



US Army Corps of Engineers  
Seattle District



# Joint Public Notice

## Application for a Department of the Army Permit and a Washington Department of Ecology Water Quality Certification and/or Coastal Zone Management Consistency Concurrence

### US Army Corps of Engineers

Regulatory Branch  
Post Office Box 3755  
Seattle, WA 98124-3755  
Telephone: (206) 316-3047  
ATTN: Steve Manlow,  
Project Manager

### WA Department of Ecology

SEA Program  
Post Office Box 47600  
Olympia, WA 98504-7600  
Telephone: (360) 407-6068  
ATTN: SEA Program,  
Federal Permit Coordinator

**Public Notice Date:** January 28, 2015

**Expiration Date:** February 27, 2015

**Reference No.:** NWS-2011-372

**Name:** Anderson, Ronald

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Interested parties are hereby notified that all or a portion of the work as described below and shown on the enclosed drawings dated April 21, 2014, was performed without specific authorization under Section 10 of the Rivers and Harbors Act (RHA) and Section 404 and 401 of the Clean Water Act (CWA). U.S. Army Corps of Engineers (Corps) permit regulations (33 CFR 320-332) allow District Engineers to make a determination of whether the activity is contrary to the public interest or if the work should be authorized by an after-the-fact permit.

The Corps will review the work in accordance with Section 404 of the CWA and Section 10 of the RHA. Ecology will review the work pursuant to Section 401 of the CWA, with applicable provisions of State water pollution control laws.

**APPLICANT:** Anderson Dairy  
Attention: Ronald Anderson  
Post Office Box 310  
Battle Ground, Washington 98601  
Telephone: (360) 687-7171

**AGENT:** Rodgers Engineering  
Attention: Robert Rodgers  
16919 Northeast 145<sup>th</sup> Avenue  
Brush Prairie, Washington 98606  
Telephone: (360) 254-3591

**LOCATION:** In the Columbia River at 12500 Northwest Lower River Road, near the City of Vancouver, Clark County, Washington.

**WORK:** To retain and reconfigure an existing 1,600-foot-long, up to 8-foot-high and 35-foot-wide bank stabilization project in the Columbia River. Existing work includes the placement of 3,000 cubic yards of rock and sediment and excavation of 1,100 cubic yards of bed material, waterward of the ordinary high water mark (OHWM). The proposed work is to retain and reconfigure the project to provide a flatter and more sinuous bank and increase habitat complexity. Work would include the additional excavation of up to 500 cubic yards of fill and bed material, and the placement of an additional 700 cubic yards of fill waterward of the OHWM. Work would

## **NWS-2011-372, Ron Anderson**

also include the installation of an additional 1,700 plants, 14 large woody material structures, 25 cottonwood poles, and 125 logs along and waterward of the OHWM.

PURPOSE: The purpose of the project is to stabilize the riverbank.

DREDGED MATERIAL TESTING: Prior to completing our review, the Corps will determine whether the proposed dredged material must be tested according to the procedures specified by the Dredged Material Management Program (DMMP). The DMMP evaluation may include both chemical and biological testing of sediments. The sediment testing data will be available at the Corps, Seattle District, Dredged Material Management Office.

MITIGATION: The applicant is not proposing compensatory mitigation but has included features in the project design, including placement of large woody material and installation of plants, to improve aquatic habitat functions.

ENDANGERED SPECIES: The Endangered Species Act (ESA) requires federal agencies to consult with the National Marine Fisheries Service (NMFS) and/or U.S. Fish and Wildlife Service pursuant to Section 7 of the ESA on all actions that may affect a species listed (or proposed for listing) under the ESA as threatened or endangered or any designated critical habitat. After receipt of comments from this public notice, the U.S. Army Corps of Engineers will evaluate the potential impacts to proposed and/or listed species and their designated critical habitat.

ESSENTIAL FISH HABITAT: The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996, requires all Federal agencies to consult with the NMFS on all actions, or proposed actions, permitted, funded, or undertaken by the agency, that may adversely affect Essential Fish Habitat (EFH). The proposed action would impact EFH in the project area. If the Corps determines that the proposed action may adversely affect EFH for federally managed fisheries in Washington waters, the Corps will initiate EFH consultation with the NMFS. The Corps' final determination relative to project impacts and the need for mitigation measures is subject to review by and coordination with the NMFS.

CULTURAL RESOURCES: The Corps has reviewed the latest published version of the National Register of Historic Places, Washington Information System for Architectural and Archaeological Records Data and other sources of information. The Corps has reviewed the latest published version of the National Register of Historic Places, Washington Information System for Architectural and Archaeological Records Data and other sources of information. Historic properties determined eligible for or listed on the National Register of Historic Places were found within or near the permit area. The Corps invites responses to this public notice from Native American Tribes or tribal governments; Federal, State, and local agencies; historical and archeological societies; and other parties likely to have knowledge of or concerns regarding historic properties and sites of religious and cultural significance at or near the project area. After receipt of comments from this public notice, the Corps will evaluate potential impacts and consult with the State Historic Preservation Officer and Native American Tribes in accordance with Section 106 of the National Historic Preservation Act, as appropriate.

PUBLIC HEARING: Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for public hearings shall state, with particularity, the reasons for holding a public hearing.

EVALUATION – CORPS: The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered, including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water

**NWS-2011-372, Ron Anderson**

supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people.

The Corps is soliciting comments from the public; Native American Nations or tribal governments; Federal, State, and local agencies and officials; and other interested parties in order to consider and evaluate the impacts of this activity. Any comments received will be considered by the Corps to determine whether to issue, modify, condition or deny a permit for the work. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the activity.

The described discharge will be evaluated for compliance with guidelines promulgated by the Environmental Protection Agency under authority of Section 404(b)(1) of the CWA. These guidelines require an alternatives analysis for any proposed discharge of dredged or fill material into waters of the United States.

SOURCE OF FILL MATERIAL: The applicant has not yet identified the source of the fill material. Should a permit be issued, the Corps will evaluate the fill material source prior to the start of construction.

EVALUATION – ECOLOGY: Ecology is soliciting comments from the public; Federal, Native American Nations or tribal governments, State, and local agencies and officials; and other interested parties in order to consider and evaluate the impacts of this activity. Ecology will be considering all comments to determine whether to certify or deny certification for the proposed project.

COMMENT AND REVIEW PERIOD: Conventional mail or e-mail comments on this public notice will be accepted and made part of the record and will be considered in determining whether authorizing the work would not be contrary to the public interest. In order to be accepted, e-mail comments must originate from the author's e-mail account and must include on the subject line of the e-mail message the permit applicant's name and reference number as shown below. Either conventional mail or e-mail comments must include the permit applicant's name and reference number, as shown below, and the commenter's name, address, and phone number. All comments whether conventional mail or e-mail must reach this office, no later than the expiration date of this public notice to ensure consideration.

CORPS COMMENTS: All e-mail comments should be sent to [steven.w.manlow@usace.army.mil](mailto:steven.w.manlow@usace.army.mil). Conventional mail comments should be sent to: U.S. Army Corps of Engineers, Regulatory Branch, Attention: Steve Manlow, P.O. Box 3755, Seattle, Washington 98124-3755. All comments received will become part of the administrative record and are subject to public release under the Freedom of Information Act including any personally identifiable information such as names, phone numbers, and addresses.

ECOLOGY COMMENTS: Any person desiring to present views on the project pertaining to a request for water quality certification under Section 401 of the CWA and/or Coastal Zone Management consistency concurrence, may do so by submitting written comments to the following address: Washington State Department of Ecology, Attention: Federal Permit Coordinator, P.O. Box 47600, Olympia, Washington 98504-7600, or e-mail to [ecyrefedpermits@ecy.wa.gov](mailto:ecyrefedpermits@ecy.wa.gov).

To ensure proper consideration of all comments, responders must include the following name and reference number in the text of their comments: Anderson, Ronald; NWS-2011-372

Encl: Figures (31)

# ANDERSEN DAIRY FISH HABITAT PROJECT

RECEIVED-SW Field Office

APR 21 2014

USACE-REGULATORY

## NOTES:

- Use Bioengineering for shallow habitat areas to tie down/ anchor fish habitat
- Remove rock from lower bank to provide anchor pocket for LWD.
- Take this rock to anchor proposed LWD and boulders rock to create more gradual slope
- Scatter natural rock & LWD in scalloped pattern along beach (sin wave pattern)
- Add anchored large woody material, such as root wades, logs, and limbs
- Plant the shallow fish habitat area with native plants
- Use cottonwood poles for anchors.
- Tie together LWD, rock and poles, and root wades and anchor to stable bank boulders.
- Use sin wave pattern for propose toe with peaks at approximately 2.00' apart.

## LEGEND

## CONTOUR (Feet)

- 1 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- 21 - 25
- 26 - 30
- 31 - 35
- 36 - 40



EXPIRES: AUGUST 27 2015

17628

4/16/14

## SHEET INDEX

1. Title Sheet
2. Vicinity Map
3. Property Map
4. Existing Condition Map
5. Existing Condition Map
6. Site Plan
7. Site Plan
- 8-10 Landscape Plan
- 11 & 11A Habitat Plan
- 12-21 Proposed X-Section/ Typical Detail
- 22-28 Existing Condition X-Section
- 29-30 Conceptual (input from corps)

## TITLE SHEET

Ref # NWS 2014-372

REFERENCE: (USACE will provide) LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
 APPLICANT: Ronald Andersen  
 ADJACENT PROPERTY OWNERS:  
 New Columbia Garden 50% @ PN 191484000  
 New Columbia Garden Company Inc. @ PN 191177000  
 DATE: 4/16/2014  
 PAGE 1 OF 1  
 PROPOSED PROJECT: Fish Habitat  
 Restoration & Bank Stabilization  
 IN: Columbia River  
 NEAR: Vancouver  
 COUNTY/STATE: Clark/Wa

## OWNER/DEVELOPER

RONALD ANDERSEN

P.O. BOX 310

BATTLEGROUND, WA 98604

## ENGINEER

RODGERS ENGINEERING

16019 NE 145th AVENUE

BRUSH PRAIRIE, WA 98606

360-254-3591

## SITE ADDRESS:

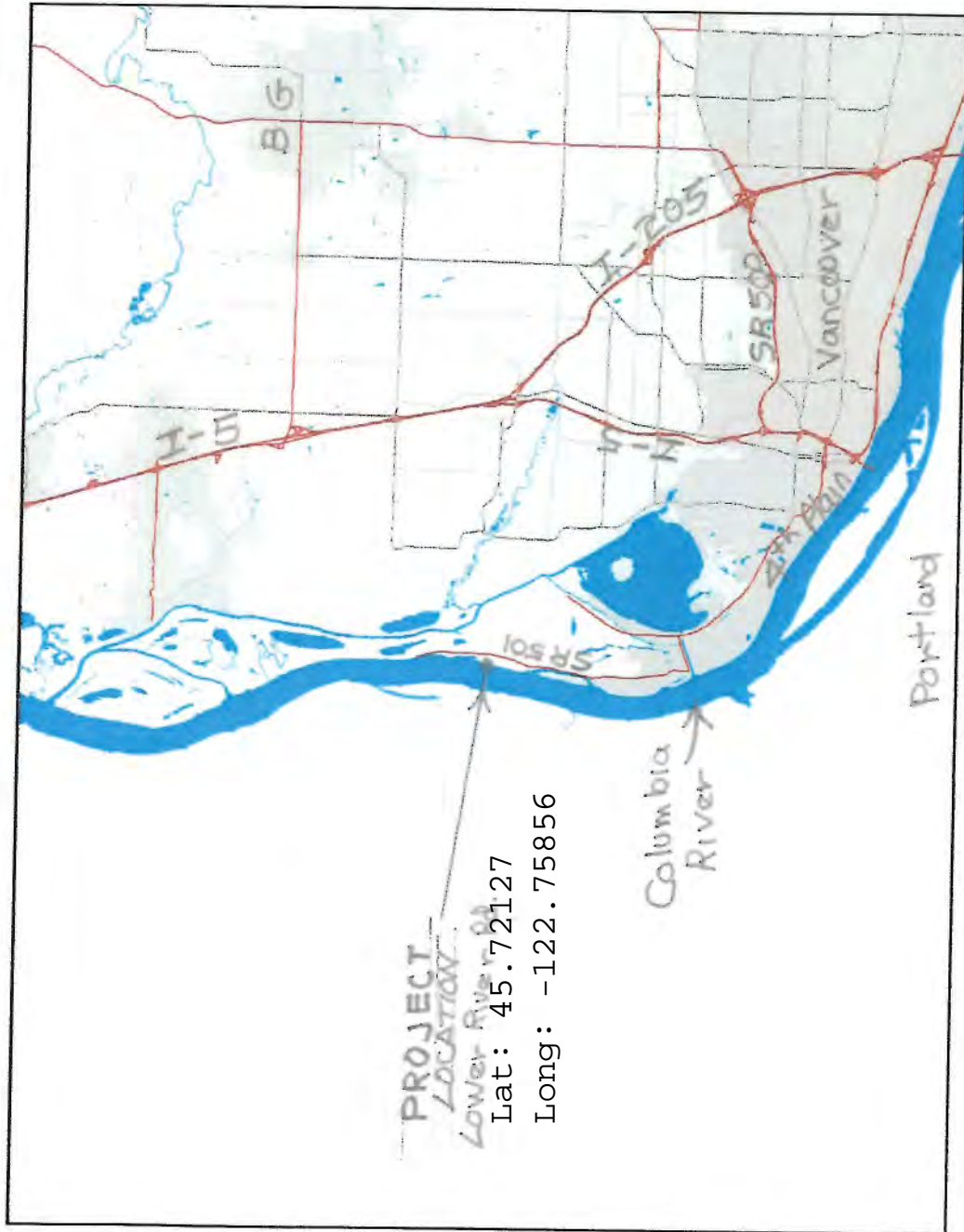
ANDERSEN DAIRY

12500 NW LOWER RIVER ROAD

VANCOUVER, WA 98660



# ADFH Vicinity Map



PROJECT  
LOCATION  
Lower River  
Lat: 45.72127  
Long: -122.75856

0 3.75 7.5 11.25 mi.

