



DEPARTMENT OF  
**ECOLOGY**  
State of Washington



Washington  
Department of  
**FISH and  
WILDLIFE**

# Case Studies and Resources

*Tim Gates, Policy and Operations Manager  
Shorelands & Environmental Assistance Program  
Washington Department of Ecology*

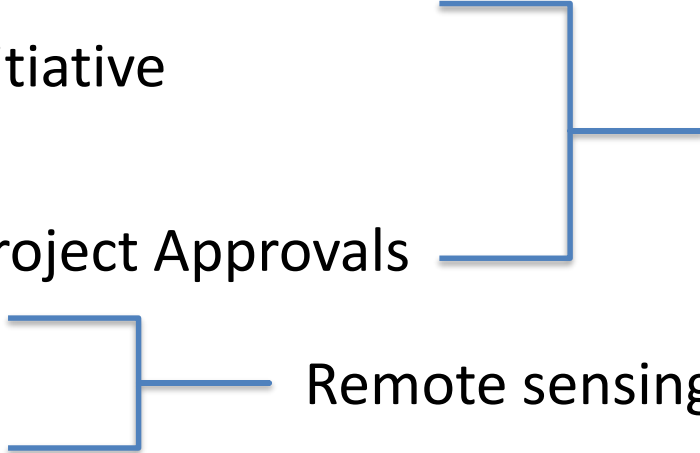


April 19, 2018  
Port Angeles Workshop

# 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

## Ongoing compliance monitoring

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

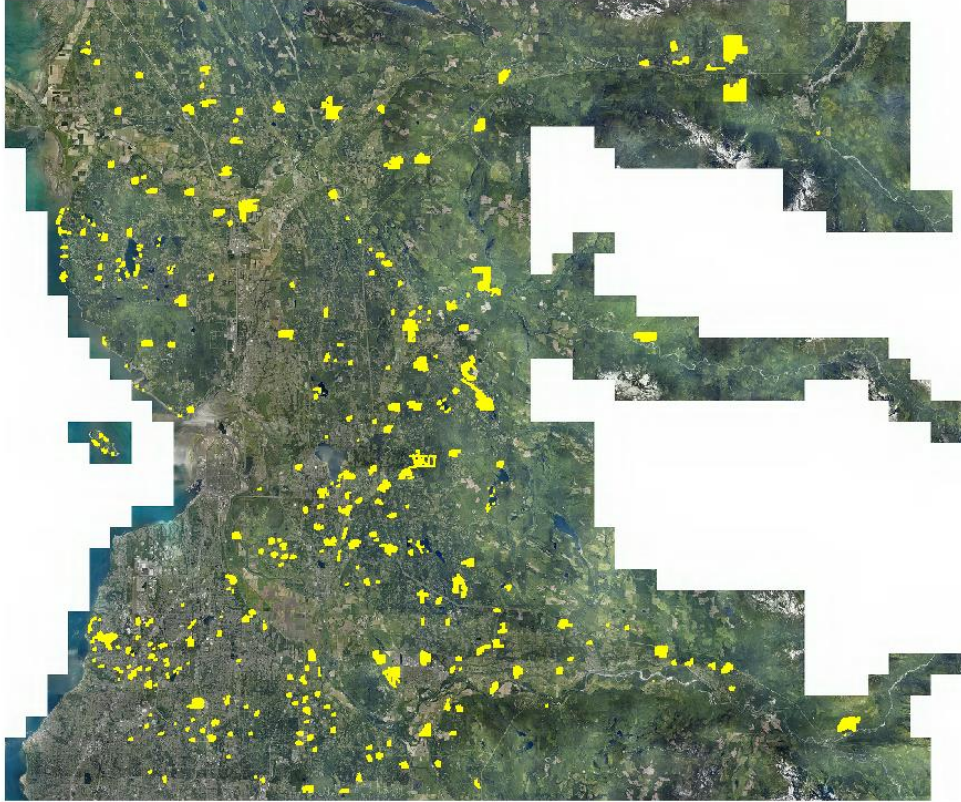
Case studies use outline of 5 key components from CAO Guidance Monitoring chapter

# 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

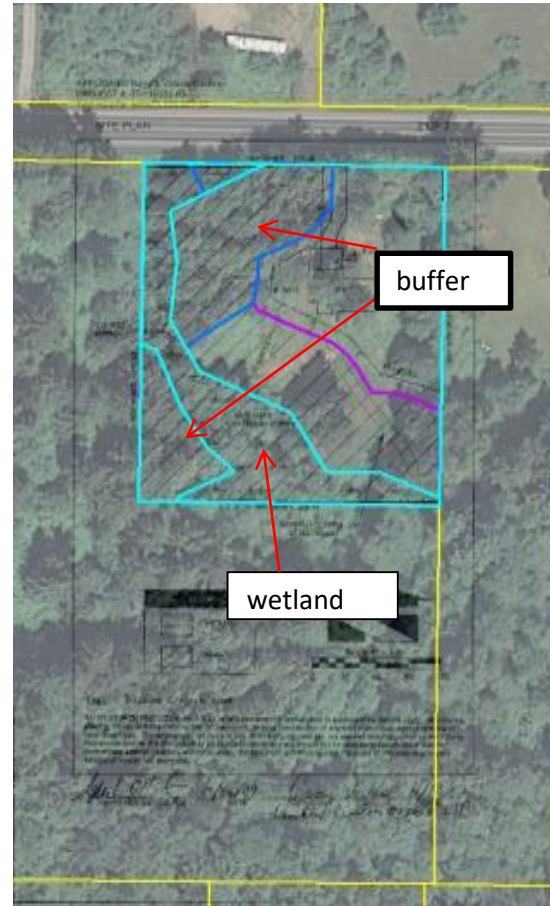


- Randomly selected 335 (of ~1,000) CASPs recorded between 11/07 and 4/13
- Also evaluated all enforcement cases

