth Conifer	Canopy composed of conifer species; trees greater than 26 in. DBH; stands form a multi-layer canopy with occasional small openings; greater horizontal and vertical canopy texture than is generally found in mature conifer stands; greater than four snags/acre greater than 20 in. DBH; not thinned <sup>1</sup> .

<sup>1</sup> Thinned stands have undergone a selected harvest of trees, resulting in a reduction in total tree canopy cover.

<sup>2</sup> Riparian zone has variable width and contains elements of aquatic and terrestrial ecosystems which mutually influence each other (Knutson and Naef 1997).

**Table 2 Criteria for Classification of Non-vegetation Cover Type**

Cover Type Code	Cover Type Name	Classification Description
RUB	Riverine Unconsolidated Bottom	Channel that contains moving water; unconsolidated substrate; less than 30% vegetation cover.
ROW	Transmission Line Right-of-Way	Area within the cleared transmission line right-of-way corridor. Type code is used as a modifier to other cover type categories.
DI	Disturbed	Exposed bare ground due to human caused activities or contains non-native invasive shrub species.
DV	Developed	Area developed with commercial buildings and/or facilities.
RES	Residential	Area developed with residential houses.

### 5.1 Vegetation Cover Type Changes

Generally, the cover type polygons provided by PacifiCorp were consistent with the observations made by the survey crew, however some exceptions did occur. MB&G changed forest stand vegetation cover types in both Merwin and Yale survey areas from the 2008 vegetation cover type mapping effort. Most of these changes were needed because the mapping effort conducted in 2008 was performed using aerial photomaps, but not verified with field surveys (Kirk Naylor, pers. comm., Principle Scientist—Wildlife and Forestry, PacifiCorp, November 29, 2010). The following are deviations from PAC's 2008 vegetation cover type mapping.

MB&G surveyors observed that several of the Mature Conifer vegetation cover type forest stands actually met the classification description for the Old-Growth Conifer vegetation cover type based on the size of the trees and the forest stand structure; a total of 39.3 acres of Old-Growth Conifer vegetation cover type now exists within the survey area (see Figures 1A and 1B, Appendix A). PAC's 2008 vegetation cover type map indicated Sapling/Seedling Conifer vegetation cover type polygons within the Yale Reservoir survey area. MB&G surveyors determined these to be the Pole Conifer vegetation cover type instead of Seedling/Sapling Conifer Forest (see Figure 1A, Appendix A).

Near the Merwin fish facility, MB&G realigned the boundary of a Riparian Mixed vegetation cover type polygon and created two Upland Deciduous vegetation cover type polygons. MB&G also created a new Mature Conifer vegetation cover type polygon immediately south of a Merwin fish facility equipment storage area; this area was previously mapped as an Upland Mixed vegetation cover type (see Figure 1B, Appendix A).

A recent clear-cut in the eastern portion of the survey area near Yale Reservoir resulted in MB&G classifying a new polygon as the non-vegetation cover type Disturbed (DI) (see Figure 1A, Appendix A); however, at PAC's request MB&G changed this polygon to the Seedling/Sapling cover type since it will be re-planted in the spring of 2011 (Kirk Naylor, pers. comm., Principle Scientist—Wildlife and Forestry, PacifiCorp, November 29, 2010).

Table 3 lists the acreage of each cover type located within the project survey boundary that could be affected by the proposed project. Table 4 lists the acreage of each cover type that could be affected by clearing of the proposed 150-foot-wide transmission corridor associated with each of the five transmission lines.

**Table 3 Summary of Cover Types Identified within the Project Survey Boundary**

Cover Type	Acreage Potentially Affected by Proposed Corridor					Total
	L Corridor	M Corridor	K Corridor	N Corridor	W Corridor	
Developed	3.85	0	0	0	0	<b>3.85</b>
Disturbed	0	0	0.39	0	0	<b>0.39</b>
Mature Conifer	1.66	0	0	0	0.53	<b>2.19</b>
Meadow	0	0	0	1.55	0	<b>1.55</b>
Mid-Successional	0	0	0.76	0	0	<b>0.76</b>
Old Growth	5.17	10.39	3.54	1.57	18.70	<b>39.37</b>
Pole Conifer	0.42	0	10.44	5.76	0.32	<b>16.94</b>
Pole Conifer-Thinned	12.99	0	4.86	0	0	<b>17.85</b>
Reservoir	0	0	8.14	0.37	5.41	<b>13.92</b>
Right-of-Way	10.12	0	1.59	7.24	0	<b>18.95</b>
Riparian Deciduous	0.07	3.13	0	0.02	0	<b>3.22</b>
Riparian Mixed	2.11	0	0	0	0	<b>2.11</b>
Riverine	0	0.61	0	0	0	<b>0.61</b>
Unconsolidated Bottom	0	0.61	0	0	0	<b>0.61</b>
Seedling/Sapling Conifer	2.78	0	2.53	8.13	6.01	<b>19.45</b>
Shrubland	0	0	0	0.23	0	<b>0.23</b>
Upland Deciduous	8.11	0	10.67	0.35	10.45	<b>29.58</b>
Upland Mixed	20.88	1.86	15.78	33.90	7.38	<b>79.80</b>
<b>Total</b>	<b>68.16</b>	<b>15.98</b>	<b>58.70</b>	<b>59.12</b>	<b>48.80</b>	<b>250.76</b>

**Table 4 Summary of Cover Types Potentially Affected by the Proposed 150-foot wide Transmission Corridors**

Cover Type	Acreage Potentially Affected by Proposed Corridor					Total
	L Corridor	M Corridor	K Corridor	N Corridor	W Corridor	
Developed	0.73	0	0	0	0	<b>0.73</b>
Mature Conifer	0.25	0	0	0	0	<b>0.25</b>
Old Growth	2.73	2.55	1.31	0.31	2.13	<b>9.03</b>
Pole Conifer	0	0	1.76	1.77	0	<b>3.53</b>
Pole Conifer-Thinned	1.39	0	1.34	0	0	<b>2.73</b>
Reservoir	0	0	1.19	0	0.93	<b>2.12</b>
Right-of-Way	1.23	0	0.21	1.20	0	<b>2.64</b>
Riparian Deciduous	0	0.68	0	0	0	<b>0.68</b>
Riparian Mixed	0.52	0	0	0	0	<b>0.52</b>
Riverine	0	0.17	0	0	0	<b>0.17</b>
Unconsolidated Bottom	0	0.17	0	0	0	<b>0.17</b>
Seedling/Sapling Conifer	0.17	0	0.71	1.33	2.22	<b>4.43</b>
Upland Deciduous	3.12	0	1.59	0	1.96	<b>6.67</b>
Upland Mixed	8.37	0.64	1.89	9.47	2.03	<b>22.40</b>
<b>Total</b>	<b>18.51</b>	<b>4.04</b>	<b>10.00</b>	<b>14.08</b>	<b>9.27</b>	<b>55.90</b>

