

DEPARTMENT OF
ECOLOGY
State of Washington



Washington
Department of
**FISH and
WILDLIFE**

Case Studies and Resources

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Shorelands & Environmental Assistance Program
Washington Department of Ecology*



April 19, 2018
Port Angeles Workshop

Case Studies of Monitoring Programs

Retroactive evaluations:

- San Juan County Initiative
 - Jefferson County
 - WDFW Hydraulic Project Approvals
 - Snohomish County
 - Thurston County
- Permit records, site visits
- Remote sensing component
-
- ```
graph LR; A[San Juan County Initiative] --- B[Permit records, site visits]; B --- C[Jefferson County]; C --- D[WDFW Hydraulic Project Approvals]; E[Snohomish County] --- F[Remote sensing component]; F --- G[Thurston County]
```

## Ongoing compliance monitoring

- City of Kirkland
- Ecology Wetland Regulatory Effectiveness
- US Army Corps Mitigation Compliance

Case studies use outline of 5 key components from CAO Guidance Monitoring chapter

# Snohomish County Critical Areas Adaptive Management Plan (2008)

1. Gains or losses of function in Fish and Wildlife Habitat Conservation Areas, Wetlands and their buffers?
2. If losses, are adjustments needed to:
  - a) Code?
  - b) Permit review process?
  - c) Enforcement improvements?
  - d) Education efforts?
  - e) Restoration projects?



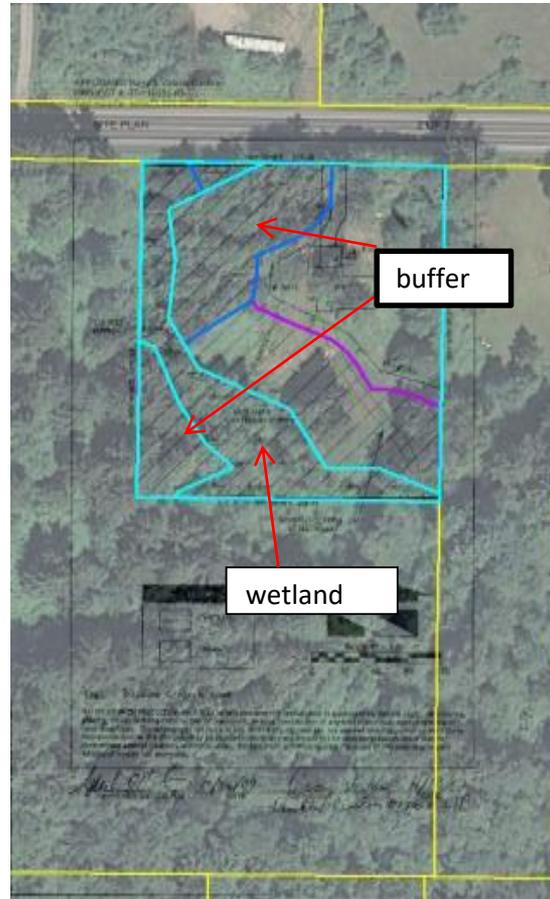
# Critical Areas Site Plans (CASP) Parcel Analysis



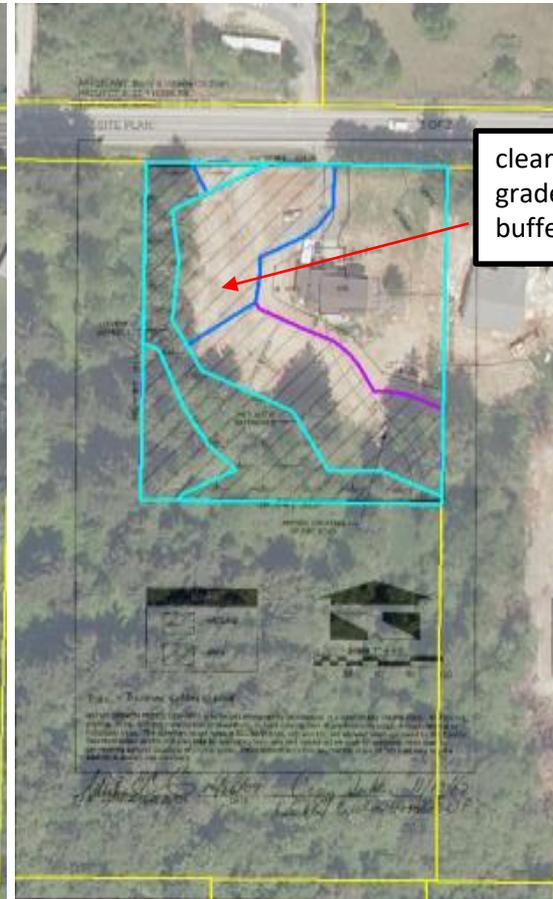
- Randomly selected 335 (of ~1,000) CASPs recorded between 11/07 and 4/13
- Also evaluated all enforcement cases

# CASP Parcel Analysis

- Digitize critical areas and buffers
- Identify, classify and digitize land cover changes in protected areas of the CASPs



2007



2009

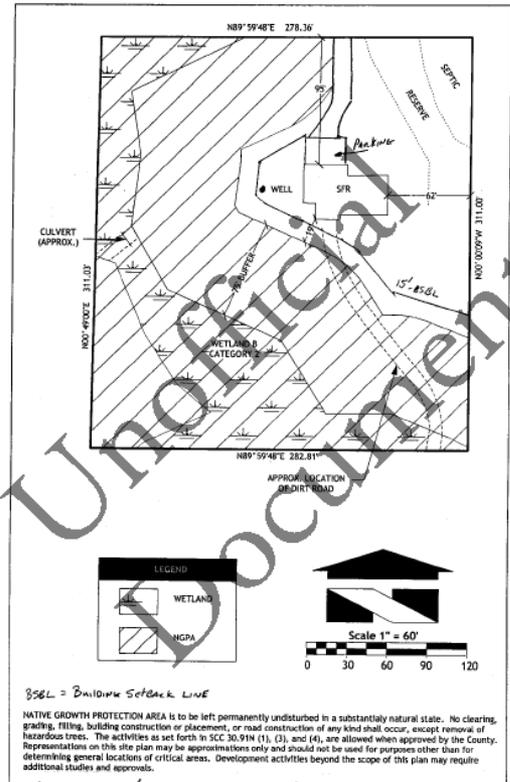
# Key Findings

- 109 acres of estimated impacts
- This is <1% of total critical and buffers identified on properties with permits and enforcement cases
- 70% occurred on properties with enforcement cases
- > 70% of CASP had problems with accuracy
- No code changes warranted

APPLICANT: Barry & Valerie Cochran  
PROJECT #: 07-110385-RK  
TAX ACCT#: 300520-003-007-00

SITE PLAN:

2 OF 2



BSBL = BUILDING SETBACK LINE  
NATIVE GROWTH PROTECTION AREA is to be left permanently undisturbed in a substantially natural state. No clearing, grading, filling, building construction or placement, or road construction of any kind shall occur, except removal of hazardous trees. The activities as set forth in SCC 30.014 (1), (3), and (4), are allowed when approved by the County. Representations on this site plan may be approximations only and should not be used for purposes other than for determining general locations of critical areas. Development activities beyond the scope of this plan may require additional studies and approvals.

