

Wetlands, Lakes, Streams, and Upland Habitats

BAS Sources Used:

1. Previous BAS files from San Juan CD&P (~ 10% of total)
2. Island County BAS (~ 15% of total)
3. Online Searches: Google Scholar etc. (70% of total)
4. Recommended by Public (5% of total)

Results:

Identified ~ 1500 potentially-relevant documents

480 were actually read and used

I did read all files sent to me privately by CSA, CAPR, and S. Neugebauer

Priorities:

San Juans > Pacific Northwest > temperate N. America > other

1. Peer-reviewed publications in professional journals that included statistical analysis of data.
2. Non peer-reviewed reports with data (not just opinion).
3. Peer-reviewed synthesis reports with no original data or statistical analyses.
4. Non peer-reviewed reports with no original data:
e.g., BAS from other counties, “consensus reports” of expert panels.

Upland Habitat Conservation Areas

Almost everything is habitat for something, but...

1. Must protect Endangered, Threatened, Sensitive Animals (4)
2. Must protect Listed Plants: 18 (9 in wetlands, 6 in prairie, 3 in other)



Peregrine Falcon



Marbled Murrelet



Water Lobelia



Few-flowered Sedge



Bald Eagle (subadult)



Taylor's Checkerspot

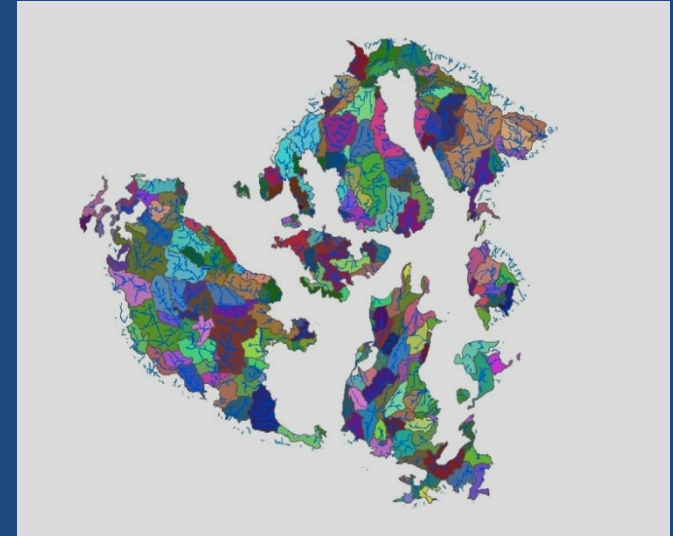
3. Must protect Streams, Lakes, Wetlands

4. Must protect Habitats and Species of Local Importance – t.b.d.

Context

Positive:

- 19% of SJC lands are protected (9% by County).
Plus wetlands, streams, lakes.
- Remainder is mostly low-intensity land use.
- Average SJC watershed:
 - 0% high density building
 - 1% moderate density building
 - 6% low density building
 - 93% other land uses

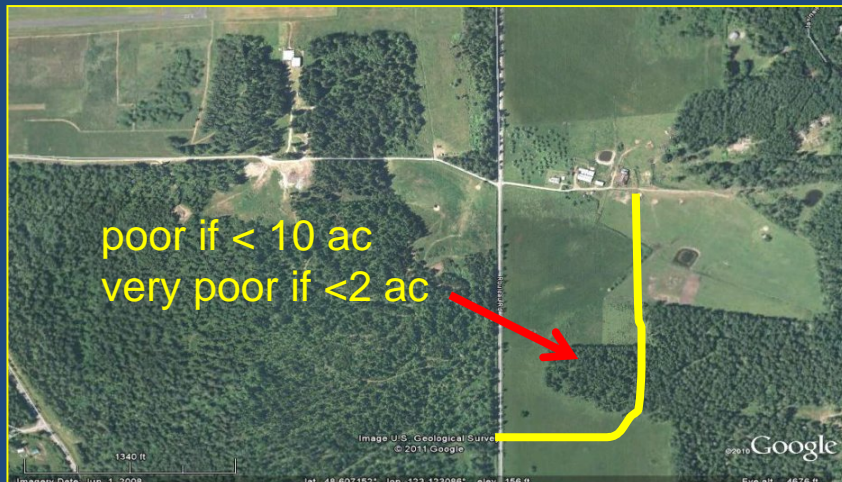


But:

- More pollution from “low “ than “high” intensity development (septic).
- Island isolation puts more species at risk (slow/no recolonization).
- SJC has lost species probably due to humans,
will lose more unless sound planning.

OPTIONS for Upland FWHCAs:

- No new roads/ buildings near:
nest of T, E, S birds
where listed plants, Checkerspot butterfly
- Adopt Locally Significant HCA types:
Prairie?
Oak Woodland & Savanna?
Herbaceous Balds & Bluffs?
- For other locally imperiled species: publicize, survey, and avoid (voluntary?)
- Expand incentives for voluntary conservation?
especially on Lopez, Blakely, Crane, Decatur, Johns
- Strengthen enforcement of waste management & leash laws?
- No new lawns on County-owned property?
- Minimize forest fragmentation (permit review process)?



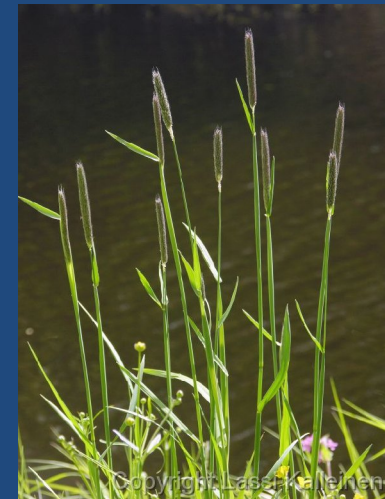
What's a Wetland ?



- MUST use State & Federal definition & delineation procedures.
- Must have Saturation and specific Soil Features and specific Vegetation
 - must recognize 100+ plant species
 - easy ones: alder, willow, rose, hawthorn, cedar, salmonberry, cattail, skunk cabbage



many difficult ones



New “Possible Wetlands” Map

- Digitized professional delineations + used latest technology (LiDAR, orthophotos)
- Maps to be used as a guide:
 - Not in-lieu of on-site delineations by qualified professional.
 - A minimal indicator of when a landowner must contract a wetland delineator.
 - For staff, looking for possible violations.
 - Use as default (when property inaccessible & no professional delineation done).
- 52% increase in wetland area from 1993 map
- errors of commission = 4%
- errors of omission = unknowable



Characteristics of Wetlands of San Juan County

From GIS tasks → Wetlands Geodatabase (in Excel):

- possible wetlands= 6% of SJC upland area
- possible wetlands on unprotected lands = 74%
- on undeveloped parcels on unprotected lands = 30%
- parcels with possible wetlands: 3023 (18% of all)

Possible wetland as % of the parcel	Number of affected parcels (of 16,798)	Median size (ac) of affected parcels	Maximum size (ac) of affected parcels
1-50%	2856	6.8	2140
51-99%	152	4.6	79
100%	15	0.6	10

STREAMS

Type F (2 & 3). Fish Bearing Streams

Type Np (4). Non Fish-bearing Perennial Streams

Type Ns (5). Non Fish-bearing Seasonal (Intermittent) Streams

WFC field-checked streams
(recognizable streambanks, etc.)



Drainageways
(predicted flow paths)



Why Keep Development Away From Dry Fishless Streams? (type Ns)

- They're pollution conduits (short-cuts to marine waters).
- They contribute leaves and wood to fish-bearing waters.
- Some can support fish "feeding frenzies."
- Travel corridors for amphibians, feeding areas for bats, birds.