## 5.2 Presence of Western Redcedar and Black Cottonwood

Western redcedar is a dominant, co-dominant or sub-dominant species in many of the Upland Mixed and Mature Conifer vegetation cover type forest stands. The MB&G surveyors recorded a total of 1,871 western redcedar trees within the survey area and created nine polygons representing particularly high concentrations of western redcedar (see Figures 2A-2D and 3A-3C, Appendix A). Polygon M1 is located north of NE Etna Road, between M/1 and M/2 of the proposed M-line. Polygons M2 and M3 are located west of NE Buncombe-Hollow Road and north of NE Etna Road, near L/4 of the proposed L-line. Polygons Y1 and Y2 are located west of Hanley-Curry Road between N/3 and N/4 of the proposed N-line. Polygon Y3 is located on the north side of Hanley-Curry Road, west of Highway 503, along the proposed N-line. Polygon Y4 is along Highway 503, north of the existing PacifiCorp transmission line, near N/5 of the proposed N-line. Polygon Y5 represents a previously inaccessible area due to steep terrain and high reservoir levels south and west of the confluence between Canyon Creek and Lewis River near the connection point between the proposed N-line, W-line and K-line. Polygon Y6 is located along the east bank of Canyon Creek near where the proposed W-line would cross the creek. Table 5 below summarizes the number of western redcedar trees in each of the nine polygons and the size of the polygons.

**Table 5 Quantity of Western Redcedar Trees within Mapped Polygons**

Polygon ID	# of Trees	Size of Polygon (acres)
M1	305	6.0
M2	76	1.7
M3	19	0.5
Y1	36	0.6
Y2	124	1.9
Y3	63	0.9
Y4	84	0.8
Y5	263	10.1
Y6	9	2.0
<b>Total</b>	<b>979</b>	<b>24.6</b>

Black cottonwood trees are scattered throughout the survey area, with the largest concentration occurring in an Upland Mixed vegetation cover type forest stand south of the Merwin fish facility, near L/3 of the proposed L-line. A total of 80 black cottonwoods were recorded within the survey area (see Figures 2A-2D and 3A-3C, Appendix A). Concentrations of black cottonwood were not significant enough to require creation of any polygons.

Some western redcedar and black cottonwood trees that were recorded along the PacifiCorp property line appear on the maps to be outside of PacifiCorp's ownership (see Figures 2A-2D and 3A-3C, Appendix A). This is likely due to poor satellite reception or incorrect locations of the parcel boundary shapefile and is not the result of the survey crew trespassing outside the survey area.

### **5.3 Wildlife Habitat Observations**

High quality wildlife habitat typically coincided with the presence of Old-Growth Conifer and Mature Conifer vegetation cover type forest stands. Observations of sensitive species included two bald eagles (*Haliaeetus leucocephalus*) identified flying over the Lewis River near Merwin Dam. Other wildlife observations included a red-tailed hawk (*Buteo jamaicensis*) perched in a red alder (*Alnus rubra*) tree near the existing PacifiCorp transmission line immediately east of Highway 503; a coyote (*Canis latrans*) in a Thinned Pole Conifer vegetation cover type forest stand in the Merwin Reservoir survey area; a hairy woodpecker (*Picoides villosus*) foraging on a downed log at the end of the recent clear-cut access spur road in the eastern portion of the Yale Reservoir survey area; two red-breasted sapsuckers (*Sphyrapicus ruber*) foraging immediately adjacent to the same recent clear-cut; a coastal tailed frog (*Ascaphus truei*) was observed approximately 150 feet above the west bank of Canyon Creek; and two Cascade torrent salamanders (*Rhyacotriton cascadae*) were observed in a seep along a steep hillside near Canyon Creek. Signs of deer (*Odocoileus* sp.) and elk (*Cervus elaphus*) were observed at almost all locations; at least two deer were observed within Old-Growth Conifer vegetation cover type forest stands.

### **6.0 BIOGRAPHIES OF SURVEYORS**

Paul Stephens has over 30 years of experience performing forest inventories and timber cruising. He possesses an excellent knowledge of Pacific Northwest vegetation and forest cover types and he has conducted numerous sensitive species surveys and habitat assessments. Paul earned a B.S. degree in Wildlife Biology from Washington State University in 1978.

Jenn Stebbings has over 6 years of experience performing biological surveys, habitat assessments and forest inventories throughout the Pacific Northwest region. She has experience identifying native trees, shrubs and forbs, as well as estimating species density and forest canopy cover. Her expertise includes knowledge of the Pacific Northwest's endangered, threatened, candidate and sensitive wildlife species and their habitats. Jenn earned a B.S. degree in Natural Resources, with a Major in Wildlife Science and a Minor in Quantitative Science from the University of Washington in 2003.

Brian Cook has over 9 years of experience performing biological surveys and habitat assessments throughout the Pacific Northwest region. He has experience identifying native trees, shrubs and forbs, as well as estimating species density and forest canopy cover. His expertise includes knowledge of the Pacific Northwest's endangered, threatened, candidate and sensitive wildlife species and their habitats. Brian earned a B.S. degree in Environmental Science and Resource Management from the University of Washington in 2007.

Refer to Appendix C for complete resumes of the surveyors.

### **7.0 CONCLUSION**

MB&G evaluated 253 acres for five transmission line alignments proposed by BPA. MB&G utilized the field survey methods described in this report to verify vegetation cover type polygons and their boundaries, as well as determine the presence and density of western redcedar and black cottonwood trees within the survey area. Boundary lines of cover type polygons were

adjusted to coincide with aerial photomaps prior to the field survey. During the field surveys, MB&G's survey crew verified vegetation cover type boundaries; however, some vegetation cover types were updated from PAC's 2008 vegetation cover type mapping effort to reflect MB&G survey crew's field observations of forest age-classes. MB&G's survey crew also documented 1,871 western redcedar and 80 black cottonwood trees within the survey area. Western redcedar was abundant throughout the survey area, with high concentrations in the vicinity of the proposed alignments L, M and N. Black cottonwood trees were present within the survey area, but in far fewer quantities than western redcedar.

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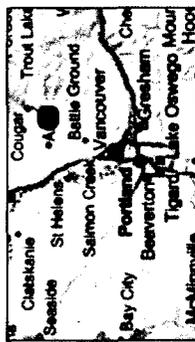
# APPENDIX A

## MAPS

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**Figure 1A: Vegetation Cover Type Map - Yale Reservoir  
I-5 Reinforcement Corridor Project**

- ✚ BPA Planned Structures
- ⚡ BPA Planned Roads
- ⚡ BPA Planned T-lines
- ⚡ Existing Roads
- Survey Boundary
- ▭ Vegetation Cover Type
- ▭ 150-F Corridor



Cover Type Code	Cover Type Name
DI	DISTURBED
M	MATURE CONIFER
MD	MEADOW
MS	MID-SUCCESSIONAL CONIFER
OG	OLD GROWTH
P	POLE CONIFER
P-T	POLE CONIFER (THINNED)
RES	RESERVOIR
RES	RESIDENTIAL
ROW	RIGHT-OF-WAY
SS	SEEDLING / SAPLING
SH	SHRUB
UD	UPLAND DECIDUOUS
UM	UPLAND MIXED

Figure 1A, map of 4/26/2011  
 Data Source: Unpublished NAD 83 2009. Produced for administrative purposes only and may not be suitable for field engineering or surveying purposes. Corrected data from such information are the responsibility of the user.



