Case Studies and Resources

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April 11, 2018
Vancouver Workshop

Case Studies of Monitoring Programs

Retroactive evaluations:

- San Juan County Initiative
- Jefferson County
- WDFW Hydraulic Project Approvals

Permit records, site visits

- Snohomish County
- Thurston County

Remote sensing component

Ongoing compliance monitoring

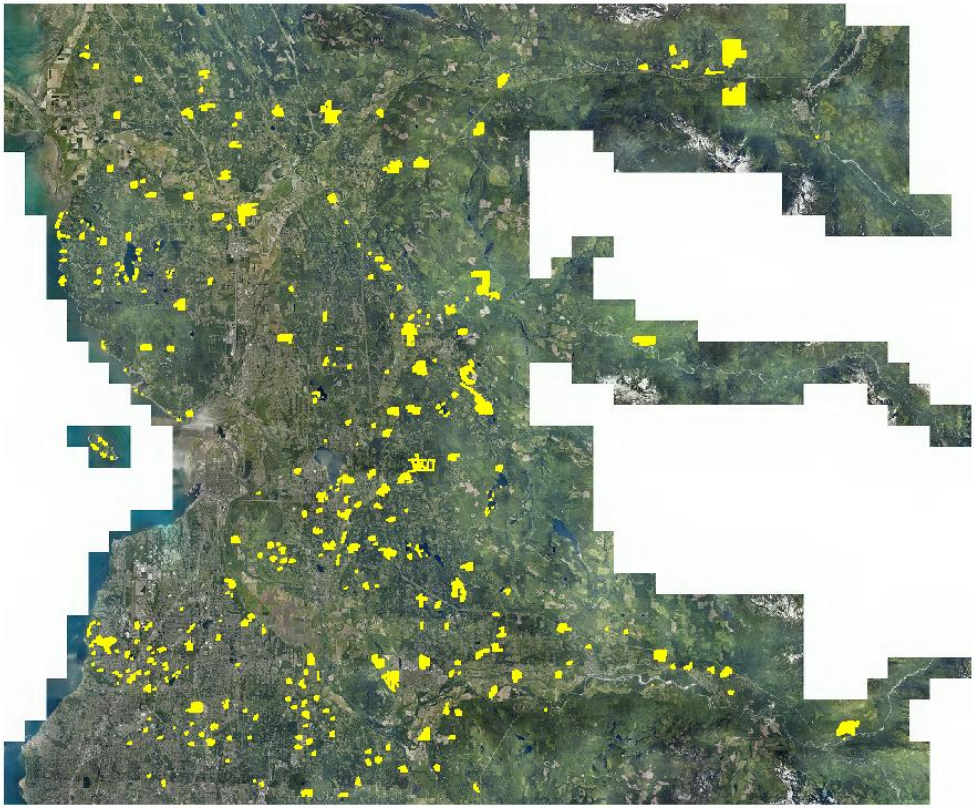
- City of Kirkland
- Ecology Wetland Regulatory Effectiveness
- US Army Corps Mitigation Compliance

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?