Why Keep Development Away From Wetlands?

- Wetlands provide important habitat (even the dry ones).
- Wetlands purify incoming water
- but legally, their water quality can't be degraded intentionally.
- Building in or near wetlands pushes pollution downslope faster.



Might We Have a Problem Here?

Don't have to "prove" this legally.

For Wetlands:

- invasive plants degrading 65%, dominating in 29%
- 16% are intersected by driveways, 13% by roads
- 43% in fragmented habitat (no forest connection)



For Streams:

- physical barriers
- shortened inundation time
- too hot/ low oxygen
- too toxic/ murky/ disorienting

RESULT:

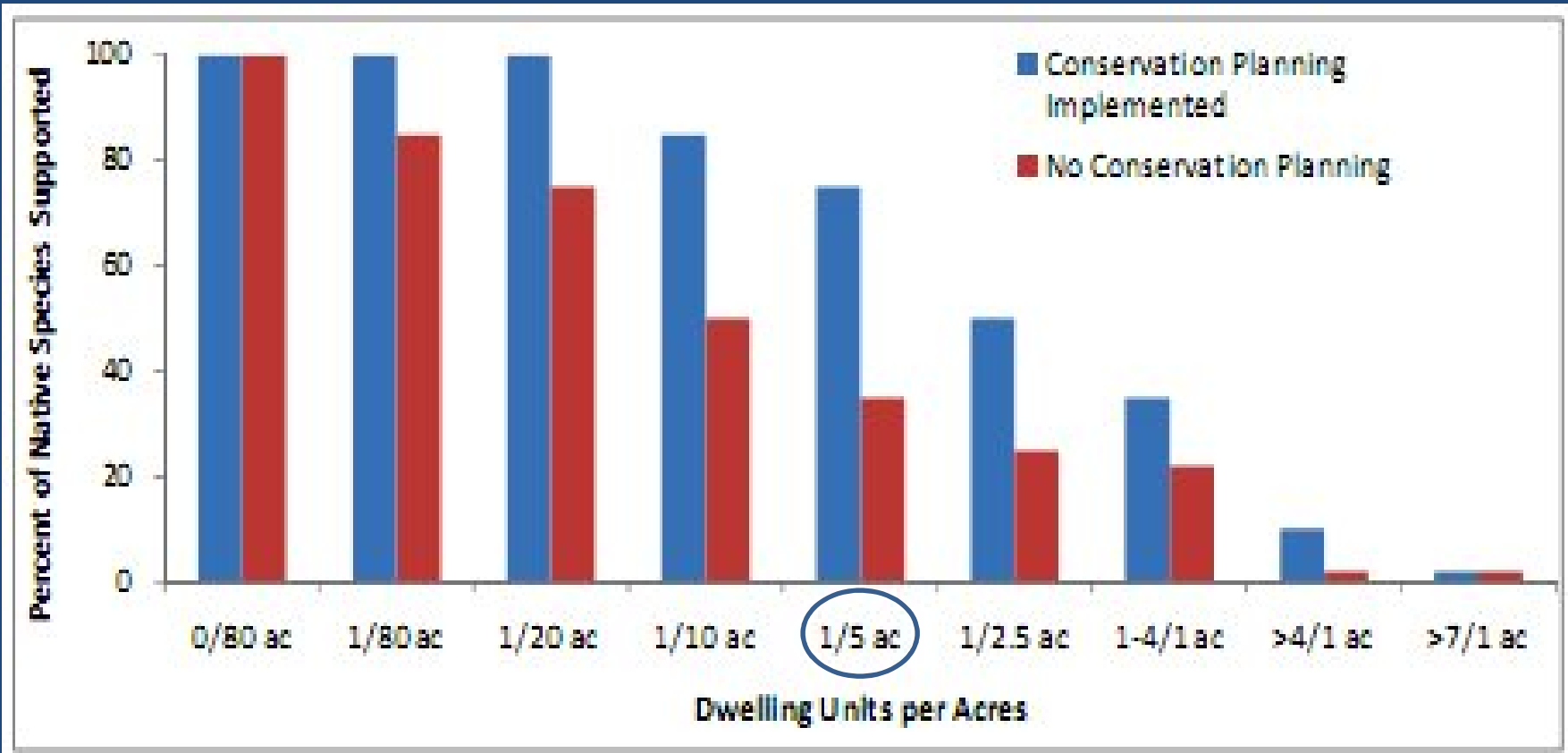
Less accessible space for fish =
fewer fish.