**Figure 1B: Vegetation Cover Type Map - Merwin Reservoir I-5 Reinforcement Corridor Project**

Cover Type Name	Cover Type Code
DEVELOPED	DV
MATURE CONIFER	M
OLD GROWTH	OG
POLE CONIFER	P
POLE CONIFER (THINNED)	P-T
RIGHT-OF-WAY	ROW
RIPARIAN DECIDUOUS	RD
RIPARIAN MIXED	RM
RIVERINE UNCONSOLIDATED BOTTOM	RUB
SEEDLING / SAPLING	SS
UPLAND DECIDUOUS	UD
UPLAND MIXED	UM

**Legend:**

- BPA Planned Structures
- BPA Planned Roads
- BPA Planned T-lines
- Existing Roads
- 150-ft Corridor
- Survey Boundary
- Vegetation

**Scale:** 0, 250, 500 Feet

**Inset Map:** Shows the project location within a larger regional context, including locations like Fishhawk, Cobble, Deer Island, St Helens, Scappoose, Banks, Hilabone, Salmon Creek, Vancouvers, Cedar Mill, Battle Ground, Walnut Grove, Washouga, and Bridle Veil.

**Disclaimer:** Figure 1B (rev. 4/2005) was produced for administrative purposes only and does not constitute a warranty of any kind. The user assumes all liability for any use of the information shown on this map.

**Figure 2A**

**Western Red Cedar & Black Cottonwood Presence Map - Yale East  
I-5 Reinforcement Corridor Project**

-  Black Cottonwood
-  Western Redcedar
-  Group of Trees
-  Western Redcedar Polygon
-  150-foot Corridor
-  BPA Planned Structures
-  BPA Planned Roads
-  BPA Planned T-lines
-  Existing Roads
-  Survey Boundary
-  Vegetation Cover Type



Data Source: USGS/USFS, 2009. Produced for information purposes only and does not constitute a warranty, representation or assumption of liability on the part of the user. Date: 06/20/11



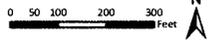
Y5

Y6

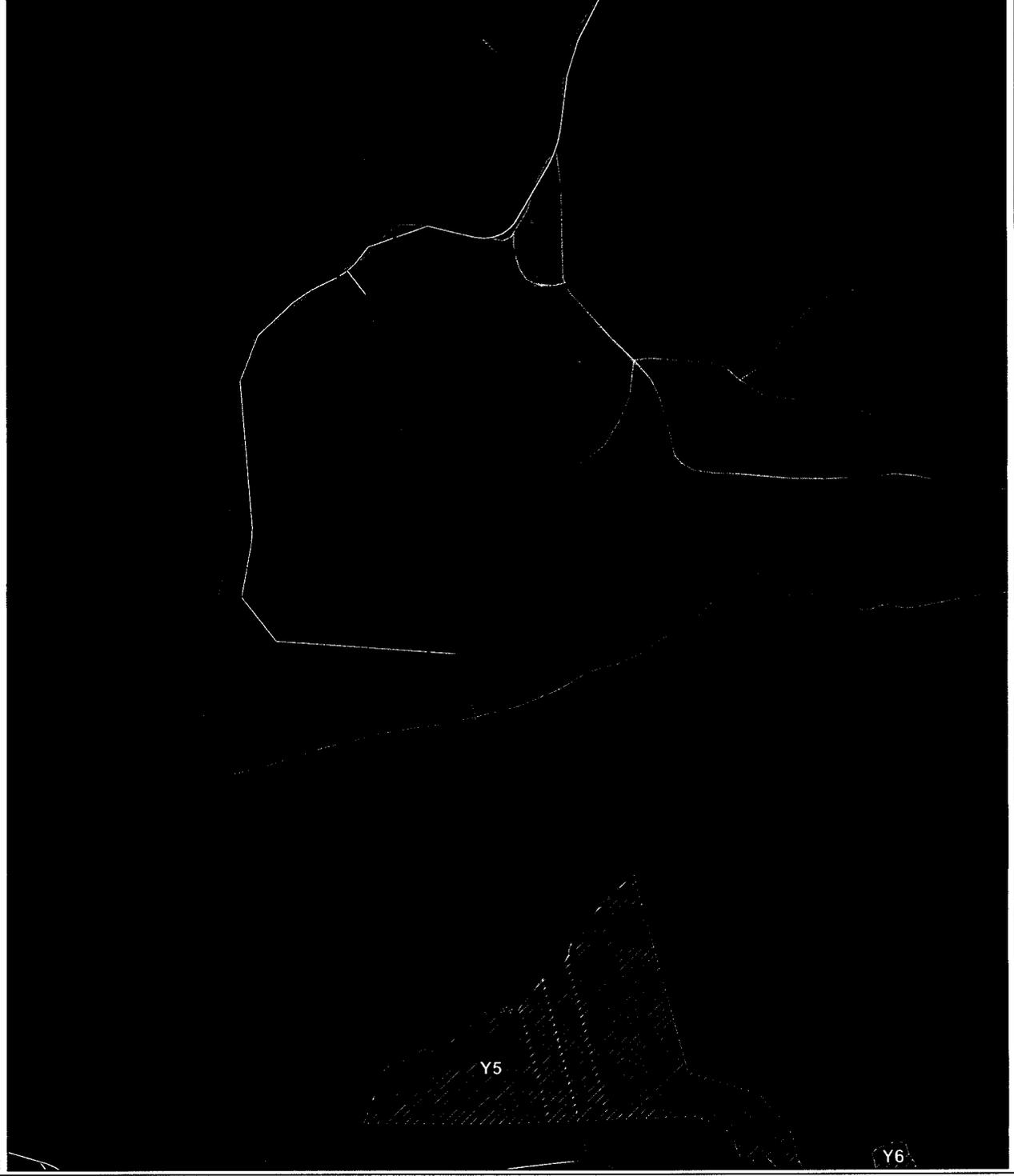
Y5

**Figure 2B**  
**Western Red Cedar & Black Cottonwood Presence Map - Yale Central #1**  
**I-5 Reinforcement Corridor Project**

-  Black Cottonwood
-  Western Redcedar
-  Groups of Trees
-  Western Redcedar Polygon
-  150-foot Corridor
-  BPA Planned Structures
-  BPA Planned Roads
-  BPA Planned T-lines
-  Existing Roads
-  Survey Boundary
-  Vegetation Cover Type



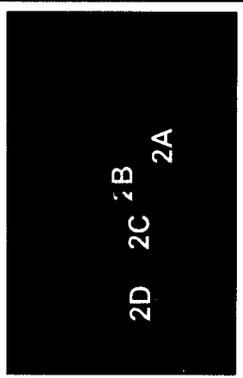
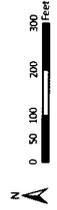
Produced for information purposes only and may not be suitable for legal, engineering or surveying purposes. Conclusions drawn from such information are the responsibility of the user. Data Source: Orthomosaic NAD 2009. Date: 4/6/2011