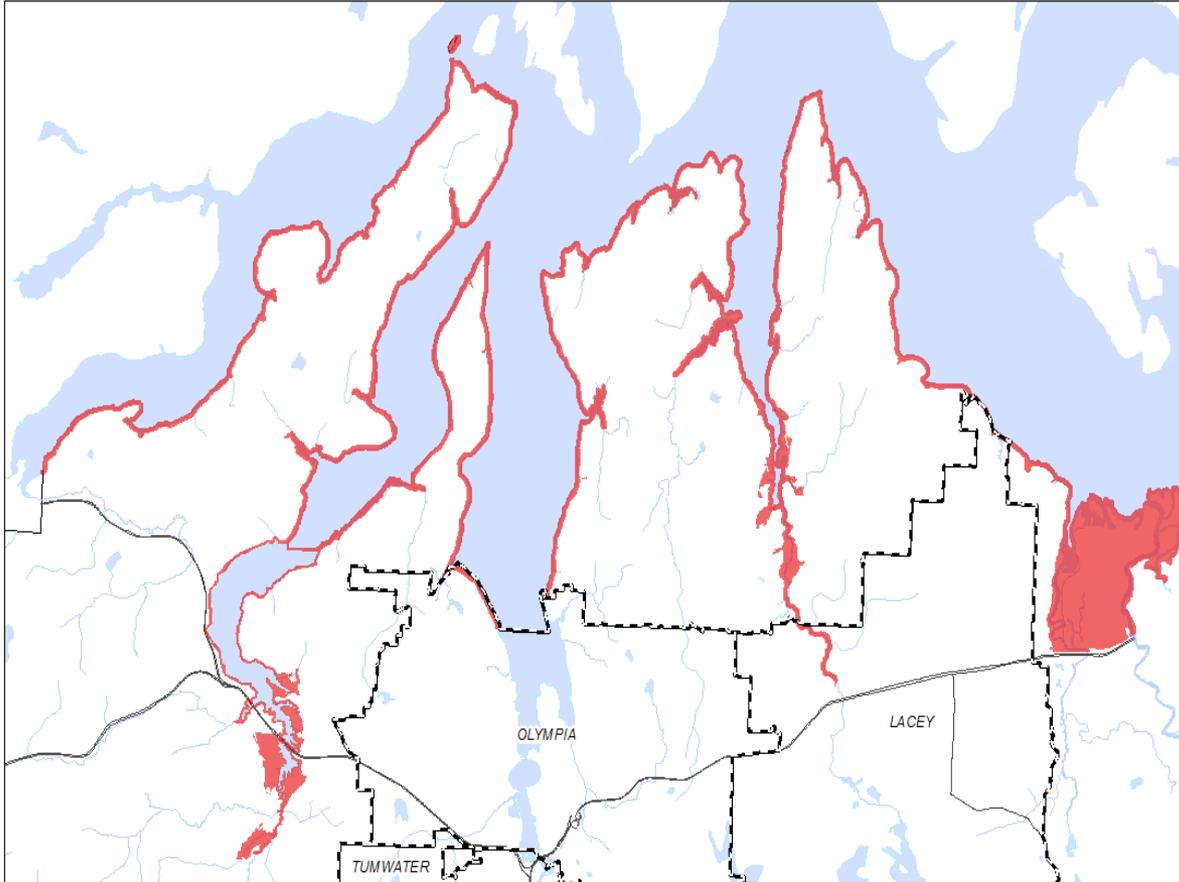
APPROVED AND CO COB DATE 10/26/07  
DATE 11/13/07  
APPROVED AND CO COB DATE 11/13/07  
DATE 11/13/07  
Sunder Custom Homes U.P.

# Recommendations

- Improve CASP accuracy
- Digitize and incorporate CASPs into GIS review of future permits
- Staff training (applicability, how to identify critical areas)
- Monitoring report every 8 years to align with GMA reviews
- Improve Critical Area tracking in AMANDA permit database

| Description                  | Value | Type | Display Order |
|------------------------------|-------|------|---------------|
| <b>A. Buffer Alterations</b> |       |      |               |
| Permanent Buffer Impacts     |       | P    | 5             |
| Buffer Alterations           |       | C    | 10            |
| Fencing                      |       | C    | 20            |
| Separate Tracts              |       | C    | 30            |
| Enhancement                  |       | C    | 40            |
| SFR Exception                |       | C    | 50            |

# Thurston County HRCD pilot project

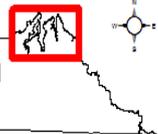


Measure change in the marine SMP area using WDFW High Resolution Change Detection

Pilot test of HRCD to measure compliance

6-year retroactive study of permits

Marine SMP Study Area in Thurston County, WA



Legend

- Marine SMP
- UGA Boundaries

0 1 2 3 4 Miles



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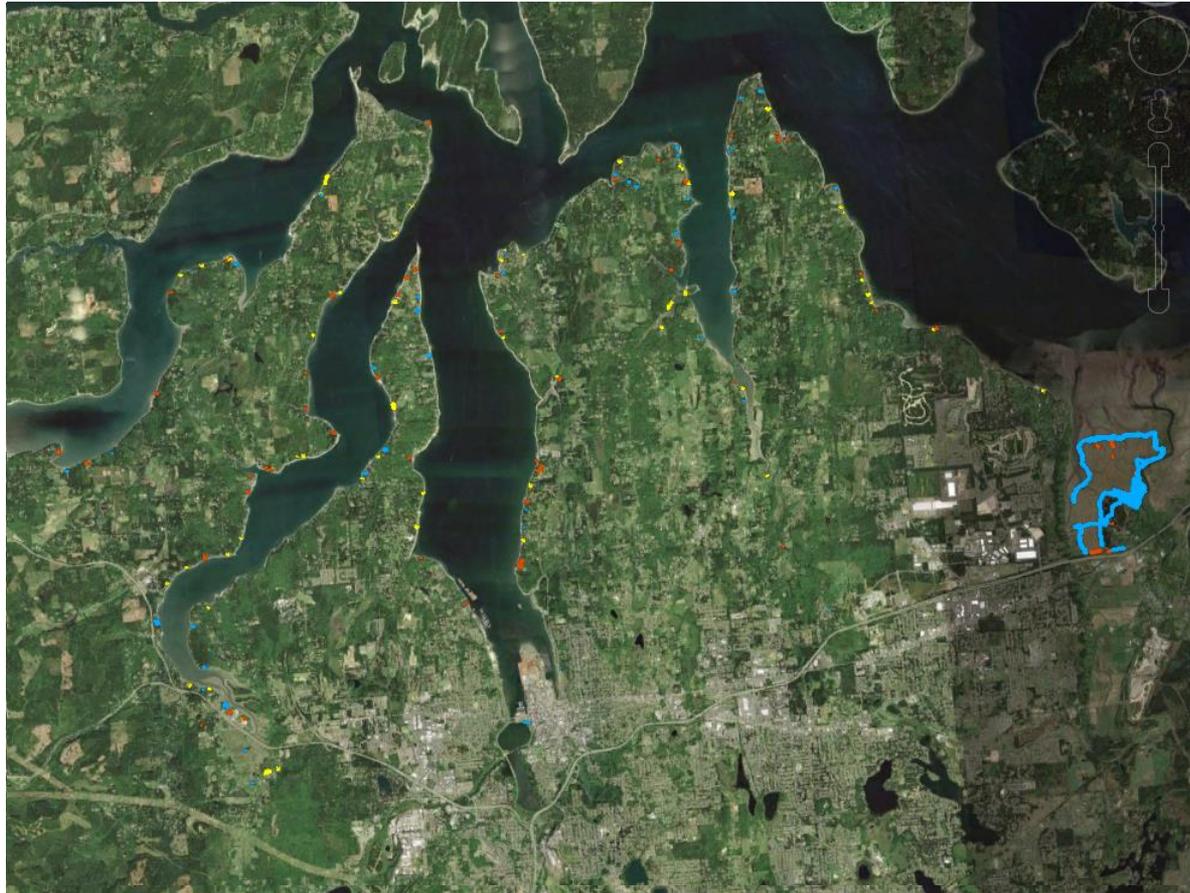
Under no circumstances, including but not limited to negligence, shall Thurston County be liable for any direct, indirect, incidental, special or consequential damages, the result from the use of, or the inability to use, Thurston County maps.

