From:	Janet Way
To:	City Council
Cc:	Jessica Simulcik Smith; janetway@yahoo.com
Subject:	Fw: Talk in case you want to post if on the Group"s web site.
Date:	Monday, May 02, 2016 10:55:48 AM
Attachments:	Wetlands and our neighborhoods-test 10.21.19 AM.pdf

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Shoreline Preservation Society
940 NE 147th St
Shoreline, WA 98155

May 2, 2016

Shoreline City Council
17500 Midvale Ave N
Shoreline, WA 98133

Subject: DEIS Study Alternatives for the 145th Station Subareas

Dear Council,

This (attached) is a power point presented by Dr Sarah Cooke at a program sponsored by Shoreline Preservation Society.
It is specifically about wetland science and why it matters in the urban area.

Shoreline Preservation Society requests that you please place it in the record for the DEIS on 145th Subarea.

In particular, I would like to call your attention to several very important points she makes.

1. The health of wetlands and the habitat they sustain is greatly improved when they are surrounded by "Forested Uplands", which of course is exactly what we have in Paramount Park, and also at Twin Ponds. These uplands have many steep slopes which should be protected on their own merit. Some are already in the buffer of the 6/9 acres of wetlands in an around the park. But some may not be in the buffer of the wetlands. However, their value ecologically should be considered in your decision. If the properties containing these steep slopes, wetlands, creeks and their buffers are retained in R-6, in the future the City could obtain them more easily for Parks and Open Space Expansion. And as you know, Open Space and Critical areas protection are required under the Growth Management Act.

2. Wetlands are very significant for fighting Climate Change. They are among the most valuable assets to protect our air quality and against Global Warming.

3. Artificial or engineered solutions using non-natural technology for stormwater attenuation, are very expensive and must include frequent upkeep and staff attention. They must be replaced frequently, and budget issues often prevent timely upkeep needs. Then the stormwater situation is worse than nothing. LID is required, but there must be room left for swales or natural drainage solutions and adequate vegetation. So, for now it is much better to retain R-6 zoning around these parks with critical areas to allow for birds and other wildlife to migrate easily nearby, and for groundwater that feeds the wetlands and sustains the creeks in dry periods to be undisturbed.

4. Best Available Science is required under GMA by the Dept of Ecology. Thus far, BAS has not been used by staff to analyze actual environmental impacts to the wetlands and critical areas. Unfortunately, the studies used to date were flawed. Staff has already admitted they were not meant to be adequate. Existing studies that were already on file and sponsored by the City were not utilized properly to inform the DEIS process.

Please review and consider these important points and others in the presentation.

Thank you,

Janet Way, President,
Shoreline Preservation Society

Our Neighborhood Wetlands

Why They Matter

Sarah Spear Cooke

Seattle, Washington

www.Cookescientific.com

How wetlands are affected by development

We live in an urban environment BUT we live in Washington State NOT Southern California

So we have expectations that our neighborhoods will be green and have parks with green space and streams and wildlife

And integral to all that is maintaining our urban wetlands

Why Urban Wetlands are Important in the Landscape

- They Maintain Water Quality
- They are integral to a watershed health
- They provide critical wildlife habitat

Wetlands are important because of the **Functions They Provide**

Wetland Functions

Wetland Functions are physical and chemical processes that occur in a wetland. They are broken down into Functions that provide for:

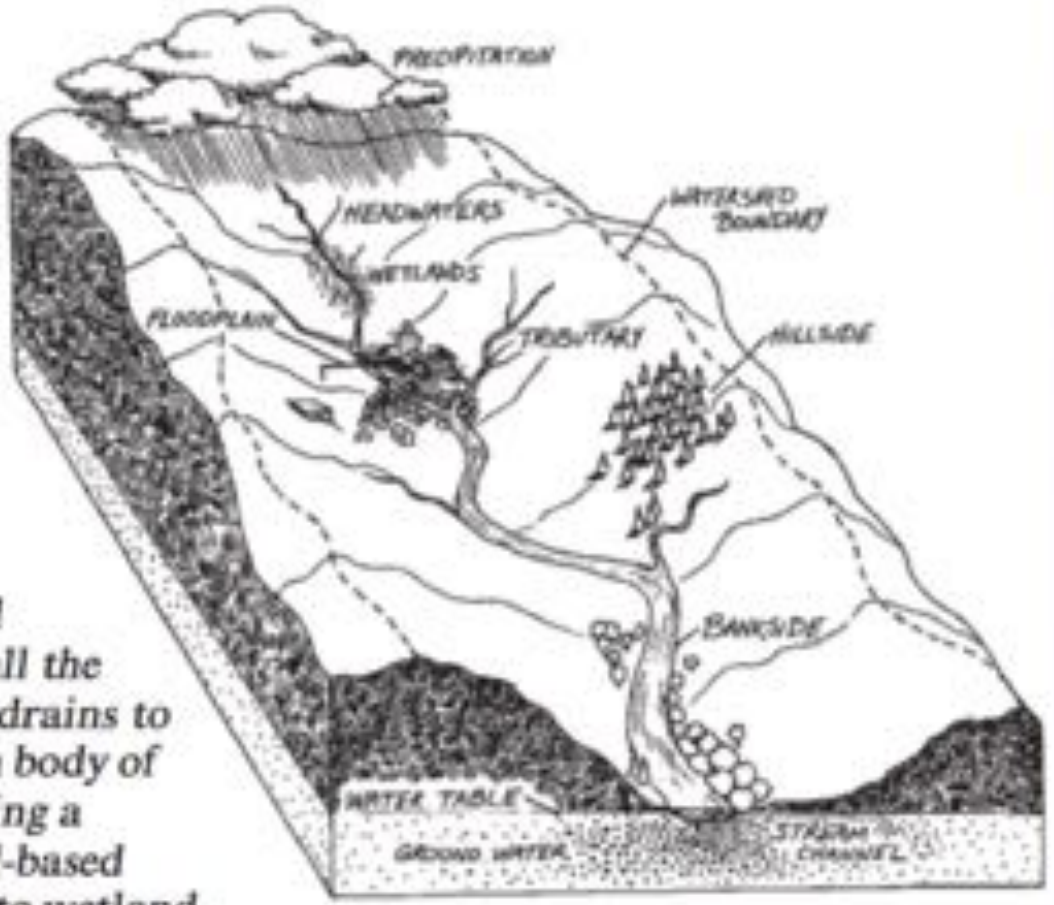
- Water Quality
- Hydrology
- Habitat

Wetland Functions

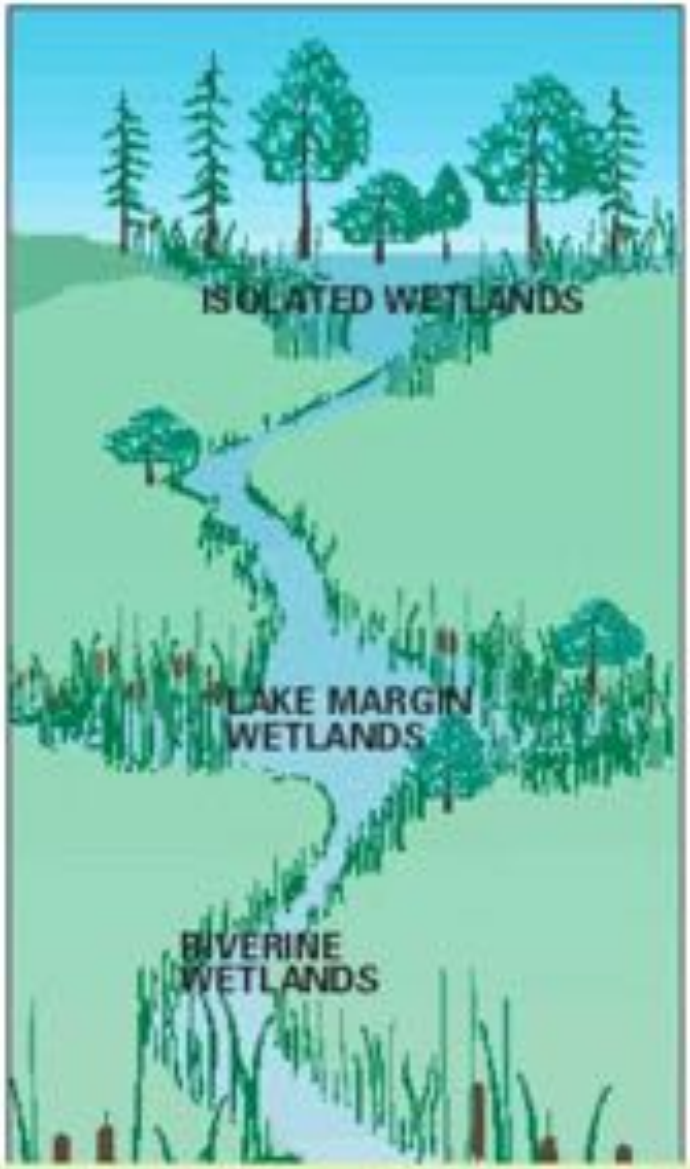
Wetlands are among the most productive ecosystems in the world, comparable to rain forests and coral reefs.

