

# Survey of Western Pearlshell Mussel (*Margaritifera falcata*) Populations

## Church Creek, Washington

Sacha Johnson, Surface Water Management, Public Works, Snohomish County

College of Forest Resources, University of Washington, Seattle

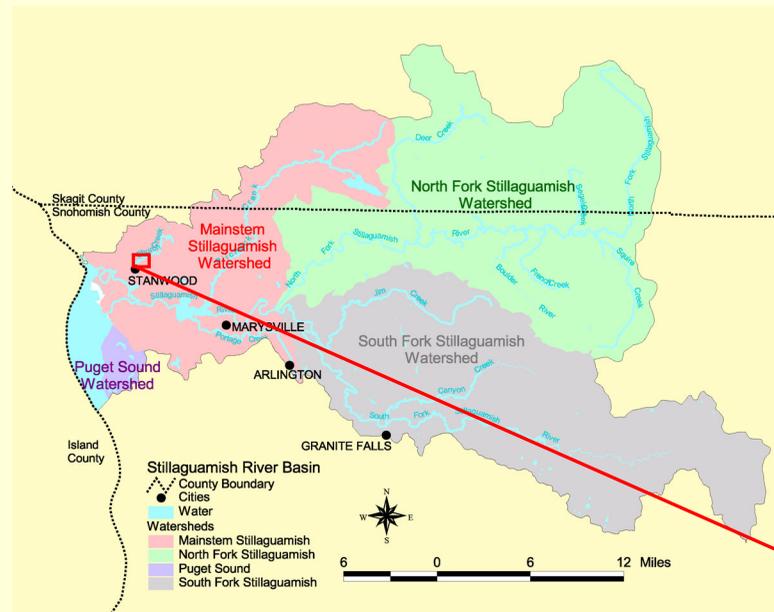


Freshwater Mussels:

- Live up to 90 years
- Rely on fish for larval dispersal
- Require:
  - low sediment
  - low temperature
  - high levels of dissolved oxygen

The **objective** of this study was to develop an effective sampling design to obtain baseline data of freshwater mussel distribution in Church Creek using minimal resources. The information obtained by this survey will provide useful guidelines for Snohomish County Surface Water Management in obtaining further information about freshwater mussel populations in the area, offering a new way of tracking pollution, analyzing stream health, and measuring success of stream restoration projects.

Freshwater Mussels are a good indicator of water quality and overall stream health due to their sensitivity towards pollution and sediment loading. Presence of many age classes may indicate low pollution and sediment-loading levels over a long period of time. Little is currently known about populations in Western Washington.



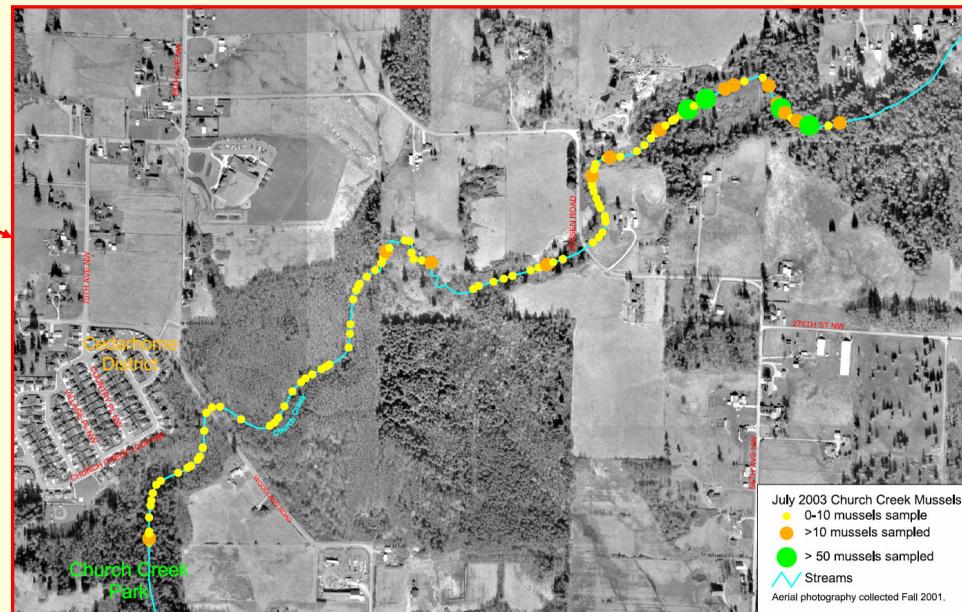
As seen below, the surveyed reaches included a wide variety of riparian habitats including a city park, pasturelands, stream restoration projects, and mature forests. Population density was notably higher where riparian habitat consisted of undisturbed mature forest and lower where riparian habitat was pasturelands and young forest. We found mussel age classes ranging from 15 – 50 years old. The range of age classes suggests a healthy and regenerating population, although lack of historical population records makes such conclusions unconfirmed.



## Methods

Upon sighting a mussel we:

- Searched one channel width downstream for overlooked mussels and four channel widths upstream for additional mussels.
- Recorded population density using the following classifications:
  - 1- less than 10
  - 2- from 10 to 50
  - 3- greater than 50.
- Recorded average channel width and thalweg depth were measured.
- Recorded habitat as riffle, pool, or glide.
- Recorded primary sediment: sand or silt, gravel less than 2.5", or cobble from 2.5" to 10".
- Recorded Hipchain and GPS reading to determine exact location of observation.
- Aged collected shells using ligament measurements as determined by the growth analysis for Battle Creek on the Tulalip Reservation (Toy 1998)



## Results

Total Length Survey		2216 m
Avg. Distance between Groups		20 m
Average Stream Width		2 m
Average Stream Depth		22 cm
Minimum Stream Depth		5 cm
Maximum Stream Depth		74 cm

### Mussel Beds

Bed Size	# of Beds	
>50 mussels	4	
10-50 mussels	15	
<10 mussels	97	
Primary Sediment # %		
Sand	19	17
Gravel	93	83
Rock	0	0
Habitat # %		
Pool	44	41
Riffle	20	19
Glide	43	40



By involving local residents like Barry Dreher in surveying activities, the surrounding community gains a greater consciousness of the natural resources in their region. Such volunteer activities provide direct communication between local taxpayers and agency officials, leading to increased public support of agency decisions and actions. Barry Dreher was key to the success of this project.



Snohomish County disclaims any warranty of merchantability or warranty of fitness of this map for any particular purpose, either express or implied. No representation or warranty is made concerning the accuracy, currency, completeness, or quality of data depicted on this map. Any user of this map assumes all responsibility for use thereof, and further agrees to hold Snohomish County harmless from and against any damage, loss, or liability arising from any use of this map.