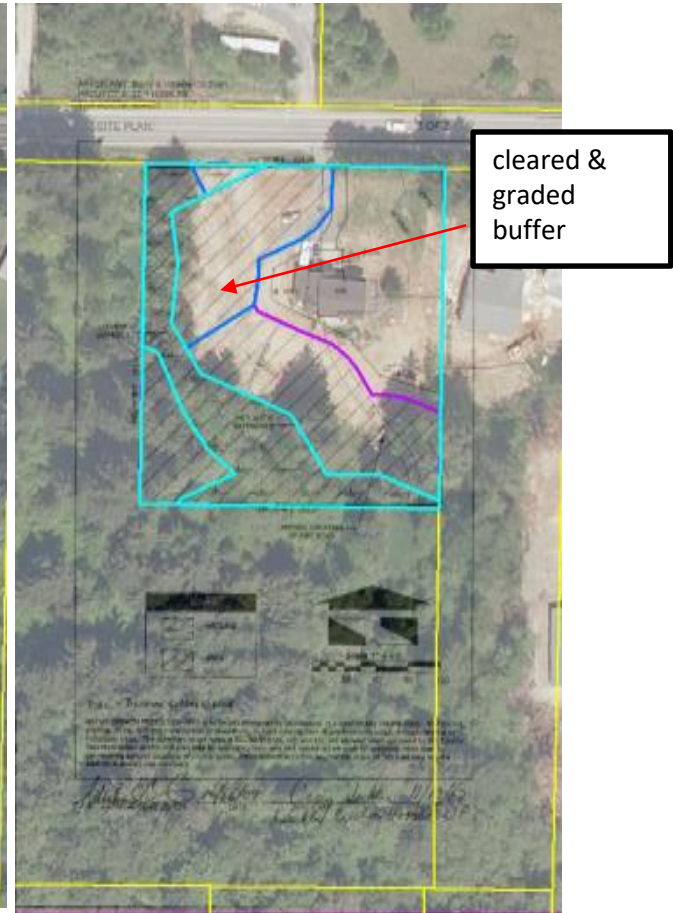


# CASP Parcel Analysis

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



2007



2009

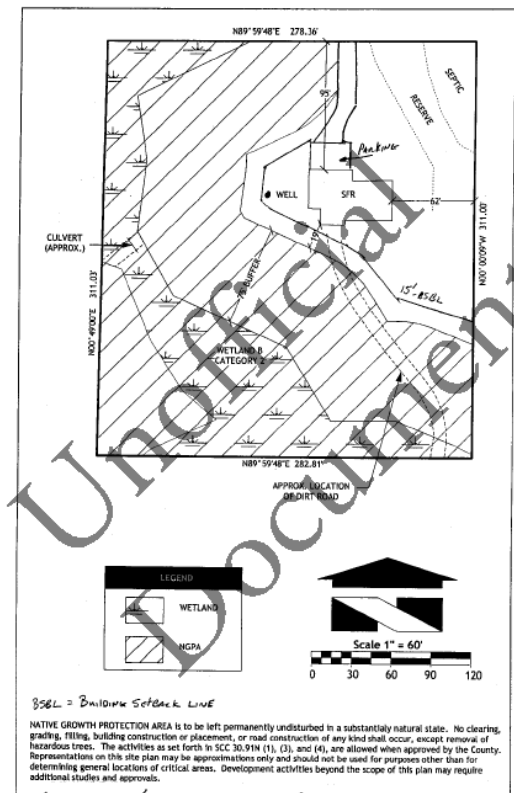
# Key Findings

- 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 #: 07-110388-RK  
TAX ACCT#: 300520-003-007-00

SITE PLAN:

2 OF 2



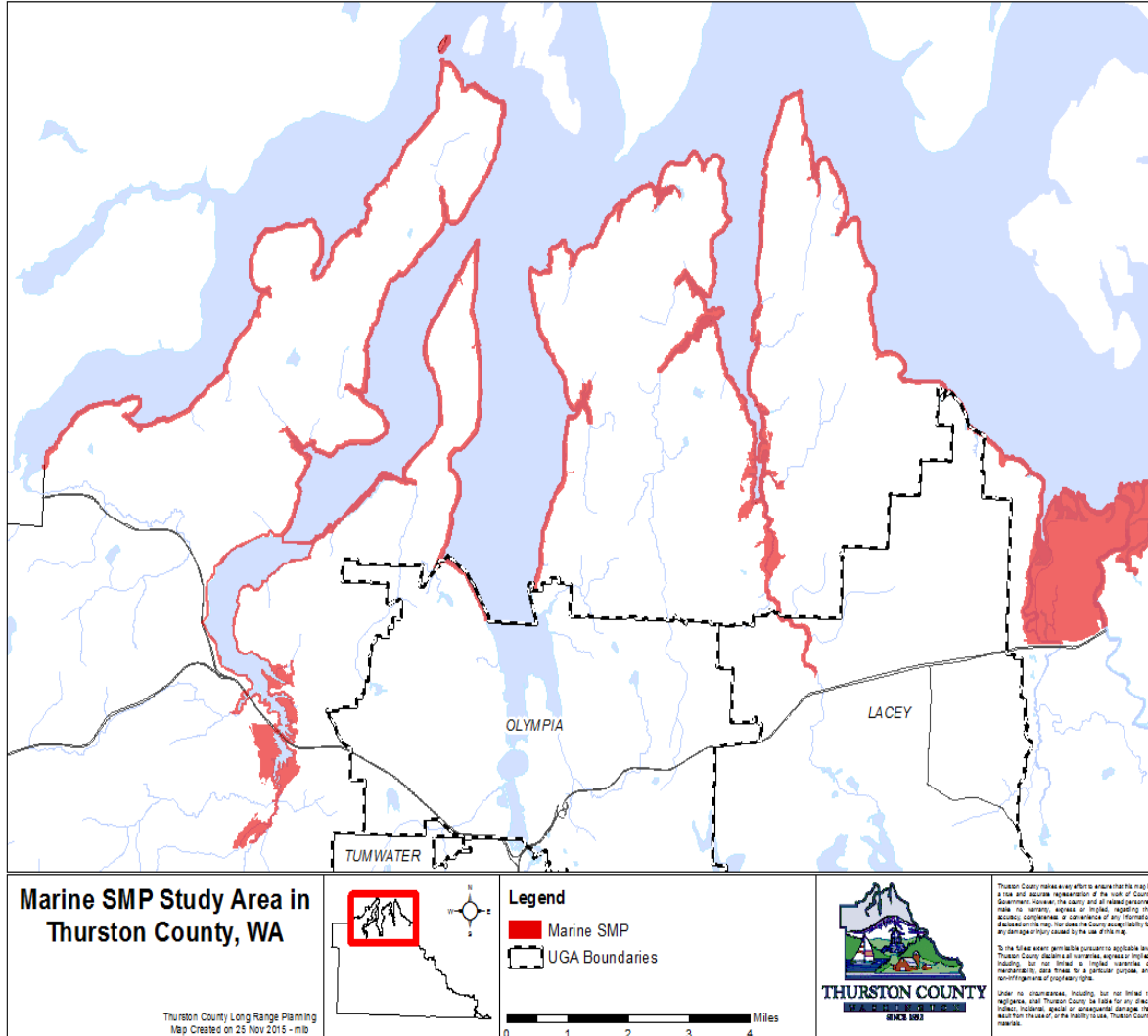
APPROVED AND CO PDS DATE 10/26/07  
APPROVED DATE 11/13/07  
Sunkin Custom Homes LP

