RESTORING FAIR SITES: STRATEGIES FOR RESTORATION

King County
Department of
Natural Resources and Parks
Water and Land Resources Division

Presented by Kate Macneale

Stakeholder Workshop, Seattle

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Recommending restoration actions

- Desktop reconnaissance & initial outreach
- Best professional judgment
- More outreach

Desktop reconnaissance & outreach

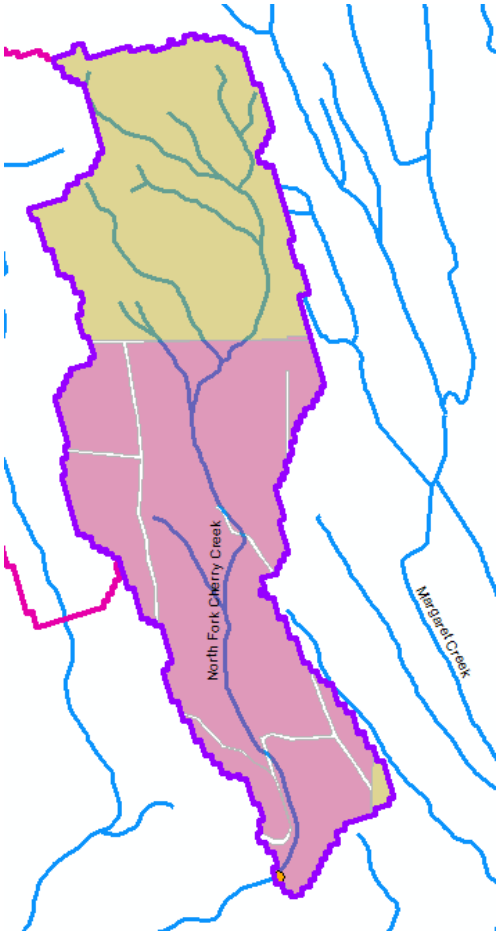
- Historic and current stressors?
- Risk of future impacts?
- What actions could alleviate or remove stressors?

Desktop reconnaissance & outreach

- Historic and current stressors?
  - Land use – CCAP data
  - 2006 and 2011 orthophotos
  - Age of homes, density of developments
  - PSWC process-specific analysis
  - People familiar with site and basin
  - Natural limitations

Desktop reconnaissance & outreach

- Risk of future impacts?
  - Zoning
  - 2011 orthophotos and Google maps
  - Zillow
  - People familiar with site and basin



Recommendations

- What actions could alleviate or remove stressors?
  - In-channel restoration
  - Riparian restoration
  - Agricultural best management practices (BMPs)
  - Forest BMPs
  - Mining BMPs
  - Stormwater BMPs
  - Programmatic BMPs

Recommendations

- What actions could alleviate or remove stressors?
  - In-channel restoration

In-stream	add wood
	add substrate
	enhance sinuosity
	replace culverts
	stabilize stream banks

Recommendations

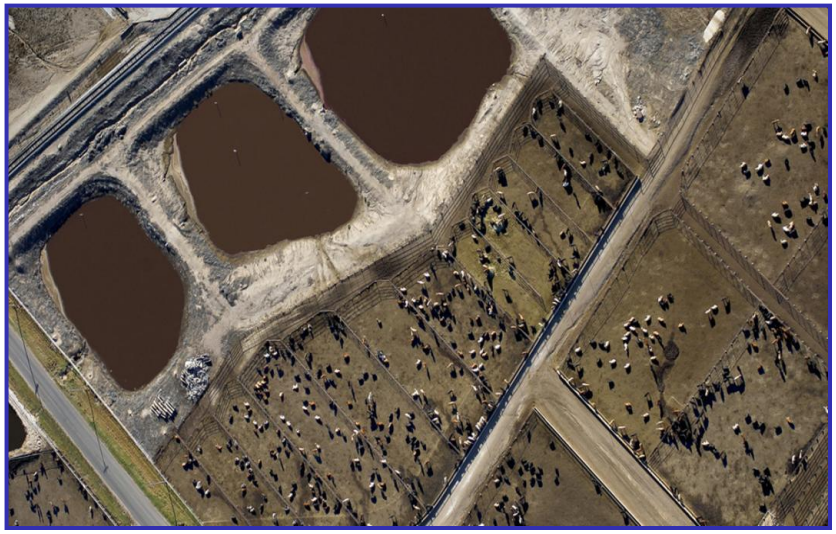
- What actions could alleviate or remove stressors?
  - Riparian restoration