# Time Frame: 3 HRCD data sets

2006-2009

2009-2011

2011-2013



HRCD-Identified Changes

# Total Change in Shoreline

Super easy

| Year        | Sum of Total Change | Sum of Canopy Loss | Sum of Impervious Gain | Sum of Semi-Impervious Gain |
|-------------|---------------------|--------------------|------------------------|-----------------------------|
| 2006-2009   | 3.4 acres *         | 2.1 acres          | 1.6 acres              | 0.2 acres                   |
| 2009-2011   | 3.9 acres *         | 2.5 acres          | 1.2 acres              | 0.3 acres                   |
| 2011-2013   | 4.2 acres           | 3.1 acres          | 0.8 acres              | 0.3 acres                   |
| Grand Total | 11.5 acres          | 7.8 acres          | 3.5 acres              | 0.8 acres                   |

< ½ of 1% of total marine area

\* *Removed 26 acres of change from restoration project at Billy Frank Jr National Wildlife Refuge*

# Change by Environment Designation

Easy math!

| Environment Designation | Sum of Total Change | Acres per 1,000 ac of each designation |
|-------------------------|---------------------|----------------------------------------|
| Rural                   | 7.2 acres           | 7 acres /1,000 acres                   |
| Conservancy             | 4.3 acres           | 2.3 acres /1,000 acres                 |
| Natural                 | 0.02 acres          | .7 acres /1,000 acres                  |
| Grand Total             | 11.5 acres          |                                        |

$$\frac{\text{acreage of total change in Natural area in marine SMP from 2006–2013}}{\text{acreage of Natural designation in marine SMP}} * 100$$

# Unpermitted Events

Tedious and difficult

No “developments” were out of compliance... (some development doesn't need a permit)



2006-2009

## 38 unpermitted events

- 16 tree removal
- 6 development
- 2 redevelopment
- 13 natural
- 1 non-natural

75 events total

2006-2009

2011-2013

2009-2011

## 9 unpermitted events

- 8 tree removal
- 1 development

50 events total

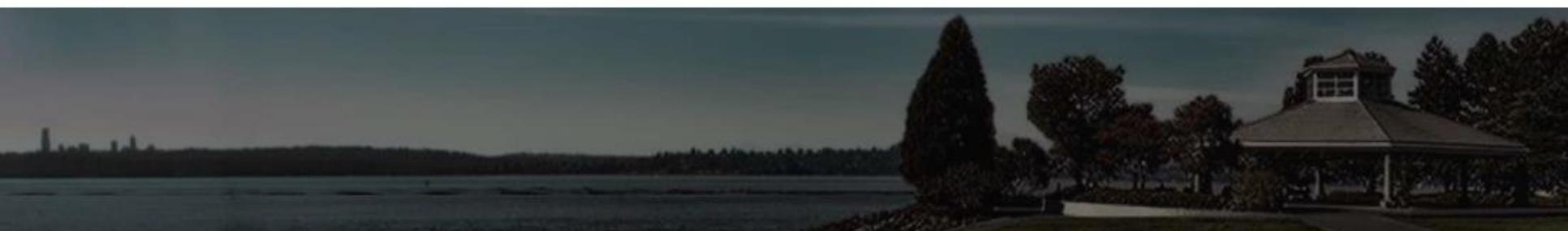
## 24 unpermitted events

- 14 tree removal
- 4 development
- 3 natural
- 1 non-natural
- 1 forestry
- 1 stream

71 events total

# City of Kirkland tracking for SMP No Net Loss

## ESTABLISH KEY OBJECTIVES AND STUDY QUESTIONS STEP TWO



### DATA COLLECTION

What are all the values, figures, and other possible data the City may want to collect?

### GOALS

What are the short term and long term goals the SMP codes are intended to achieve?

### PURPOSE & INTENT ADMINISTRATION

Do the figures being collected capture the required information to show whether or not the City is maintaining ecological function and following the purpose and intent of the SMP?

Can code administrators apply the code and collect the data without being unnecessarily burdened?

### BUILD CONSENSUS

Will the data be useful in future discussions with citizens, council, or commission members?

# Kirkland Tracking SMP No Net Loss Indicators

## DESIGN THE MONITORING PROGRAM STEP THREE



- Spreadsheet Tracking: Excel
  - Simple
  - Effective
  - Accessible
  - Short Term data collection
  - Easily Modified
- Permit Tracking Software Development (EnerGov)
  - Developed reviews and holds for specific project types
  - Long Term data collection
  - Reporting capabilities
  - Fee, security, inspection, and plan tracking



# An Ongoing Program with 8-year Reviews

## DETERMINE THE MONITORING TIME FRAME STEP FOUR



- Programmatic – Ongoing
- Interim internal check-ins
- Eight year review – Reporting