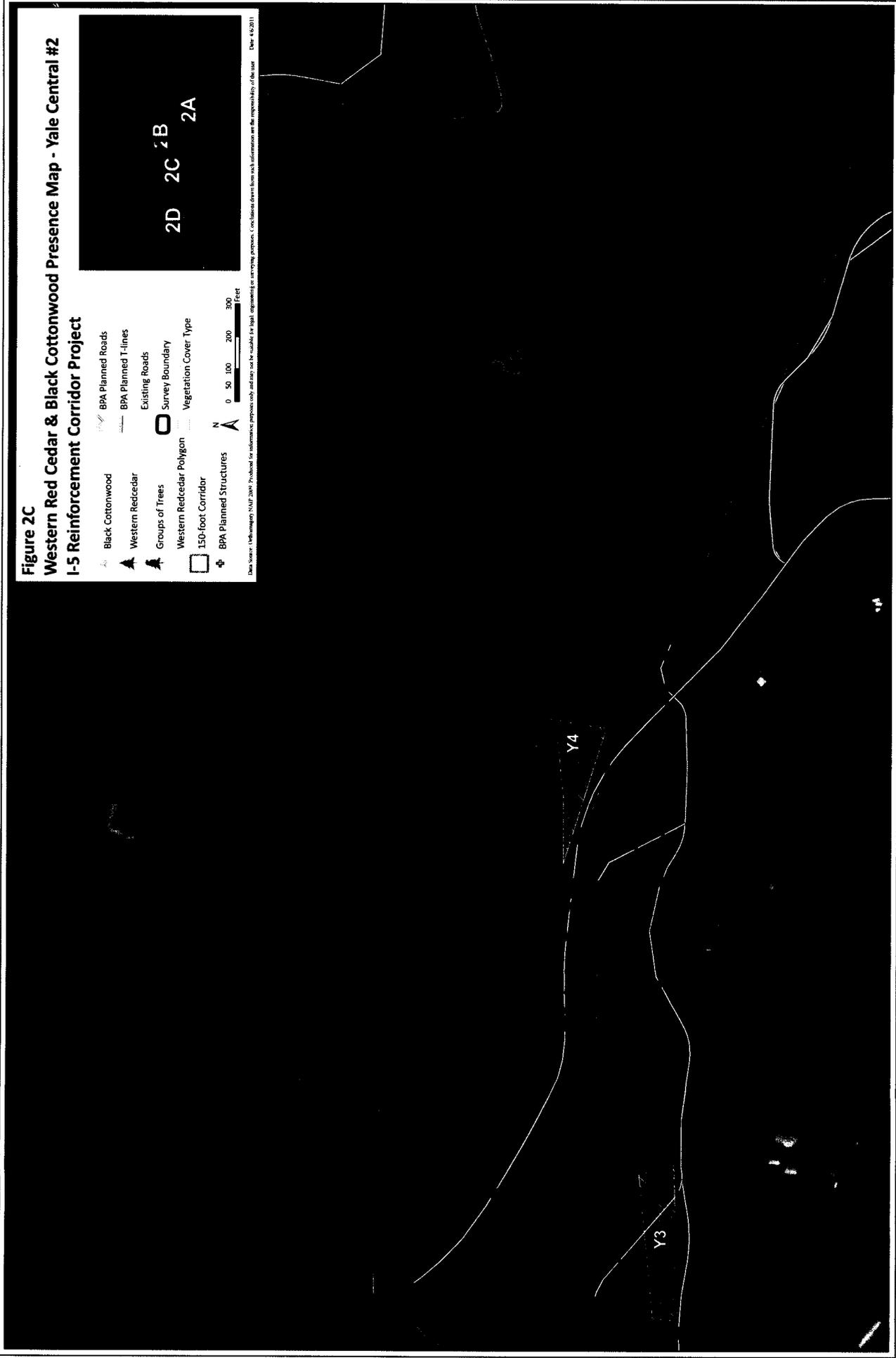
**Figure 2C**

**Western Red Cedar & Black Cottonwood Presence Map - Yale Central #2  
I-5 Reinforcement Corridor Project**

	Black Cottonwood		BPA Planned Roads
	Western Redcedar		BPA Planned T-lines
	Groups of Trees		Existing Roads
	Western Redcedar Polygon		Survey Boundary
	150-foot Corridor		Vegetation Cover Type
	BPA Planned Structures		

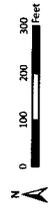


Data Source: USGS National Wetland Inventory (NWI) 2007. Provided for informational purposes only, and may not be suitable for legal applications or engineering purposes. Coordinates derived from such information are the responsibility of the user. Date: 4/6/2011



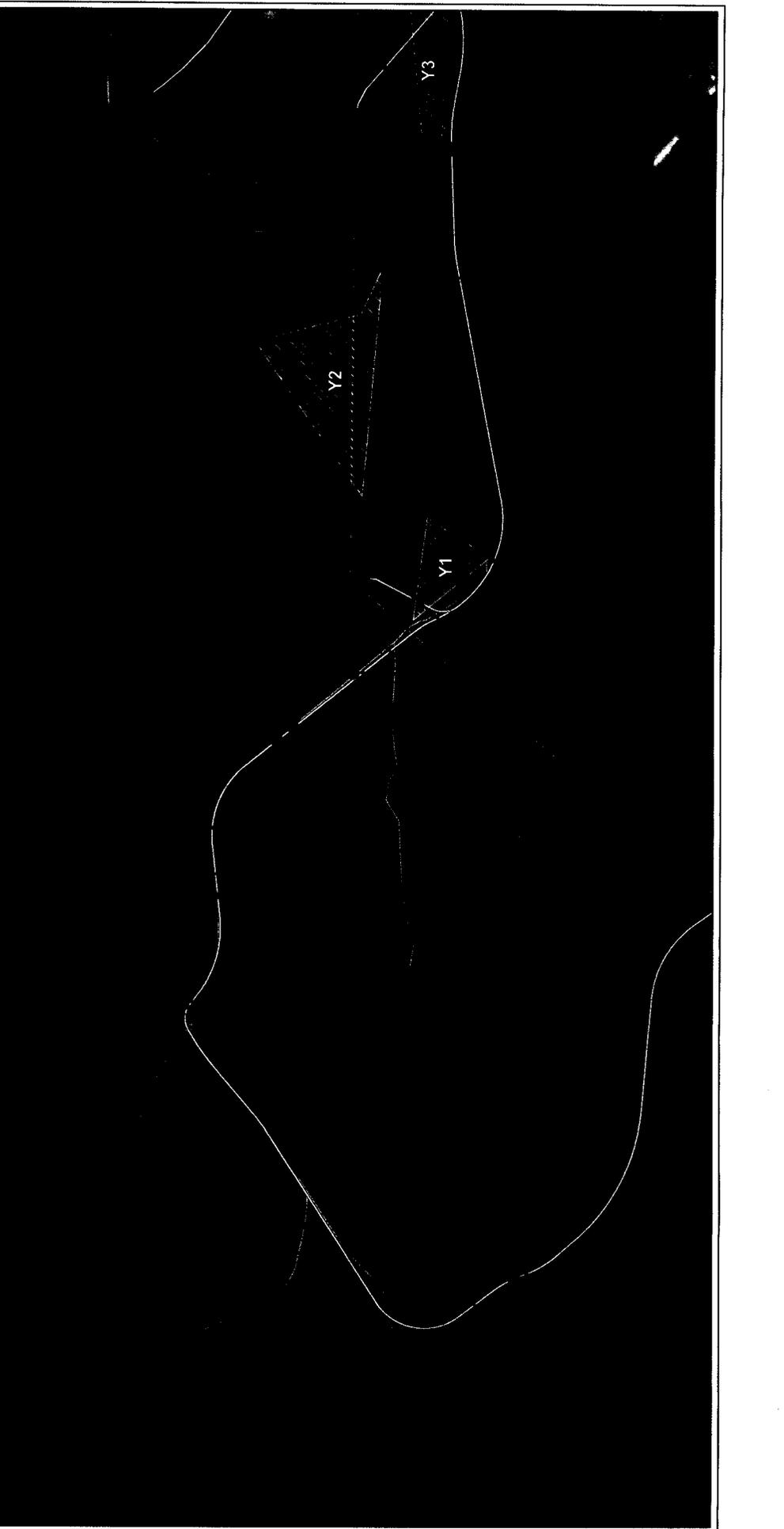
**Figure 2D**  
**Western Red Cedar & Black Cottonwood Presence Map - Yale West**  
**I-5 Reinforcement Corridor Project**

