

THE DESTRUCTION OF HISTORIC SEQUALITCHEW CREEK

Preface

This paper chronicles the events that have led to the degradation and could lead to the destruction of historic Sequalitchew Creek and Edmonds Marsh.

A Hydrologic Context

Sequalitchew Creek and Edmonds Marsh are located in the American Lake subwatershed of the Chambers/Clover Creek Watershed (WRIA 12). This subwatershed supports a number of lakes including American, Gravelly, Louise and Sequalitchew, wetlands including Kinsey, McKay, Hamer, Park, Elliot, Sears and Edmonds Marshes and streams including Murray and Sequalitchew Creeks. The topography of this subwatershed is fairly flat; as a result, surface water tends to accumulate in lakes and wetlands. Groundwater has an important hydrologic role within this watershed because it supplies water to American Lake, Gravelly Lake, Lake Louise, Sequalitchew Lake, Murray and Sequalitchew Creeks and the many wetlands located in this subwatershed.

The Importance of Sequalitchew Lake and Sequalitchew Creek

Sequalitchew Lake is about 80 acres in extent and is located approximately one-half mile southwest of American Lake. The lake varies in depth from 6 to 15 feet. It is fed primarily from groundwater sources, including Sequalitchew Springs. The springs are located at the northeastern corner of the lake and provide a substantial portion of the drinking water supply for the Fort Lewis military installation. In 1959 and 1960, Sequalitchew Lake was utilized by the Washington Department of Fisheries as a fish farm that reared and released coho salmon to Sequalitchew Creek. From 1976 until the mid 1990s the Washington Department of Fisheries operated a coho fish hatchery and rearing facility on Sequalitchew Lake. In the past, Native Americans caught from 3,500 to 4,000 fish annually in Sequalitchew Creek.

The Beginning of Degradation of Sequalitchew Creek and Associated Wetlands

An overflow from American Lake historically drained through a natural channel into Sequalitchew Lake. Though it appears that this connection is now severed and the only connection between the two lakes is subsurface (groundwater) flow, there is a manmade weir and canal system that drains water from the surface of American Lake when its level exceeds 233 feet above mean sea level. Sequalitchew Lake has its own manmade overflow outlet that forms the beginning of Sequalitchew Creek. To control the water level in Sequalitchew Lake, which fluctuates year around because of varying groundwater input (discharge) into the lake, Fort Lewis, around 1950, constructed a diversion dam/canal structure at the outlet of Sequalitchew Lake. This structure directs water that originates in Hamer Marsh, east of the Sequalitchew Creek and part of Lake Sequalitchew's overflow into a drainage ditch that continues west for one mile, and then turns north to empty into Puget Sound at Tatsolo Point. This 1950 Fort Lewis Hamar

Marsh/Sequalitchew Lake surface water drainage and diversion system was the second human act leading to the diminishment of historical flows and degradation of water quality in Sequalitchew Creek and Edmonds Marsh. The first human act of degradation was Fort Lewis' tapping of Sequalitchew Springs as a domestic water source.

In 1980 the Department of Ecology closed the subwatershed to the issuance of new consumptive surface water rights because of concerns about declining groundwater levels, diminished stream flows and lowered wetland and lake levels. In the winter of 1989 American Lake experienced the first toxic algae bloom to be documented in any lake in Western Washington. Eleven pets were poisoned, five died. The cause of this, and its recurring toxic algae blooms, has been attributed to groundwater pollution from septic system effluent (phosphorus) and diminished groundwater flow through (loss of dilution), or lake flushing action, because of lower groundwater levels. Carp Lake (near Lake Louise) has gone dry in recent years as a result of declining groundwater levels.

To summarize: Draining surface water through constructed canals (drainage ditches) to Puget Sound and extraction of groundwater in excess of its replenishment has resulted in diminished stream flows and degradation of the quality of water in those streams, dry streams, drying wetlands and stagnant and toxic algae infested lakes.

The Environmental Threat Posed by Glacier Northwest's Gravel Mining Expansion

Further degradation, if not destruction, of Sequalitchew Creek and Edmonds Marsh is likely as a result of Glacier Northwest's proposed gravel mining expansion.

Glacier's proposed 177-acre gravel mine expansion will involve the removal of 184 acres of forest and topsoil. It will create a 550-acre hole in the underlying gravel as 40 million tons of gravel is extracted over the next 14 years. The pit will be 80 feet deep and expose an underlying aquifer. The flow from this exposed aquifer (estimated at approximately 6.5 million gallons per day) will be directed down a man made ditch to Sequalitchew Creek with a flow eight times that of present Sequalitchew Creek. This dewatering of the aquifer will lower the groundwater level in the vicinity by as much as 30 feet!