Riparian	stabilize slopes
	plant vegetation, extend buffer

Recommendations

- What actions could alleviate or remove stressors?
  - Agricultural best management practices (BMPs)

Agricultural BMPs	exclude livestock
	manage waste
	manage soil loss



Recommendations

- What actions could alleviate or remove stressors?
  - Forest BMPs

Forest BMPs	road maintenance
	minimize clearcutting
	replant

Recommendations

- What actions could alleviate or remove stressors?
  - Mining BMPs

Mining BMPs	mining BMPs

Recommendations

- What actions could alleviate or remove stressors?
  - Stormwater BMPs

Stormwater BMPs	flow controls
	treatment
	maintain storage and treatment facilities
	street sweeping

Recommendations

- What actions could alleviate or remove stressors?
  - Programmatic BMPs

Programmatic BMPs	limit pesticide use
	outreach and education campaign
	create incentives to follow BMPs
	purchase and protect property
	seed invertebrates

Recommendations

Likelihood action would help restore the basin:

not applicable	unlikely	possibly	likely	highly likely
0	1	2	3	4

Recommendations

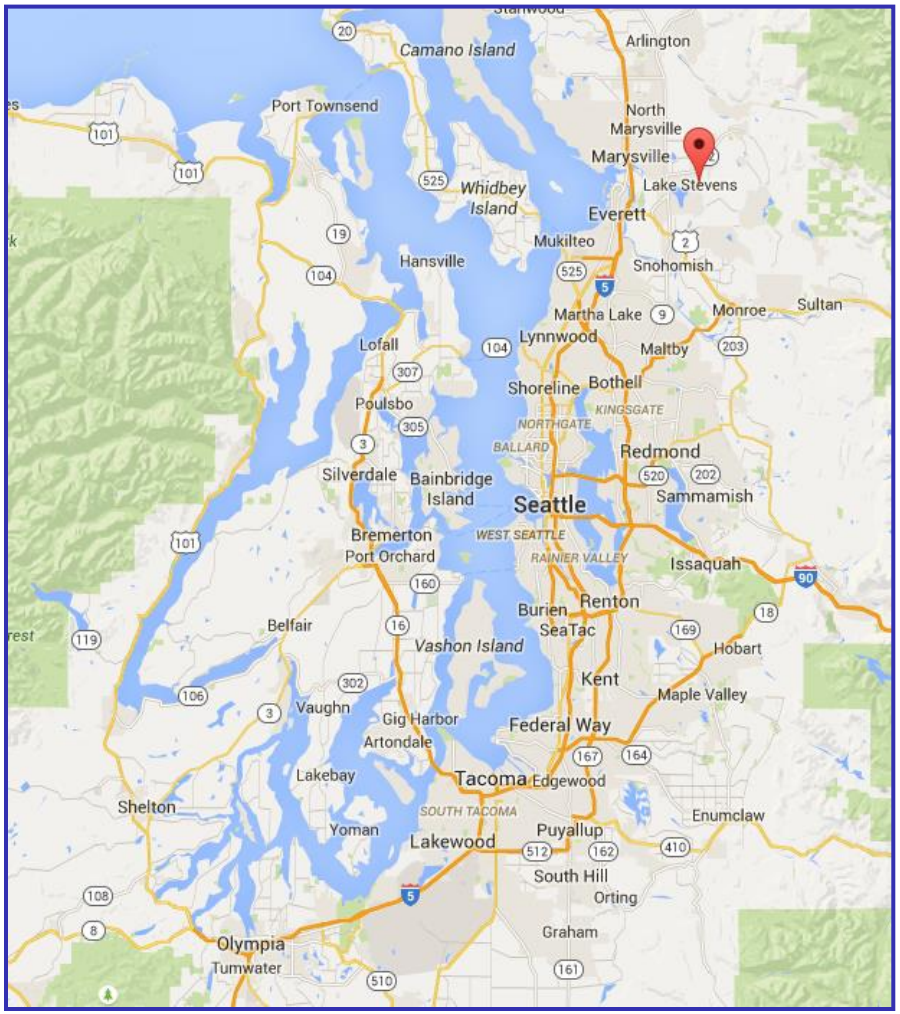
Likelihood action would help restore the basin:

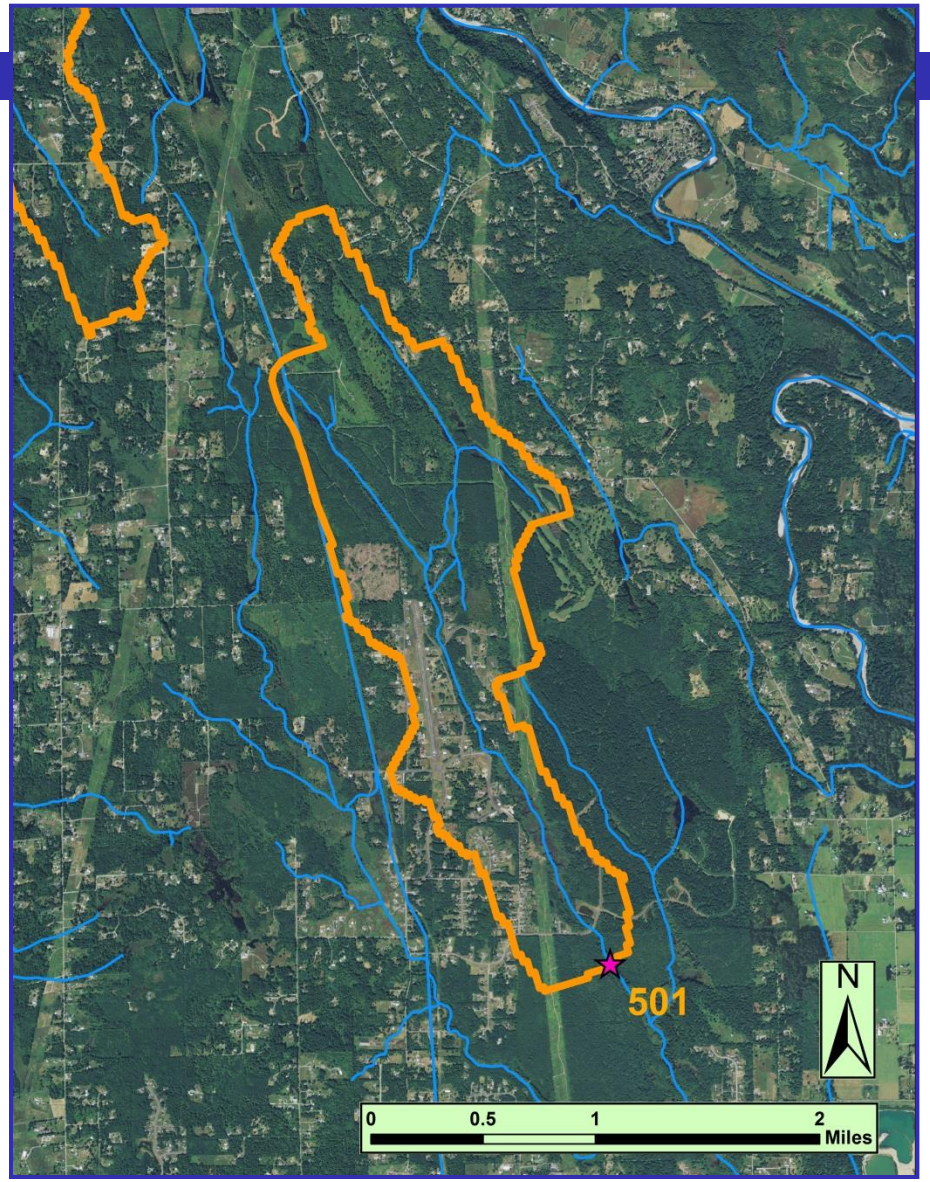
not applicable	unlikely	possibly	likely	highly likely
0	1	2	3	4