Map center: 1068225, 150077

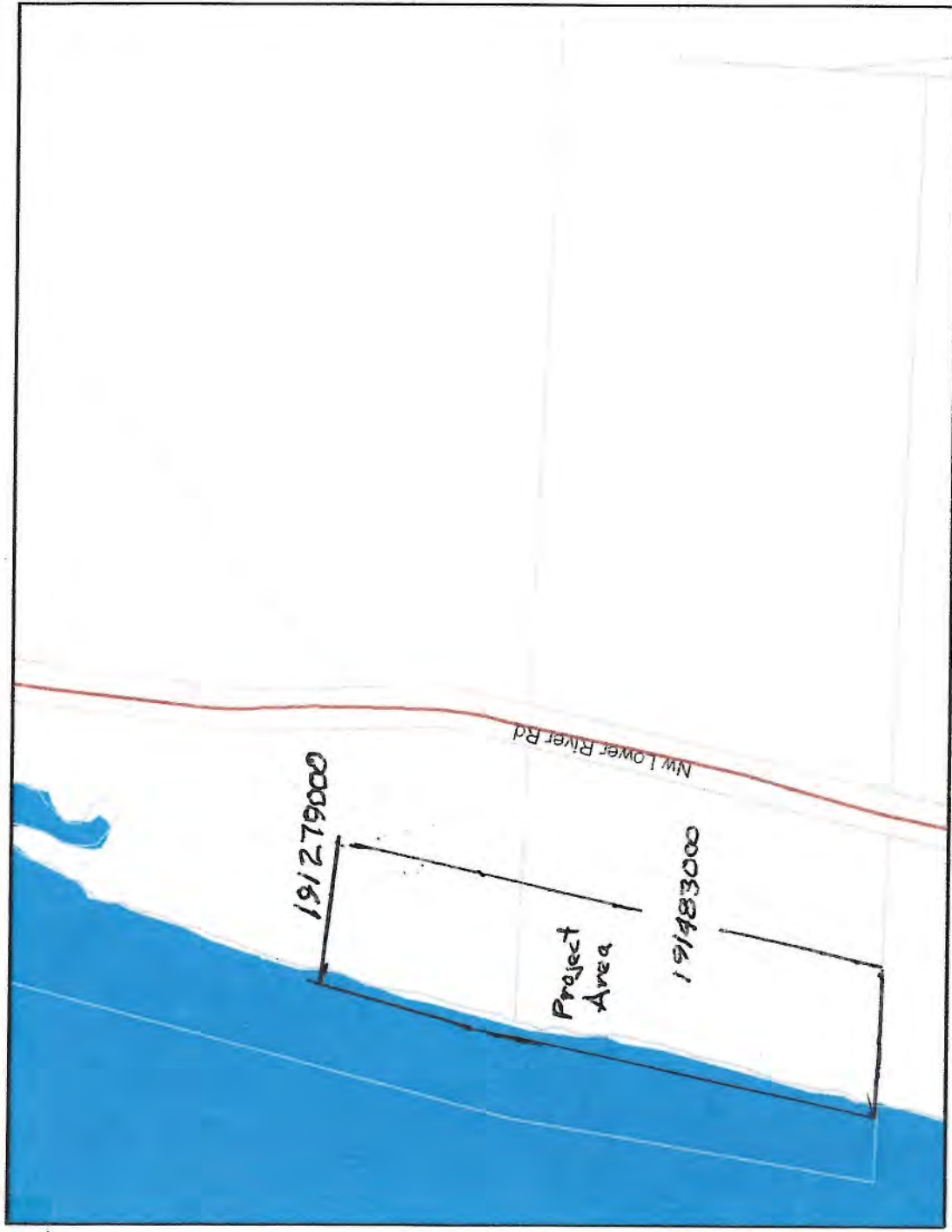
## Legend

- Major Roads
- State Route
- Interstate
- Minor Collector
- Major Collector
- State Route
- Interstate
- Waterbodies
- Rural Centers
- City Boundaries
- Urban Growth Boundaries
- County Boundary
- Site

Scale: 1:201,253

REFERENCE: (USACE will provide) LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
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 IN: Columbia River  
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 COUNTY/STATE: Clark/Wa  
 DATE: April 21, 2014  
 PAGE 1 OF 2

This map was generated by Clark County's "Maps Online" website. Clark County does not warrant the accuracy, reliability or timeliness of any information on this map, and shall not be held liable for losses caused by using this information.



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Map center: 1065066, 149890

### Legend

- Parcels
- Roads
- Alley
- Arterial
- DNR
- DNR (Private Land)
- Driveway
- Interstate
- Interstate Ramp
- Primary Arterial
- Private Roads
- Private Roads w/o Names
- Public Roads
- SR Ramp
- State Route
- Waterbodies
- Rural Centers
- City Boundaries
- Urban Growth Boundaries
- County Boundary



Scale: 1:7,200

*NW 1/4 2011-372*

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 New Columbia Garden 50% @ PN 191484000  
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 IN: Columbia River  
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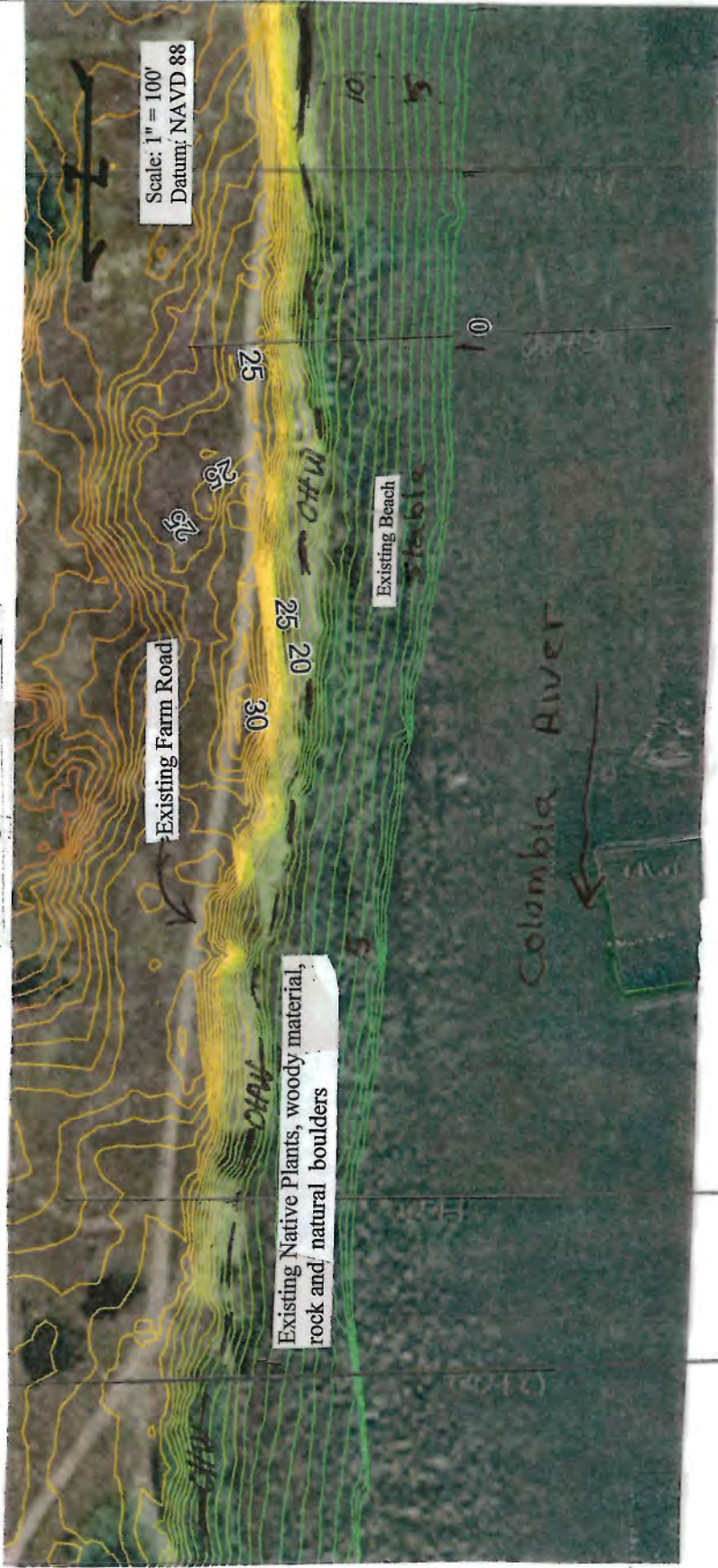
LAT/LONG: 45.719993, -122.758827

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DATE: ~~xxxxxx~~ April 21, 2014



# Existing Condition Map



NWS 2011-372

REFERENCE: (USACE will provide) LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
 APPLICANT: Ronald Andersen  
 ADJACENT PROPERTY OWNERS:  
 New Columbia Garden 50% @ PN 191484000  
 New Columbia Garden Company Inc. @ PN 191177000

PROPOSED PROJECT: Fish Habitat  
 Restoration & Bank Stabilization  
 IN: Columbia River  
 NEAR: Vancouver  
 COUNTY/STATE: Clark/Wa

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 DATE: APR 21, 2014

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# Existing Condition Map



Scale: 1" = 100'  
Datum: NAVD 88

REFERENCE: (USACE will provide) LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
 APPLICANT: Ronald Andersen  
 ADJACENT PROPERTY OWNERS:  
 New Columbia Garden 50% @ PN 191484000  
 New Columbia Garden Company Inc. @ PN 191177000

PROPOSED PROJECT: Fish Habitat  
 Restoration & Bank Stabilization  
 IN: Columbia River  
 NEAR: Vancouver  
 COUNTY/STATE: Clark/Wa

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 DATE: April 21, 2014

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# SITE PLAN

## Riparian Zone Planting

Plant Riparian Area between OHW and the Farm Road with Native Plants and Cuttings (Willow, Cotton Wood, Red Osier Dogwood, and Shrubs)

Scale: 1" = 100'  
Datum: NAVD 88

River Bank Fish Enhancement

Limit of Temporary Disturbance

8+00 Match Line

0+00

1+00

3+00

3+50

5+50

6+00

7+00

## Shallow Water Fish Habitat & River Bank Modifications Notes:

Remove natural rock from lower bank to provide anchor pocket for LWM & WM.  
And reduce the river bank height to provide flatter bank slopes (2:1 to 3:1) & high Anchor LWM by placing boulders on top of the trunk installed in pocket  
Also use this rock to anchor proposed LWM and to create more gradual slope & Install natural rock & woody material in wave pattern toe along beach  
Add anchored large woody material, such as root wades, and logs  
Plant the shallow fish habitat area with native plants @ 5' o.c.  
Use cottonwood poles for anchors as needed.  
Tie together woody material in triangular pattern as needed.

Use sin wave pattern for propose toe with peaks at approximately 200' apart.  
SWFH width varies from 0 to 15'. Area of proposed SWFH = 0.7 acres  
SWFH = 0.35 ac created habitat + 0.35 ac of enhance habitat

## Erosion Control Plan:

Install 8" stream gravel berm below work area & place to catch any sediment from immediate work area  
Use small equipment as much as possible &  
Keep grading to minimum so impacts are minimized  
Move material the least amount and shortest distances  
Plant all bare areas & mulch riparian area as needed

## Enhance River Bank (0+00 to 15+00)

Remove exist, natural rock from the top of the river bank  
Reduce height & slope of lower river bank  
Excavate pockets in bank to install LWM & WM  
Anchor trunk by backfilling with exist boulders  
Place exist, natural rock & WM on beach to form wave pattern  
Install native plants @ 5' oc over entire area  
Spread stream gravel over area when done w/ project

NWS 2011-372

REFERENCE: NWS 2011-372  
APPLICANT: Ronald Andersen  
ADJACENT PROPERTY OWNERS:  
New Columbia Garden 50% @ PN 191484000  
New Columbia Garden Company Inc. @ PN 191177000

LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
LAT/LONG: 43.719993, -122.758827

PAGE 1 OF  
DATE: April 21, 2014

PROPOSED PROJECT: Fish Habitat  
Restoration & Bank Stabilization  
IN: Columbia River  
NEAR: Vancouver  
COUNTY/STATE: Clark/WA



# SITE PLAN

## Riparian Zone Planting

Plant Riparian Area between OHW and the Farm Road with Native Plants and Cuttings (Willow, Cotton Wood, Red Osier Dogwood, and Shrubs)

River Bank Fish Enhancement

OHW

OHW

OHW

Limit of Temporary Disturbance

0' - 15' Wide Shallow Water Fish Habitat

Scale: 1" = 100'  
Datum: NAVD 88

## Shallow Water Fish Habitat & River Bank Modifications Notes:

Remove natural rock from lower bank to provide anchor pocket for LWM & WM.  
And reduce the river bank height to provide flatter bank slopes (2:1 to 3:1) & hi-Anchor LWM by placing boulders on top of the trunk installed in pocket  
Also use this rock to anchor proposed LWM and to create more gradual slope  
Install natural rock & woody material in wave pattern along beach  
Add anchored large woody material, such as root wades, and logs  
Plant the shallow fish habitat area with native plants.  
Use cottonwood poles for anchors as needed.