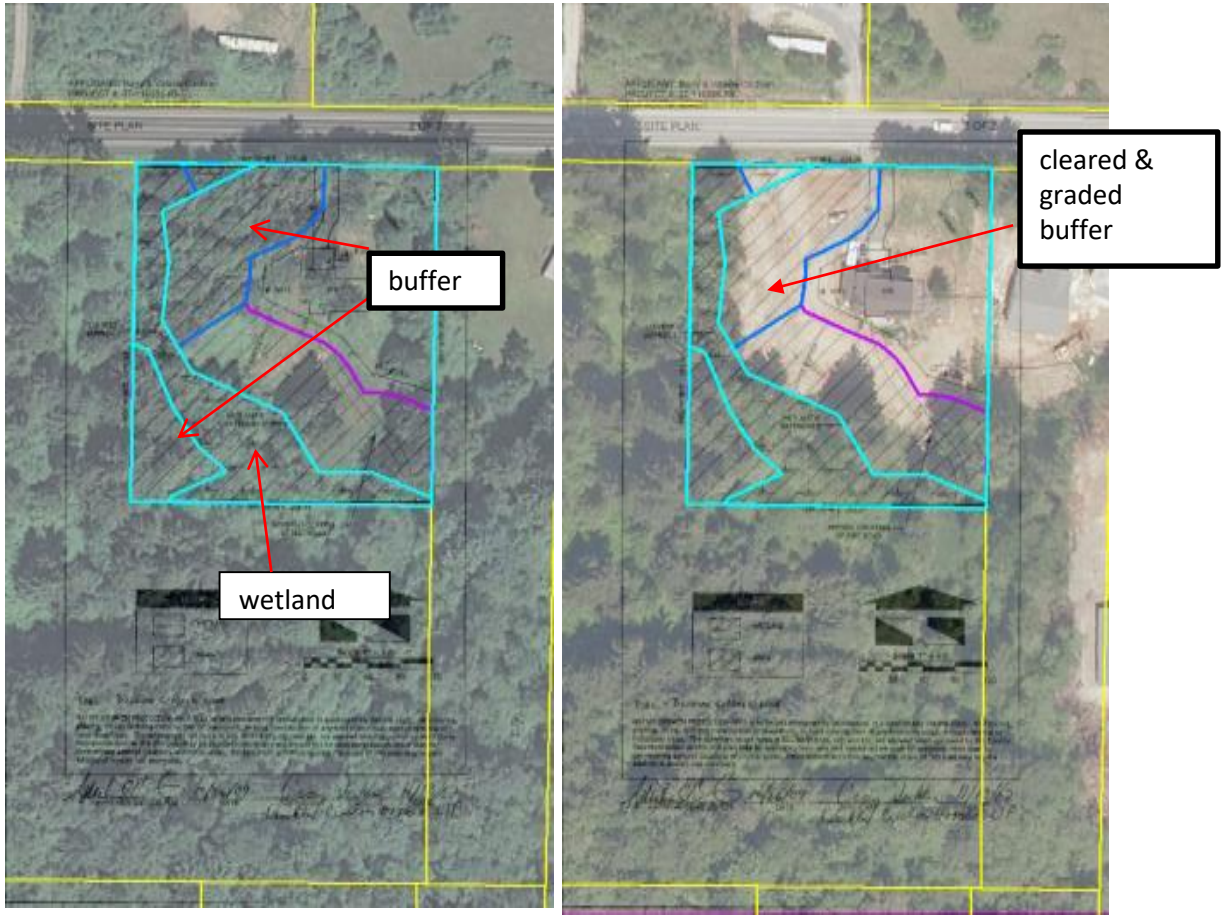
Critical Areas Site Plans (CASP) Parcel Analysis