more confident less confident more confident

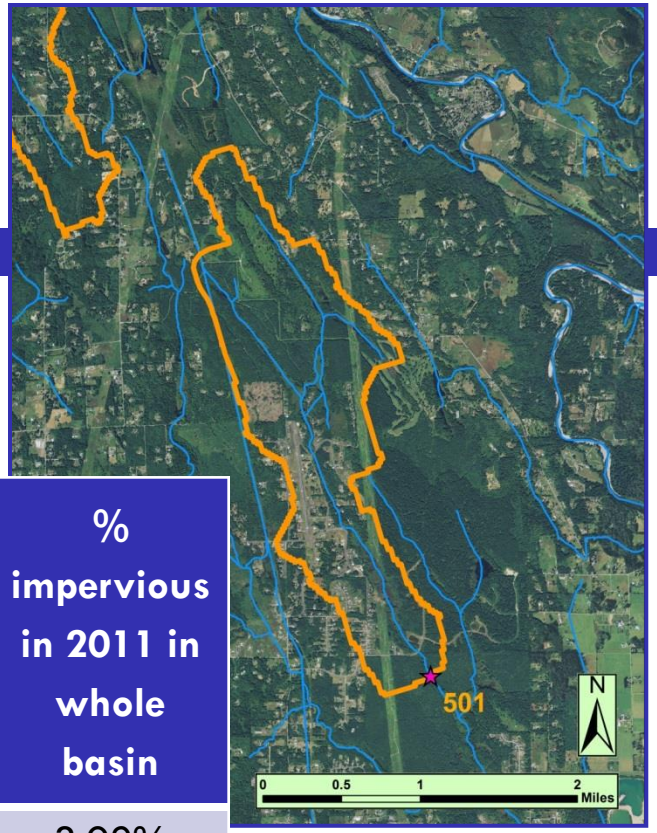
Example 1: Little Pilchuck Creek (Snohomish)

(CAR3A, 501)





Example 1: Little Pilchuck Creek

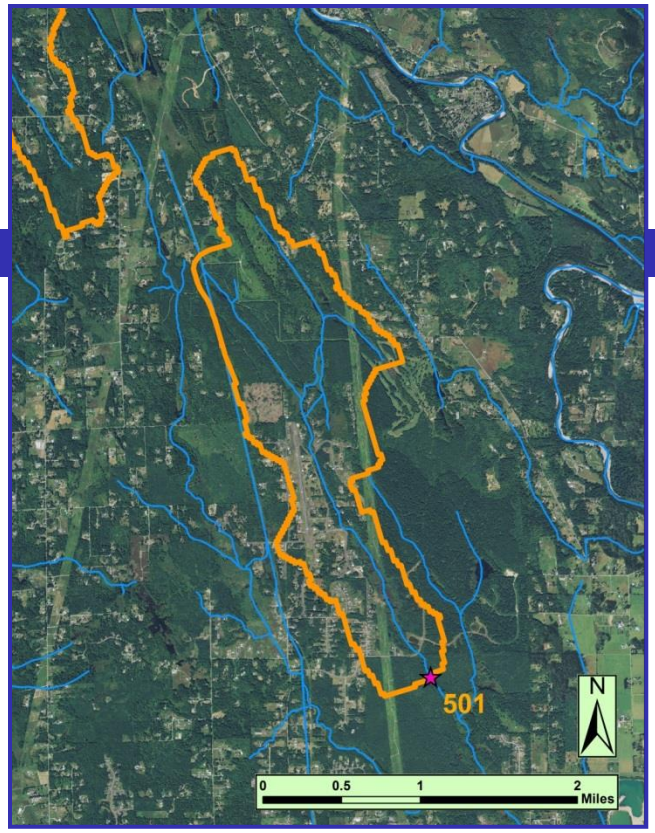


Basin area (acres)	% urban within basin 1-km of site	% urban in whole basin	% pasture in whole basin	% natural in 90-m buffer in whole basin	% impervious in 2011 in whole basin
1406.5	11.41%	11.89%	0.52%	93.43%	3.92%