Tie together woody material in triangular pattern as needed.  
Use sin wave pattern for propose toe with peaks at approximately 200' apart.  
SWFH width varies from ' to 15', Area of proposed SWFH = 0.7 acres  
SWFH = 0.35 ac created habitat + 0.35 ac of enhance habitat

## Erosion Control Plans:

Install 8" stream gravel berm below work area &  
Place to catch any sediment form immediate work area  
Use small equipment as much as possible &  
Keep grading to minimum so impacts are minimized  
Move material the least amount and shortest distances  
Plant all bare areas & mulch riparian area as needed

## Enhance River Bank (0+00 to 15+00)

Remove exist. natural rock from the top of the river bank  
Reduce height & slope of lower river bank  
Excavate pockets in bank to install LWM & WM  
Anchor trunk by backfilling with exist. boulders  
Place exist. natural rock & WM on beach to form wave pattern  
Install native plants @ 5' oc over entire area  
Spread stream gravel over area when done w/ project

REFERENCE: (USACE will provide)  
APPLICANT: Ronald Andersen  
ADJACENT PROPERTY OWNERS:  
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New Columbia Garden Company Inc. @ PN 191177000

LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
LAT/LONG: 45.719993, -122.758827  
PAGE 1 OF  
DATE: April 21, 2014

PROPOSED PROJECT: Fish Habitat  
Restoration & Bank Stabilization  
IN: Columbia River  
NEAR: Vancouver  
COUNTY/STATE: Clark/Wa



& Wild Rose at 3' o.c. and re-plant exist. Natives as needed. Use bio-bags if needed and use steel rod to open hole to native soil if possible.

0+00 0+27

Farm Road

OHW

OHW

OHW

Shallow water habitat/Flood plain

Riparian Area

Eliminate Invasive vegetation (Black Berries & Scotch Broom)

Shallow water habitat/Flood plain (from top of lower bank to OHW) & Riparian Area (from OHW to edge of Farm Road)

Plant this area with native plants and live cuttings of Willow, Red Osier Dogwood, Cottonwood & Wild Rose at 5' o.c. Fill in open space and replace plants as needed to obtain densities.

**NOTES:**  
 The ~~in~~vasive vegetation (Black Berries, Scotch Broom and etc) will be treated to eliminate.  
 Proposed Native Plants will be a mixture of 70 % live cuttings and 30 % one gal pots.  
 Use top soil in holes as needed.  
 Plant in the Fall & Spring as dictated by Weather Patterns  
 Inspect every three months & replant as needed for 3-5 year period.  
 To Maintain density and survival rate of 75- 80%

**Therapeutic vegetation (Black Berries, Scotch Broom and etc)**  
will be treated to eliminate.

Proposed Native Plants will be a mixture of 70 % live cuttings and 30 % one gal pots. Use top soil in holes as needed.

Plant in the Fall & Spring as dictated by Weather Patterns  
Inspect every three months & replant as needed for 3-5 year period.  
To Maintain density and survival rate of 75- 80%

Protect and Save All Exist. Native Plants from Previous Project.

A vertical number line with tick marks at 0, 60, 120, and 180 ft.

## PLANTING PLAN

REFERENCE: (USACE will provide)  
APPLICANT: Ronald Andersen  
ADJACENT PROPERTY OWNERS:  
New Columbia Garden 50% @ PN 191484000  
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PROPOSED PROJECT: Fish Habitat Restoration & Bank Stabilization  
IN: Columbia River  
NEAR: Vancouver  
COUNTY/STATE: Clatsco/Wa

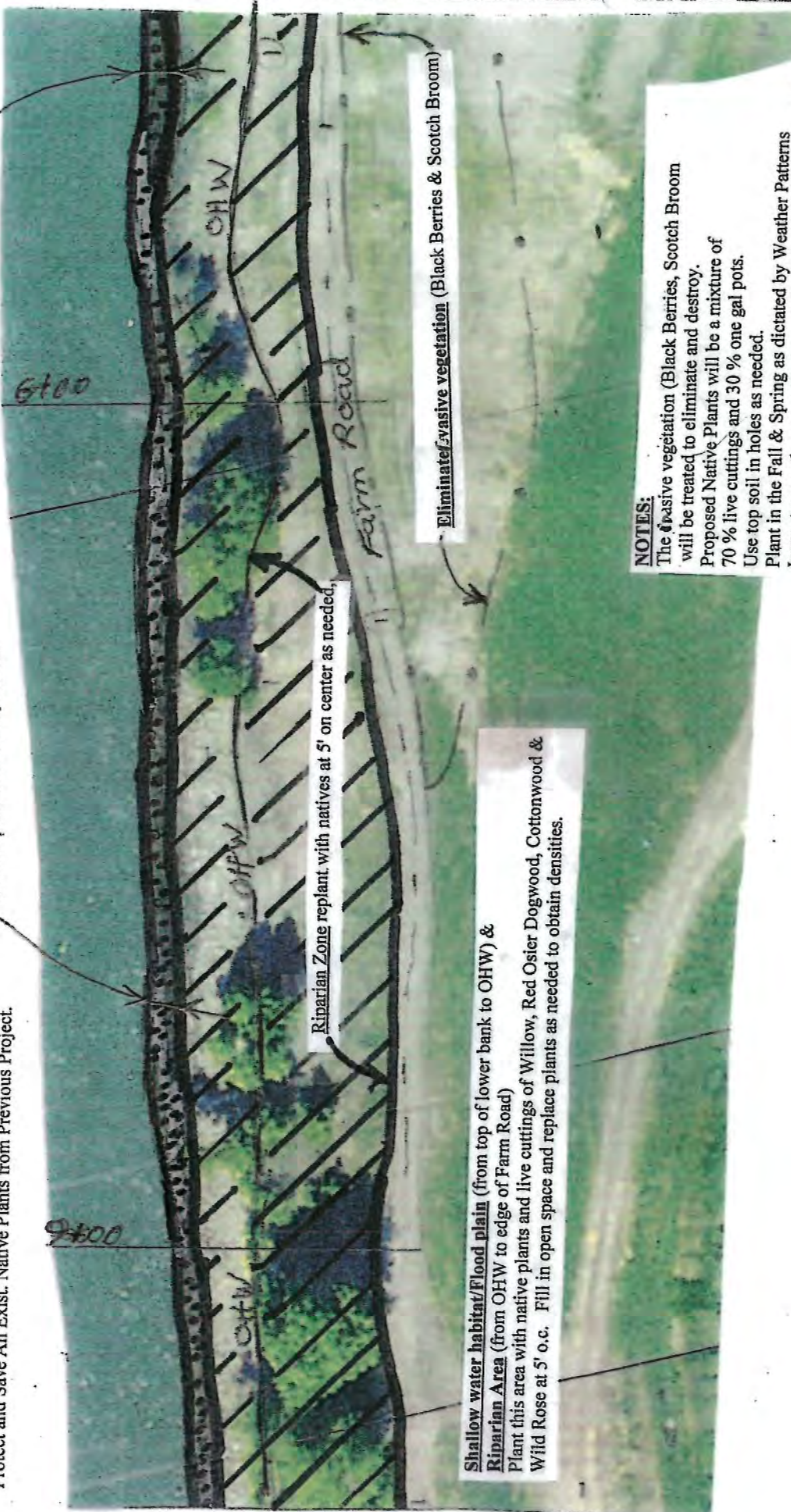




Scale: 1:800

Lower river bank & proposed shallow water fish habitat (from top of bank to toe of proposed swfh)  
Plant this area with native plants and live cuttings of Willow, Red Osier Dogwood, Cottonwood, & Wild Rose at 3' o.c. and re-plant exist. Natives as needed. Use bio-bags if needed and use steel rod to open hole to native soil if possible.

Protect and Save All Exist. Native Plants from Previous Project.



Shallow water habitat/Flood plain (from top of lower bank to OHW) & Riparian Area (from OHW to edge of Farm Road)  
Plant this area with native plants and live cuttings of Willow, Red Osier Dogwood, Cottonwood & Wild Rose at 5' o.c. Fill in open space and replace plants as needed to obtain densities.

**NOTES:**

The Invasive vegetation (Black Berries, Scotch Broom) will be treated to eliminate and destroy.

Proposed Native Plants will be a mixture of 70 % live cuttings and 30 % one gal pots.

Use top soil in holes as needed.

Plant in the Fall & Spring as dictated by Weather Patterns

Inspect every three months & replant as needed for 3-5 year period.

To Maintain density and survival rate of 75- 80%

NWS 2011 372

REFERENCE: (USACE will provide) LOCATION: 12500 NW Lower River Rd., Vancouver, 98660

APPLICANT: Ronald Andersen

ADJACENT PROPERTY OWNERS:

New Columbia Garden 50% @ PN 191484000

New Columbia Garden Company Inc. @ PN 191177000

180 ft.

120

60

**PLANTING PLAN**

PROPOSED PROJECT: Fish Habitat Restoration & Bank Stabilization  
IN: Columbia River  
NEAR: Vancouver  
COUNTY/STATE: Clark/Wn

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DATE: 04/21/2014

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Scale: 1:800

Lower river bank & proposed shallow water fish habitat (from top of bank to toe of proposed swth)  
Plant this area with native plants and live cuttings of Willow, Red Osier Dogwood, Cottonwood, & Wild Rose at 3' o.c. and re-plant exist. Natives as needed. Use bio-bags if needed and use steel rod to open hole to native soil if possible.

Stream Gravel Bio-Bags  
for Erosion Control.

Seed and Mulch all Bare Areas EC  
as soon as possible



Shallow water habitat/flood plain (from top of lower bank to OHW) & Riparian Area (from OHW to edge of Farm Road)  
Plant this area with native plants and live cuttings of Willow, Red Osier Dogwood, Cottonwood & Wild Rose at 5' o.c. Fill in open space and replace plants as needed to obtain densities.

**NOTES:**

- The existing vegetation (Black Berries, Scotch Broom and etc) will be treated to eliminate it.
- Proposed Native Plants will be a mixture of 70 % live cuttings and 30 % one gal pots.
- Use top soil in holes as needed.
- Plant in the Fall & Spring as dictated by Weather Patterns
- Inspect every three months & replant as needed for 3-5 year period.
- To Maintain density and survival rate of 75- 80%
- Protect and Save All Exist. Native Plants from Previous Project.



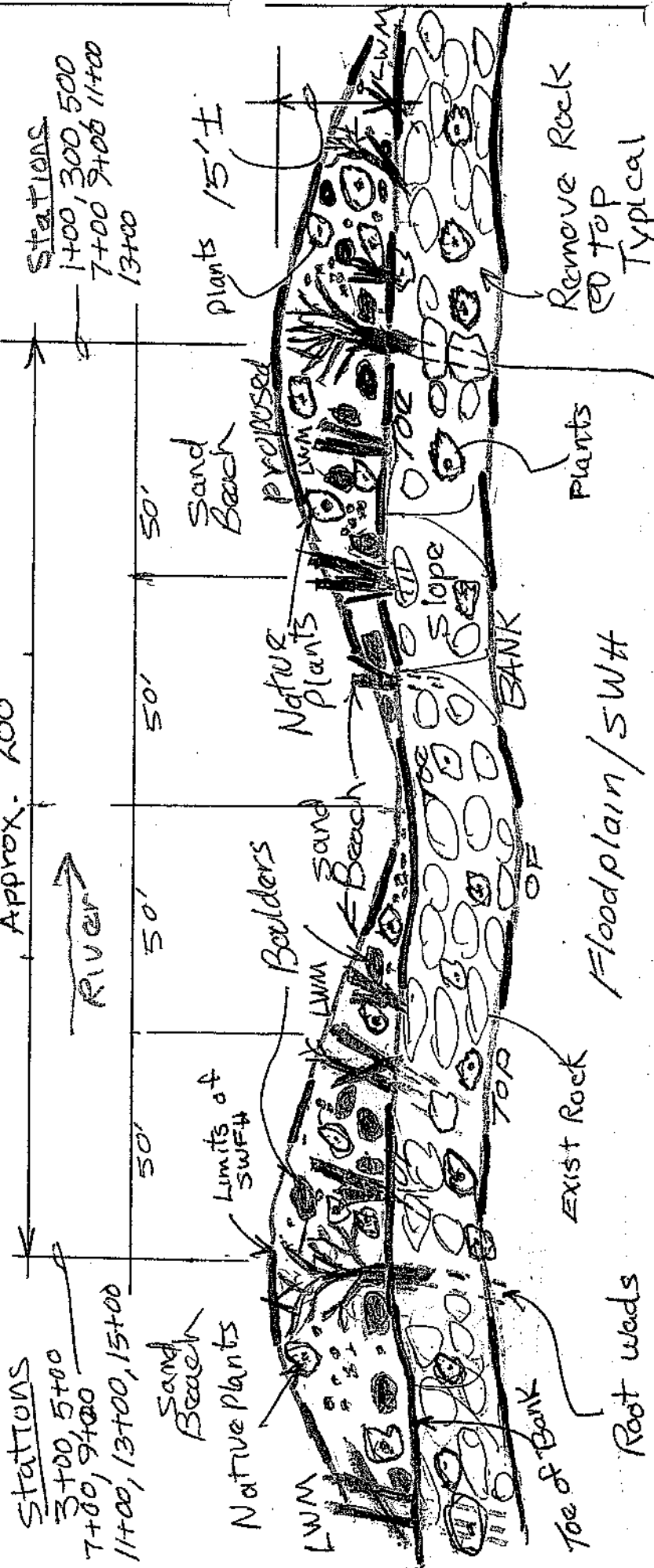
**PLANTING PLAN**

REFERENCE: WWS 2014 571 LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
APPLICANT: Ronald Andersen  
ADJACENT PROPERTY OWNERS:  
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PROPOSED PROJECT: Fish Habitat  
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IN: Columbia River  
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COUNTY/STATE: Clark/Wa  
PAGE 1 OF  
DATE: 04/21/2014  
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# HABITAT PLAN TYPICAL DETAIL