- 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



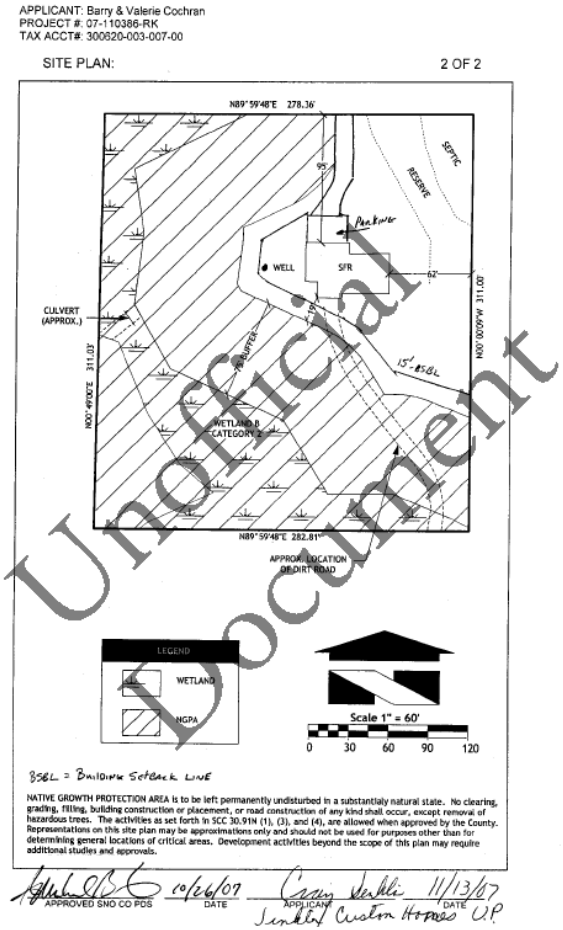
2007

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



Unofficial Document

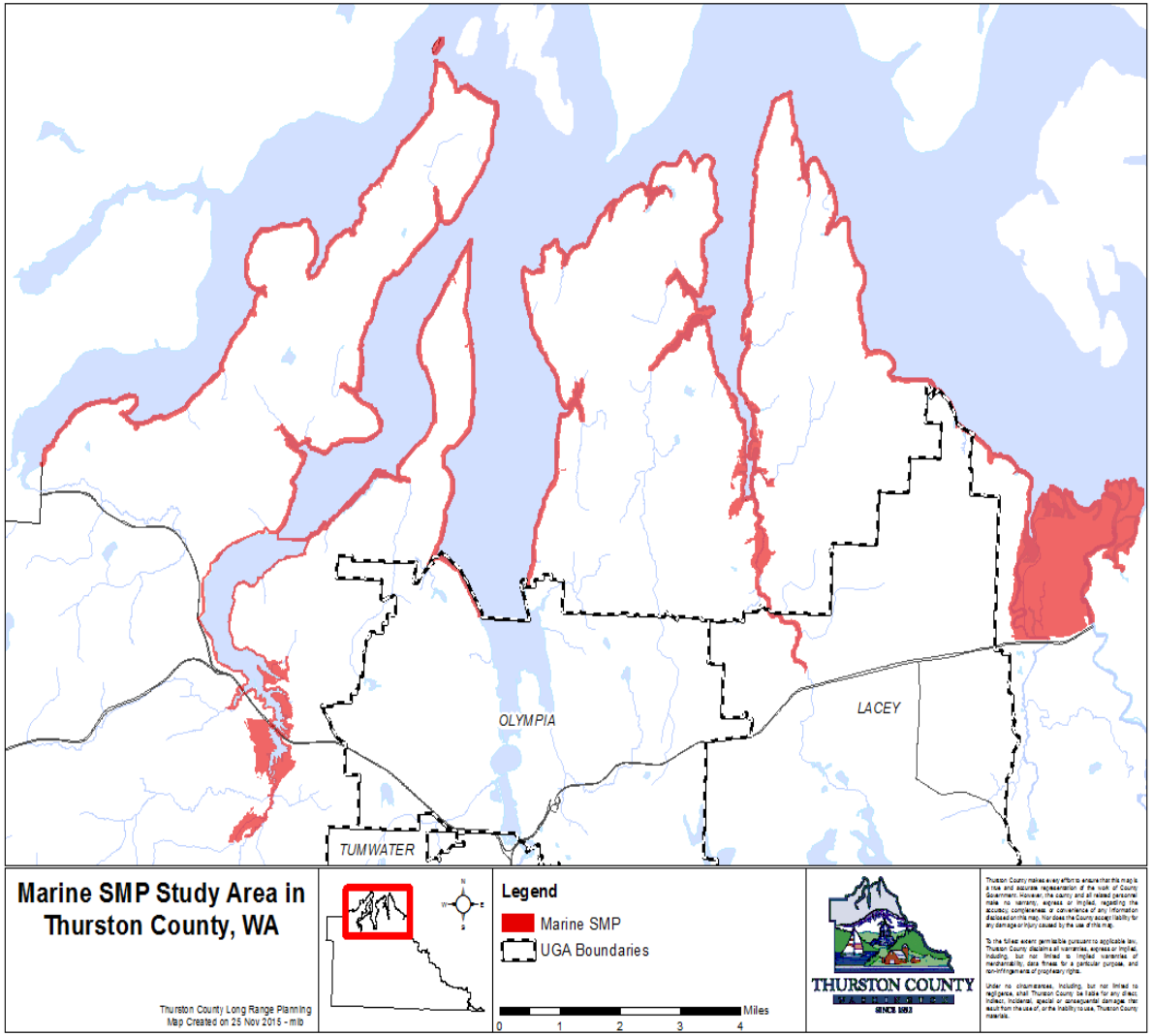
Recommendations

- 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	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

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	

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

Unpermitted Events

Tedious and difficult

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

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 CONCENSUS

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		
XXXX Lake Washington Blvd	BLD10-00500	DOE	CPG												
XXX Lake Ave West	BLD10-00314	SMITH	CPG	0		0	0	0	0	0	0	0	0		
XXXX Lake Ave West	BLD11-00181	JONES	CPG		1	3	500	300	809	720	280	0	65		
XXXXX Holmes Point Road	BLD11-00431	JOHNSON	CPG	0		7	600	400	2280	0	0	0	0		
XXXXX Champagne Pt Rd SE	BLD11-00534	TAYLOR	CPG	0		3	365	170	950	535	0	0	0		
XXXX NE 154th St	BLD11-00351	JACKSON	CPG												
XXXX SW 166th	BLD11-00350,	JAMES	CPG												
XXXXX Champagne Pt Rd NW	MIS11-00006	DAWES	CPG	0		0	0	0	0	0	0	0	0		
XXX Lake Ave West	SHR11-00004	BAILEY	CPG												
XXX Lake Ave West	BLD11-00109	BRONSON	CPG	0		0	0	0	0	0	0	0	0		
XXXXX Holmes Point Road	1/10/2012	GLASS	CPG												
XXX Lake Ave West	BLD11-00462	SIMS	STL		6	6	90	632	400	990	0	0	0	Y	N
XXXX Rose Point Lane	BLD11-00689	RIVERA	CPG												
Marina Park Pier	exemption	City	TJS												
0	0	0	0