# 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

Attempt	Checklist (29)	Memo	Deficiency	Attachment	Dependency	Info (15)	Consent	Insp. Detail
Description			Value			Type	Display Order	
A. Buffer Alterations								
Permanent Buffer Impacts						P		
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

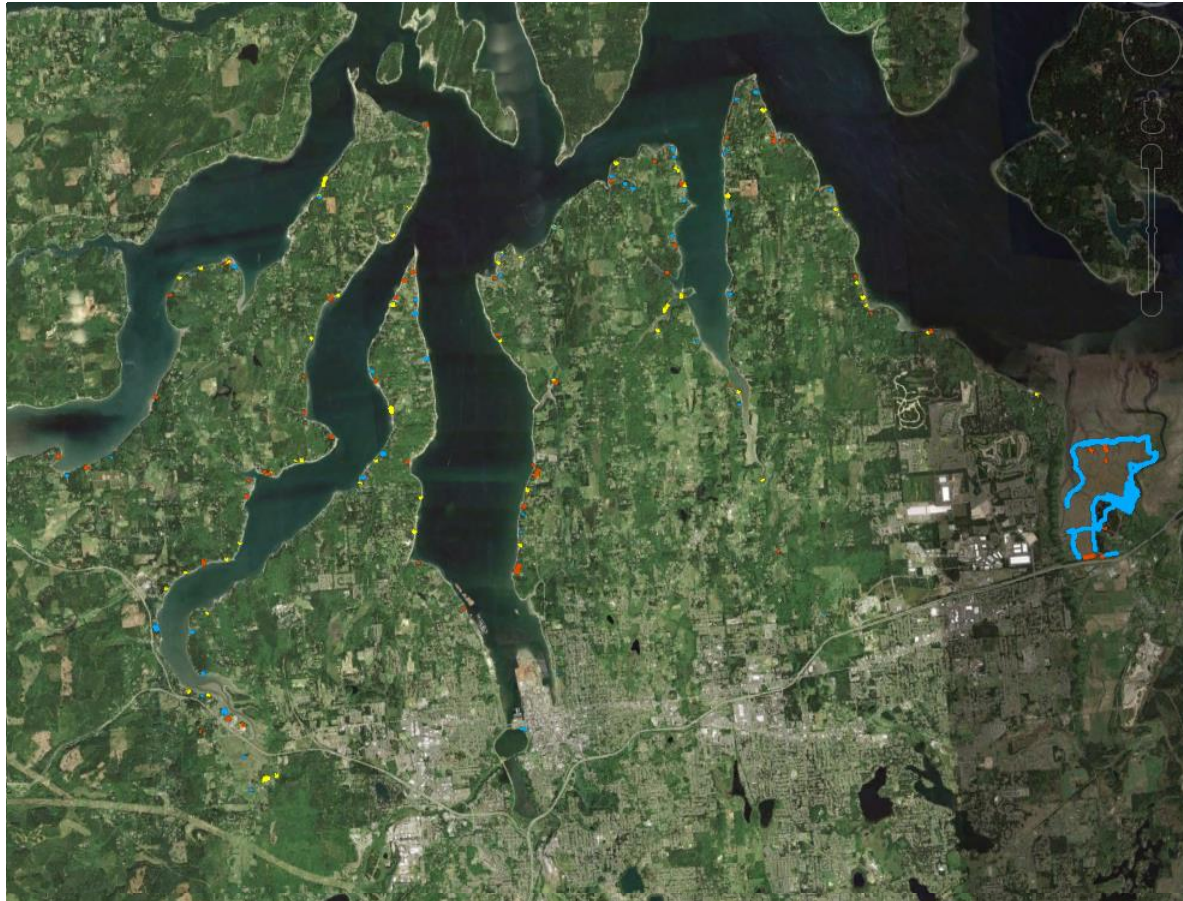


# Time Frame: 3 HRCD data sets

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

2009-2011

2011-2013

## 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

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?