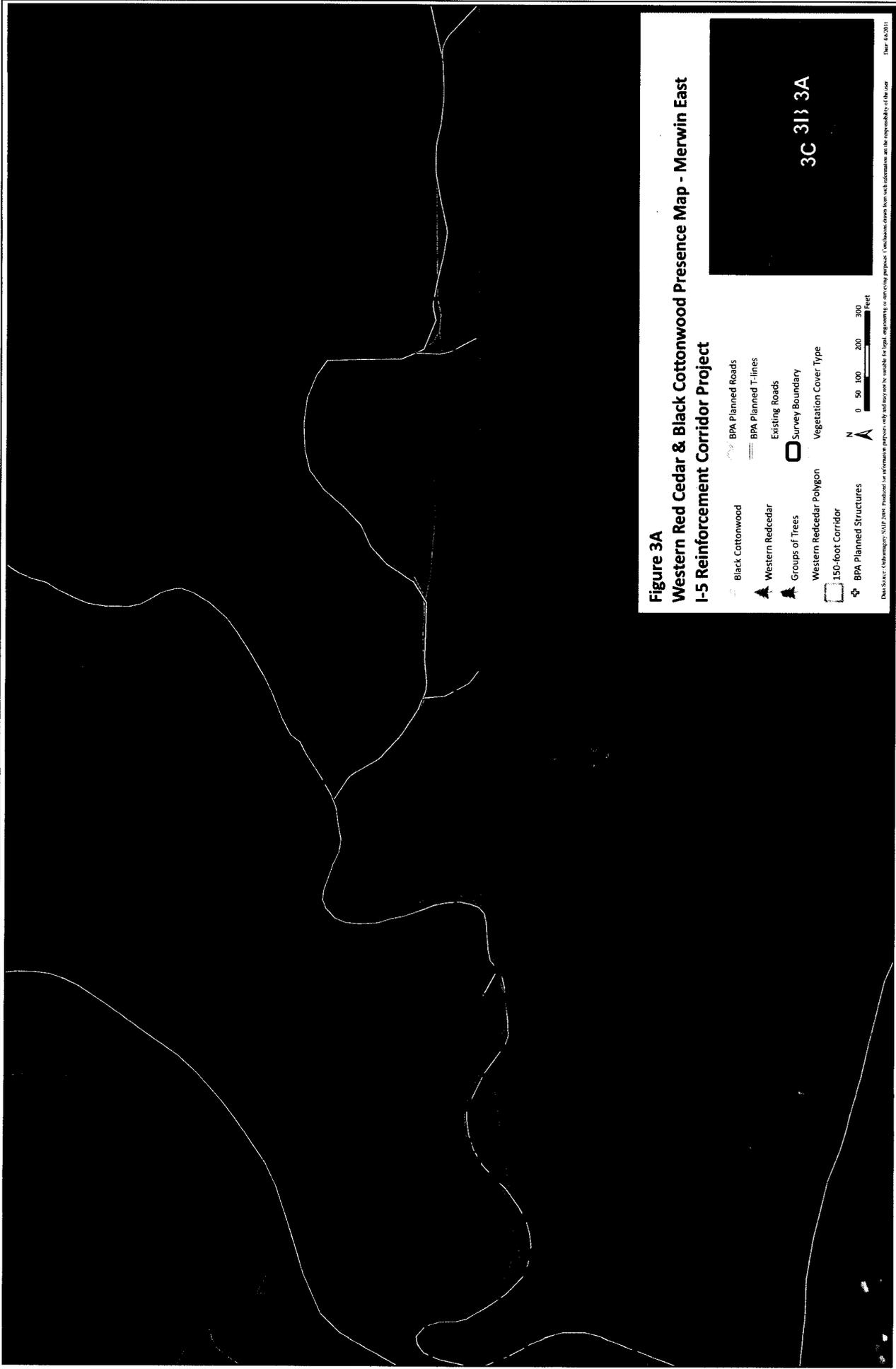
- Black Cottonwood
- Western Redcedar
- Group of Trees
- Western Redcedar Polygon
- 150-foot Corridor
- BPA Planned Structures
- BPA Planned Roads
- BPA Planned T-lines
- Existing Roads
- Survey Boundary
- Vegetation Cover Type



2D 2C 2B 2A

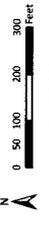
Data Source: Intellicorps SAUP 2000. Prepared for information purposes only and does not constitute a warranty of the accuracy of the data. (Date: 12/20/11)





**Figure 3A**  
**Western Red Cedar & Black Cottonwood Presence Map - Merwin East**  
**I-5 Reinforcement Corridor Project**