- An immense variety of species of microbes, plants, insects, amphibians, reptiles, birds, fish and mammals can be part of a wetland ecosystem.
- Physical and chemical features such as climate, landscape shape, geology, and water help to determine the plants and animals that inhabit each wetland.

Wetlands in a Watershed



A watershed includes all the land that drains to a common body of water. Using a watershed-based approach to wetland protection ensures that the whole ecosystem is protected.



CHARACTERISTICS AND FUNCTIONS OF WETLANDS

Isolated Wetlands

1. Waterfowl feeding and nesting habitat
2. Habitat for both upland and wetland species of wildlife
3. Floodwater retention area
4. Sediment and nutrient retention area
5. Area of special scenic beauty

Lake Margin Wetlands

1. See "isolated wetlands" above
2. Removal of sediment and nutrients from inflowing waters
3. Fish spawning area

Riverine Wetlands

1. See "isolated wetlands" above
2. Sediment control, stabilization of river banks
3. Flood conveyance area

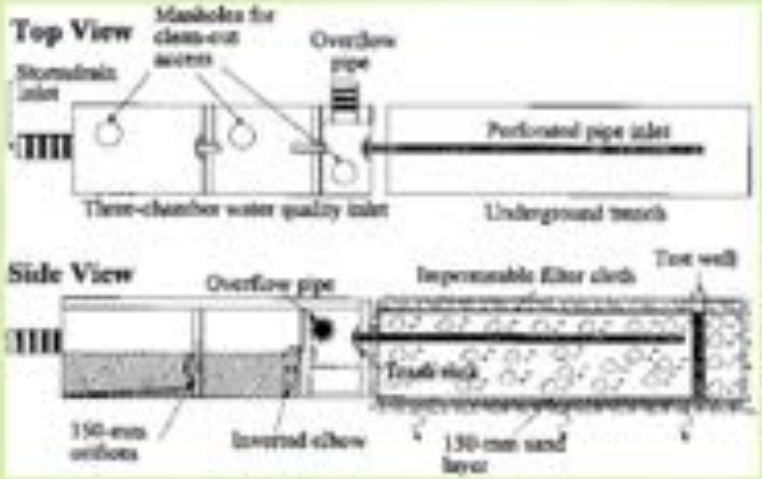
Water Quality Functions

1. Filtering sediments
2. Trapping nutrients
3. Breaking down pollutants
4. Reducing erosion by slowing down runoff
5. Regulating runoff by storing flood waters
6. Recharging or replenishing groundwater

Water Quality in Urban Areas

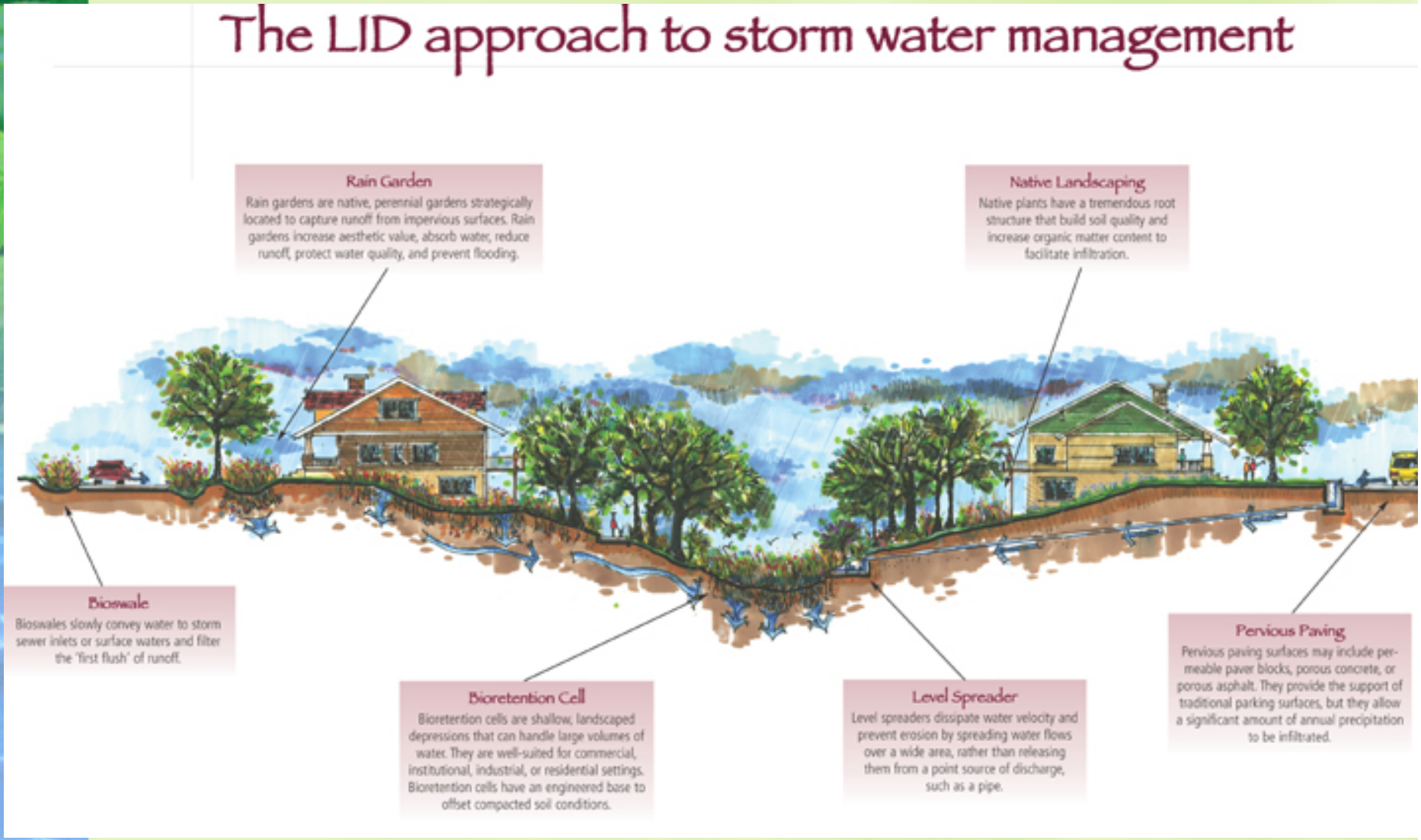
City Engineers try to replace wetlands with engineered Stormwater Systems. They require maintenance and are expensive and NEVER work as well as wetlands