What Harm Can a Single-family Home Do?

- Removes vegetation (habitat loss AND microclimate altered)
- Humans & pets disturb wildlife
- Stormwater → alters quality, quantity, timing of water downslope
- Property drainage (ditches, rerouted gullies, storm drains, etc.)
- If Pond created: usually illegal, bad for seasonal streams





from WDFW (Azzad et al. 2009):

What the Science Says:

- Control pollution at its source , and use Low Impact Development practices
- Stay away from drainageways – keep water belowground
- Don't connect drains/ runoff → ditches → wetlands or streams (including Ns)
- Don't clean out ditches (except where flooding harms infrastructure)
- Minimize pavement & buildings upslope from sensitive wetlands or streams
- Minimize landscaping – leave deadwood, native vegetation
- Maintain wide buffer of natural vegetation & undisturbed soil
- Tailor the buffer width to the site and to the type of development:
 - intensity of development (type, configuration, veg removal)
 - pollution transport risk (septic system type, soil type, slope)
 - wetland/stream sensitivity
 - wetland/stream importance
- Minimize visits by people, pets, livestock
- Enforce regulations
- Monitor the effectiveness over time

Buffers

Purposes:

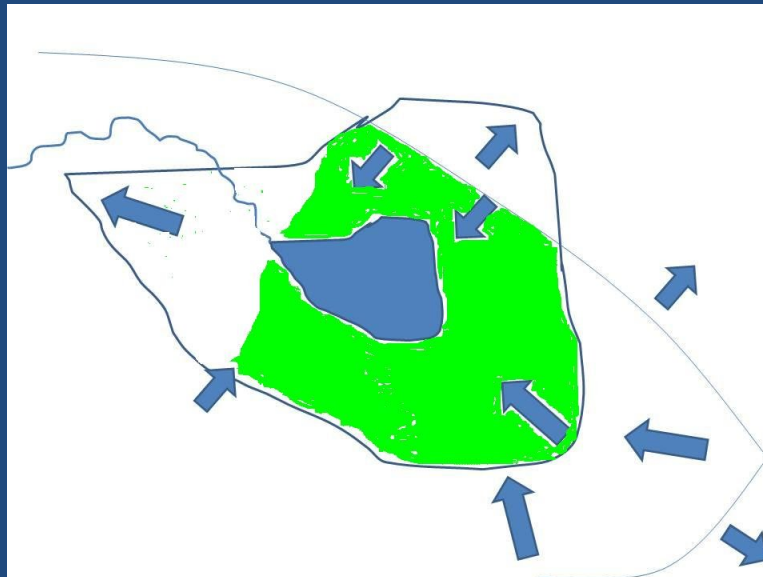
- Process pollution
- Protect local microclimate
- Support wetland & stream habitat

Why they work:

They're in the runoff-generating parts of the landscape.

Easy to measure and enforce buffer width

but infiltration & subsurface flow more important



We can estimate how much pollution originates from a single-family home
BUT...