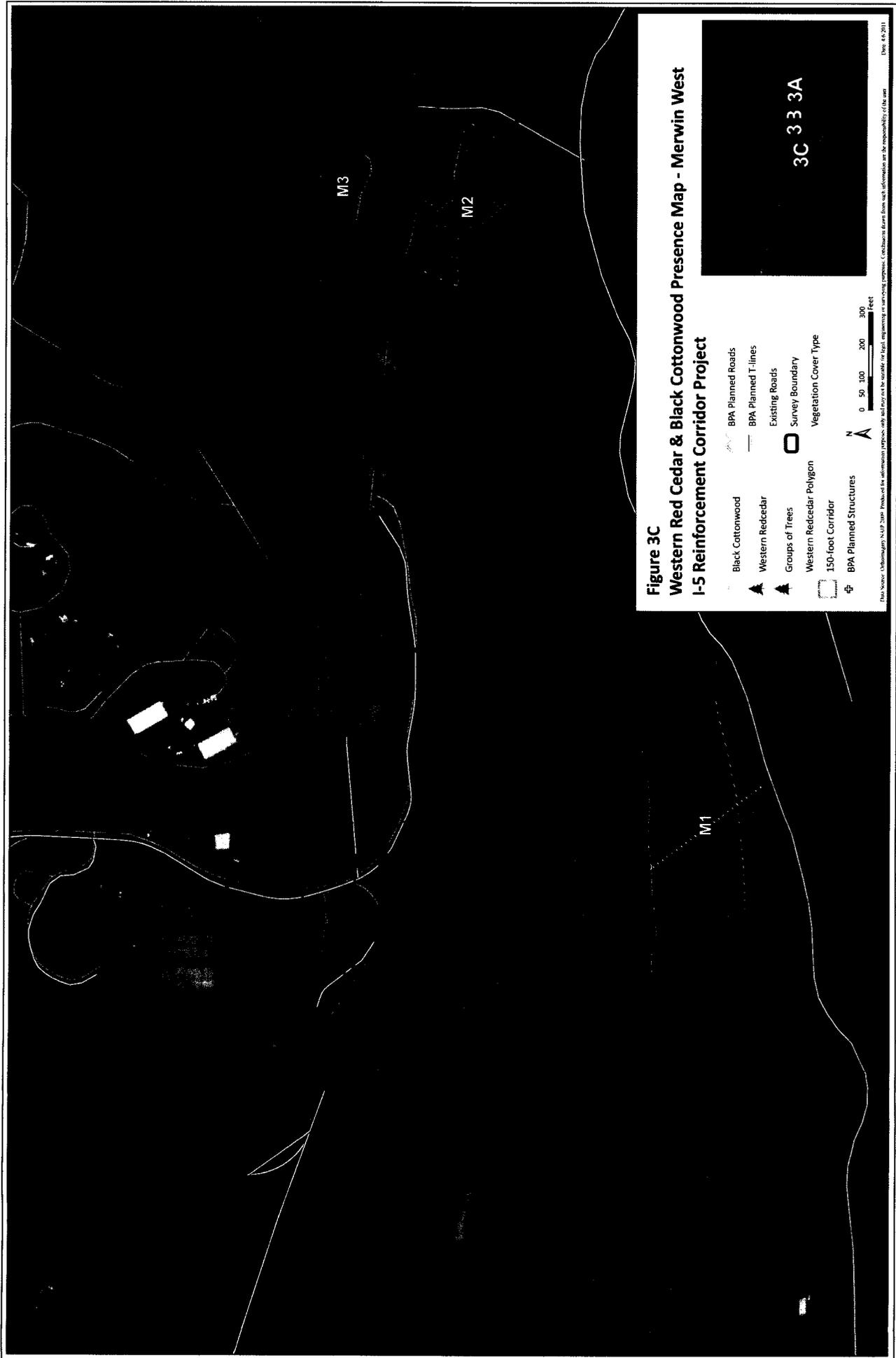
	Black Cottonwood		BPA Planned Roads
	Western Redcedar		BPA Planned T-Hines
	Groups of Trees		Existing Roads
	Western Redcedar Polygon		Survey Boundary
	150-foot Corridor		Vegetation Cover Type
	BPA Planned Structures		



3C 313 3A

Data Source: Caltrans/MapInfo. Produced for informational purposes only and may not be suitable for legal applications or other critical purposes. Use below drawn from such information are the responsibility of the user. Date: 4/2/2011





**APPENDIX B**  
**GROUND LEVEL COLOR PHOTOGRAPHS**

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1

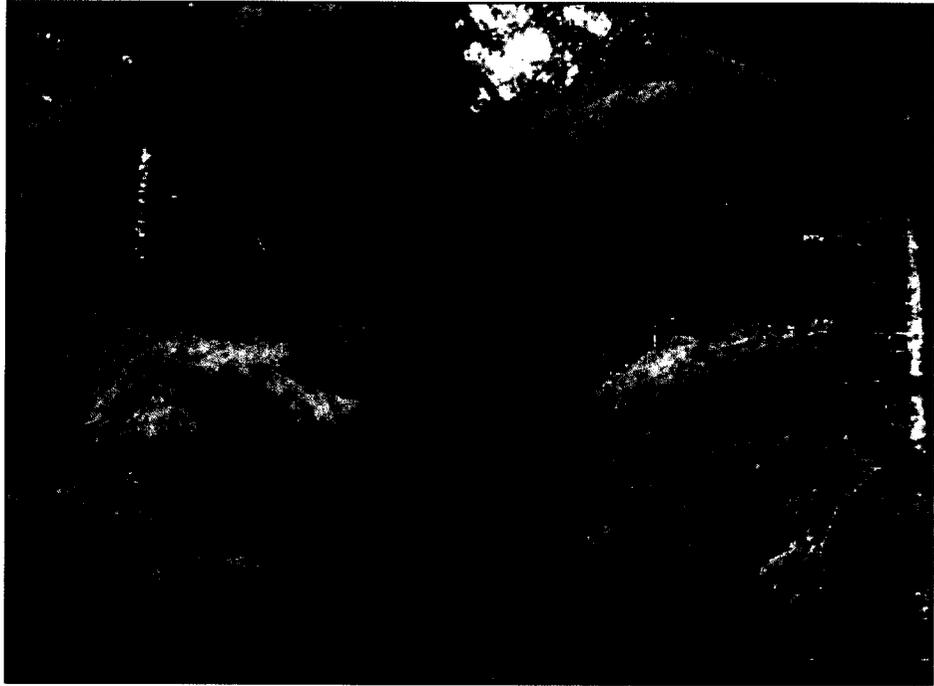


2



<b>MB&amp;G</b>	<ol style="list-style-type: none"><li>1. View of a typical Upland Mixed vegetation cover-type. Vegetation includes western hemlock (<i>Tsuga heterophylla</i>), Douglas-fir (<i>Pseudotsuga menziesii</i>), western redcedar (<i>Thuja plicata</i>), red alder (<i>Alnus rubra</i>) and bigleaf maple (<i>Acer macrophyllum</i>).</li><li>2. View of a typical Seedling/Sapling Conifer vegetation cover-type. This stand is approximately 9 years old and is dominated by Douglas-fir (<i>Pseudotsuga menziesii</i>).</li></ol>
Mason, Bruce & Girard, Inc.	

3



4



<b>MB&amp;G</b>	3. View of a typical Pole Conifer—Thinned vegetation cover-type. Note the evenly spaced gaps between the trees where crowded trees have been removed.
Mason, Bruce & Girard, Inc.	4. View to the west south showing a stand of black cottonwood ( <i>Populus balsamifera</i> ssp. <i>trichocarpa</i> ) near the Merwin fish facility. This stand was identified within a Upland Deciduous vegetation cover-type.