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

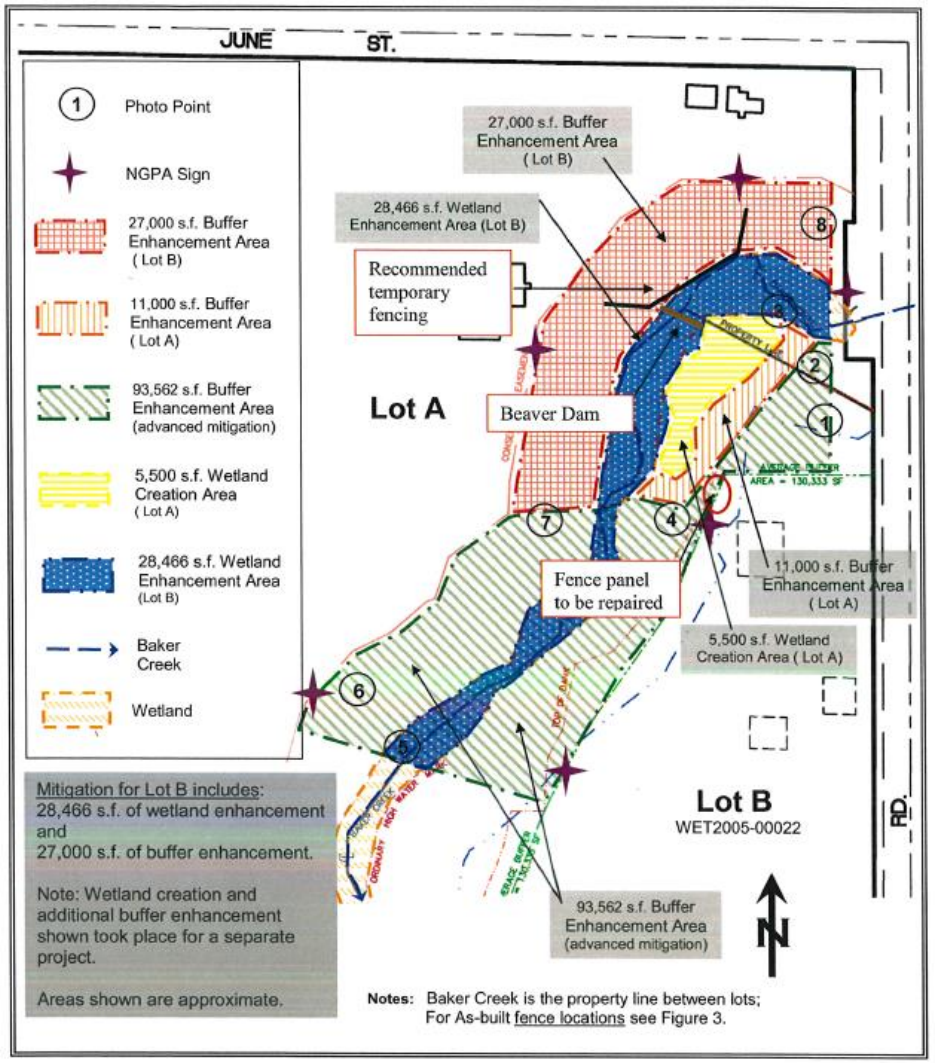
Keys: adequate plan, conservation easement, financial surety, performance standards

Mitigation Plan

Compensation for fill with:

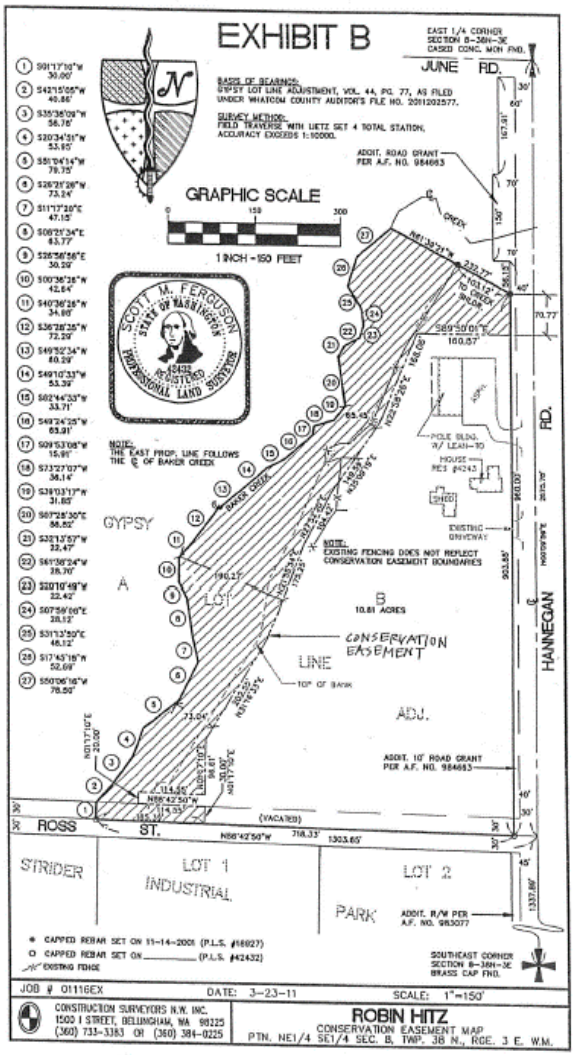
- Newly created wetland (5,500 sf)
- Wetland enhancement (28,466 sf)
- Buffer enhancement (38,000 sf)