# City of Kirkland Spreadsheet

PLEASE READ TUTORIAL TAB FIRST

|    | ADDRESS                   | PERMIT # OR DATE | APPLICANT NAME | PLANNER | NATIVE VEGETATION (SQ.FT) WITHIN SHORELINE SETBACK |                  |                    |        |              |      |                 |                       |                     |                    | MITIGATION FOR TREE REMOVAL | MITIGATION FOR 83.550.5.B.5 (10%) SQ.FT |   |
|----|---------------------------|------------------|----------------|---------|----------------------------------------------------|------------------|--------------------|--------|--------------|------|-----------------|-----------------------|---------------------|--------------------|-----------------------------|-----------------------------------------|---|
|    |                           |                  |                |         | # OF TREES REMOVED                                 | # TREES RETAINED | # OF TREES PLANTED | SHRUBS | GROUND COVER | LAWN | REMOVAL OF LAWN | REMOVAL OF ORNAMENTAL | REMOVAL OF INVASIVE | AQUATIC VEGETATION |                             |                                         |   |
| 5  | XXXX Lake Washington Blvd | BLD10-00500      | DOE            | CPG     |                                                    |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 6  | XXX Lake Ave West         | BLD10-00314      | SMITH          | CPG     | 0                                                  |                  | 0                  | 0      | 0            | 0    | 0               | 0                     | 0                   | 0                  | 0                           |                                         |   |
| 7  | XXXX Lake Ave West        | BLD11-00181      | JONES          | CPG     |                                                    | 1                | 3                  | 500    | 300          | 809  | 720             | 280                   | 0                   | 65                 |                             |                                         |   |
| 8  | XXXXX Holmes Point Road   | BLD11-00431      | JOHNSON        | CPG     | 0                                                  |                  | 7                  | 600    | 400          | 2280 | 0               | 0                     | 0                   |                    |                             |                                         |   |
| 9  | XXXXX Champagne Pt Rd SE  | BLD11-00534      | TAYLOR         | CPG     | 0                                                  |                  | 3                  | 365    | 170          | 950  | 535             | 0                     | 0                   |                    |                             |                                         |   |
| 10 | XXXX NE 154th St          | BLD11-00351      | JACKSON        | CPG     |                                                    |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 11 | XXXX SW 166th             | BLD11-00350      | JAMES          | CPG     |                                                    |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 12 | XXXXX Champagne Pt Rd NW  | MIS11-00006      | DAWES          | CPG     | 0                                                  |                  | 0                  | 0      | 0            | 0    | 0               | 0                     | 0                   |                    |                             |                                         |   |
| 13 | XXX Lake Ave West         | SHR11-00004      | BAILEY         | CPG     |                                                    |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 14 | XXX Lake Ave West         | BLD11-00109      | BRONSON        | CPG     | 0                                                  |                  | 0                  | 0      | 0            | 0    | 0               | 0                     | 0                   |                    |                             |                                         |   |
| 15 | XXXXX Holmes Point Road   | 1/10/2012        | GLASS          | CPG     |                                                    |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 16 | XXX Lake Ave West         | BLD11-00462      | SIMS           | STL     |                                                    | 6                | 6                  | 90     | 632          | 400  | 990             | 0                     | 0                   | 0                  | Y                           |                                         | N |
| 17 | XXXX Rose Point Lane      | BLD11-00689      | RIVERA         | CPG     |                                                    |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 18 | Marina Park Pier          | exemption        | City           | TJS     |                                                    |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 19 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 20 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 21 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 22 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 23 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 24 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 25 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 26 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 27 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 28 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 29 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 30 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 31 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 32 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 33 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 34 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 35 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 36 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 37 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 38 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 39 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 40 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 41 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 42 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 43 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 44 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 45 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |
| 46 |                           | 0                | 0              | 0       | 0                                                  |                  |                    |        |              |      |                 |                       |                     |                    |                             |                                         |   |

Spreadsheet posted on Commerce web site.

Tracks indicators for each project – built into staff review time

# Measurables from Kirkland Spreadsheet

- 2100 SF structures removed from shoreline setback
- 62 native trees planted (15 Permits)
- 4000 SF lawn removed (6 Permits)
- 8600 SF of native vegetation (13 Permits)
- 103 linear feet of bulkhead removed (3 Permits)
- 16,672 SF grated pier surface replacing solid decking
- 1472 SF of overwater structures removed
- 200 SF of in-water structures removed
- 33 piles removed (5 parcels)
- 6000 SF spawning gravel installed (6 parcels)