Two Root Wads - 14' - LWM (Logs) - Native Plants,  
Boulders & Cobble 35cy - Stream Gravel 15cy

Approx. 700'



**Enhance River Bank (0+00 to 15+00)**  
Remove exist. natural rock from the top of the river bank  
Reduce height & slope of lower river bank  
Excavate pockets in bank to install LWM & WM  
Anchor trunk by backfilling with exist. boulders  
Place exist. natural rock & WM on beach to form wave pattern  
Install native plants @ 5' oc over entire area  
Spread stream gravel over area when done w/ project

Note =  
\* Will Redo Sheets 11 & 12  
Need input

NWS - 2011-372

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COUNTY/STATE: Clark/Wa

PAGE 1 OF  
DATE: April 21, 2014

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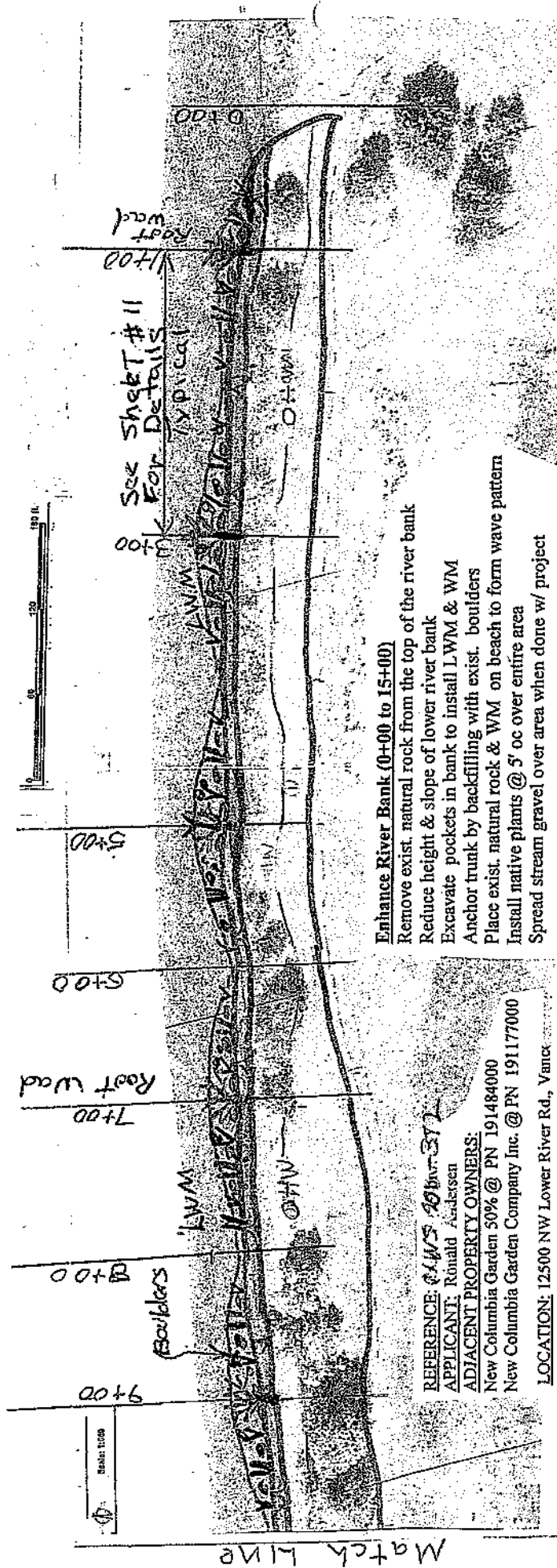
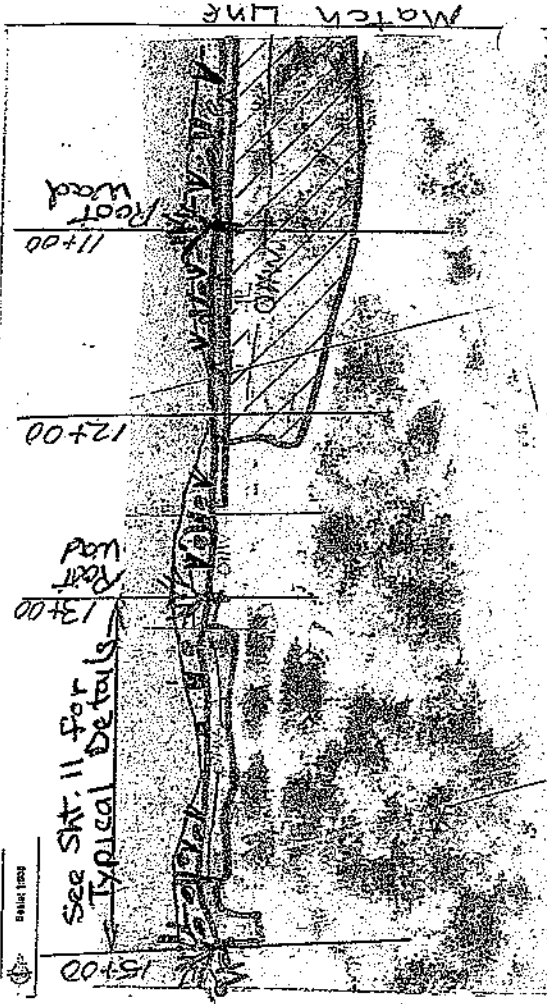


# HABITAT PLAN

NW 5-2011-372

## Shallow Water Fish Habitat & River Bank Modifications Notes:

- Remove natural rock from lower bank to provide anchor pocket for LWM & WM.
- And reduce the river bank height to provide flatter bank slopes (2:1 to 3:1) & higher quality habitat
- Anchor LWM by placing boulders on top of the trunk installed in pocket
- Also use this rock to anchor proposed LWM and to create more gradual slope &
- Install natural rock & woody material in wave pattern toe along beach
- Add anchored large woody material, such as root wades, and logs
- Plant the shallow fish habitat area with native plants @ 5' o.c.
- Use cottonwood poles for anchors as needed.
- Tie together woody material in triangular pattern as needed.
- Use sin wave pattern for propose toe with peaks at approximately 200' apart.
- SWFH width varies from 5' to 15'. Area of proposed SWFH = 0.7 acres
- SWFH = 0.35 ac created habitat + 0.35 ac of enhance habitat



**Enhance River Bank (0+00 to 15+00)**  
 Remove exist. natural rock from the top of the river bank  
 Reduce height & slope of lower river bank  
 Excavate pockets in bank to install LWM & WM  
 Anchor trunk by backfilling with exist. boulders  
 Place exist. natural rock & WM on beach to form wave pattern  
 Install native plants @ 5' oc over entire area  
 Spread stream gravel over area when done w/ project

## Erosion Control Plan:

- Install 8" stream gravel berm below work area & place to catch any sediment from immediate work area
- Use small equipment as much as possible &
- Keep grading to minimum so impacts are minimized
- Move material the least amount and shortest distances
- Plant all bare areas & mulch riparian area as needed

REFERENCE: AMS 2010-372  
 APPLICANT: Ronald Andersen  
 ADJACENT PROPERTY OWNERS:  
 New Columbia Garden 50% @ PN 191484000  
 New Columbia Garden Company Inc. @ PN 191177000

LOCATION: 12500 NW Lower River Rd., Vanc  
 LAT/LONG: 45.719993, -122.75

PAGE 1 OF

DATE: APR 4, 2013 April 21, 2014

PROPOSED PROJECT: Fish Habitat  
 Restoration & Bank Stabilization  
 IN: Columbia River  
 NEAR: Vancouver  
 COUNTY/STATE: Clark/Wa

STA 0+00 - 1+50 Looking U.S.

Ref #: NWS-2011-372

OHW = 15.5' Datum NGVD 29

1" = 10'  
0' 5' 10'

**Riparian Zone Planting**

Plant Riparian Area between OHW and the Farm Road: Save & Protect the Existing native vegetation; filled in open areas with Native Plants and Cuttings @ 5' o.c. (Willow, Cotton Wood, and Red Oster Dogwood & Wild Rose)

Plants shall be maintained for 3 years to ensure 80 % survival

Plant & Re-plant flood plain/shallow water fish habitat, river bank with native plants at 3' on center

ANDERSEN DAIRY

COLUMBIA RIVER

Plants shall be maintained for 3 years to ensure 80 % survival

Plant & Re-plant as needed area below OHW at 3' o.c.

Proposed Native Plants shall be a mixture of 70 % cuttings plus 30 % one gal. potted plants

Install Native Plants btw. Rocks

Shaded Components are proposed

Plant swth @ 3' o.c. w/ native plants

Stream Gravel Bio-Bags for EC

Proposed Beach

STA 0+00 - 1+50 Looking U.S.

Ref #: NWS-2011-372

OHW = 15.5' Datum NGVD 29

**Proposed Plan**

REFERENCE: (NWS 2011 372 LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
APPLICANT: Ronald Andersen  
ADJACENT PROPERTY OWNERS:  
New Columbia Garden 50% @ PN 191484000  
New Columbia Garden Company Inc. @ PN 191177000

PAGE 1 OF

DATE: 02/08/2014 April 21, 2014

PROPOSED PROJECT: Fish Habitat  
Restoration & Bank Stabilization  
IN: Columbia River  
NEAR: Vancouver

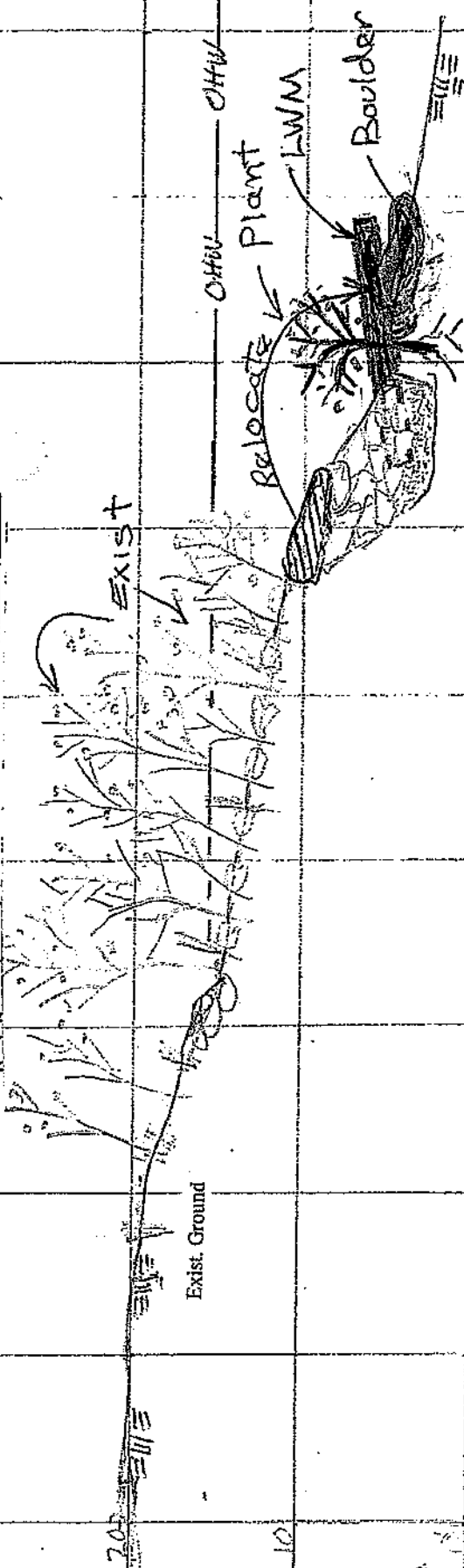
COUNTY/STATE:



Looking U.S.

1" = 10'  
0' 5' 10'

Proposed Project: Modify existing work: Remove existing natural rock at the top of the exist. river bank to reduce bank height  
flatten the bank slope, install on beach to anchor LWM and /or WM.



NWS-2011-372

Datum: NGVD 29 & OHW = 15.5' 0+00 - 1+50

Proposed Plan

REFERENCE: (USACE will provide) LOCATION: 12300 NW Lower River Rd., Vancouver, 98660  
APPLICANT: Ronald Andersen LAT/LONG: 45.719993, -122.758827  
ADJACENT PROPERTY OWNERS: PAGE 1 OF  
New Columbia Garden 50% @ PN 191484000 DATE: April 21, 2014  
New Columbia Garden Company Inc. @ PN 191177000  
PROPOSED PROJECT: Fish Habitat  
Restoration & Bank Stabilization  
IN: Columbia River  
NEAR: Vancouver  
COUNTY/STATE:

STA 2+00 - 4+00 Looking U.S.