Included advance mitigation (93, 562 sf)



Conservation Easement

Recorded before site disturbance with County Auditor

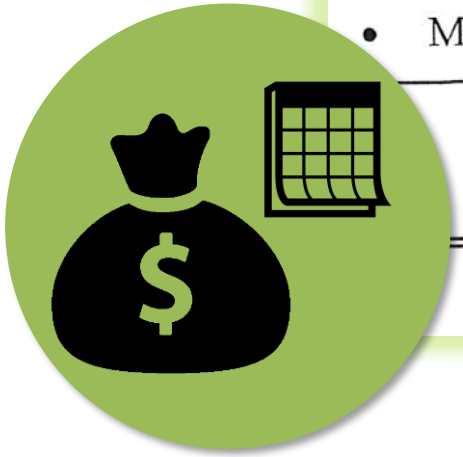


Financial Surety Requirement

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
	Total Bond:	$ 8,767.50



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		12/31/17 - Due					$10,254	
		building permits		3/11/16 - Received						
	CAP2014-00049		Partial as-built		12/31/16 - Due				$400	
			12/09/14 - Received	11/10/16 - Received						
	CAP2014-00052			6/28/16 - Received	12/31/17 - Due				$1,125	
			4/29/15 - Received	10/21/16 - Received						
	CAP2014-00072	3/15/15 - Due		12/31/15 - Received	12/31/17 - Due				$5,850	
			4/14/15 - Received	5/16/17 - Received						
	CAP2015-00001				12/31/18 - Due				$10,200	
				10/10/17 - Received						
	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	Due after planting						
			Sep-2015	for Phase II						
	CAP2015-00020			12/31/17 - Due						
			3/22/16 - Received	5/15/17 - Received						
	CAP2015-00049			10/19/16 - Received	12/31/17--Due				$1,800	
	CAP2015-5004		3/31/16 - Due							
			Onsite Mitigation	300 additonal plants to be installed by 2/28/18>release surety					$257,505	
	CAP2015-5007		12/16/16 - Received	11/28/17 - Received	12/31/2018					

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)*

Review reports

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

Formal follow-up letters

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

Ecology's field checklist included in Commerce Guidebook

Wetlands Program Benefits

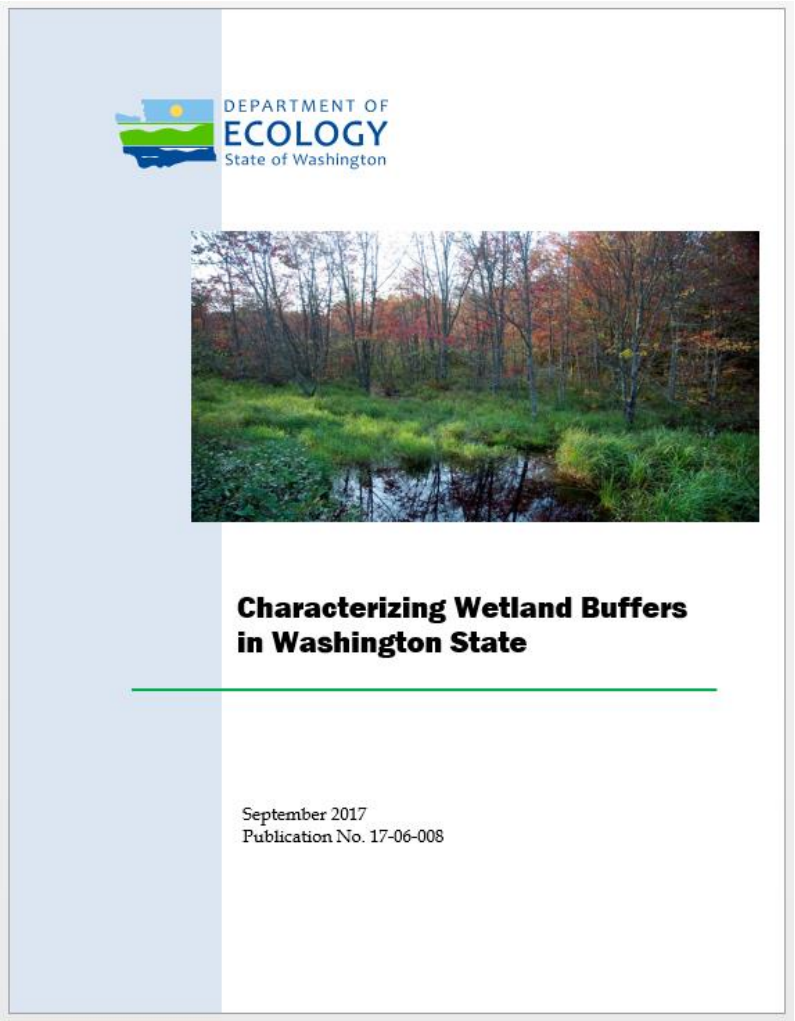
Increased mitigation success: work with the applicant to address issues that would result in site failure.