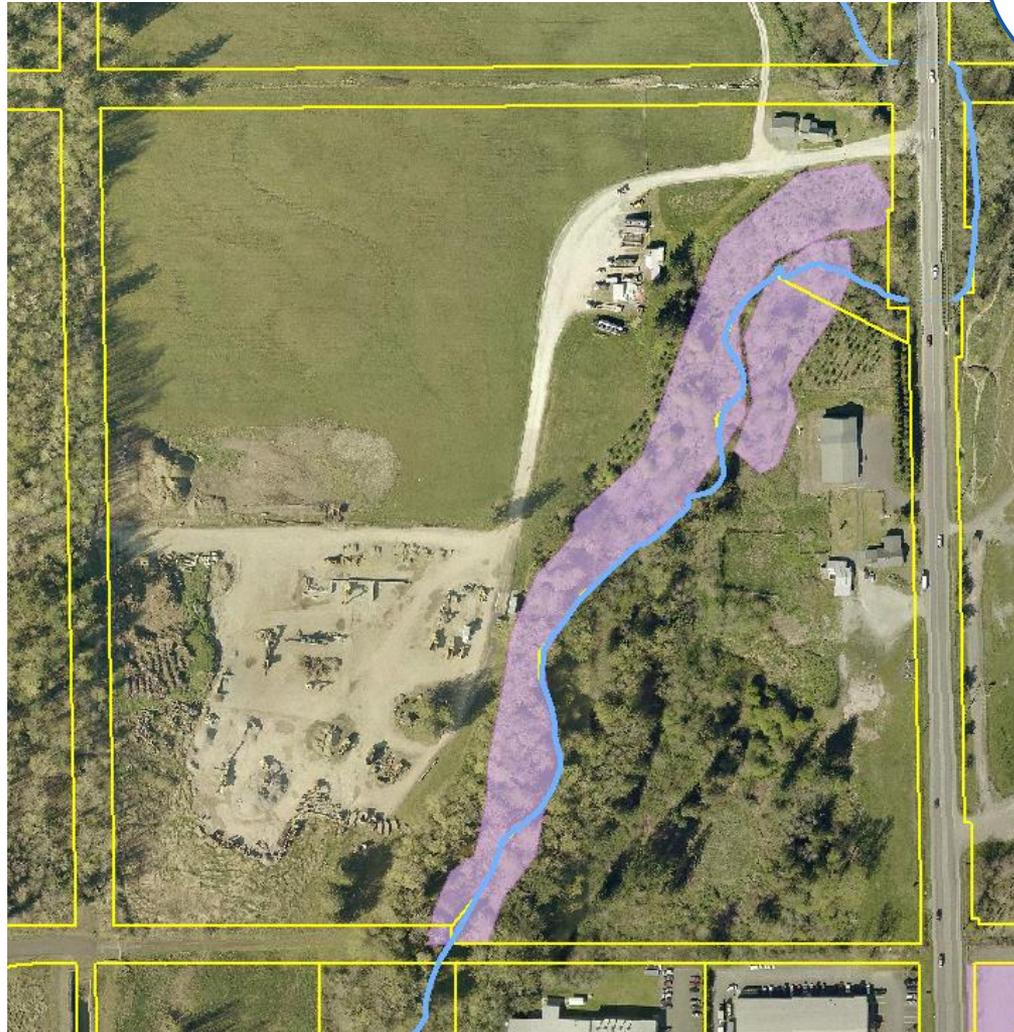


# City of Bellingham Critical Areas Monitoring



**Example:** project-specific feedback loop for adaptive management of compensatory mitigation

**Keys:** adequate plan, conservation easement, financial surety, performance standards



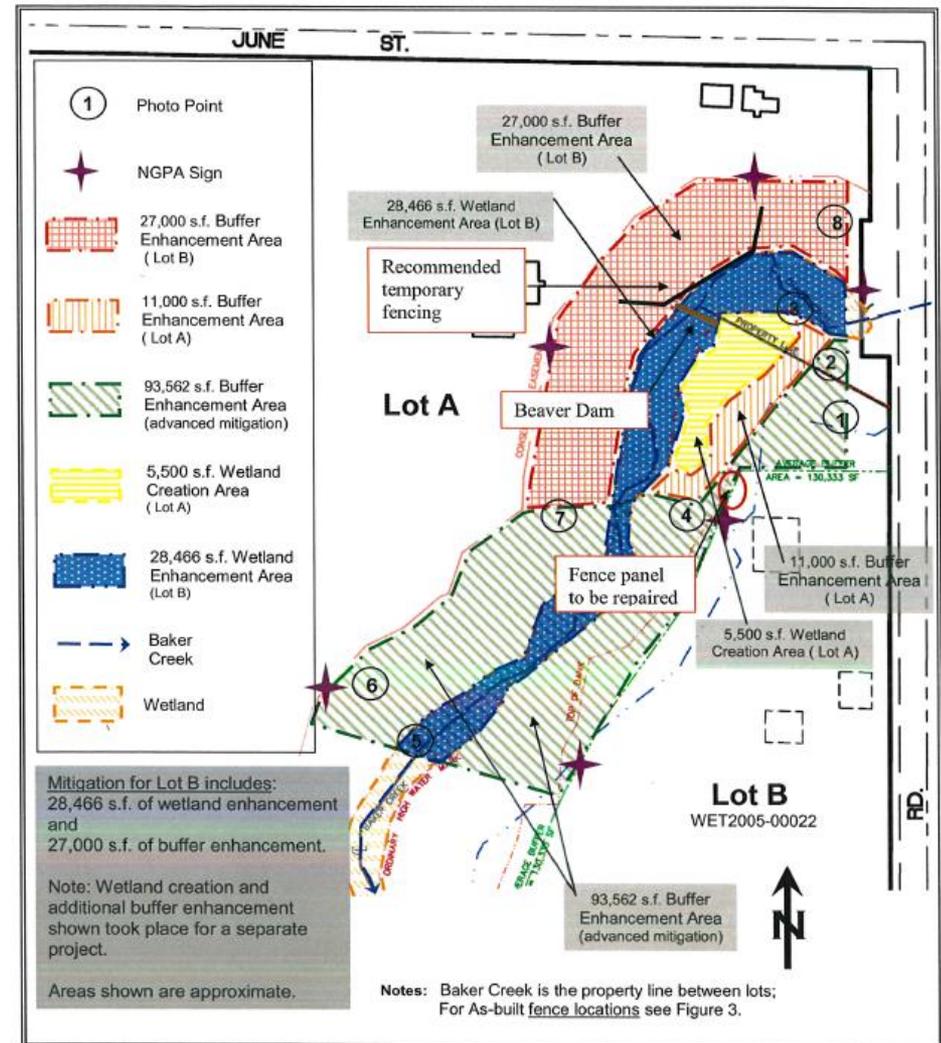
# Mitigation Plan



Compensation for fill with:

- Newly created wetland (5,500 sf)
- Wetland enhancement (28,466 sf)
- Buffer enhancement (38,000 sf)

Included advance mitigation (93,562 sf)





# Financial Surety Requirement



Assignment of funds or bond for 150% of costs

The following items are included in the bond amount for this project:

|                                                |             |
|------------------------------------------------|-------------|
| • Plants (shrubs): (50 plants x \$5 /plant)    | \$ 250.00   |
| • Mulch: (50 plants x \$4 /plant)              | \$ 200.00   |
| • Signage: (1 sign x \$45/sign)                | \$45.00     |
| • Fencing (20ft x \$5/ft)                      | \$100.00    |
| • Biological Supervision                       | \$250.00    |
| • As-built Report                              | \$ 625.00   |
| • Monitoring (Year 1= \$875, Years 2-5= \$625) | \$3,375.00  |
| • Maintenance (\$200/ year for 5 years)        | \$ 1,000.00 |

---

|          |             |
|----------|-------------|
| subtotal | \$ 5,845.00 |
|----------|-------------|

|         |             |
|---------|-------------|
| x (50%) | \$ 2,922.50 |
|---------|-------------|

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|                    |                    |
|--------------------|--------------------|
| <b>Total Bond:</b> | <b>\$ 8,767.50</b> |
|--------------------|--------------------|



# Funds Released in Stages



First surety released with “as-built” mitigation report



wetland enhancement



buffer enhancement

# Performance Standards Tracking



**Goal:** Create 5,500 square feet of seasonally saturated scrub/shrub wetland.

**Objective:** Created wetland shall have seasonally saturated soils.

**Performance Standard:** Soils inundated or saturated within 12” of surface, for 10% of the growing season

| Compliance Status | Project #     | Mitigation Installation Due / Completed | As-Built Due / Received                 | Year 1 Monitoring Due / Received                                | Year 2 Monitoring Due / Received | Year 3 Monitoring Due / Received | Year 4 Monitoring Due / Received | Year 5 Monitoring Due / Received | Surety Status | Performance Standards Met / Case Closed |
|-------------------|---------------|-----------------------------------------|-----------------------------------------|-----------------------------------------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|---------------|-----------------------------------------|
|                   | CAP2014-00032 | Due before building permits             |                                         | 12/31/17 - Due<br>3/11/16 - Received                            |                                  |                                  |                                  |                                  | \$10,254      |                                         |
|                   | CAP2014-00049 |                                         | Partial as-built<br>12/09/14 - Received | 11/10/16 - Received                                             | 12/31/16 - Due                   |                                  |                                  |                                  | \$400         |                                         |
|                   | CAP2014-00052 |                                         | 4/29/15 - Received                      | 6/28/16 - Received<br>10/21/16 - Received                       | 12/31/17 - Due                   |                                  |                                  |                                  | \$1,125       |                                         |
|                   | CAP2014-00072 | 3/15/15 - Due                           | 4/14/15 - Received                      | 12/31/15 - Received<br>5/16/17 - Received                       | 12/31/17 - Due                   |                                  |                                  |                                  | \$5,850       |                                         |
|                   | CAP2015-00001 |                                         |                                         | 10/10/17 - Received                                             | 12/31/18 - Due                   |                                  |                                  |                                  | \$10,200      |                                         |
|                   | CAP2015-00007 |                                         | 4/13/16 - Received                      | 10/10/17 - Received                                             | 12/31/18 - Due                   |                                  |                                  |                                  |               |                                         |
|                   | CAP2015-00008 |                                         | 4/26/16 - Received                      | 12/31/16 - Due                                                  |                                  |                                  |                                  |                                  | \$3,000       |                                         |
|                   | CAP2015-00017 | Due around Sep-2015                     |                                         | Due after planting for Phase II                                 |                                  |                                  |                                  |                                  |               |                                         |
|                   | CAP2015-00020 |                                         | 3/22/16 - Received                      | 12/31/17 - Due<br>5/15/17 - Received                            |                                  |                                  |                                  |                                  |               |                                         |
|                   | CAP2015-00049 |                                         |                                         | 10/19/16 - Received                                             | 12/31/17--Due                    |                                  |                                  |                                  | \$1,800       |                                         |
|                   | CAP2015-5004  |                                         | 3/31/16 - Due                           |                                                                 |                                  |                                  |                                  |                                  |               |                                         |
|                   |               |                                         |                                         | 300 additional plants to be installed by 2/28/18>release surety |                                  |                                  |                                  |                                  |               |                                         |
|                   | CAP2015-5007  | Onsite Mitigation                       | 12/16/16 - Received                     | 11/28/17 - Received                                             | 12/31/2018                       |                                  |                                  |                                  | \$257,505     |                                         |