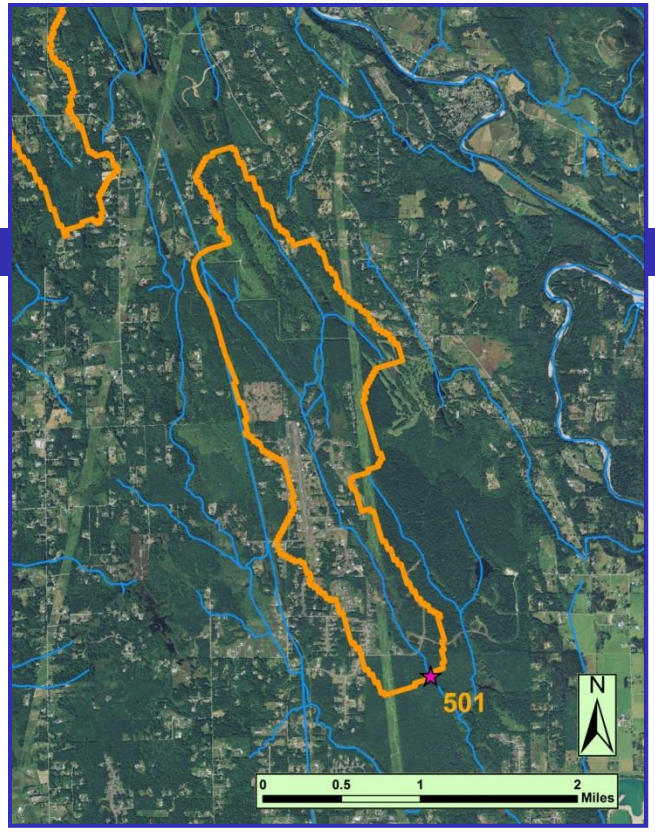
Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	1999-2012 Median
B-IBI										32	30	28					30

Example 1: Little Pilchuck Creek

Restoration and Management Actions		Likelihood action would help restore the basin
In-stream	add wood	2
	add substrate	2
	enhance sinuosity	2
	replace culverts	2
	stabilize stream banks	2
Riparian	stabilize slopes	2
	plant vegetation, extend buffer	3
Agricultural BMPs	exclude livestock	0
	manage waste	0
	manage soil loss	0
Forest BMPs	road maintenance	0
	minimize clearcutting	0
	replant	0
Mining BMPs	mining BMPs	0
Stormwater BMPs	flow controls	4
	treatment	4
	maintain storage and treatment facilities	4
	street sweeping	1
Programmatic BMPs	limit pesticide use	2
	outreach and education campaign	3
	create incentives to follow BMPs	3
	purchase and protect property	3
	seed invertebrates	3
Is the basin at risk of further degradation?		4



Example 1: Little Pilchuck Creel



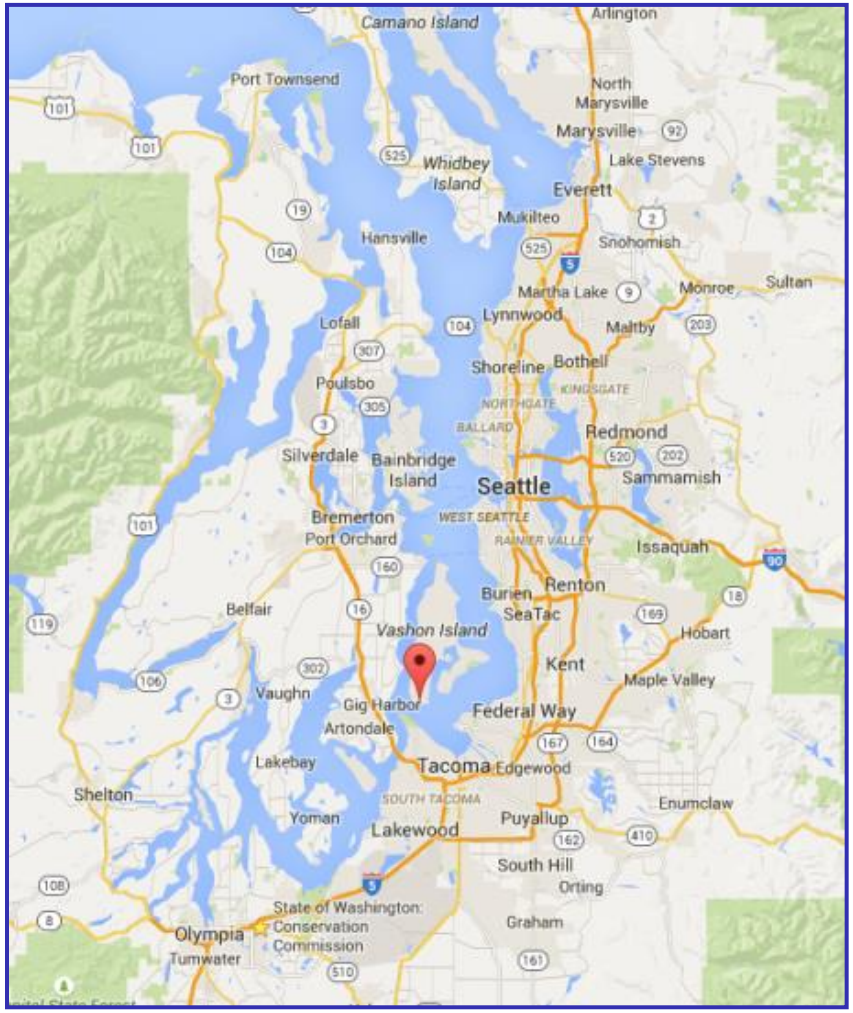
<u>Key restoration or management action(s) recommended:</u>