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


DEPARTMENT OF
ECOLOGY
State of Washington

Characterizing Wetland Buffers in Washington State

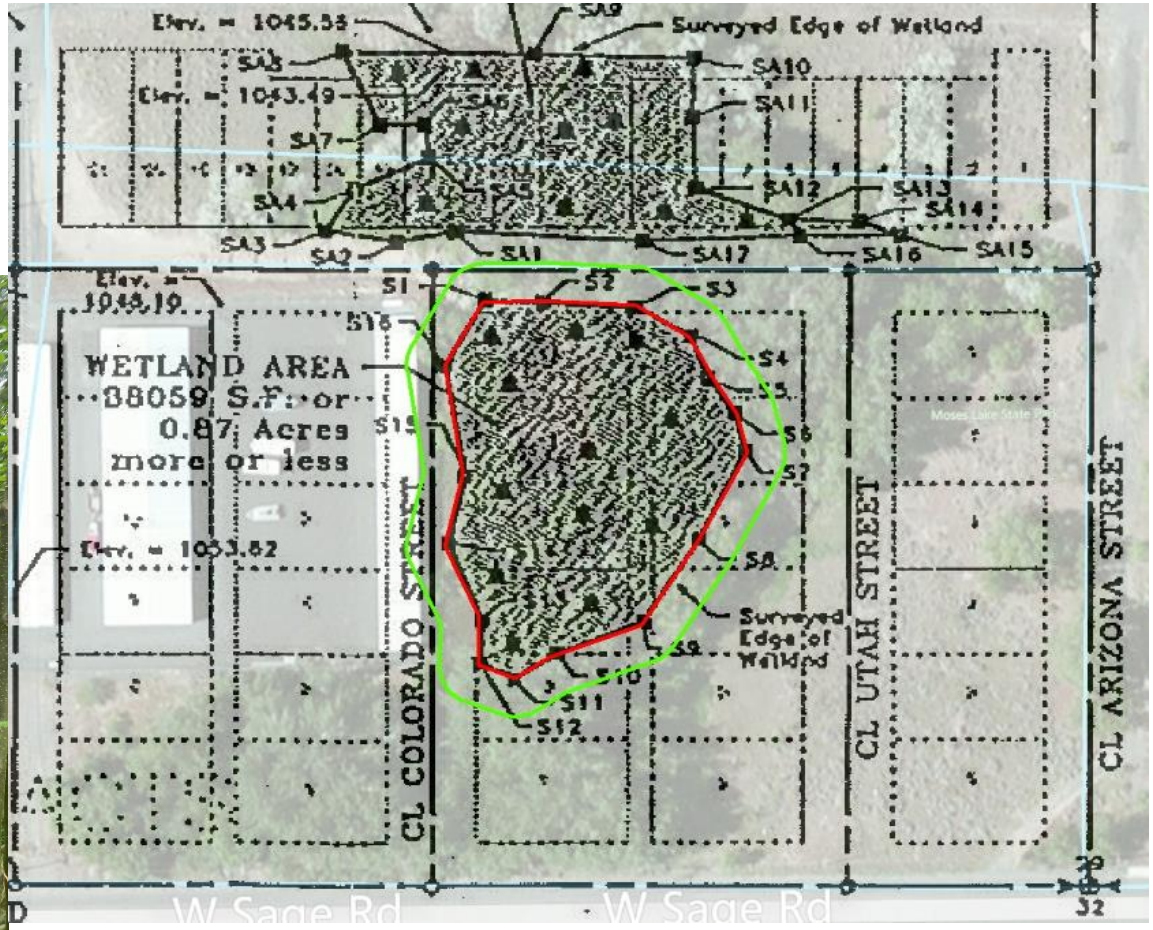
September 2017
Publication No. 17-06-008

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

	Buffer width (in feet) based on habitat score			
Wetland Category	**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?