Ref #: NWS-2011-372

OHW = 15.5' Datum NGVD 29

ANDERSEN DAIRY

Scale: 1" = 10'

**Proposed Project:** Modify existing work: Remove existing natural rock at the top of the exist. river bank to reduce bank height, flatten the bank slope, install on beach to anchor LWM and/or WM, scatter on beach in wave pattern to provide swfh; Provide Bank Protection and Stabilization; Create & Restore Shallow Water Aquatic Habitat & Flood Plain; Protected & Enhanced The River Bank System (Native plants, Woody Material, move exist. CR Boulders & cobble, stream gravel, bedding, save existing native trees and shrubs)

Riparian Zone Planting

Plant Riparian Area between OHW and the Farm Road: Save & Protect the Existing native vegetation; filled in open areas with Native Plants and Cuttings @ 5' o.c. (Willow, Cotton Wood, and Red Oster Dogwood & Wild Rose)

COLUMBIA RIVER

Relocate Existing Native Plants as needed with Excavation of Natural Rock

Exist. Native Plants

Plant & Re-plant flood plain/shallow water fish habitat, river bank with native plants at 3' on center as needed

Relocated Natural Boulders & Cobble

OHW

Potted Plant

WD

WD

Beach

Proposed LWM & WM Proposed LWM & WM Proposed SWFH Install Native Plants b/w. Rocks use bio-bags as needed

80'

Stream Gravel Bio-Bags for EC Spread on beach

Re-Install Columbia River Boulders & Cobble With Bedding (12')

Relocated Natural Boulders & Cobble

REFERENCE: NWS 2011 372

APPLICANT: Ronald Andersen

ADJACENT PROPERTY OWNERS: New Columbia Garden 50% @ PN 191484080

New Columbia Garden Company Inc. @ PN 191177000

LAY/ONG: 45-719994, -122.758827

DATE: Dec 2013

April 21, 2014

STA 2+00 - 4+00 Looking U.S.  
Ref #: NWS-2011-372  
OHW = 15.5' Datum NGVD 29

Proposed Plan

PROPOSED PROJECT: Fish Habitat Restoration & Bank Stabilization  
IN: Columbia River  
NEAR: Vancouver  
COUNTY/STATE: WA/OR



**Proposed Project:** Modify existing work. Remove existing natural rock at the top of the exist. river bank to reduce bank height, flatten the bank slope, install on beach to anchor LWM and /or WM, scatter on beach in wave pattern to provide swft. Provide Bank Protection and Stabilization: Create & Restore Shallow Water Aquatic Habitat & Flood Plain: Protected & Enhanced The River Bank System (Native plants, Woody Material, move exist. CR Boulders & cobble, stream gravel, bedding, save existing native trees and shrubs)

STA 4+00 - 7+00 Looking U.S.

Ref #: NWS-2011-372

OHW = 15.5' Datum NGVD 29

### Riparian Zone Planting

Plant Riparian Area between OHW and the Farm Road: Save & Protect the Existing native vegetation; filled in open areas with Native Plants and Cuttings @ 5' o.c. (Willow, Cotton Wood, and Red Osier Dogwood & Wild Rose) with top soil in hole

Plant & Re-plant as needed area below OHW at 3' o.c.

Native Trees Saved & Protected  
Relocate Existing Native Plants as needed with Excavation of Natural Rock

Shaded Components are proposed

Re-Install Columbia River Boulders & Cobble With Bedding

OHW

OHW

Drill Hole 2"x 8" & install anchor bolt in Rock & Tie down with Hemp Rope the proposed LWM/WM

Natural 6" Poles, Drill Hole

Root Wood

Bio Bag

Proposed SWFH

Proposed LWM & WM

Install Native Plants btw. Rocks use bio-bags as needed

Columbia River Boulders & Cobble & WM & LWM With Bedding & Plants to provide Bank Stabilization & Aquatic Habitat

Edge or proposed toe of new habitat components in sinual wave pattern; this provides effective slope reduction

STA 4+00 - 7+00 Looking U.S.

Ref #: NWS-2011-372

OHW = 15.5' Datum NGVD 29

Proposed Plan

REFERENCE: NWS 2011-372 LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
APPLICANT: Ronald Andersen  
ADJACENT PROPERTY OWNERS:  
New Columbia Garden 50% @ PN 191484000  
New Columbia Garden Company Inc. @ PN 191177000

LAYLONG: 45.719993, -122.758827  
PAGE 1 OF

DATE: Dec 30, 2013 April 21, 2014

PROPOSED PROJECT: Fish Habitat Restoration & Bank Stabilization  
IN: Columbia River  
NEAR: Vancouver  
COUNTY/STATE

Page 16 of 31



Sta. 4+00-7+00 Looking U.S.  
NWS 2011-372

0 5 10

OHW

OHW

WAPW  
BIO BOSS  
W/ CUTTINGS

Proposed  
4+00-7+00

OHW=15.5

NGVD29 Datum

REFERENCE: (USACE will provide)  
APPLICANT: Ronald Anderson  
ADJACENT PROPERTY OWNERS:  
New Columbia Garden 50% @ PN 191484000  
New Columbia Garden Company Inc. @ PN 191177000

LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
LAT/LONG: 45.719993, -122.758827  
PAGE 1 OF  
DATE: 09/03/2008 April 21, 2014

PROPOSED PROJECT: Fish Habitat  
Restoration & Bank Stabilization  
IN: Columbia River  
NEAR: Vancouver  
COUNTY/STATE:

**Proposed Project:** Modify existing work; Remove existing natural rock at the top of the exist. river bank to reduce bank height, flatten the bank slope, install on beach to anchor LWM and/or WM, scatter on beach in wave pattern to provide swfh; Provide Bank Protection and Stabilization; Create & Restore Shallow Water Aquatic Habitat & Flood Plain; Protected & Enhanced The River Bank System (Native plants, Woody Material, move exist. CR Boulders & cobble, stream gravel, bedding, save existing native trees and shrubs)

STA 7+50 - 10+50 Looking U.S.  
Ref #: NWS-2011-372  
OHW = 15.5' Datum NGVD 29

Scales:  
0 5 10

Drill Hole 2"x 8" hole & install anchor bolt in Rock & Tie down with Hemp Rope the proposed LWM/WM

ANDERSEN DAIRY

LEGEND:  
Shaded Components are proposed

Columbia River Boulders & Cobble & WM & LWM With Bedding & Plants to provide Bank Stabilization & Aquatic Habitat

Exist. Ground

Exist. Native Plants

Proposed LWM & WM  
Install Native Plants btw. Rocks use bio-bags as needed

Install Root Wad into existing river bank by excavating rock lower bank to from a pocket then backfill by installing boulders and cobble over the top of the LWM

Re-Install Columbia River Boulders & Cobble With Bedding

Plant & Re-plant as needed area below OHW at 3' o.c.

Plant & Re-plant flood plain/shallow water fish habitat, river bank with native plants at 3' on center as needed

Relocate Existing Native Plants as needed with Excavation of Natural Rock bank

COLUMBIA RIVER

Riparian Zone Planting

Plant Riparian Area between OHW and the Farm Road: Save & Protect the Existing native vegetation; filled in open areas with Native Plants and Cuttings @ 5' o.c. (Willow, Cotton Wood, and Red Oster Dogwood & Wild Rose)

Edge or proposed toe of new habitat components  
In wave pattern; this provides effective slope reduction

Stream Gravel Bio-Bags for EC  
Spread on beach when project complete

STA 7+50 - 10+50 Looking U.S.

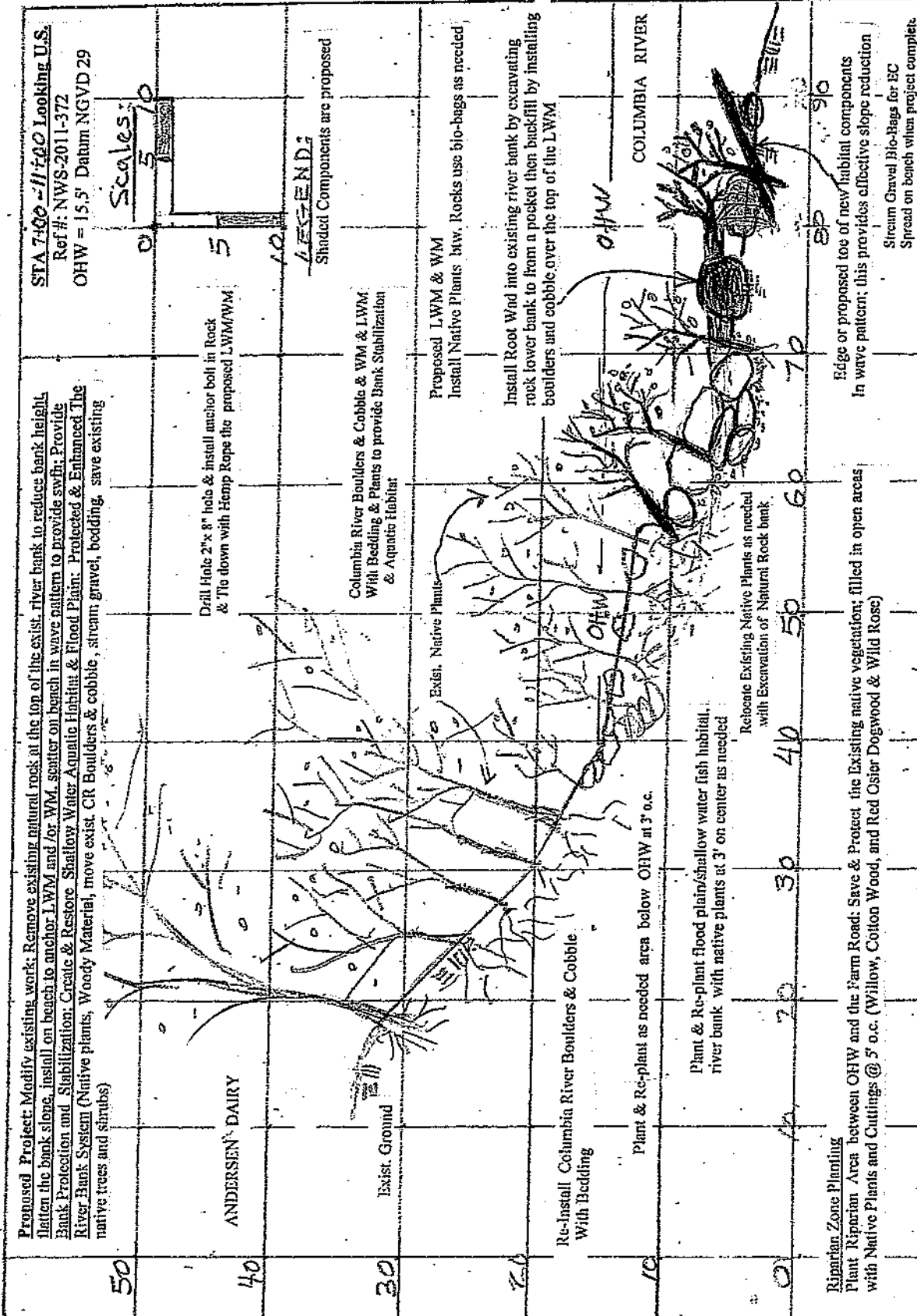
Ref #: NWS-2011-372

OHW = 15.5' Datum NGVD 29

Proposed Plan

REFERENCE: (S) W-2011-0372 LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
APPLICANT: Ronald Andersen  
ADJACENT PROPERTY OWNERS: New Columbia Garden 50% @ PN 191484000  
DATE: Dec 2013 April 21, 2014  
PROJECT: PROPOSED PROJECT: Fish Habitat Restoration & Bank Stabilization  
IN: Columbia River  
NEAR: Vancouver  
COUNTY/STATE: COUNTRY/STATE





STA 7400-11+00 Looking U.S.  
 Ref #: NWS-2011-372  
 OHW = 15.5' Datum NGVD 29

Proposed Plan

REFERENCE: (NWS-2011-372) LOCATION: 12500NW Lower River Rd., Vancouver, 98660  
 APPLICANT: Ronald Andersen  
 ADJACENT PROPERTY OWNERS:  
 New Columbia Garden 50% @ PN 191484000  
 New Columbia Garden Company Inc. @ PN 19177000

PROPOSED PROJECT: Fish Habitat Restoration & Bank Stabilization  
 IN: Columbia River  
 NEAR: Vancouver  
 COUNTY/STATE:

DATE: Dec 28, 2014 April 21, 2014

7+50-12+00 Looking U.S.

NWS 2011-372

Scales:

0 5 10

Proposed Project: Modify existing work: Remove existing natural rock at the top of the exist. river bank to reduce bank height. Flatten the bank slope, install on beach to anchor LWM, scatter on beach in wave pattern to provide swft. Provide Bank Protection and Stabilization: Create & Restore Shallow Water Aquatic Habitat & Flood Plain: Protected & Enhanced The River Bank System (Native plants, Woody Material, moved CR Boulders & cobble, stream gravel, bedding, saved existing native trees and shrubs)

50

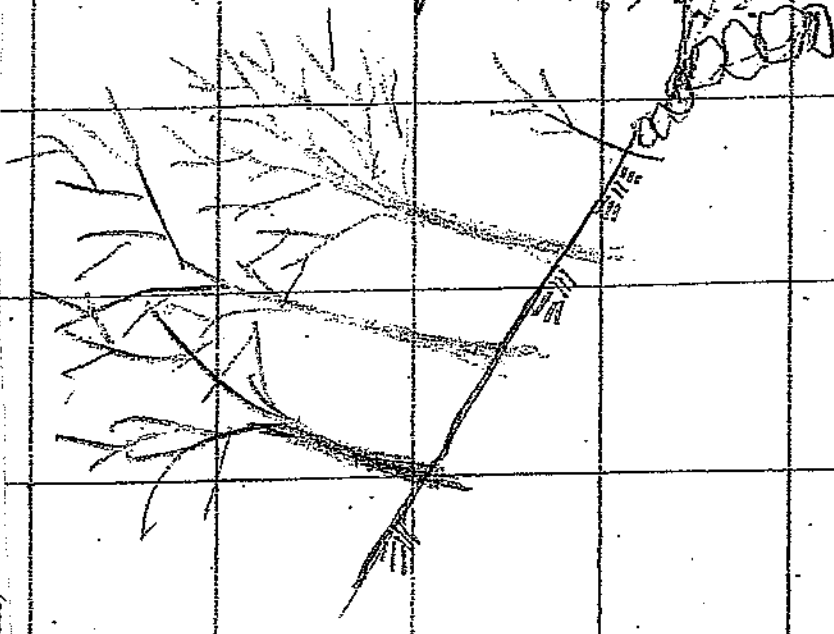
40

30

20

10

0



Exist

Shaded

OHW

Root wad

Plant

Boulder

90

80

70

60

50

40

30

20

10

STA. 7+50 - 12+00  
OHW  $\approx$  15.5 Datum: NGVD 29  
Scale = 1" = 10' (Horizontal & Vertical)

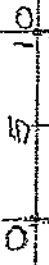
REFERENCE: (USACE will provide) LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
APPLICANT: Ronald Andersen LAYLONG: 48-719993, -122.75827  
ADJACENT PROPERTY OWNERS: PAGE 1 OF  
New Columbia Garden 50% @ PN 191484000 DATE: 4/21/2014  
New Columbia Garden Company Inc. @ PN 191177000

PROPOSED PROJECT: Fish Habitat Restoration & Bank Stabilization  
IN: Columbia River  
NEAR: Vancouver  
COUNTY/STATE:



10+00-13+00 Looking U.S.  
NWS-2011-372

Scales =



Legend:



Exist.