5



6



<b>MB&amp;G</b>	5. View to the west of a western redcedar ( <i>Thuja plicata</i> ) stand within an Upland Mixed vegetation cover-type below the Merwin fish facility. The western redcedar was abundant but densities were not high enough to generate a polygon in this location.
Mason, Bruce & Girard, Inc.	6. View of MB&G field crew measuring DBH of western redcedar ( <i>Thuja plicata</i> ), located on the boundary of polygon Y2, located in an Upland Mixed vegetation cover-type.

7



8



<b>MB&amp;G</b>	7. View to the north of polygon Y4 located east of Highway 503 and north of the existing PacifiCorp transmission line. These western redcedar ( <i>Thuja plicata</i> ) are located in an Upland Mixed vegetation cover-type.
Mason, Bruce & Girard, Inc.	8. View to the east of polygon Y3 located west of Highway 503, along Hanley-Curry Road. Polygon Y3 is situated between Hanley-Curry Road and the existing PacifiCorp transmission line.

**APPENDIX C**  
**RESUMES OF SURVEYORS**

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## Paul Stephens

**Title** Forester/Wildlife Biologist

**Expertise**

- 30+ Years of Experience
- Timber Cruising and Marking
- Forest Inventory
- Unit Traversing and Surveying
- Timber Sale Layout
- Traversing with Criterion Laser
- Trimble-Certified in GPS
- Traverse PC Program
- Proficiency with Allegro Data Recorder, Relaskop, and Compass Operation
- Knowledgeable of Western Tree and Vegetation Species
- Map and Photo Interpretation Skills

**Academic Background** B.S., Wildlife Biology, Washington State University, 1978

**Experience** 1996 to Present - Mason, Bruce & Girard, Inc.

**Forester, McMinnville Watershed McMinnville, Oregon.** Assist lead Forester with timber sale planning, Sale layout, designate pole harvest area , select timber for pole harvest, harvest supervision, tree planting inspection, pre-commercial thinning inspection, asses winter storm damage inspect roads and culvertsLidar plot installation in Washington and Oregon including collection of down-woody-debris data. Work in Washington, Oregon, California and Alaska.

**Forester, Swan Lake, Lake Tye Interchange Ketchikan Alaska.** Assist lead Forester in hazard tree analysis, marking, and mapping of hazard trees to be removed. Spring-Summer of 2008.

**Forest Technician, Timbervest Properties, Foresthill and Yreka, California.** Assist Registered Professional Foresters (RPFs) with the layout and of timber harvest plans for the Timbervest LLC property in Foresthill and Yreka, California.

**Field Supervisor, Yurok Tribal Lands, Northern California.** Served as MB&G's field supervisor for the re-measurement of existing and establishment of new continuous forest inventory (CFI) plots on the Yurok Tribal Lands in northern California during the 1997 field season.

**1995-1996, Power Resource Group, Pacific Corp Forestry Program, Reno, Nevada, Forest Technician.** Inspected power lines for vegetative clearance. Advised customers about tree growth patterns, structural strengths, rot resistance, and current tree trimming methods for power line clearance. Communicated safety concerns and vegetative issues to property owners in a positive and tactful manner, in order to ensure compliance with Pacific Corp policies. Researched rural property owner records in county assessor's office. Assisted in the completion of Pacific Corp's Albany District Hotspot program.

**1995, US Forest Service, Entiat Ranger District, Entiat, Washington, Cruiser.** USFS Certified Involved with fire recovery project. Cruised in the fire burn area, utilizing laser relaskop.

**1992-1994, J&S Hardwoods, Inc., Parkersburg, West Virginia, Procurement Forester and Log Buyer.**

As the *Procurement Forester*, responsibilities included locating tracts of merchantable timber/contacted landowners, established property boundaries and cruised timber using variable plot or 100 percent tree cruising methods, and made bids for purchase of standing timber. Also verified progress of logging operations, maintained compliance of logging operations with contract requirements and state laws, and arranged for transport of logs from harvest site to sawmill. As the *Log Buyer*, one of the primary responsibilities was scaling, appraising and purchasing hardwood logs at mill log yard and at independent logging sites. Also, arranged for trucking of logs to mill; training employees; locating and purchasing parts and supplies for mill, trucks, loaders and office; and repairing equipment as necessary.

## Jenn Stebbings

**Title** **Biologist**

**Expertise**

- 6 years of experience
- Wildlife Habitat Assessment
- Wildlife Species Surveys
- Endangered Species Act (ESA) Compliance
- Erosion and Sediment Control Monitoring
- Stormwater Analysis and Water Quality Assessment
- Environmental Compliance Monitoring
- Wetland and Waters Delineations
- Wetland Mitigation Monitoring

**Academic Background** B.S., Natural Resources, University of Washington, 2003  
 Major in Wildlife Science and Minor in Quantitative Science

Jenn has experience with wildlife habitat assessments and species-specific surveys, including sensitive and endangered species, such as bald eagles and other raptors. She has monitored wetland restoration sites, performed wetland and waters delineations, and gathered field data. Her expertise includes environmental permitting and compliance, erosion control and stormwater analysis, water quality testing and assessment, and environmental site monitoring.

**Experience** **June 2010 to Present – Mason, Bruce & Girard, Inc.**

**Lead Author/Team Biologist, US 26/Glencoe Road Interchange**, Oregon Department of Transportation (ODOT), Washington County, Oregon. Conducted delineations of Jurisdictional Wetlands and Waters of the US/State of Oregon. Prepared a wetland delineation report and functional assessment report.

**Environmental Project Manager/Environmental Compliance Monitor, Powerdale Hydroelectric Project Removal**, PacifiCorp, Hood River, Oregon. Served as Environmental Project Manager for decommissioning and removal of PacifiCorp's 5 MW Powerdale Dam on the Hood River. Conducted water quality measurements multiple times a day, inspected erosion and sediment control measures on a weekly basis, and maintained extensive recordkeeping and reports for the duration of the project. MB&G led state and federal permitting, and prepared a project-specific water quality monitoring plan that received approval from Oregon Department of Environmental Quality (DEQ).

**Lead Author/Team Biologist, Lewis River Recreational Park Design Enhancements**, PacifiCorp, Lewis River Hydroelectric Project, Cowlitz County, Washington. Performed as a team biologist and lead author for the preparation of the Stormwater Pollution Prevention Plans in accordance with the Section 401 Certification requirements to improve Merwin Dam Park and Yale Park on the Lewis River. These projects are implemented as part of a Federal Energy Regulatory Commission (FERC) Settlement Agreement on the hydroelectric project.

**Team Biologist, McMinnville Water & Light Wetland Mitigation**, McMinnville, Oregon. Conducted vegetation survey along reservoir to maintain compliance with state and federal wetland permits as part of a five-year monitoring contract.

**Team Biologist, Forest Heights Mill Pond Improvement**, Portland, Oregon. Conducted a wetland determination to delineate areas for dredging a pond feature in the Forest Heights community. Provided a report and permits associated with the fill/removal aspects of the project.

**Team Biologist, Various Fish Salvage Projects**, Statewide Oregon. Fish salvage is required on construction projects

in waterways where endangered fish are known to occur and where equipment or construction debris may enter the water. Assisted with the use of a backpack electrofisher and netted fish. Prepared fish salvage report for the Marion County Buena Vista Ferry fish salvage effort.