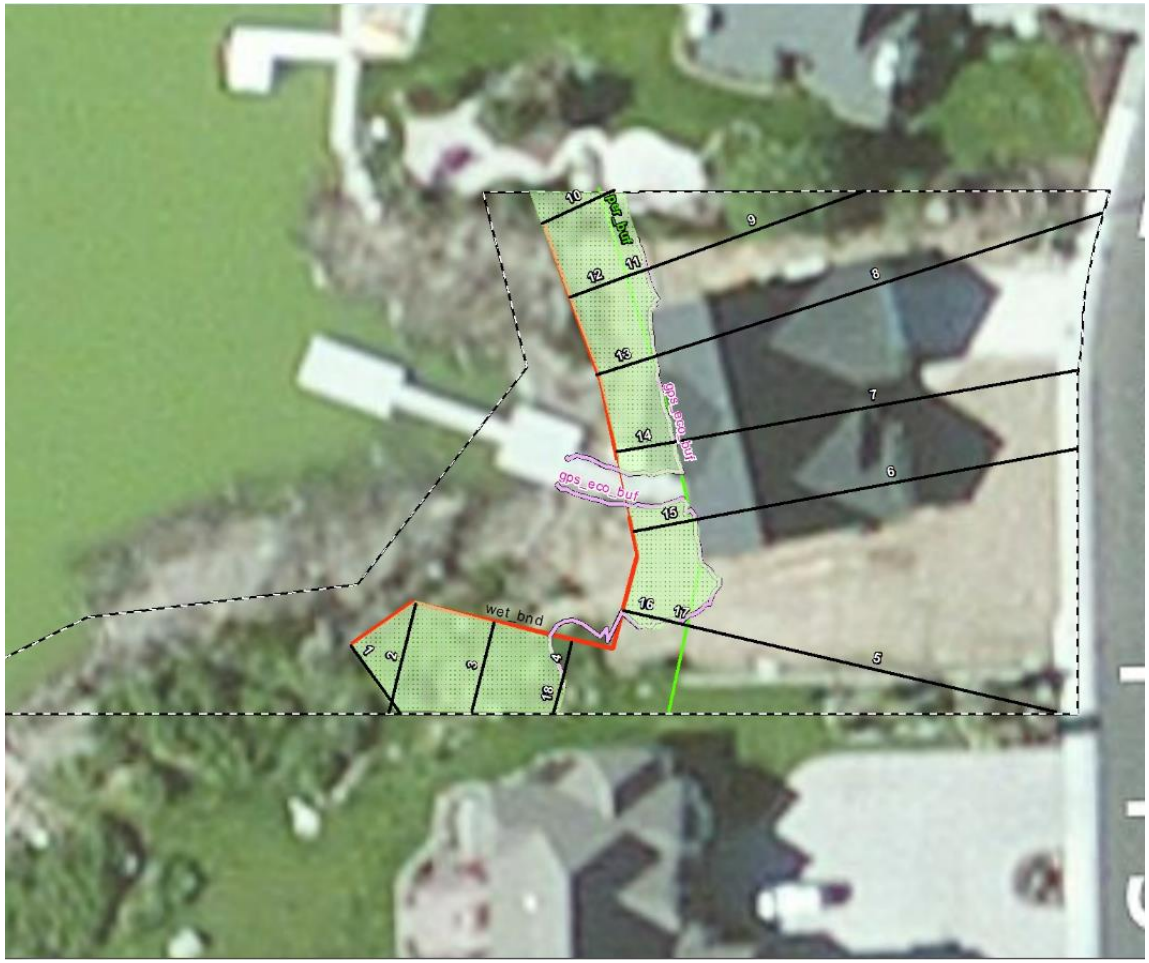
Characterize Ecological Condition of Buffer