No data or computer models that predict :

- How far pollution travels at any location in SJC before becoming harmless.
- How much the use of LID can offset need for a large buffer.
 - Not for all potential pollutants.
 - Not for pollutants in combination.
 - Not under extreme weather conditions.
- Not to the most sensitive forms of aquatic life.

for
Seasonal
(Intermittent,
Type Ns)
Streams

Intensity of Proposed Development	Transport & Sensitivity Factors	Importance of resources in or below the intermittent stream	Necessary buffer width (ft) along flow path to the intermittent stream
High	High	High	200
		Moderate	175
		Low	150
	Moderate	High	175
		Moderate	150
		Low	125
	Low	High	150
		Moderate	125
		Low	100
Moderate	High	High	125
		Moderate	100
		Low	75
	Moderate	High	100
		Moderate	75
		Low	60
	Low	High	60
		Moderate	50
		Low	40
Low	High	High	50
		Moderate	40
		Low	30
	Moderate	High	40
		Moderate	30
		Low	20
	Low	High	30
		Moderate	20
		Low	10

for
Perennial
(Types F, Np)
Streams

Intensity of Proposed Development	Transport & Sensitivity Factors	Importance of resources in or below the perennial stream reach	Necessary Buffer Width (ft) Along Flow Path to the Perennial Stream	
High	High	High	400	
		Moderate	350	
		Low	300	
	Moderate	Moderate	High	300
			Moderate	250
			Low	200
	Low	Low	High	200
			Moderate	175
			Low	150
Moderate	High	High	300	
		Moderate	250	
		Low	200	
	Moderate	Moderate	High	200
			Moderate	175
			Low	150
	Low	Low	High	150
			Moderate	125
			Low	75
Low	High	High	200	
		Moderate	175	
		Low	150	
	Moderate	Moderate	High	150
			Moderate	125
			Low	75
	Low	Low	High	75
			Moderate	50
			Low	10

for Wetlands:

Table 2-3.

Intensity of Proposed Development	Transport & Wetland Sensitivity Factors	Importance of Receiving Waters Below Wetland	Necessary Buffer Width (ft) Along Flow Path to Wetland	
High	High	High	800	
		Moderate	700	
		Low	600	
	Moderate	High	High	700
			Moderate	600
			Low	500
	Low	High	High	600
			Moderate	500
			Low	400
Moderate	High	High	400	
		Moderate	350	
		Low	300	
	Moderate	High	High	300
			Moderate	250
			Low	200
	Low	High	High	250
			Moderate	175
			Low	125
Low	High	High	125	
		Moderate	100	
		Low	75	
	Moderate	High	High	100
			Moderate	75
			Low	50
	Low	High	High	75
			Moderate	50
			Low	10

Notable Wetland Types in San Juan County – need definitions:

HIGH Importance?

- Bog
- Tidal Wetland
- Mature Forested Wetland
- Salmonid Fish Wetland
- Lakeside Wetland

MODERATE Importance?

- Wetland Contiguous to a Tidal Wetland
- Non-tidal Wetland Near a Sensitive Marine Feature
- Wet Prairie
- Aspen/Cottonwood Wetland
- Large Ponded Wetland
- Rare Species Wetland
- Wetland connected to large area of undeveloped land
- Structurally diverse wetland
- Wetland with little or no cover of exotic plants

Council Options:

- Adopt WFC stream typing maps?
- Adopt “Possible Wetlands” map? (with restrictions on its use)
- For development near wetlands/streams:
 - Expand septic inspections of existing?
 - Require high-tech septic (for new/ replacement)?
 - Require LID?
 - Require approval of driveway design & construction?
- For all, or only for the most sensitive or important wetlands/ streams?
- Adopt concept of variable-sized buffers?
- In Tables 2-3, 4-3, 4-4, adopt the factors and High-Moderate-Low categories as being the ones that shall determine buffer widths for those resources?
- Adopt these particular buffer widths for site-specific application?
- Allow buffer reduction if specific minimization actions undertaken? Which?

Next Up:

- Define buffer specifics?
- Simulate buffers to determine impacts on landowners?
- Risk Assessment?
- Review existing regulations: wording of revisions?
- Address easily fill-able information gaps?



Questions?