Oil trap



Sediment trap

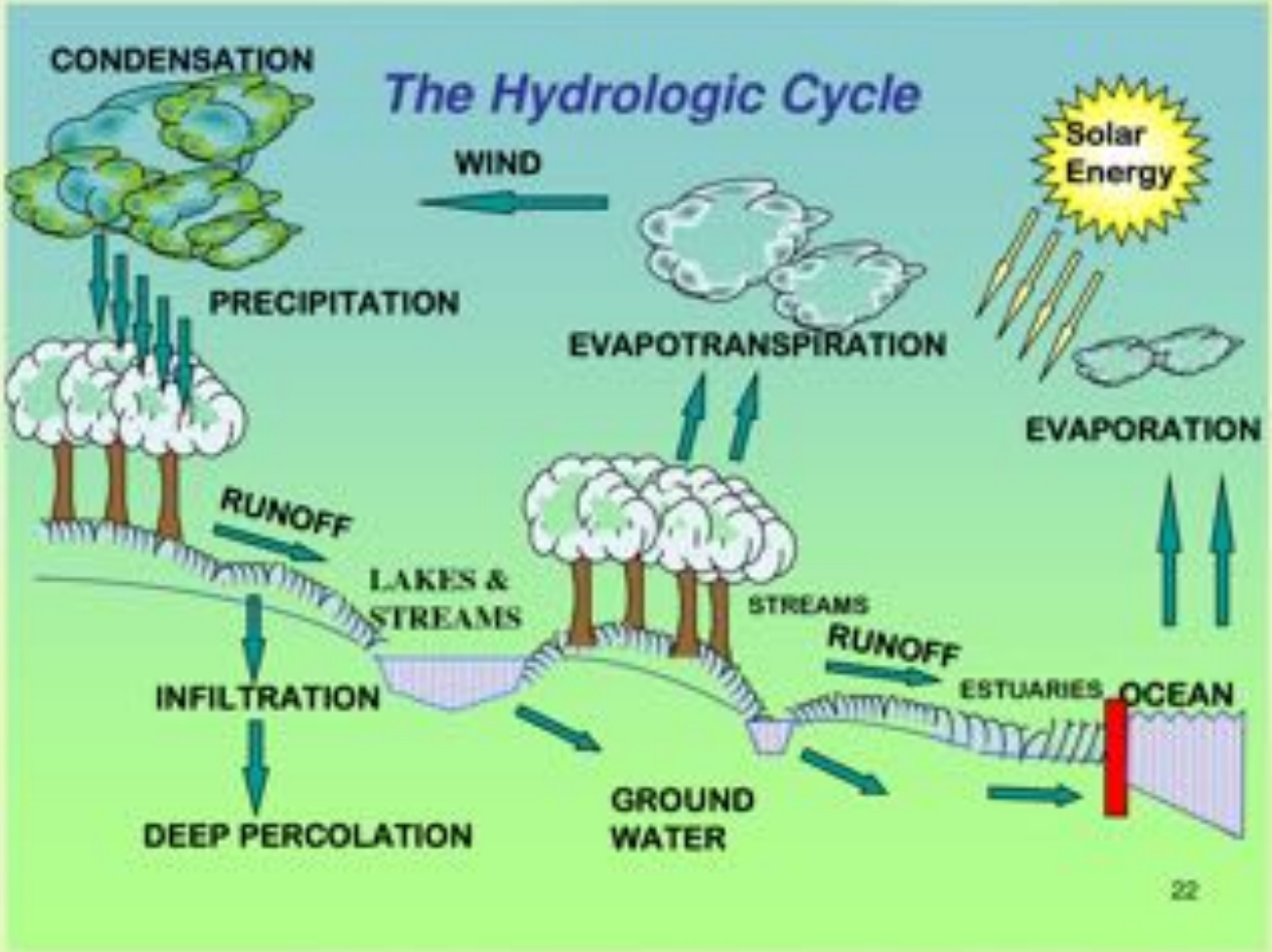
Low Impact Design



Low Impact Design

Rain gardens can be helpful but still don't provide all the functions of wetlands

Wetland Hydrology



This cycle needs wetlands to work!

Wetland Hydrology Functions

1. Wetlands Store water after it rains and that prevents downstream flooding.
1. Wetlands can be places where water RECHARGES the aquifer
1. Wetlands can be places where groundwater DISCHARGES to the surface

Wetland Hydrology Engineered

Do you prefer this or this?

Stormwater Vault

Wetland Habitats

Fresh water habitats

Wetland Habitats- Forest

Wetland Habitats- Shrub

Wetland Habitats- Shallow Emergent

Wetland Habitats- Deep Emergent

Wetland Habitats

Are also the home to a variety of wildlife including:

- Birds (especially waterfowl)
- Fish
- Mammals

Amphibians In Our Wetlands

Northwestern salamander
(Ambystoma gracile)

Salamanders:

Long-Toed salamander
(Ambystoma macrodactylum)

Pacific Giant
(Dicamptodon tenebrosus)

Ensatina
(Ensatina eschscholtzi)

Amphibians In Our Wetlands

Salamanders:

Western redback
(Plethodon vehiculum)

Roughskin newt
(Taricha granulosa)

Amphibians In Our Wetlands

Frogs

Red-legged
(Rana aurora)

Western Toad
(Bufo boreas)

Tree (Hyla regilla=
Pseudacris regilla)

Bullfrogs
(Rana castesbeiana)

Tailed
(Ascaphus truei)

Reptiles

Western pond turtle
(Clemmys marmrata)

Painted turtle
(Chrysemys picta)

Northern alligator lizard
(Elgaria coerulea)

Rubber boa
(Charina bottae)

Reptiles

Western terrestrial garter snake
(Thamnophis elegans)

Northwestern garter snake
(Thamnophis ordinoides)