- stormwater BMPs, homes and airport
- widen buffer where possible
- outreach

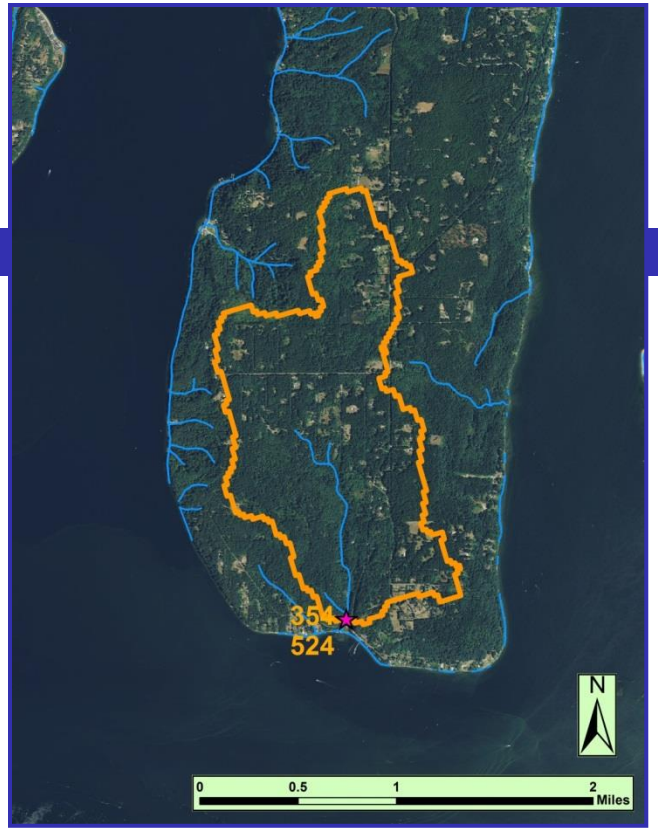
✓ More development likely

Example 2: Tahlequah Creek

(E2887, 354 and 524)



Example 2: Tahlequah Creek

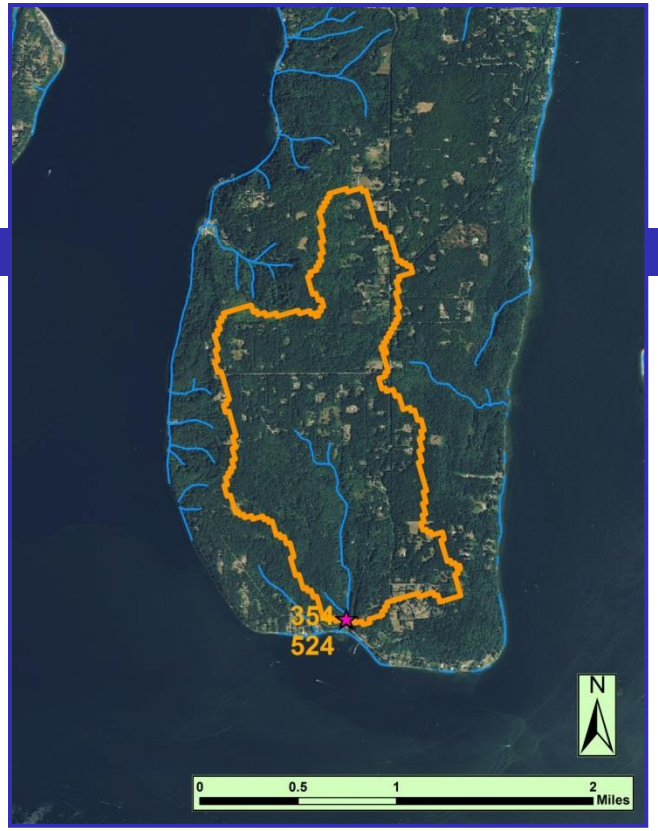


Basin area (acres)	% urban within basin 1-km of site	% urban in whole basin	% pasture in whole basin	% natural in 90-m buffer in whole basin	% impervious in 2011 in whole basin
984.1	3.35%	4.93%	0.05%	99.26%	2.37%