# Close-out



- Final surety released with Year 7 monitoring report
- Conservation easement provides legal protection in perpetuity



# Ecology Wetlands Evaluation Program \*

## Site inspections

- As-built
- Mid-monitoring
- End of monitoring (*10 years*)

## Formal follow-up letters

## Review reports

- Track deadlines
- Ensure reports have complete information per Ecology's Order

*\* 401 WQ certifications for compensatory mitigation projects*



| Element                       | What to Look For<br>(add in specifics from order, mitigation plan, and/or as-built)                                                                                       | Comments or Deviations<br>from the Plan/Permit | Follow-up / Contingency | For<br>Administrative<br>Use |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------------------------|------------------------------|
| <b>On-the-Ground Elements</b> |                                                                                                                                                                           |                                                |                         |                              |
| 1.                            | Grading<br><i>(for example, slopes, elevations, topographic features, microtopography, soil treatment)</i>                                                                |                                                |                         |                              |
| 2.                            | Water/<br>hydroperiod<br><i>(for example, water-control structures, specified water regime, wetland hydrologic indicators)</i>                                            |                                                |                         |                              |
| 3.                            | Planting<br><i>(including: presence, numbers, location, spacing, and size of planted or seeded vegetation species or plant communities; plant protectors, irrigation)</i> |                                                |                         |                              |
| 4.                            | Management/<br>control of<br>invasive<br>species<br><i>(for example, mowing, rolling, spraying, covering with plastic)</i>                                                |                                                |                         |                              |
| 5.                            | Habitat<br>features<br><i>(for example, nest boxes, snags, stumps, LWD, brush piles)</i>                                                                                  |                                                |                         |                              |
| 6.                            | Required<br>acreage of<br>mitigation<br><i>(Does mitigation area appear to be the appropriate size?)</i>                                                                  |                                                |                         |                              |
| 7.                            | Other<br><i>(for example, buffers, signs, fences, trails)</i>                                                                                                             |                                                |                         |                              |



Ecology's field checklist included in Commerce Guidebook

# Wetlands Program Benefits



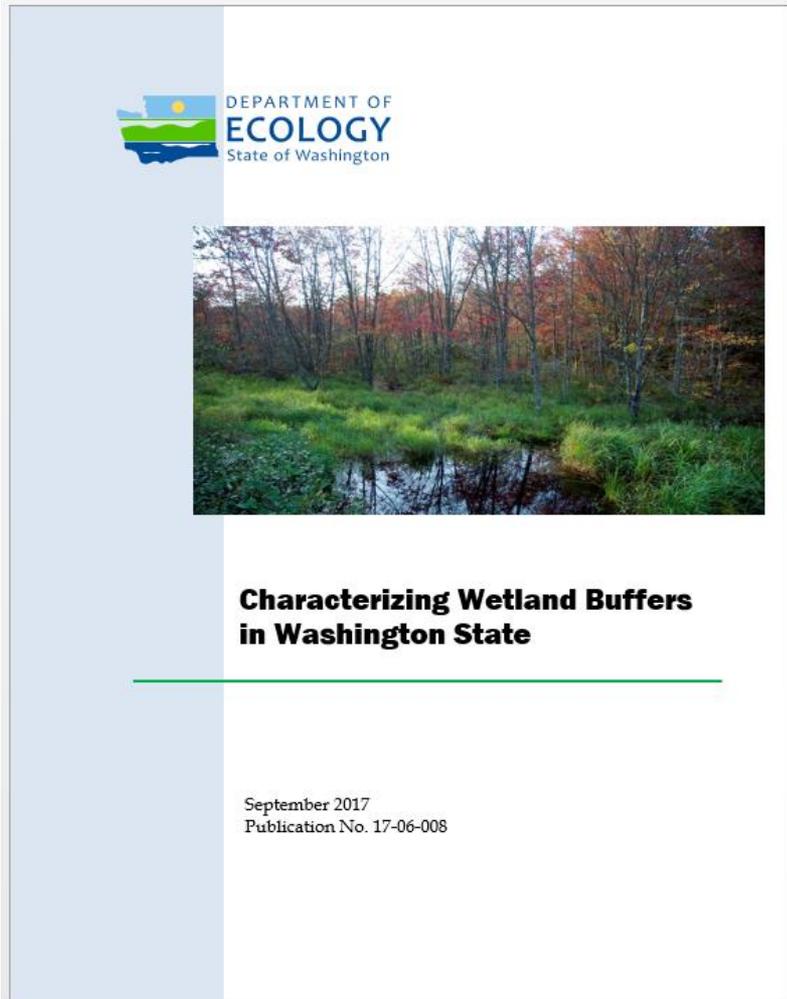
**Increased mitigation success:** work with the applicant to address issues that would result in site failure.

**Improved permitting decisions:** lessons learned during site visits can be applied to review of current mitigation proposals.

**Voluntary compliance:** improves when people expect oversight (less time needed to check on every project)

Improved **consistency and predictability** by standardizing permit conditions or project plan requirements

# New Guidance: Evaluating Buffer Compliance



Outlines **steps** for characterizing how well regulations are protecting buffers.