Common garter snake
(Thamnophis sirtalis

Urbanization and Amphibians

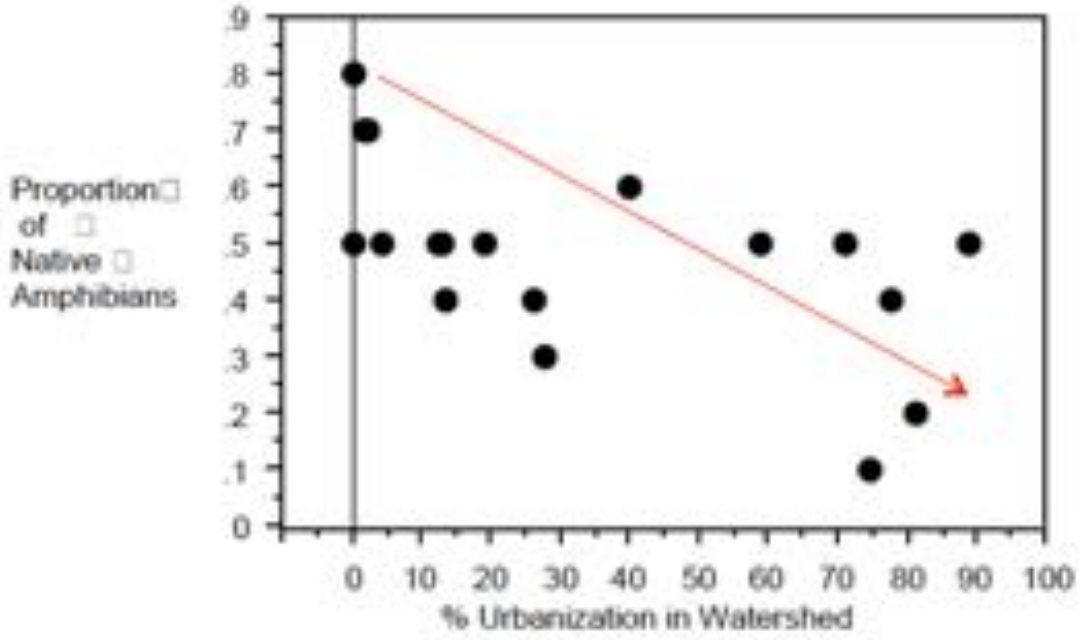


Figure 5-4. Relationship between the percent of native amphibian species present and percent of watershed urbanization.

Birds That Use Wetlands

Table 6-1. Species and life history traits of birds sighted at study wetlands.

Bird Species	Percent of Wetlands 1989	Percent of Wetlands 1991	Percent of Wetlands 1995	Percent of Wetlands All Years	Status	Population	Adapt-ability	Versatility Rating
American Coot	0.05	0.06	0.05	0.05	resident	insufficient data	Adapter	10
American Goldfinch	0.79	0.50	0.68	0.84	resident	declining	Adapter	23
American Robin	1.00	1.00	1.00	1.00	resident	increasing	Adapter	37
Anna's Hummingbird	0.11	0.00	0.05	0.16	rare resident	insufficient data	Adapter	25
Bald Eagle	0.00	0.06	0.11	0.11	migrant	insufficient data	Adapter	19
Barn Swallow	0.26	0.22	0.42	0.53	resident	increasing	Adapter	18
Black-capped Chickadee	1.00	0.94	1.00	1.00	migrant	declining	Adapter	28
Belted Kingfisher	0.26	0.22	0.21	0.58	resident	no change	Adapter	Undetermined
Bewick's Wren	0.68	0.89	0.74	0.95	resident	declining	Adapter	22
Brown-headed Cow Bird	0.58	0.33	0.63	0.95	migrant	insufficient data	Adapter	9
Band-tailed Pigeon	0.05	0.06	0.05	0.16	migrant	increasing	Adapter	17
Bushtit	0.84	0.61	0.21	0.95	migrant	no change	Adapter	10
Canada Goose	0.11	0.06	0.11	0.16	resident	declining	Adapter	22
California Quail	0.05	0.00	0.16	0.21	rare resident	no change	Adapter	8
Chestnut-backed Chickadee	0.79	0.78	0.47	1.00	resident	increasing	Adapter	27
Cedar Waxwing	0.84	0.78	0.53	0.89	resident	insufficient data	Adapter	28
Cliff Swallow	0.05	0.11	0.11	0.16	migrant	insufficient data	Adapter	12
Common Yellow-throat	0.58	0.67	0.47	0.68	rare resident	no change	Adapter	9
Dark-eyed Junco	0.68	0.50	0.37	0.84	migrant	insufficient data	Adapter	Undetermined
Downy Woodpecker	0.47	0.56	0.63	0.89	resident	insufficient data	Adapter	21
Fox Sparrow	0.05	0.00	0.11	0.16	resident	insufficient data	Adapter	34
Gadwall	0.11	0.06	0.05	0.11	resident	insufficient data	Adapter	10
Great Blue Heron	0.42	0.28	0.21	0.63	resident	no change	Adapter	27