### ADMINISTRATION

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

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	PLEASE READ TUTORIAL TAB FIRST															
2																
3					NATIVE VEGETATION (SQ.FT) WITHIN SHORELINE SETBACK											
4	ADDRESS	PERMIT # OR DATE	APPLICANT NAME	PLANNER	# OF TREES REMOVED	# TREES RETAINED	# OF TREES PLANTED	SHRUBS	GROUND COVER	LAWN	REMOVAL OF LAWN	REMOVAL OF ORNAMENTAL	REMOVAL OF INVASIVE	AQUATIC VEGETATION	MITIGATION FOR TREE REMOVAL	MITIGATION FOR 83.550.5.8.5 (10%) SQ.FT
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		
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	0		
9	XXXXX Champagne Pt Rd SE	BLD11-00534	TAYLOR	CPG	0		3	365	170	950	535	0	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	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	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												
20		0	0	0												
21		0	0	0												
22		0	0	0												
23		0	0	0												
24		0	0	0												
25		0	0	0												
26		0	0	0												
27		0	0	0												
28		0	0	0												
29		0	0	0												
30		0	0	0												
31		0	0	0												
32		0	0	0												
33		0	0	0												
34		0	0	0												
35		0	0	0												
36		0	0	0												
37		0	0	0												
38		0	0	0												
39		0	0	0												
40		0	0	0												
41		0	0	0												
42		0	0	0												
43		0	0	0												
44		0	0	0												
45		0	0	0												
46		0	0	0												

Spreadsheet posted on Commerce web site.

Tracks indicators for each project – built into staff review time

TUTORIAL

DEVELOPMENT OR ACTION

PROJECT DETAILS & MISC.

SHORELINE SETBACK

VEGETATION

STABILIZATION

OVER

...

+

:

←

# 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)



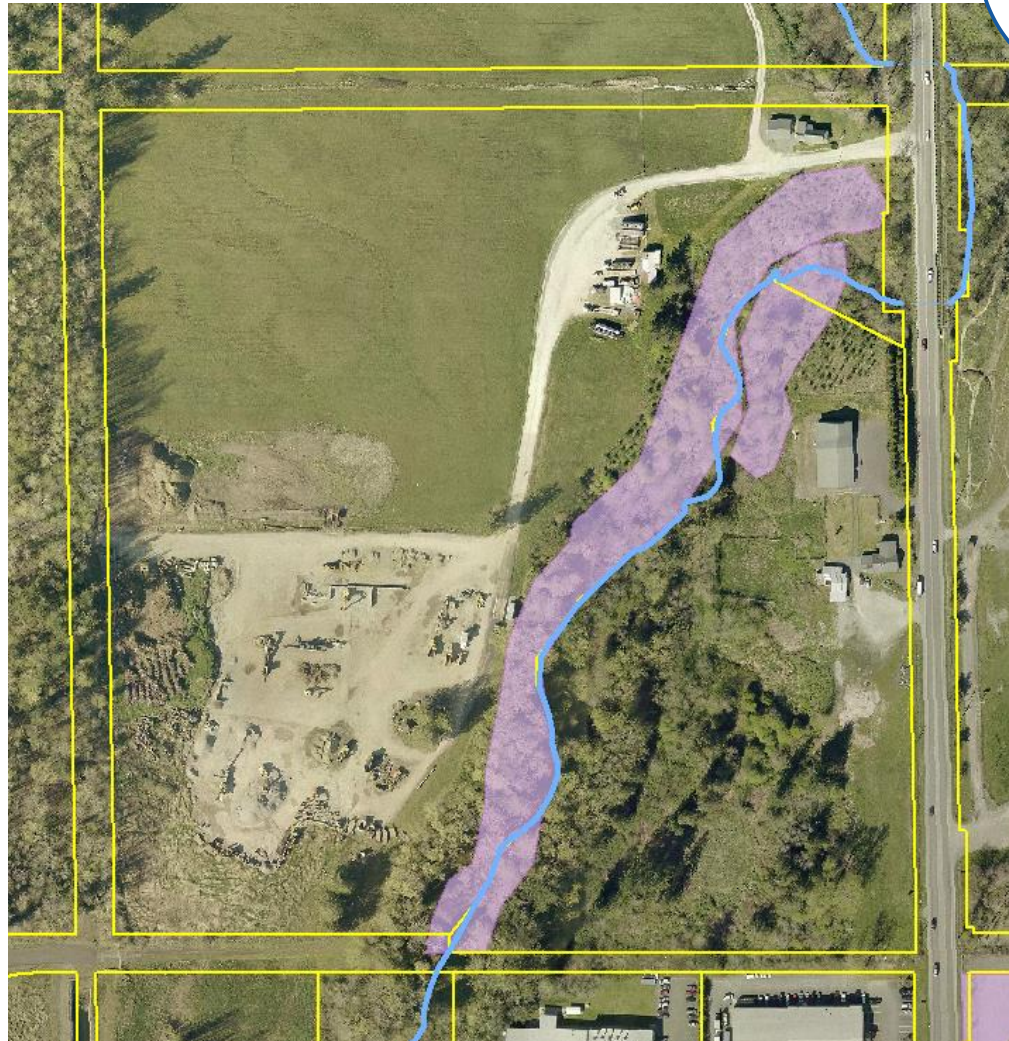


# City of Bellingham Critical Areas Monitoring



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

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





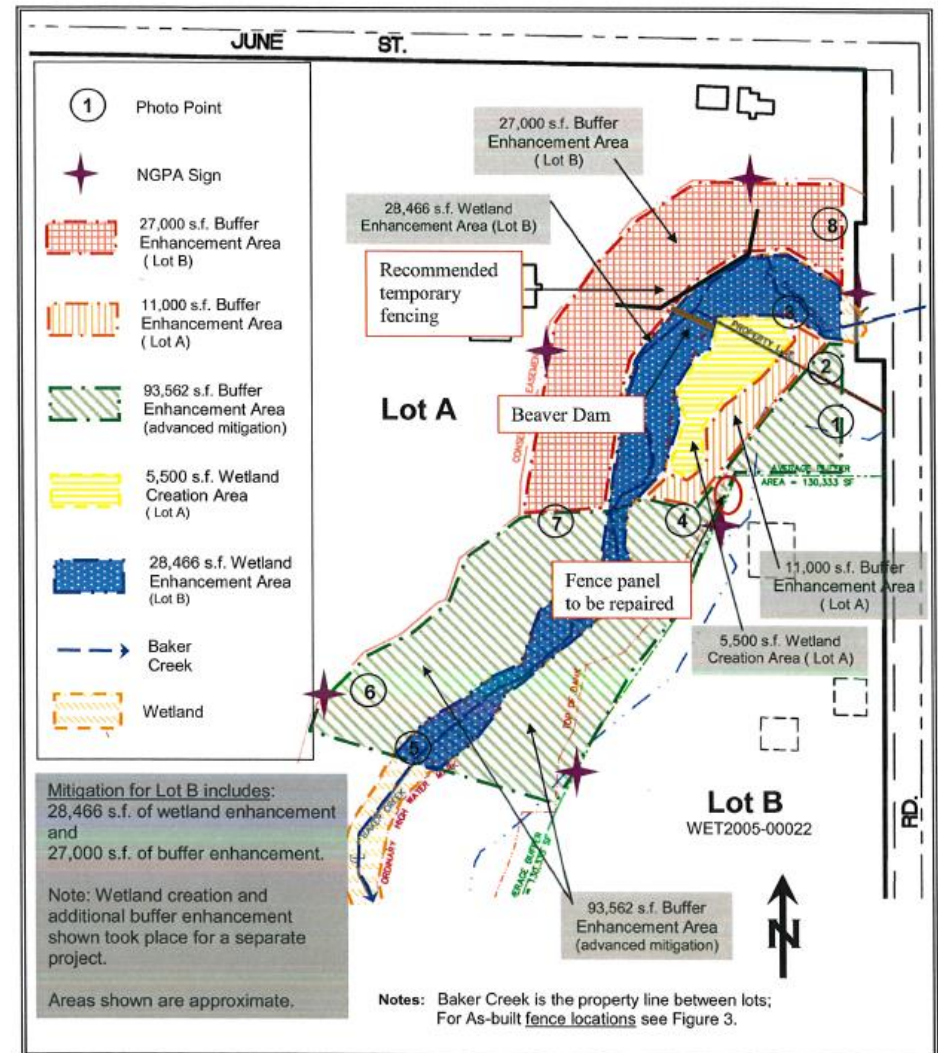
# Mitigation Plan



Compensation for fill with:

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

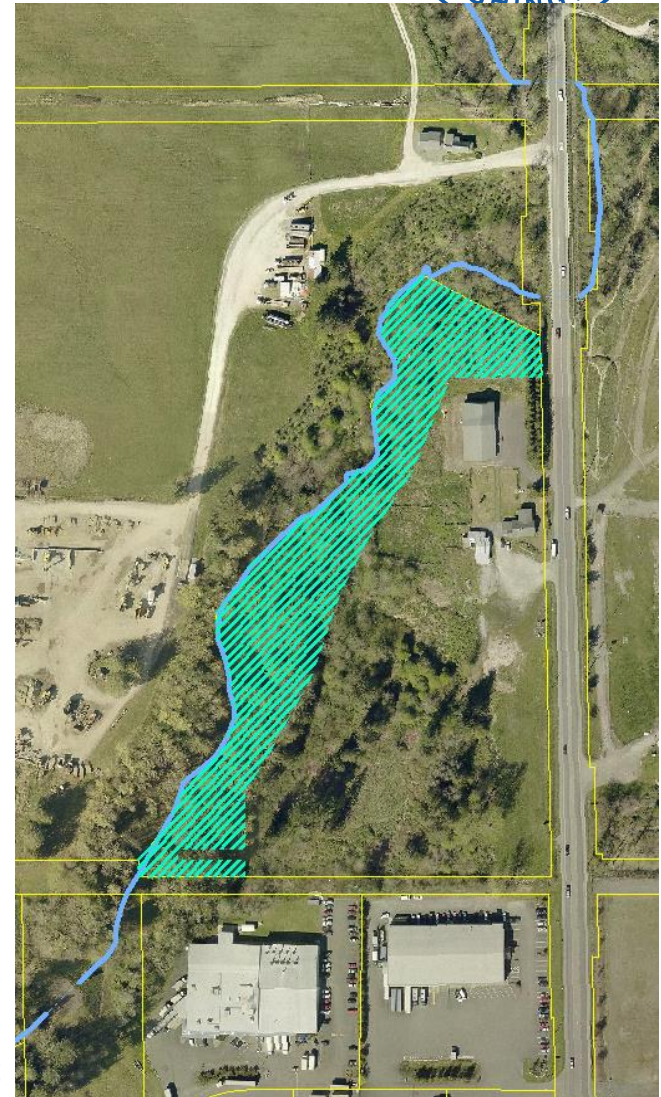
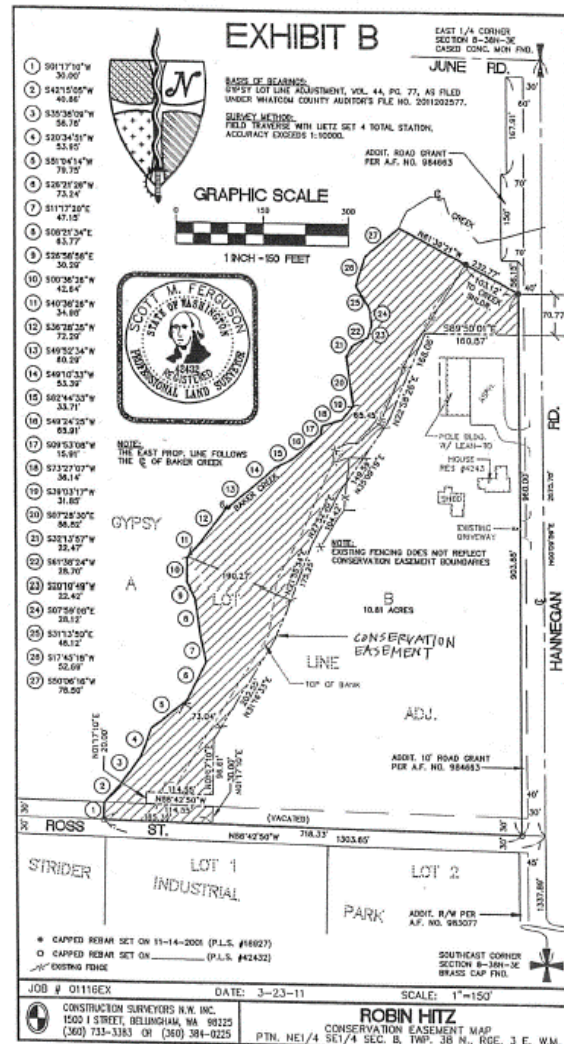
Included advance mitigation (93,562 sf)