% 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 chan s to buffer width

Averaging _____ how much _____

Reduction if enh _____ how much _____

Increases for tions _____ what conditions _____

Ot _____

Other req

En nity, removal of non-

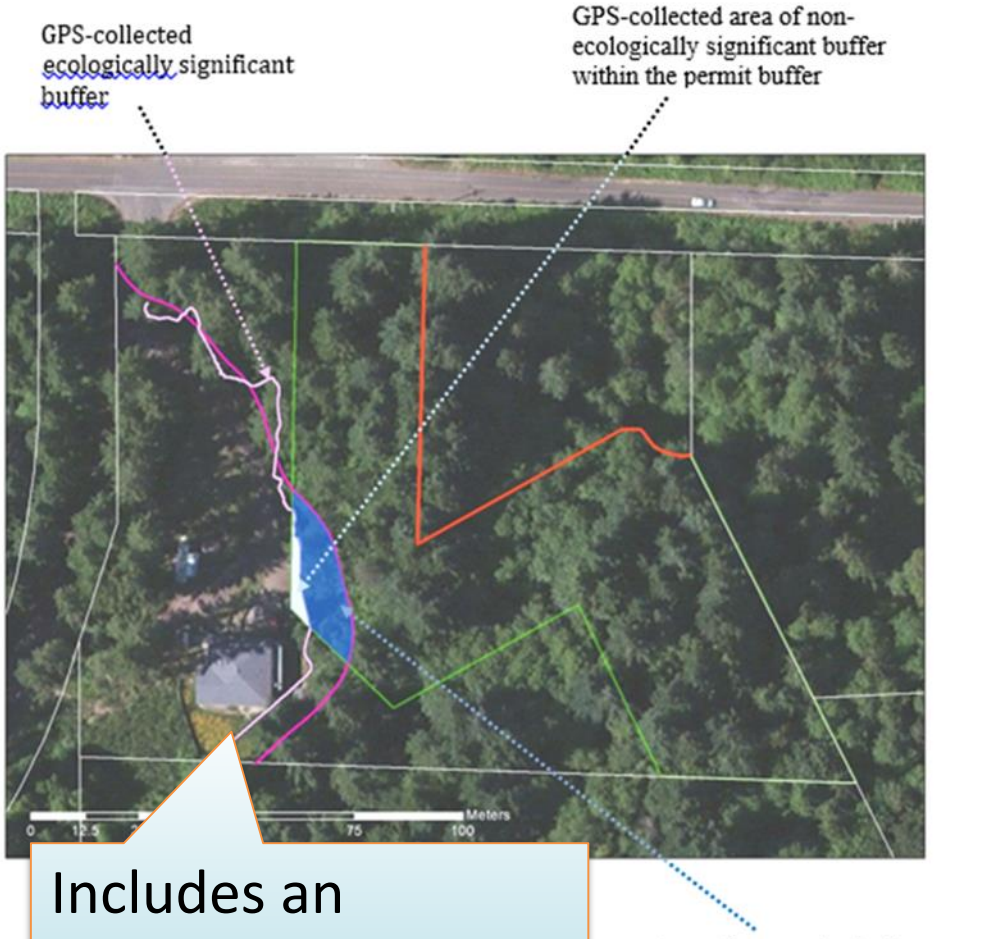
na _____

Sig _____

Fe _____

Ot _____

Includes samples of forms used in these steps.

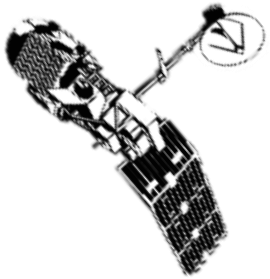


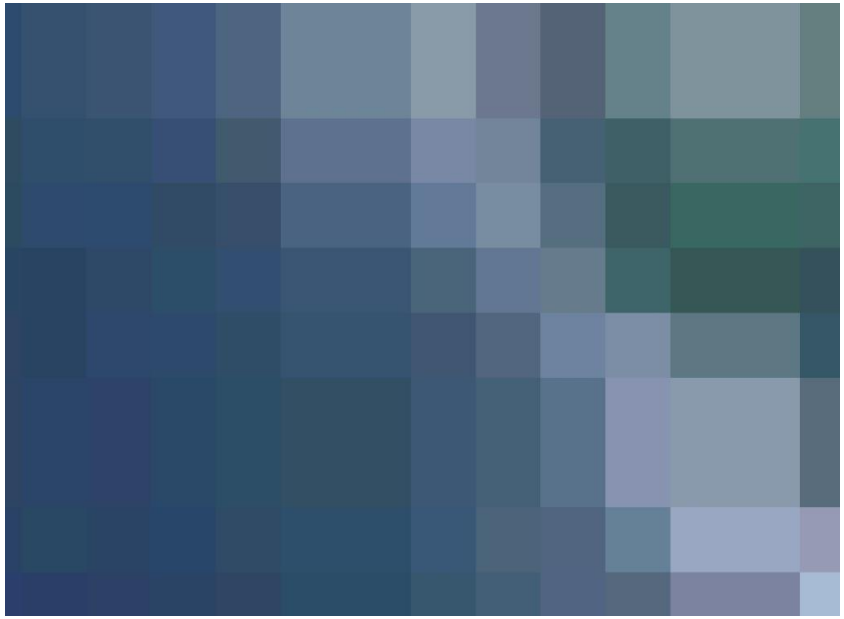
Includes an example of a GIS/GPS-based method to collect data

WDFW's High Resolution Change Detection

- Decision support tool
  - Decision = Is there a need to modify how we protect critical areas?
- Helps answer key questions
  - How much change is happening in our critical areas?
  - What are the trends in that change?
- Not a silver bullet
  - Change = visible (tree removal, addition of impervious surfaces); not gains
  - Narrows the haystack to needles but additional analysis is necessary
- WDFW's labor costs: ~$15,000/County/time period

HRCD: New Tool Built on New Technology





WDFW's High Resolution Change Detection

- Complex processing; simple output
  - Where trees are lost
  - Where roads and buildings are built
  - Real person verifies each change
- Tracks changes down to 1/20 ac
- Includes what caused the change
  - Development, forestry, tree removal, stream meander, etc.

- www.pshrcd.com