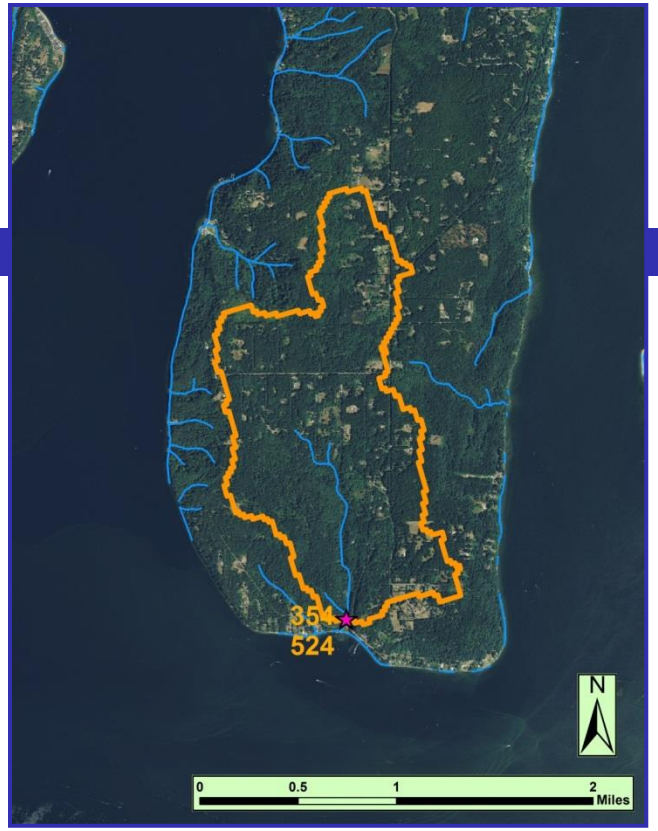
Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	1999-2012 Median
B-IBI						22	24	32	34	32	28	24					28

Example 2: Tahlequah Creek

Restoration and Management Actions		Likelihood action would help restore the basin
In-stream	add wood	3
	add substrate	3
	enhance sinuosity	3
	replace culverts	2
	stabilize stream banks	2
Riparian	stabilize slopes	2
	plant vegetation, extend buffer	1
Agricultural BMPs	exclude livestock	2
	manage waste	0
	manage soil loss	0
Forest BMPs	road maintenance	0
	minimize clearcutting	0
	replant	0
Mining BMPs	mining BMPs	0
Stormwater BMPs	flow controls	3
	treatment	3
	maintain storage and treatment facilities	2
	street sweeping	2
Programmatic BMPs	limit pesticide use	2
	outreach and education campaign	2
	create incentives to follow BMPs	2
	purchase and protect property	2
	seed invertebrates	4
Is the basin at risk of further degradation?		4



Example 2: Tahlequah Creek



<u>Key restoration or management action(s) recommended:</u>

- Invertebrate seeding
- Possibly stormwater BMPs
- Possibly in-channel restoration

✓ Local support for restoration

Take home impressions

Actions recommended most:

protect what is there (zoning indicates basin at further risk)	200
flow controls (stormwater BMPs)	173
treatment (stormwater BMPs)	172
outreach and education campaign	157
maintain storage and treatment facilities	155
plant vegetation, extend buffer	150
create incentives to follow BMPs	148
limit pesticide use	137
seed invertebrates	137
add wood	130
add substrate	121
enhance sinuosity	120

Values are the sum of the 0-4 scores across the 54 fair basins

Take home impressions

- Protecting intact forest, buffers, in-channel habitat from further impacts is critical
- Basins with pre-1990 development would likely benefit from stormwater BMPs
- Many "fair" basins zoned primarily for rural residential, but have a range of potential stressors
- Basins with fewer identified stressors likely easier to fix
- Tracking effectiveness of restoration actions and BMPs will be critical