Golden-crowned kinglet	0.95	0.94	0.37	1.00	resident	no change	Adapter	14
Glaucous-winged Gull	0.16	0.06	0.05	0.16	migrant	declining	Adapter	26
Hammond's Flycatcher	0.26	0.33	0.05	0.47	migrant	no change	Adapter	26
Hairy Woodpecker	0.79	0.50	0.32	0.79	rare resident	insufficient data	Adapter	10
House Finch	0.58	0.22	0.32	0.68	resident	no change	Adapter	28
Hutton's Vireo	0.42	0.06	0.11	0.47	resident	no change	Adapter	27
Killdeer	0.21	0.00	0.11	0.32	resident	no change	Adapter	28
Mallard	0.42	0.28	0.42	0.58	resident	no change	Adapter	10
Marsh Wren	0.68	0.22	0.16	0.68	resident	no change	Adapter	8
Northern Flicker	0.37	0.39	0.37	0.63	migrant	declining	Adapter	27
Northern Oriole	0.11	0.00	0.11	0.21	resident	no change	Adapter	33
Pied-billed Grebe	0.26	0.06	0.11	0.26	resident	no change	Adapter	Undetermined
Pacific-slope Flycatcher	0.95	1.00	0.84	1.00	migrant	insufficient data	Adapter	10
Purple Finch	0.63	0.44	0.47	0.79	migrant	increasing	Adapter	24
Red-breasted Nuthatch	0.53	0.56	0.63	0.84	migrant	insufficient data	Adapter	Undetermined
Red Crossbill	0.32	0.67	0.16	0.79	rare resident	declining	Adapter	29
Red-eyed Vireo	0.11	0.00	0.11	0.16	resident	no change	Adapter	26
Rufous-sided Towee	0.89	0.89	0.89	1.00	migrant	no change	Adapter	37
Rufous Hummingbird	0.21	0.17	0.16	0.32	resident	insufficient data	Adapter	28
Ruby Crowned Kinglet	0.53	0.44	0.63	0.89	resident	no change	Adapter	31
Red-winged Blackbird	0.53	0.33	0.53	0.68	rare resident	insufficient data	Adapter	22
Savannah Sparrow	0.00	0.06	0.00	0.05	resident	increasing	Adapter	11
Song Sparrow	1.00	1.00	1.00	1.00	resident	no change	Adapter	24
Sharp-shinned Hawk	0.21	0.00	0.00	0.21	rare resident	no change	Adapter	15
Steller's Jay	0.58	0.61	0.68	0.84	rare resident	insufficient data	Adapter	33
Tree Swallow	0.58	0.39	0.42	0.84	rare resident	no change	Adapter	22
Violet-green Swallow	0.47	0.39	0.79	0.79	rare resident	insufficient data	Adapter	28
Virginia Rail	0.26	0.11	0.16	0.32	migrant	no change	Adapter	33
White-crowned Sparrow	0.32	0.22	0.05	0.32	migrant	no change	Adapter	29
Western Wood-pewee	0.32	0.17	0.32	0.47	migrant	declining	Adapter	30
Winter Wren	0.95	0.94	0.68	1.00	resident	increasing	Adapter	27