# Conservation Easement



Recorded  
before site  
disturbance  
with  
County Auditor



# 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
---------	-------------

---

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





# Funds Released in Stages



First surety  
released with  
“as-built”  
mitigation  
report



# 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 3/11/16 - Received					\$10,254	
	CAP2014-00049		Partial as-built 12/09/14 - Received	11/10/16 - Received	12/31/16 - Due				\$400	
	CAP2014-00052		4/29/15 - Received	6/28/16 - Received 10/21/16 - Received	12/31/17 - Due				\$1,125	
	CAP2014-00072	3/15/15 - Due	4/14/15 - Received	12/31/15 - Received 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 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 (add in specifics from order, mitigation plan, and/or as-built)	Comments or Deviations from the Plan/Permit	Follow-up / Contingency	For Administrative Use
--	---------	---	--	-------------------------	------------------------------

#### On-the-Ground Elements

1.	Grading	<i>(for example, slopes, elevations, topographic features, microtopography, soil treatment)</i>			
2.	Water/ hydroperiod	<i>(for example, water-control structures, specified water regime, wetland hydrologic indicators)</i>			
3.	Planting	<i>(including: presence, numbers, location, spacing, and size of planted or seeded vegetation species or plant communities; plant protectors, irrigation)</i>			
4.	Management/ control of invasive species	<i>(for example, mowing, rolling, spraying, covering with plastic)</i>			
5.	Habitat features	<i>(for example, nest boxes, snags, stumps, LWD, brush piles)</i>			
6.	Required acreage of mitigation	<i>(Does mitigation area appear to be the appropriate size?)</i>			
7.	Other	<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



## **Characterizing Wetland Buffers in Washington State**

September 2017  
Publication No. 17-06-008

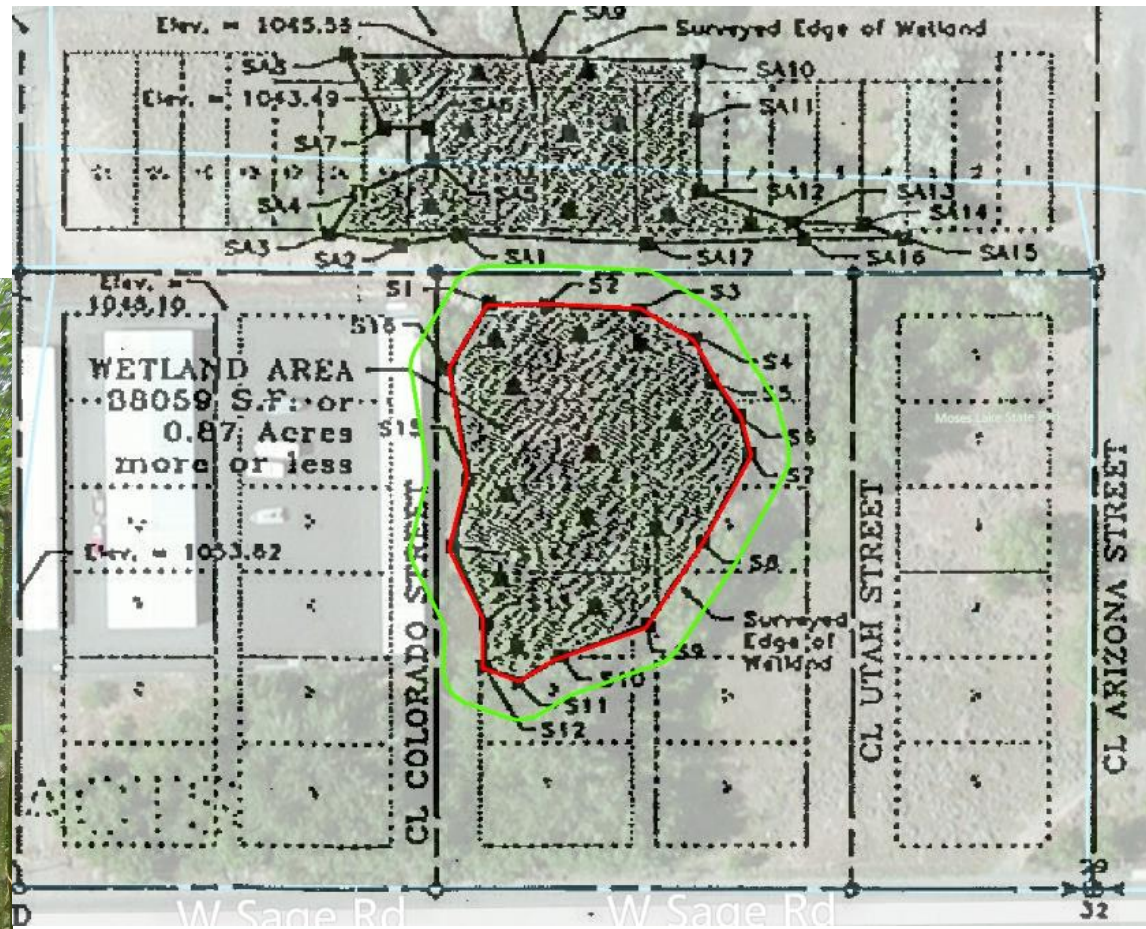
Outlines **steps** for characterizing how well regulations are protecting buffers.