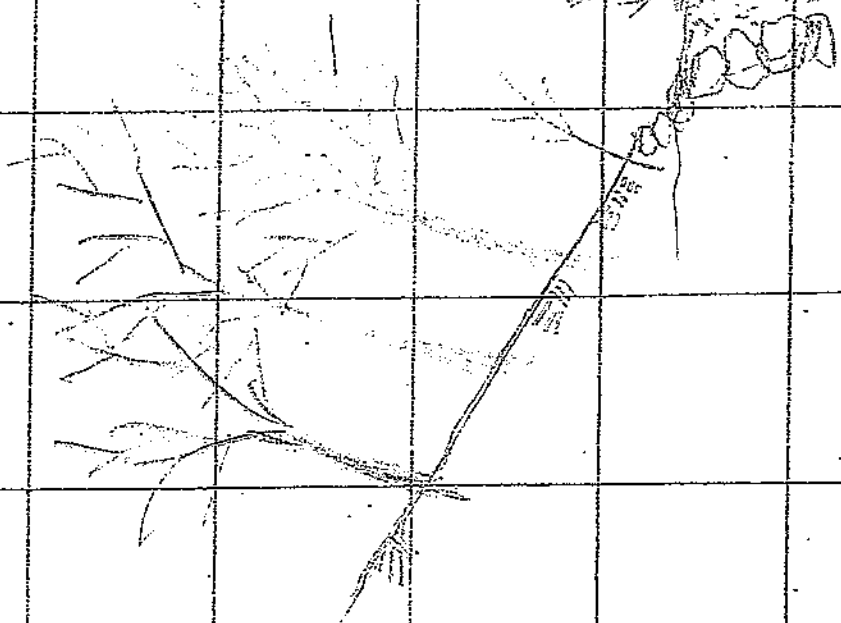
... Boulder To Be Relocated



... Proposed Relocated Boulder

Relocated & Proposed

OHW



EXIST

STA 10+00 to 13+00  
OHW  $\approx$  15' 5"  
Scale & 1" = 10' (Horizontal & Vertical)

REFERENCE: (USACE will provide)  
APPLICANT: Ronald Anderson  
ADJACENT PROPERTY OWNERS:  
New Columbia Garden 50% @ PN 191484000  
New Columbia Garden Company Inc. @ PN 191177000  
LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
LAYLONG: 45-719993, -122.758827  
PROPOSED PROJECT: Fish Habitat Restoration & Bank Stabilization  
IN: Columbia River  
NEAR: Vancouver  
COUNTY: STATE  
DATE: April 2014  
PAGE 1 OF 1  
April 21, 2014

STA 13+00 - 15+00 Looking U.S.  
Ref #: NWS-2011-372  
OHW = 15.5' Datum NGVD 29

Proposed Project: Modify existing work: Remove existing natural rock at the top of the exist. river bank to reduce bank height, flatten the bank slope, install on beach to anchor LWM, scatter on beach in wave pattern to provide swift; Provide Bank Protection and Stabilization; Create & Restore Shallow Water Aquatic Habitat & Flood Plain; Protected & Enhanced The River Bank System (Native plants, Woody Material, moved CR Boulders & cobble, stream gravel, bedding, saved existing native trees and shrubs)

Anderson Dairy

Columbia River

Re-plant flood plain/shallow water fish habitat, river bank with native plants at 3' on center

Columbia River Boulders & Cobble & LWM / WM With Bedding & Plants to provide Aquatic Habitat

Relocate Existing Native Plants as needed with Excavation of Natural Rock

Drill Hole 2"x 8" & install anchor bolt in Rock & Tie down with Hemp Rope the proposed LWM/WM

Stream Gravel Bio-Bags for EC

Scales: 1" = 10'

0 5 10

Scale Bar

NWS-2011-372

STA 13+00 - 15+00  
OHW = 15.5' Datum NGVD 29  
Scales: 1" = 10' Proposed Plan

REFERENCE: (NWS 2011-372) LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
APPLICANT: Ronaid Andersen  
ADJACENT PROPERTY OWNERS:  
New Columbia Garden 50% @ PN 191484000  
New Columbia Garden Company Inc. @ PN 191177000  
PROPOSED PROJECT: Fish Habitat Restoration & Bank Stabilization  
IN: Columbia River  
DATE: April 21, 2014  
COUNTY/STATE: Vancouver



STA 1+00 Looking U.S.  
Ref: NWS-2011-372

Scale Bar

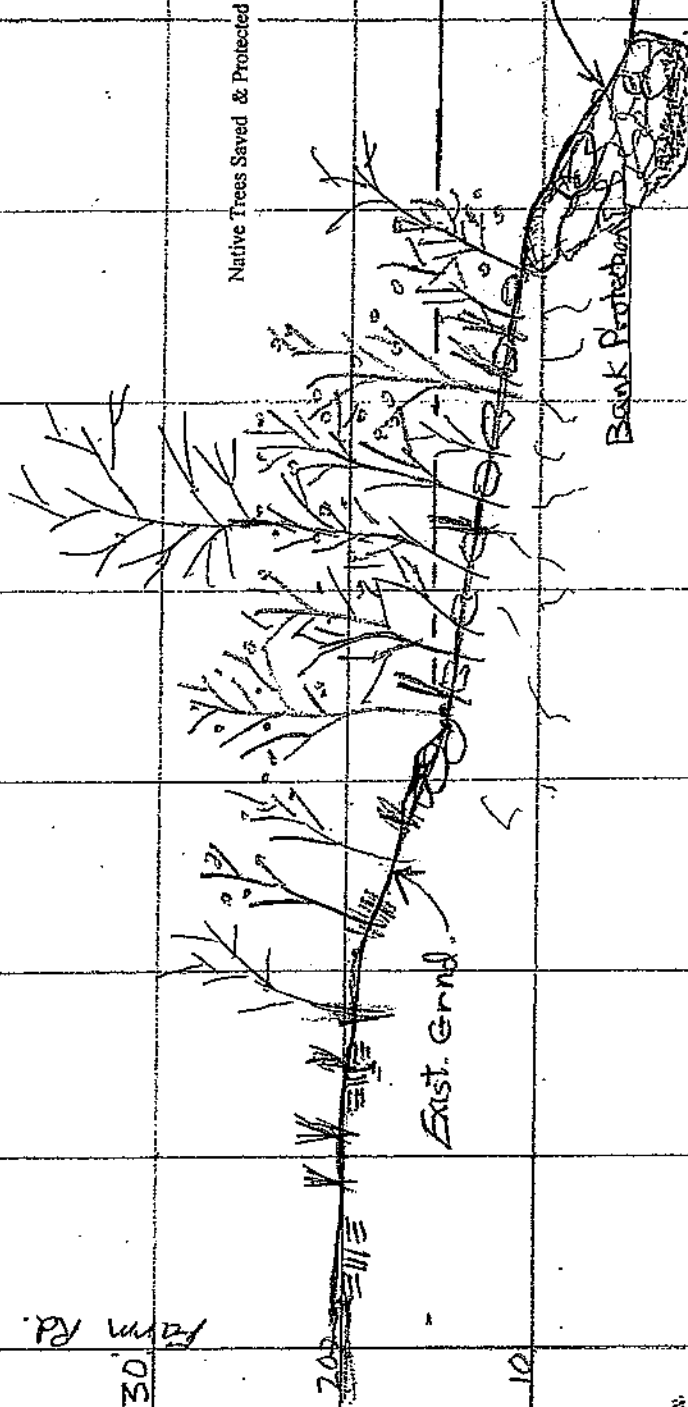
1" = 10'

0' 5' 10'

Datum: NGVD 29 & OHW = 15.5'

Riparian Zone  
Riparian Area between OHW and the Farm Road  
Native Plants and Cuttings (Willow, Cotton Wood, Red Osier Dogwood, and Shrubs)

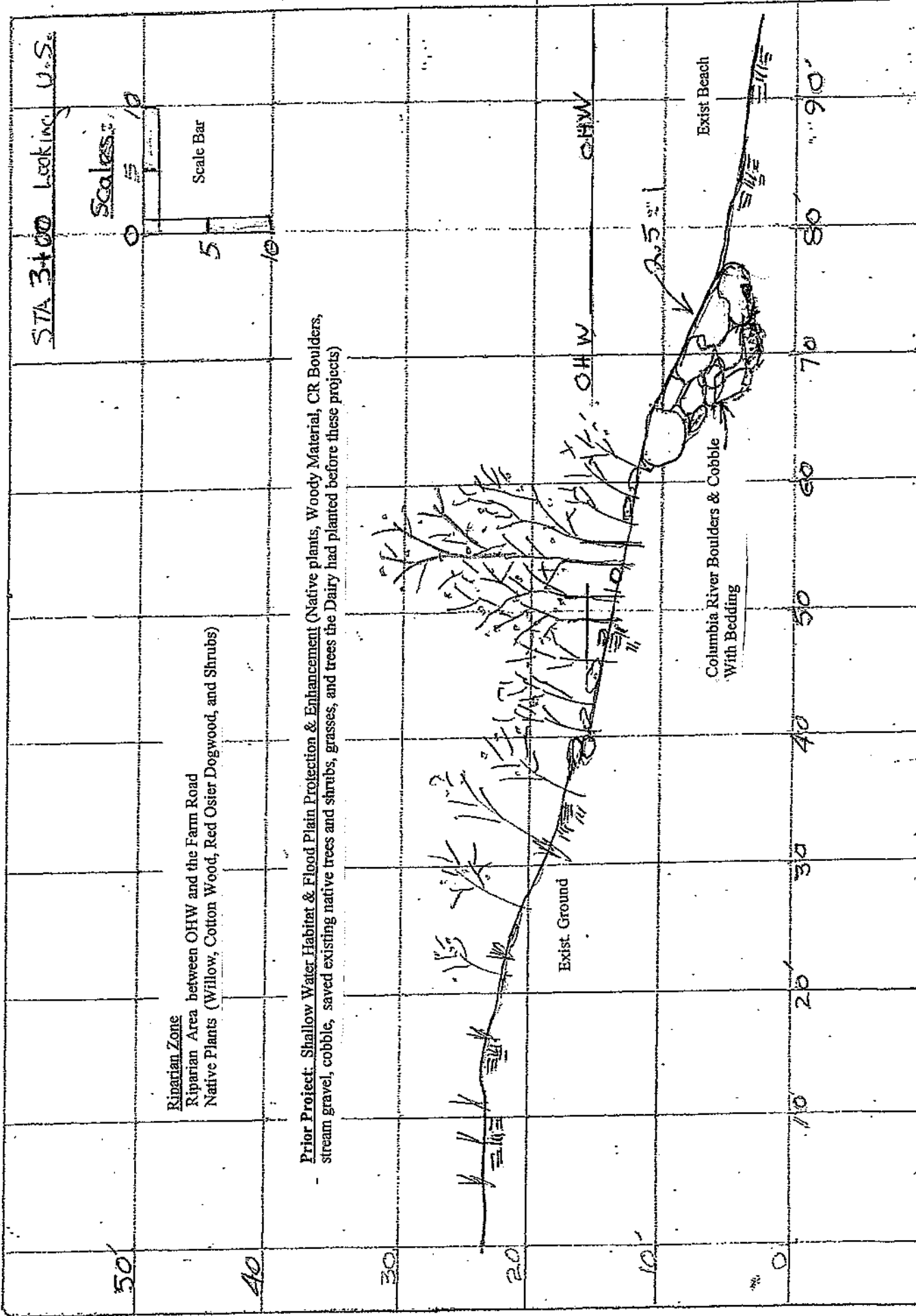
Prior Project: Shadow Water Habitat & Flood Plain Enhancement (Native plants, Woody Material, CR Boulders, stream gravel, saved existing native trees and shrubs, grasses, and trees the Dairy had planted before these projects)



STA 1+00

Existing Condition

REFERENCE: NWS-2011-372 LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
APPLICANT: Ronald Andersen  
ADJACENT PROPERTY OWNERS:  
New Columbia Garden 50% @ PN 191484000  
New Columbia Garden Company Inc. @ PN 191177000  
PAGE 1 OF  
DATE: April 2014  
APRIL 21, 2014  
PROPOSED PROJECT: Fish Habitat  
Restoration & Bank Stabilization  
IN: Columbia River  
NEAR: Vancouver  
COUNTY/STATE:



Prior Project: Shallow Water Habitat & Flood Plain Protection & Enhancement (Native plants, Woody Material, CR Boulders, stream gravel, cobble, saved existing native trees and shrubs, grasses, and trees the Dairy had planted before these projects)

**STA 3+00**

Datum: NGVD 29 & OHW = 15.5'