In a study done in King County over a 10-year period 94 species of birds were found to use the wetlands!

Birds That Use Wetlands

Table 6-1 continued. Species and life history traits of birds sighted at study wetlands.

Bird Species	Percent of Wetlands 1989	Percent of Wetlands 1991	Percent of Wetlands 1995	Percent of Wetlands All Years	Status	Population	Adapt-ability	Versatility Rating
Wood Duck	0.32	0.22	0.37	0.63	rare resident	no change	Adapter	25
Yellow Warbler	0.74	0.72	0.21	0.95	migrant	declining	Adapter	19
Yellow-rumped Warbler	0.26	0.11	0.21	0.47	rare resident	no change	Adapter	31
Black Headed Grosbeak	0.84	0.61	0.79	1.00	rare resident	no change	Avoider	34
Brewer's Blackbird	0.21	0.39	0.11	0.47	migrant	no change	Avoider	28
Brown Creeper	0.26	0.28	0.16	0.47	resident	no change	Avoider	32
Black-throated Gray Warbler	0.53	0.39	0.47	0.79	migrant	increasing	Avoider	24
Blue-winged Teal	0.00	0.00	0.11	0.11	resident	no change	Avoider	29
Caspian Tern	0.00	0.00	0.11	0.11	migrant	insufficient data	Avoider	Undetermined
Chipping Sparrow	0.11	0.06	0.11	0.26	migrant	no change	Avoider	36
Cooper's Hawk	0.11	0.00	0.16	0.26	migrant	no change	Avoider	8
Common Raven	0.00	0.00	0.11	0.11	rare resident	insufficient data	Avoider	32
Evening Grosbeak	0.21	0.06	0.21	0.32	rare resident	no change	Avoider	33
Green Heron	0.11	0.06	0.05	0.16	migrant	no change	Avoider	6
Hermit Thrush	0.84	0.33	0.21	0.84	resident	no change	Avoider	22
Hooded Merganser	0.05	0.00	0.05	0.05	migrant	insufficient data	Avoider	25
MacGillivary's Warbler	0.11	0.00	0.21	0.26	migrant	insufficient data	Avoider	Undetermined
Northern Pigmy Owl	0.05	0.06	0.05	0.16	migrant	no change	Avoider	20
Orange-crowned Warbler	0.74	0.44	0.37	0.84	rare resident	declining	Avoider	31
Olive-sided Flycatcher	0.16	0.22	0.11	0.32	resident	no change	Avoider	36
Pine Siskin	0.26	0.00	0.26	0.47	resident	no change	Avoider	27
Pileated Woodpecker	0.21	0.00	0.11	0.26	resident	no change	Avoider	32
Red-breasted Sapsucker	0.21	0.00	0.21	0.37	resident	no change	Avoider	24
Red-eyed Vireo	0.05	0.06	0.11	0.16	resident	no change	Avoider	26
Ruffed Grouse	0.05	0.11	0.05	0.16	resident	insufficient data	Avoider	29
Sora	0.00	0.06	0.11	0.16	migrant	no change	Avoider	28
Solitary Vireo	0.21	0.39	0.21	0.58	migrant	insufficient data	Avoider	10
Spotted Sandpiper	0.05	0.00	0.00	0.05	rare resident	no change	Avoider	4
Swainson's Thrush	0.95	1.00	0.95	1.00	resident	increasing	Avoider	32
Townsend's Warbler	0.68	0.06	0.37	0.79	migrant	no change	Avoider	26
Varied Thrush	0.21	0.00	0.00	0.21	migrant	declining	Avoider	29
Vaux's Swift	0.58	0.44	0.16	0.68	migrant	no change	Avoider	34
Warbling Vireo	0.68	0.17	0.26	0.79	resident	insufficient data	Avoider	10
Western Tanager	0.47	0.33	0.42	0.63	migrant	no change	Avoider	34
Willow Flycatcher	0.84	0.83	0.79	0.95	migrant	declining	Avoider	20
Wilson's Warbler	0.89	0.78	0.63	1.00	migrant	no change	Avoider	33
American Crow	0.84	0.94	0.89	0.95	resident	declining	Exploiter	32
European Starling	0.42	0.28	0.16	0.53	resident	no change	Exploiter	27
House Sparrow	0.21	0.22	0.05	0.42	resident	insufficient data	Exploiter	12
Rock Dove	0.11	0.11	0.00	0.11	resident	increasing	Exploiter	Undetermined