Based on pilot of 10 randomly selected projects from:

- Pierce County
- Tacoma
- Marysville
- Moses Lake



# Review Permits, Assess Sites



# 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 (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 (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?

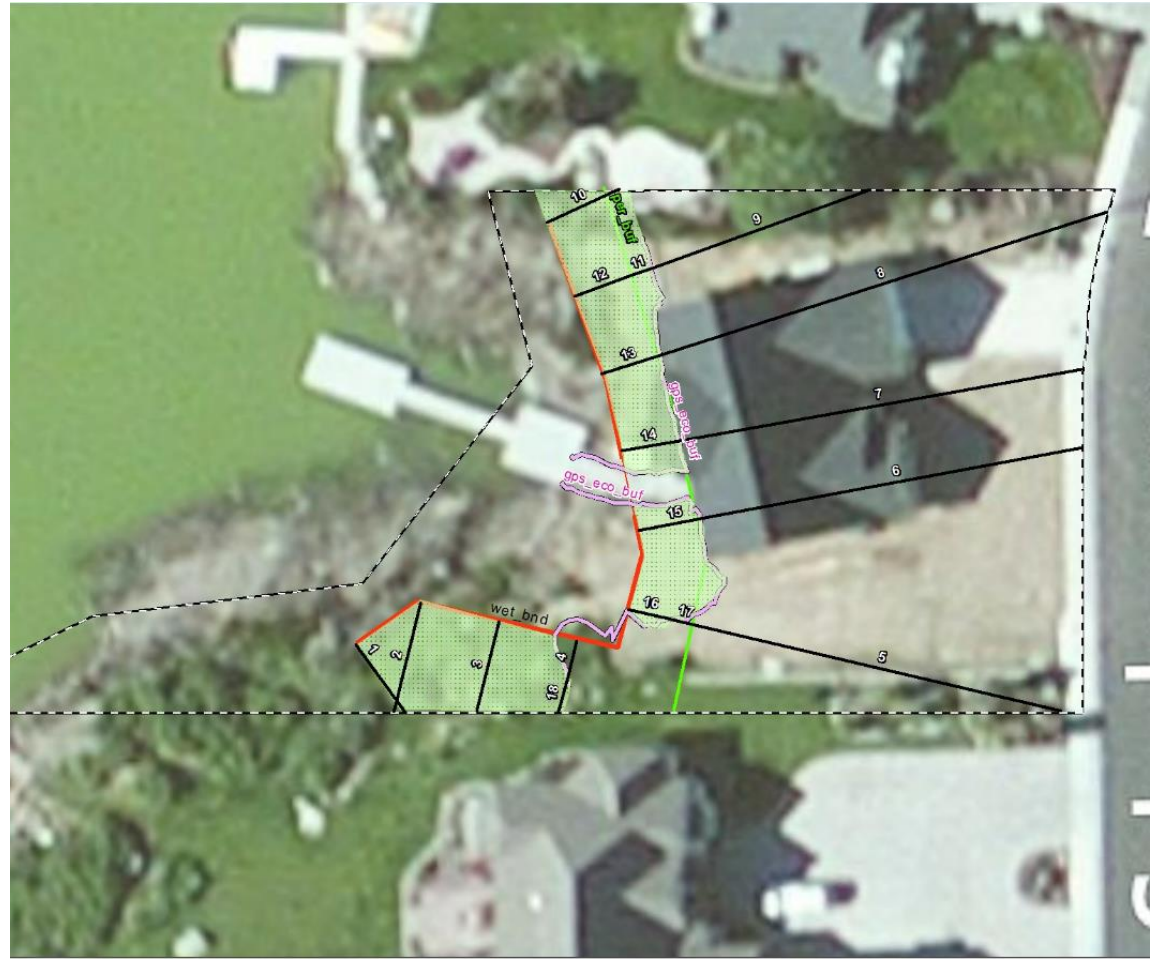
Response	Percentage
Yes	65%
No	25%
Don't know	10%