**2009-2010, Wilson Construction Company, Canby, Oregon, *Environmental Specialist.***

Researched and addressed various nationwide, state-specific and local environmental regulations and restrictions according to project requirements. Developed and implemented Stormwater Pollution Prevention Plans and conducted onsite monitoring and inspections during construction. Worked closely with BPA and other utilities in implementing stormwater BMPs and monitoring construction activities in sensitive areas. Created and performed crew training presentations of project-specific environmental requirements.

**2004-2008, Longview Timberlands, Longview, Washington, *Wildlife/Forestry Technician.***

Performed a variety of biological surveys and habitat assessments, including those for federally and state endangered/threatened or sensitive species (i.e., roosting areas of bald eagles). Provided wildlife habitat recommendations to tree farms for harvest planning in sensitive areas. Led field crews, conducted lab analyses, and performed data management on multiple biological research projects. These included a streamside aquatic amphibian shade study; long-term population trends for two species of *Rana*; snowshoe hare DNA collection; pika population research; rough-skin newt biomass research; and a watershed analysis of amphibian presence. Assisted in environmental and biological training staff for Sustainable Forestry Initiative (SFI) certification.

**Professional Memberships**

- The Wildlife Society (TWS), Oregon and Washington
- Society of Northwestern Vertebrate Biology (SNVB)
- Desert Tortoise Council
- International Erosion Control Association (IECA)

**Certifications/ Training**

- Certified Erosion and Sediment Control Lead (CESCL), 2009
- Certified Erosion Control Inspector (CECI), 2010
- First Aid/CPR Training, 2010

## Brian Cook

**Title**                      **Biologist**

- Expertise**
- 9 Years of Experience
  - Wetland and Waters Delineations and Permitting
  - Wetland/Riparian Mitigation Installation, Monitoring and Maintenance
  - Rare Plant and Noxious Weed Surveys
  - Wildlife Habitat Assessment
  - Northwest Native Plant Nursery Management

**Academic Background**                      B.S., Environmental Science and Resource Management, University of Washington, 2007  
 A.T.A., Environmental Conservation, Skagit Valley College, 2005

Brian primary experience has been performing wetland/waters delineations, conducting botanical surveys, and assisting with associated regulatory permitting. His work at MB&G primarily involves performing wetland delineations; leading surveys for a wide range of sensitive, threatened, and endangered plant species and habitats; inventorying noxious weed populations across Oregon and conducting fish salvage efforts. He has conducted wetland/riparian habitat restoration and mitigation installations and maintenance for the Natural Resource Conservation Service and private clients as well as annual vegetation monitoring for compliance with regulatory permits. He also has extensive experience collecting and propagating Pacific Northwest native plants.

**Experience**                      **April 2007 to Present – Mason, Bruce & Girard, Inc.**

**Biologist, Riparian Mitigation Monitoring**, Oregon Department of Transportation, Jackson County, Lane County, Douglas County, and Multnomah County, Oregon. Conduct monitoring for riparian and stream impacts associated with bridge replacement and/or repair at 13 locations. Collected monitoring data including vegetation species and density using GPS hand-held application and ArcPad software. Apply best available science in prescription designation for maintenance plans using observed site characteristics, data from previous maintenance efforts, and client goals to adequately meet long term permit application requirements. Utilize GIS software to create site maps from GPS field data and Microsoft Access software to facilitate efficient reporting to our client.

**Biologist, Vernonia School District, New K-12 School**, Vernonia, Oregon. Conducted delineations of Jurisdictional Wetlands/Waters of the US/State of Oregon and produced associated documentation for regulatory permitting associated with the Vernonia School District K-12 School Relocation project.

**Biologist, OR 213: I-205 – Redland Road O’xing (Oregon City)**, City of Oregon City, subconsultant to OBEC, Clackamas County, Oregon. Conducted delineations of Jurisdictional Wetlands/Waters of the US/State of Oregon, noxious weed surveys, Natural Resource Overlay District vegetation community surveys, and produced associated documentation for regulatory permitting within the on the OR 213: I-205 – Redland Road O’xing (Oregon City) project.

**Biologist, Riparian Habitat Enhancement and Mitigation Monitoring**, OBEC, Marion County, Oregon. Conduct monitoring for riparian and waters impacts associated with bridge scour countermeasures project. Collected as-built monitoring data including vegetation species and density, stream bank grading, riprap/large

woody debris trench and blanket characteristics to ensure project is adequately meeting long term permit application requirements.

**Biologist, Duck Delivery Facility**, Spada Investments SPII, LLC, Peirce County, Oregon. Conducted a habitat assessment within property owned by client for Federal and State listed endangered, threatened and sensitive species including Washington Department of Fish and Wildlife Priority Habitats and Species with subsequent production of a habitat management plan as required for regulatory permitting.

**Biologist, Various Fish Salvage Projects**, Statewide Oregon. Fish salvage is required on construction projects in waterways where endangered fish are known to occur and where equipment or construction debris may enter the water. Assisted with the use of a backpack electrofisher and netted fish.

**2006, Wetland Resources, Inc., Everett, Washington, Biological Technician**. Performed delineations of wetlands/waters of the US/State of Washington through soil analysis, on-site vegetation identification, and observations of wetland hydrology. Completed technical reports including scale maps using VectorWorks, AutoCAD and ArcGIS software. Assisted with wetland and buffer mitigation plan development by coordinating communications with permitting agencies and clientele.

**2005, Skagit County Public Works, Salmon Habitat Inventory Intern**. Conducted stream data collection utilizing the EPA EMAP Wadeable Stream Assessment protocol. Collected data on riparian vegetation including species and canopy cover, in-stream large wood characteristics, pool and riffle formation, and floodplain structure. Completed data entry and organization tasks using Access, Excel and Microsoft Word.

**2004-2005 Cascade Critical Areas, Mount Vernon, Washington, Owner/Manager**. Coordinated Natural Resource Conservation Service (NRCS) wetland restoration of the 25-acre Butler Flats wetlands. Managed and supervised installation and maintenance activities for over 3,000 native plants by up to ten personnel. Completed three wetland mitigation contracts for private sector clients ranging in size from 1/8 acre to 5 acres. Also Contracted by Skagit Wetlands and Critical Areas to conducted delineations of wetlands/waters of the US/State of Washington.

**1997-2002, Blue Heron Farm & Nursery, Rockport, Washington, Nursery Manager**. Responsible for the identification, collection, propagation, maintenance and marketing of various native species of trees and shrubs. Operated and maintained tractors, mowers, weed eaters, and hand tools. Maintained nursery infrastructure. Managed two to five seasonal employees.

- Professional Memberships**
  - Society of Wetland Scientists
  - Soil Science Society of America

- Certifications/ Training**
  - Society of Wetland Scientists Wetland Professional In Training 2009
  - First Aid/CPR, 2008
  - Basic Wetland Delineation Training, 2006
  - Wetland Science and Delineation, Northwest Environmental Training Center, Seattle, Washington 2003