**Existing Condition**

REFERENCE: (USACE will provide) LOCATION: 12500NW Lower River Rd., Vancouver, 98660

APPLICANT: Ronald Andersen LAYLONG: 45719993, -122,758827

ADJACENT PROPERTY OWNERS: PAGE 1 OF

New Columbia Garden 30% @ PN 191464000 DATE: APRIL 2013 April 21, 2014

New Columbia Garden Company Inc. @ PN 191177000

PROPOSED PROJECT: Fish Habitat Restoration & Bank Stabilization

IN: Columbia River

NEAR: Vancouver

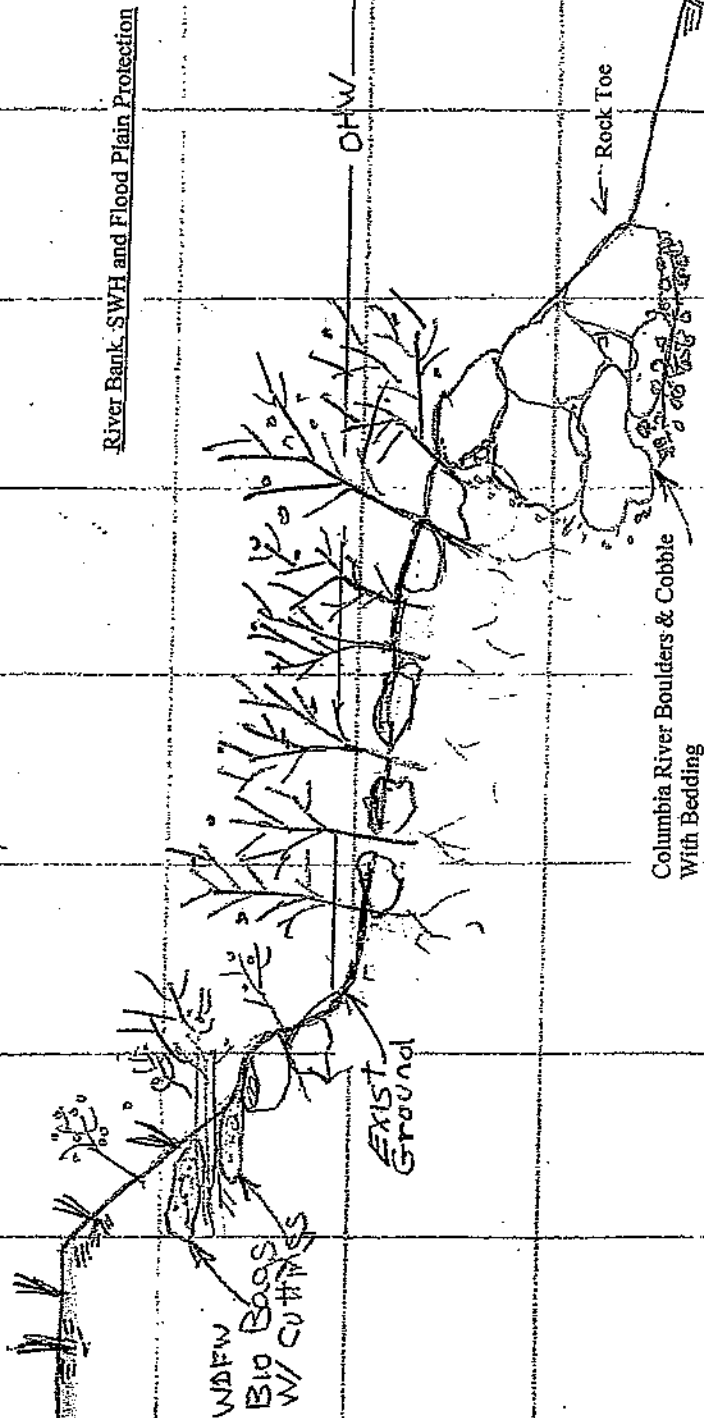
COUNTY/STATE: WA



STA 6+00 Looking U.S.

Riparian Zone  
Riparian Area between OHW and the Farm Road  
Native Plants (Willow, Cotton Wood, Red Osier Dogwood, and Shrubs)

Prior Project: Shallow Water Habitat & Flood Plain Protection (Native plants, Woody Material, CR Boulders, stream gravel, cobble & saved existing native trees and shrubs, grasses, and trees the Dairy had planted before these projects)



REFERENCE: (USACE will provide) LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
APPLICANT: Ronald Anderson  
ADJACENT PROPERTY OWNERS:  
New Columbia Garden 50% @ PN 191484000  
New Columbia Garden Company Inc. @ PN 191177000  
PROPOSED PROJECT: Fish Habitat Restoration & Bank Stabilization  
IN: Columbia River  
NEAR: Vancouver  
COUNTY/STATE: WA/OR

Existing Condition

STA 6+00  
OHW = 15.5

ASCD29 Datum

DATE: April 2012 April 21, 2014

PAGE 1 OF

Page 25 of 31

**Prior Project: Bank Stabilization; Create & Restore Shallow Water Aquatic Habitat & Flood Plain; Protected & Enhanced The River Bank System (Native plants, Woody Material, CR Boulders, stream gravel, cobble, saved existing native trees and shrubs)**

**STA 7+50 - 10+50**

Datum: NGVD 29 & OHW = 15.5'

Scales:  
5' 10'

Riparian Zone  
Riparian Area between OHW and the Farm Road  
Native Plants and Cuttings (Willow, Cotton Wood, Red Osier Dogwood, and Shrubs)

Bank Stabilization and F&W Habitat

Exist. Ground

Natural rock (Cobble & small boulders) on surface with native plants between Upper Bank Protected & Saved

Columbia River Boulders & Cobble & some LWD  
With Bedding & Plants to provide Bank Stabilization & Aquatic Habitat

Rock Toe

Core Materials Erosion Control wave dissipater: River Sand, Soil, Woody Materials, Cuttings, and native rock; providing a Native Plant Root Mix *Engineered Design*

Core Materials That Provide: Plant Survival/ Stabilization/Erosion Control/ Wave Dissipater: River Sand, Natural Top Soil, Woody Materials, LWD, Native Cuttings, and native rock; providing a Native Plant Root Mix; Bioengineered;

River Bank SWH and Flood Plain Protection

STA 7+50 - 10+50

OHW = 15.5 Datum: NGVD 29

Existing Condition

REFERENCE: See Above  
APPLICANT: Ronald Andersen  
ADJACENT PROPERTY OWNERS:  
New Columbia Garden 50% @ PN 191484000  
New Columbia Garden Company Inc. @ PN 191177000

LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
LAT/LONG: 45.719993, -122.758827  
PAGE 1 OF

PROPOSED PROJECT: Fish Habitat  
Restoration & Bank Stabilization  
IN: Columbia River  
NEAR: Vancouver  
COUNTY/STATE: CLATSOP/OREGON

DATE: 03/03/2013 April 21, 2014

Page 26 of 31



STA 12+00 Looking U.S.

Scales =

0 5 10

50'

40'

30'

20'

10'

0'

10'

20'

30'

40'

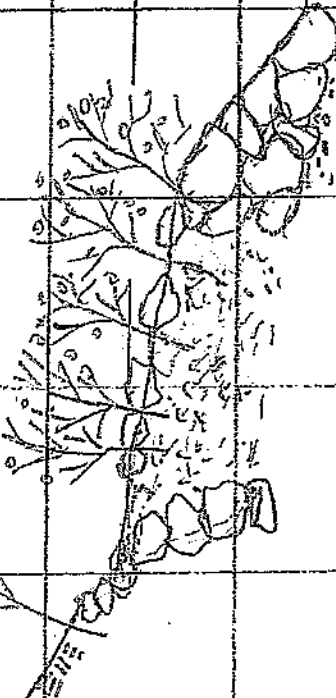
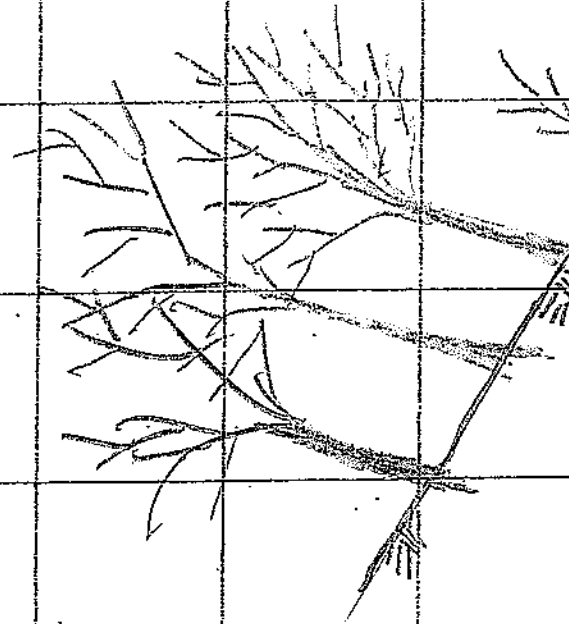
50'

60'

70'

80'

90'



OHW

STA 12+00 Exist. Condition

OHW  $\approx$  15.5' Datum: NGVD 29

Scale = 1" = 10' (Horiz & Vert)

REFERENCE: (USACE will provide)

APPLICANT: Ronald Andersen

ADJACENT PROPERTY OWNERS:

New Columbia Garden 50% @ PN 191484000

New Columbia Garden Company Inc. @ PN 191177000

LOCATION: 12500 NW Lower River Rd., Vancouver, 98560

LAT/LONG: 45.719993, -122.758827

PAGE 1 OF

DATE: April 2013

April 21, 2014

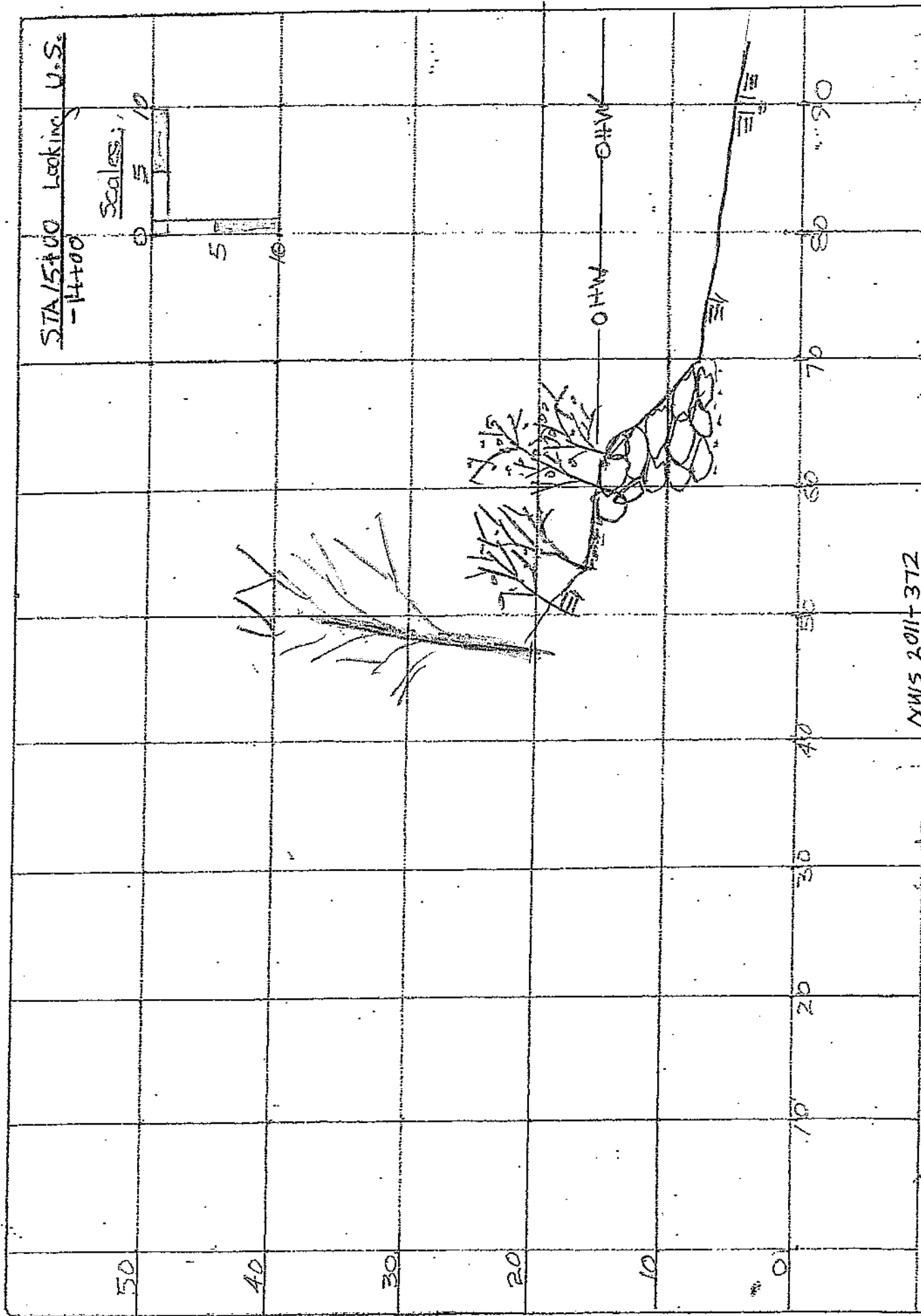
PROPOSED PROJECT: Fish Habitat

Restoration & Bank Stabilization

IN: Columbia River

NEAR: Vancouver

COUNTY/STATE:



STA 15+00 Looking U.S.