## Width of 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 required \_\_\_\_\_

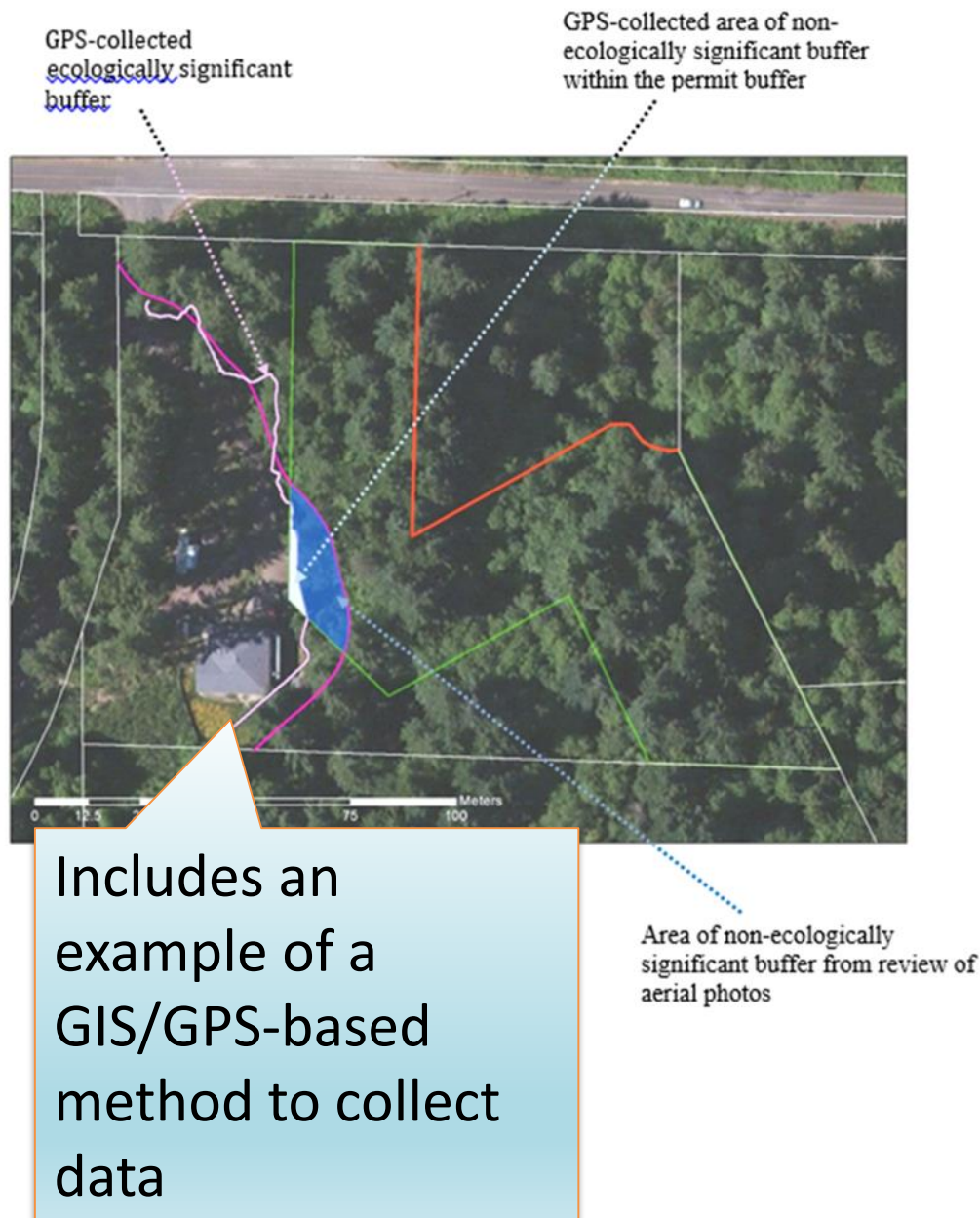
Enhanced \_\_\_\_\_

Significant \_\_\_\_\_

Feasible \_\_\_\_\_

Other \_\_\_\_\_

Includes samples of forms used in these steps.



# New: Guide for Using Ecology Air Photos



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

## Washington Oblique Aerial Photography



September 2017  
Publication no. 17-06-026

1997



2002



2006



2016



## Shoreline Photo Viewer

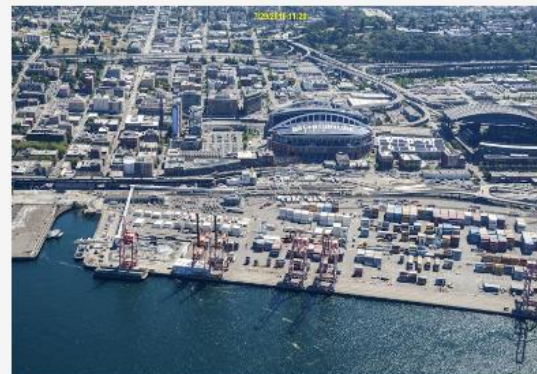
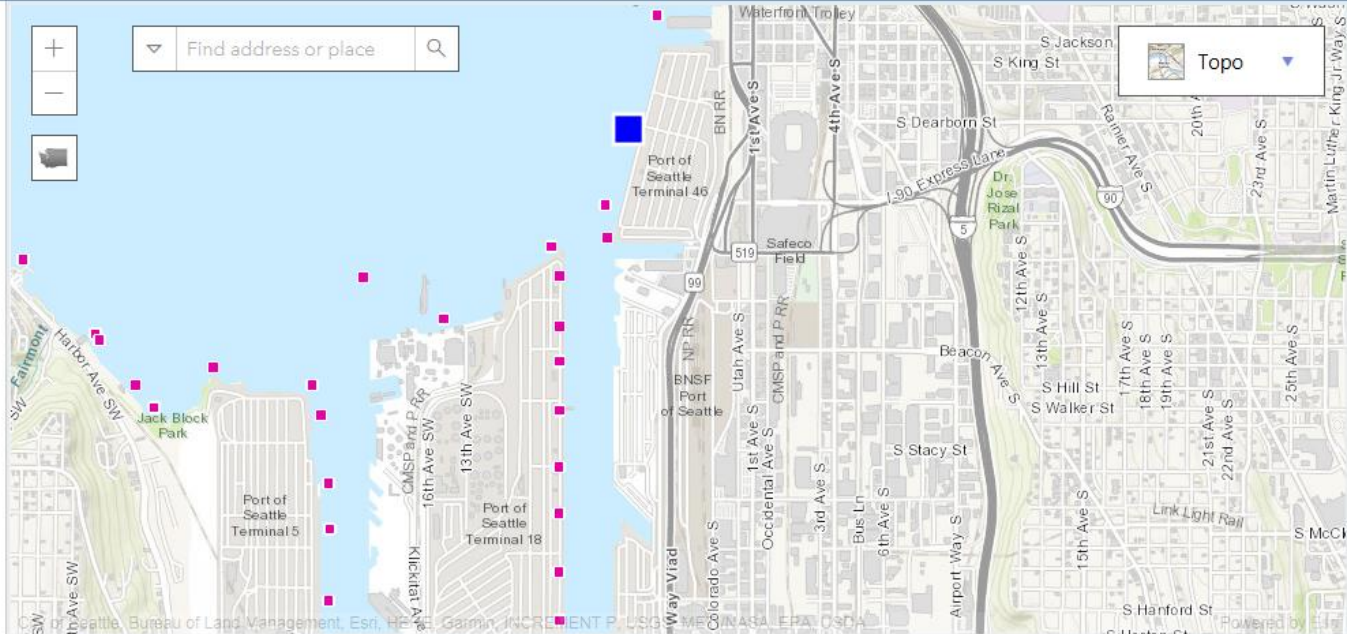
Choose a photo series:

- ☒ 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 ☐