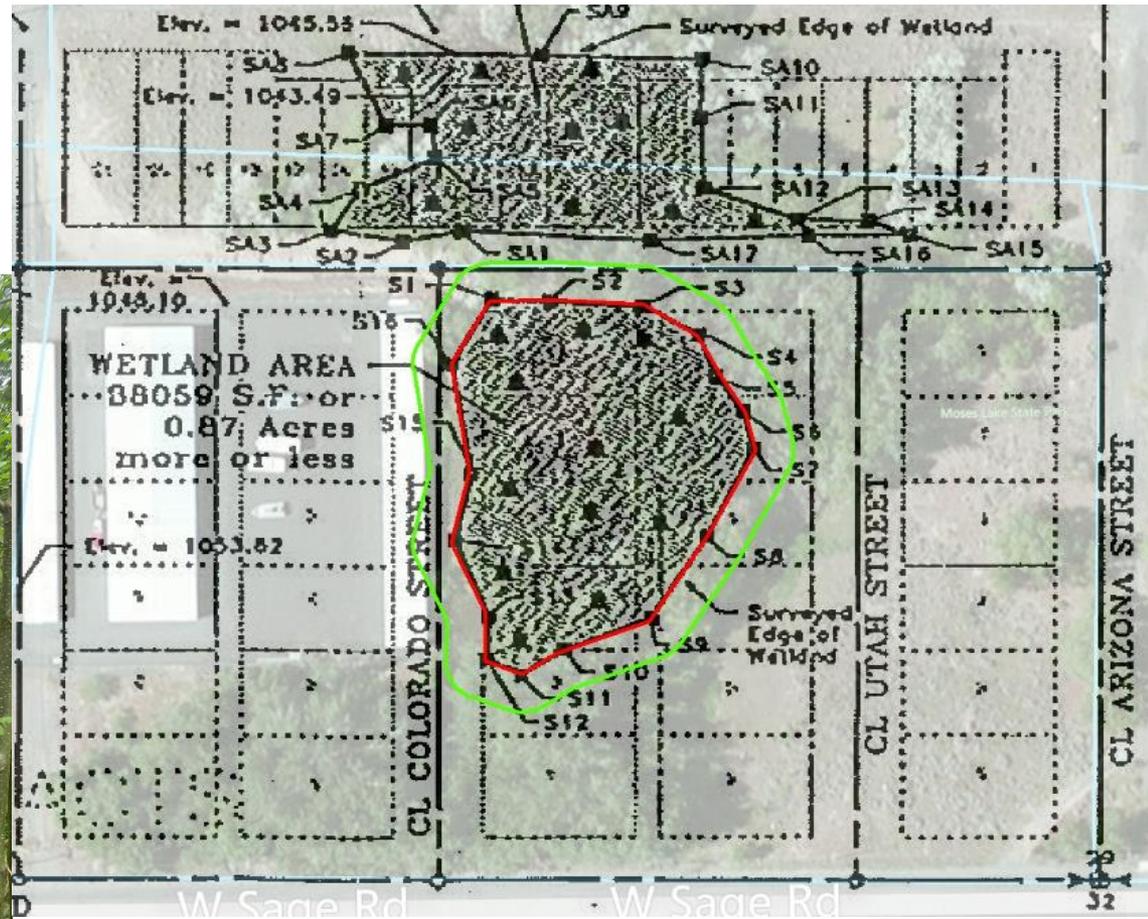
Based on pilot of 10 randomly selected projects from:

- Pierce County
- Tacoma
- Marysville
- Moses Lake

# Review Permits, Assess Sites



05-08-2013 13:15



# Compare Permit Requirements to CAO

| Wetland Category                                         | Buffer width (in feet) based on habitat score     |     |     |     |
|----------------------------------------------------------|---------------------------------------------------|-----|-----|-----|
|                                                          | 3-4                                               | 5   | 6-7 | 8-9 |
| Category I: Based on total score                         | 75                                                | 105 | 165 | 225 |
| Category I: Bogs and Wetlands of High Conservation Value | 190                                               |     |     | 225 |
| Category I: Coastal Lagoons                              | 150                                               |     | 165 | 225 |
| Category I: Interdunal                                   |                                                   |     |     | 225 |
| Category I: Forested                                     | 75                                                | 105 | 165 | 225 |
| Category I: Estuarine                                    | 150<br>(buffer width not based on habitat scores) |     |     |     |
| Category II: Based on score                              | 75                                                | 105 | 165 | 225 |
| Category II: Interdunal Wetlands                         | 110                                               |     | 165 | 225 |
| Category II: Estuarine                                   | 110<br>(buffer width not based on habitat scores) |     |     |     |
| Category III (all)                                       | 60                                                | 105 | 165 | 225 |
| Category IV (all)                                        | 40                                                |     |     |     |



- Was permit issued according to CAO requirements?
- Was buffer width more or less protective than basic CAO buffer?

Are justification for changes documented?  
Consistent w/CAO criteria?

# Compare Permit to Built Conditions



Is vegetation  
management  
consistent?  
Fencing?



Signage?

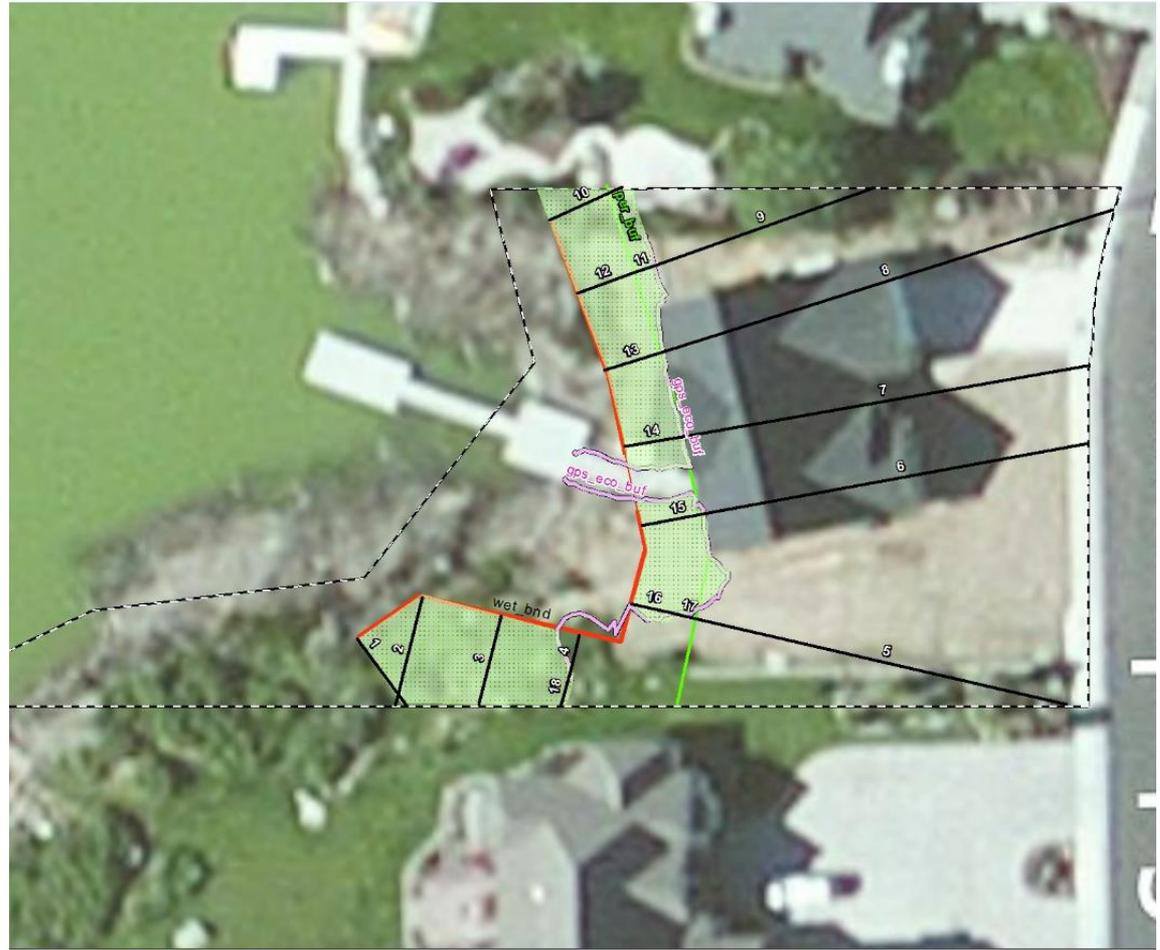
# Characterize Ecological Condition of Buffer

**% of wetland edge adjacent to “ecologically significant buffer”**

**Width** of ecologically significant buffer

**Area** of ecologically significant buffer

What are dominant stressors?