Wetland area and habitat diversity were found to be critical factors for high bird diversity

Common Wetland Birds

Green Heron

Virginia Rail

Blue Heron

Blue-winged Teal

Marsh Wren

Cedar waxwing

Common Wetland Birds

Red-wing Blackbird

Mallard ducks

Wood Duck

Kildeer

Birds That Use Wetlands

- This is of a possible 158 species known to exist in the Puget Basin (Dennis Paulson – UW)
- Of course the lowest richness was found in the urban wetlands
- Only 3 species were found in every study wetland: American robin, black-caped chickadee and song sparrow.
- 50% of the 94 species were found in over half of the wetlands!
- Migrant species were 37% (35) of the overall birds on the list
- Many resident were species of the adjacent upland habitats that use wetlands for- water, food and raising their young

Mammals in Our Wetlands

Large mammals:

Beaver (Castor canadensis)

White Tail Deer (Odocoileus)

Mountain beaver (Aplodontia rufa)

Mammals in our Wetlands

Small mammals:

Black Rat	*Rattus rattus*
Bushy-tailed Woodrat	*Neotoma cinerea*
Creeping vole	*Microtus oregoni*
Deer Mouse	*Peromyscus maniculatus*
Douglas Squirrel	*Tamiasciurus douglasii*
Ermine	*Mustela erminea*
Forest Deer mouse	*Peromyscus oreas*
Long-tailed Vole	*Microtus longicaudus*
Marsh Shrew	*Sorex bendirei*
Masked Shrew	*Sorex cinereus*
Montane Shrew	*Sorex monticolus*
Northern Flying Squirrel	*Glaucomys sabrinus*
Norway Rat	*Rattus norvegicus*
Pacific Jumping Mouse	*Zapus trinotatus*
Shrew-mole	*Neurotricus gibbsii*
Southern Red-backed Vole	*Clethryonomys qapperi*
Townsend's Chipmunk	*Eutamias townsendii*
Townsend's Vole	*Microtus townsendii*
Trowbridge's Shrew	*Sorex trowbridgei*
Vagrant Shrew	*Sorex vagrans*
Water Shrew	*Sorex palustris*

- 21 species found in King County
- 19 are native!

Mammals in our Wetlands

Small Mammals Findings of the Wetland Study:

- Wetland size not significant????
- Total area of adjacent development
- Percent of Adjacent forest most important!
  (especially forests where woody debris is left)

What Does Protecting Wetlands Mean for Our Neighborhoods

- Maintaining better Water Quality for streams and of course also any fish
- Help prevent flooding both locally and downstream
- Maintains wildlife habitat locally