Scales:

0 5 10

NW 5 2011-372

REFERENCE: (USACE will provide) LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
 APPLICANT: Ronald Andersen  
 ADJACENT PROPERTY OWNERS:  
 New Columbia Garden 50% @ PN 191484000  
 New Columbia Garden Company Inc. @ PN 191177000  
 DATE: 4/21/2014  
 PAGE 1 OF 1  
 PROPOSED PROJECT: Fish Habitat  
 Restoration & Bank Stabilization  
 IN: Columbia River  
 NEAR: Vancouver  
 COUNTY/STATE: WA/OR

STA 14+00 = 15+00  
 OHV = 15' 5" NGVD 29  
 Scales = 1" = 10' Datum  
 Exist. Condition



Conceptual Proposed Detail  
For Review / Not to Scale  
NWS 2011 - 372

DETAIL SHEET # 28

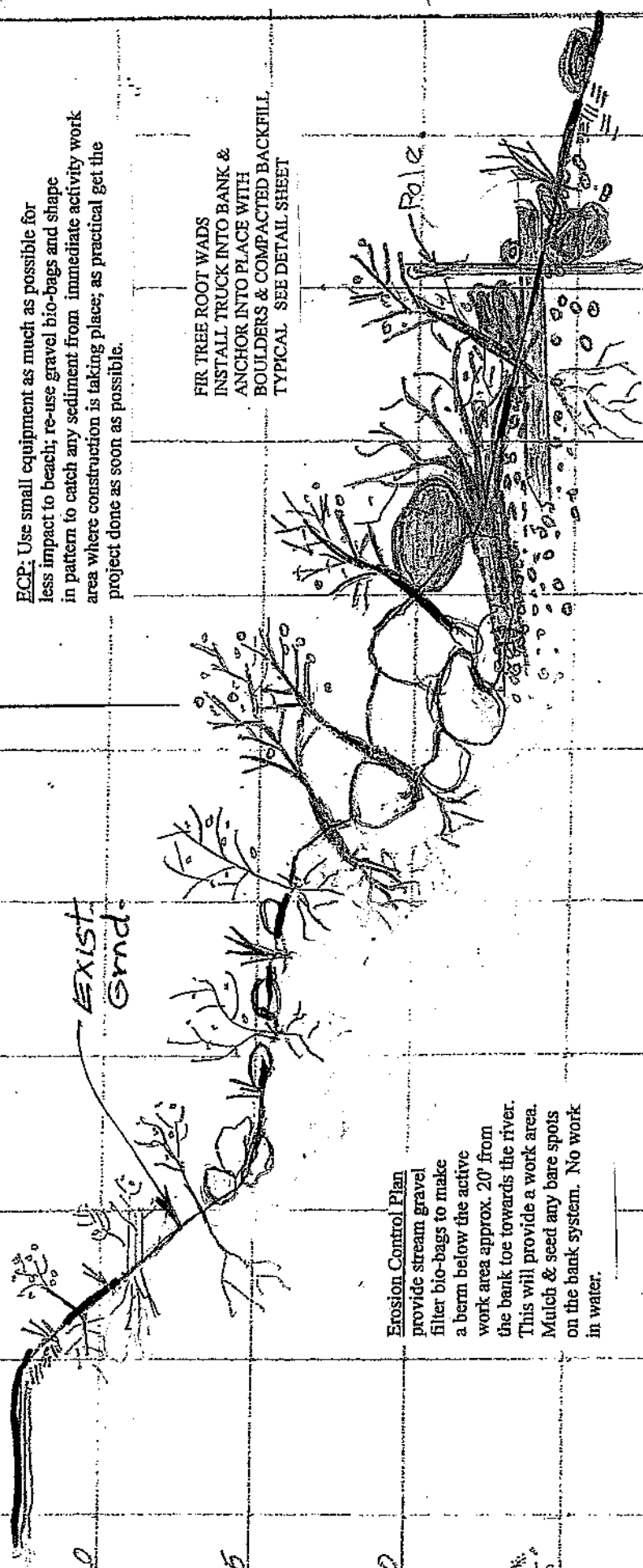
River bank Plants & Cuttings:  
Wild Rose, Columbia & Sitka Willow  
Red Oster Dogwood, Cotton Wood  
Use Post Driver for Fir & Cotton Wood Poles

**LWM Installation:** place end into slope or beach and tie down with rope and bolts; place natural boulders at each end with rip-rap & stream gravel; Interlock with adjacent WM; place boulder over LWM; install anchor poles; tie together and anchor with bolts. Spread any excess excavated sand over this area.

**ECP:** Use small equipment as much as possible for less impact to beach; re-use gravel bio-bags and shape in pattern to catch any sediment from immediate activity work area where construction is taking place; as practical get the project done as soon as possible.

FIR TREE ROOT WADS  
INSTALL TRUCK INTO BANK &  
ANCHOR INTO PLACE WITH  
BOULDERS & COMPACTED BACKFILL  
TYPICAL SEE DETAIL SHEET

**Erosion Control Plan**  
provide stream gravel  
filter bio-bags to make  
a berm below the active  
work area approx. 20' from  
the bank toe towards the river.  
This will provide a work area.  
Mulch & seed any bare spots  
on the bank system. No work  
in water.



Conceptual Proposed Detail  
For Review / Not to Scale  
NWS 2011 - 372

REFERENCE: (USACE will provide) LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
APPLICANT: Ronald Anderson  
ADJACENT PROPERTY OWNERS:  
New Columbia Garden 50% @ PN 191484000  
New Columbia Garden Company Inc. @ PN 191177000  
PAGE 1 OF  
DATE: April 21, 2014  
PROPOSED PROJECT: Fish Habitat  
Restoration & Bank Stabilization  
IN: Columbia River  
NEAR: Vancouver  
COUNTY/STATE

**Conceptual Proposed Detail**  
For Review / Not to Scale  
NWS 2011 - 372

Detail Sheet #29

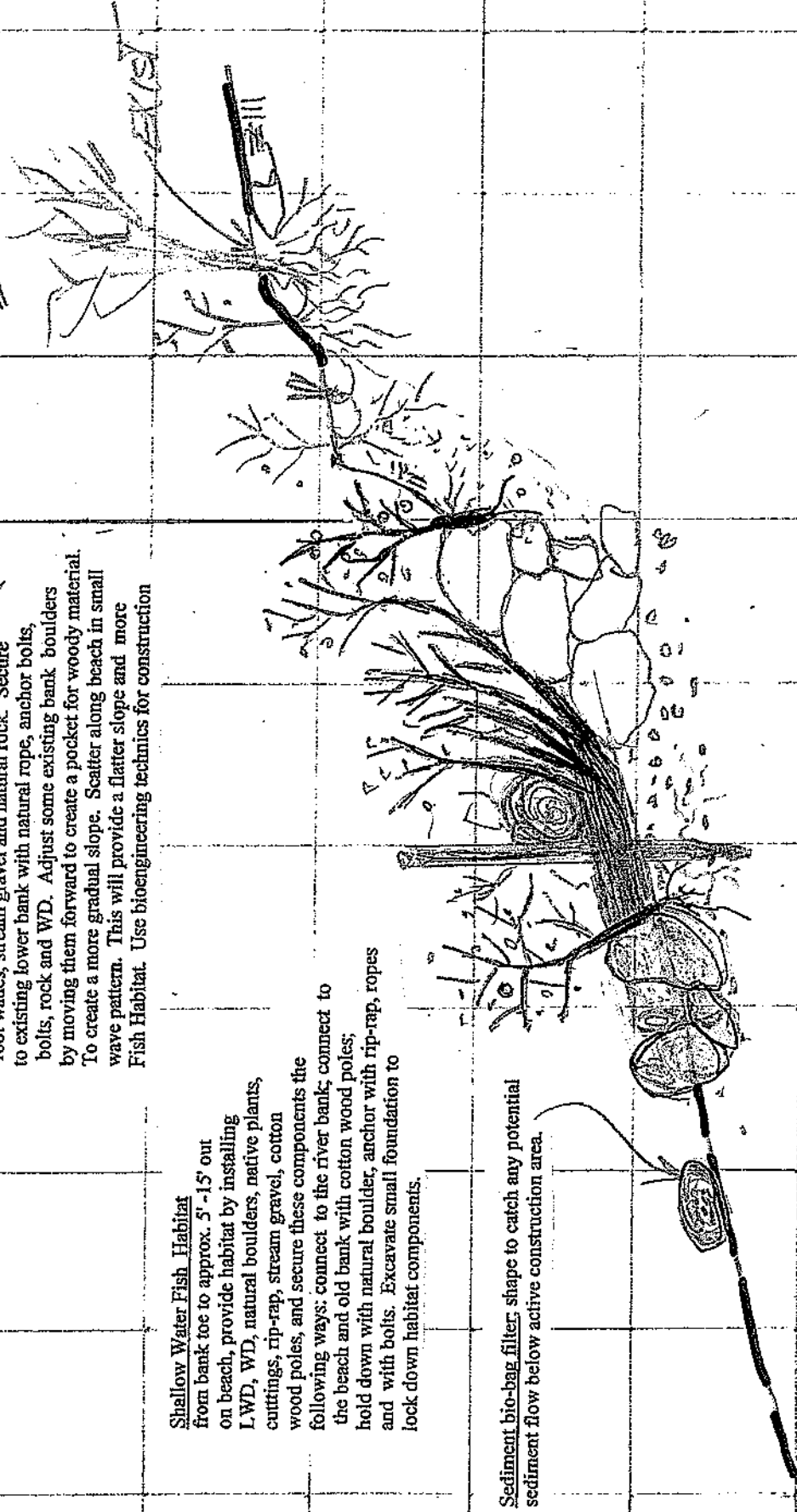
Enhance River Bank (0+00 to 15+00)

to provide fish habitat by enhancing the bank by installing native plants, cuttings, woody material, root wades, stream gravel and natural rock. Secure to existing lower bank with natural rope, anchor bolts, bolts, rock and WD. Adjust some existing bank boulders by moving them forward to create a pocket for woody material. To create a more gradual slope. Scatter along beach in small wave pattern. This will provide a flatter slope and more Fish Habitat. Use bioengineering techniques for construction

Shallow Water Fish Habitat from bank toe to approx. 5' -15' out on beach, provide habitat by installing LWD, WD, natural boulders, native plants, cuttings, rip-rap, stream gravel, cotton wood poles, and secure these components the following ways: connect to the river bank; connect to the beach and old bank with cotton wood poles; hold down with natural boulder, anchor with rip-rap, ropes and with bolts. Excavate small foundation to lock down habitat components.

Sediment bio-bag filter; shape to catch any potential sediment flow below active construction area.

Existing Native Plants, woody material, rock and natural boulders



**Conceptual Proposed Detail**  
For Review / Not to Scale  
NWS 2011 - 372

REFERENCE: (USACE will provide) LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
APPLICANT: Ronald Andersen LAT/LONG: 45.719993, -122.758827  
ADJACENT PROPERTY OWNERS: PAGE 1 OF  
New Columbia Garden 50% @ PN 191484000 DATE: April 2014  
New Columbin Garden Company Inc. @ PN 191177000

PROPOSED PROJECT: Fish Habitat  
Restoration & Bank Stabilization  
IN: Columbia River  
NEAR: Vancouver  
COUNTY/STATE:



# Detail Sheet #30

## Conceptual Proposed Detail

For Review / Not to Scale

NWS 2011 - 372

### River bank Slope Plants & Cuttings:

- Wild Rose
- Columbia & Sitka Willow
- Red Osier Dogwood
- Cotton Wood

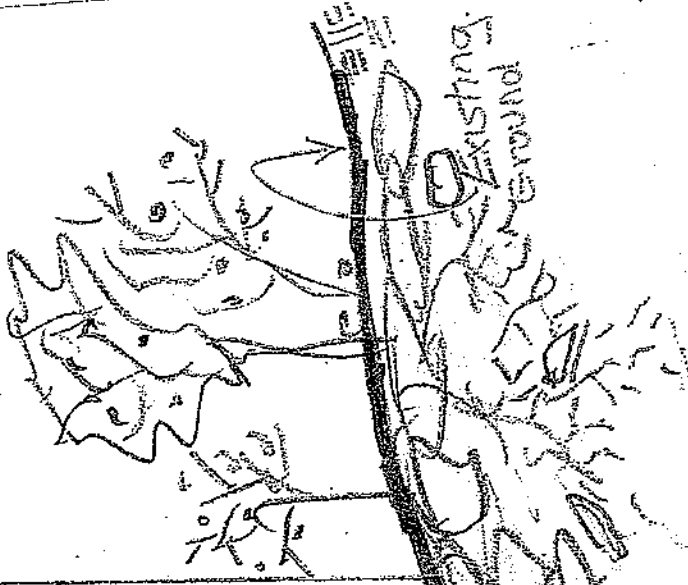
LWM Installation: place end into slope and tie down with rope and bolts; place natural boulders at each end with crushed rock & stream gravel; Interlock with adjacent WD; place boulder over LWD; install anchor poles; tie together and anchor with bolts. Spread any excess excavated sand over this area.

Existing Beach

"S" = 10' 0" ±

ENTER CHANNEL

Existing Native Plants, woody material, rock and natural boulders



Conceptual Proposed Detail  
For Review / Not to Scale  
NWS 2011 - 372

REFERENCE: (USACE will provide)  
APPLICANT: Ronald Andersen  
ADJACENT PROPERTY OWNERS:  
New Columbia Garden 50% @ PN 191484000  
New Columbia Garden Company Inc. @ PN 191177000

LOCATION: 12500 NW Lower River Rd., Vancouver, 98660  
LAT/LONG: 45.719993, -122.758827  
PAGE 1 OF  
DATE: April 2013 April 21, 2014

PROPOSED PROJECT: Fish Habitat  
Restoration & Bank Stabilization  
IN: Columbia River  
NEAR: Vancouver  
COUNTY/STATE