# Methods, Forms

## Worksheet For Reviewing a Permit

Permit # \_\_\_\_\_  
 Date of permit \_\_\_\_\_ Date of CAO in effect when vested \_\_\_\_\_  
 Date of Review \_\_\_\_\_ Reviewed by: \_\_\_\_\_

Category of wetland for which permit is required

Category I \_\_\_\_\_  
 Category II \_\_\_\_\_  
 Category III \_\_\_\_\_  
 Category IV \_\_\_\_\_  
 Other \_\_\_\_\_

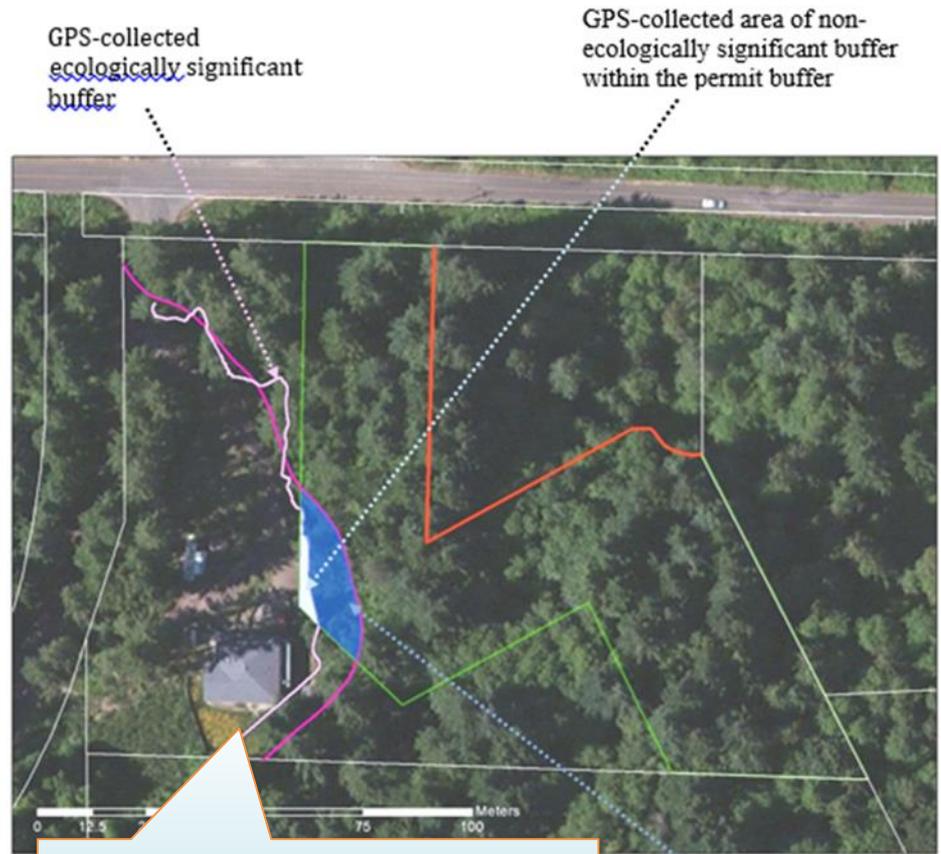
Basic buffer width specified in the permit \_\_\_\_\_ (including adjustment for habitat points and impact-reducing measures if properly documented) (N/A if not discussed in permit)

Allowable discretionary changes to buffer width

Averaging \_\_\_\_\_ how much \_\_\_\_\_  
 Reduction if enhanced \_\_\_\_\_ how much \_\_\_\_\_  
 Increases for \_\_\_\_\_ what conditions \_\_\_\_\_  
 Other \_\_\_\_\_

Other requirements \_\_\_\_\_  
 Erosion control \_\_\_\_\_  
 Signage \_\_\_\_\_  
 Fencing \_\_\_\_\_  
 Other \_\_\_\_\_

Includes samples of forms used in these steps.



Includes an example of a GIS/GPS-based method to collect data

Area of non-ecologically significant buffer from review of aerial photos

# New: Guide for Using Ecology Air Photos



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

## Washington Oblique Aerial Photography



September 2017  
Publication no. 17-06-026



# Shoreline Photo Viewer

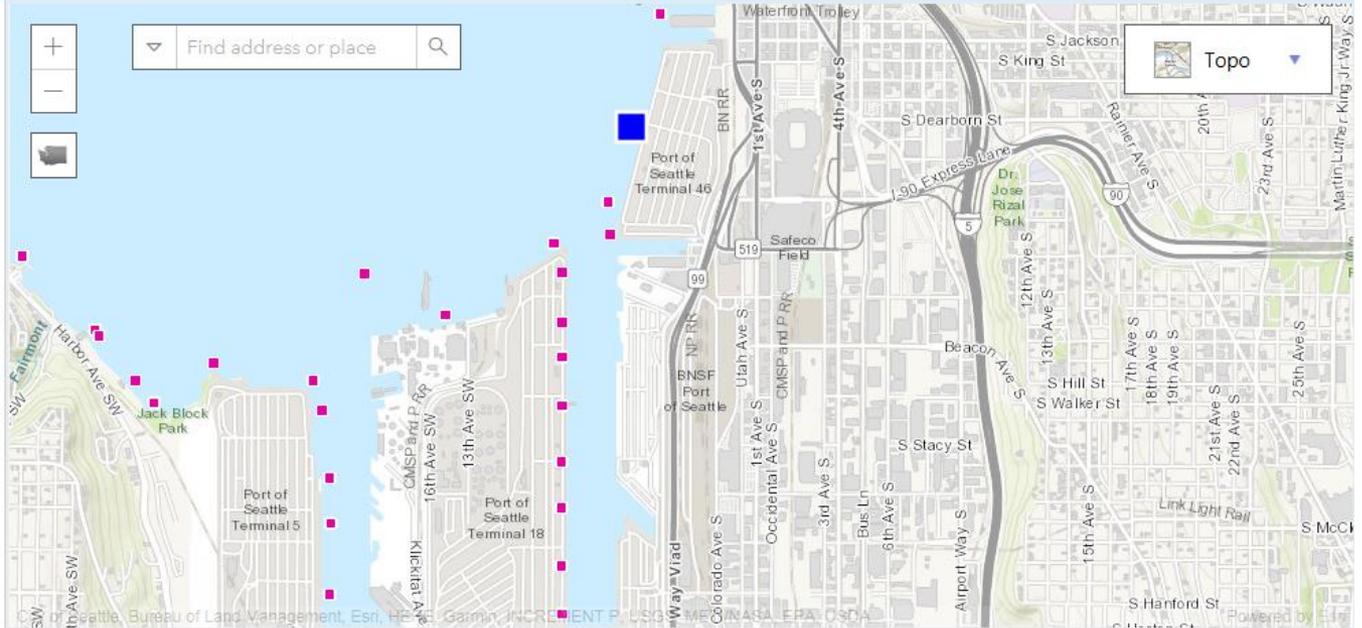
Choose a photo series:

- 2016-17
- 2006-07
- 2000-02
- 1992-97
- 1976-77

[Compare years](#)

[Share page](#)

[Open Coastal Atlas map](#)



Elliott Bay (7/29/2016)

2016

[Back](#)



2006

2000

1990



1970