Glacier claims that this dewatering of the exposed aquifer will reduce by 3 inches groundwater levels under the Sequalitchew Springs that supplies Fort Lewis with its drinking water. It would cut in half the flows in the upper part of Sequalitchew Creek, which already frequently runs dry during the summer months (from the effects of Fort Lewis' withdrawal of water from Sequalitchew Springs). DuPont is concerned about this project's impact on culturally and environmentally important Edmonds Marsh. Glacier claims that the lowering of the water table beneath the Marsh by 12 to 18 inches will not adversely affect the Marsh! Glacier also claims that DuPont's drinking water wells should not be adversely effected. We have heard all these optimistic forecasts before in the Lakewood area. Sewering of the area was supposed to drop groundwater levels by 6 inches. Groundwater levels dropped by 3 feet (as recorded by Kris Kauffman in comparing Gravelly Lake's level pre vs post sewerage) as a result of this "dewatering" (conversion from septic systems to a sewer system) activity by Pierce County. Similar

optimistic forecasts have been made indicating that Lakewood Water District's acquisition of Abitibi water rights will have minimal impacts on lake levels/groundwater flow through (dilution), discharge rates at springs that supply water at WDFW hatcheries and groundwater discharge into lower Clover Creek in Lakewood and surrounds.

If this project is permitted to proceed and it is later found out that upper Sequelitchew Creek remains dry year around, Fort Lewis's drinking water supply from Sequelitchew Springs is diminished and its quality degraded, Edmonds Marsh dries up and becomes a nitrate and phosphate source (due to mineralization of its organic deposits) to contaminate groundwater (which is already the case in the marshes located in the area south of Spanaway Lake), and DuPont's domestic water supply is diminished and degraded (by nitrate buildup) what can be done to stop the continued dewatering of the entire area by exposure of an aquifer that previously flowed subsurface very slowly to Puget Sound and emanated as springs and seeps all along the bluffs overlooking Puget Sound?

Conclusion

I served on the planning committee that was charged with the responsibility of developing a Chambers/Clover Creek Watershed Management Plan. Its purpose was to assure an adequate quantity of water in the watershed for people (development) and fish (instream flows). The Plan was not acceptable to the Puyallup Tribe (and therefore not implemented) because the Technical Assessment upon which the Plan was based failed to define the quantity and quality (and interactions) of the surface/ground water resource to be managed. The expert drafters of the Technical Assessment acknowledged that the data available about the interdependence of surface and ground water was insufficient to forecast the likely outcome of increased groundwater withdrawals upon surface water bodies. I currently serve on a committee that is advising the USGS in the development of a Chambers/Clover Watershed numerical groundwater model. This tool will be used to forecast the likely surface water impact of increased groundwater withdrawals in the Chambers/Clover Creek watershed. Until this model is developed, promulgated (in about two years) and used by hydrologists, any assertion about how little adverse impact Glacier Northwest's dewatering of an underlying aquifer will have on contiguous Sequelitchew Creek, Edmond Marsh, and other surface water bodies throughout the American Lake subwatershed, and Fort Lewis' and DuPont's domestic water supply should be consider biased speculations.

The history of the American/Sequelitchew Lake subwatershed clearly indicates that man's activities (surface water diversion and drainage and groundwater extraction) are the proximate cause of the past degradation of the streams, wetlands and lakes of this subwatershed. It is likely, despite any assurances to the contrary, that the anticipated 6.5 million gallon per day dewatering of the aquifer that sustains springs, streams, wetlands and lakes in this subwatershed will cause extensive and irreversible environmental damage and compromise the domestic water source for Fort Lewis and DuPont.

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THE RESTORATION OF HISTORIC SEQUALITCHEW CREEK

Preface

This paper chronicles the events that have led to the degradation of historic Sequalitchew Creek and describes an alternative for its restoration as a viable salmon-bearing stream.

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To summarize: Draining surface water through constructed canals (drainage ditches) to Puget Sound and extraction of groundwater in excess of its replenishment has resulted in diminished stream flows and degradation of the quality of water in those streams, dry streams, drying wetlands and stagnant and toxic algae infested lakes.

Restoration of Historic Sequalitchew Creek and Edmonds Marsh

The fish and wildlife habitat that formerly existed in the corridor from Sequalitchew Lake via Squalitchew Creek/Edmonds Marsh to Puget Sound could be restored by a joint effort of Fort Lewis, the City of DuPont and the Nisqually Tribe. The elements of this restoration project would include the following.

Re-engineering of the diversion/canal structure at the outlet of Sequalitchew Lake in a way that allows management of Sequalitchew Lake levels (to protect the Sequalitchew Springs waterworks), provides fish passage into Sequalitchew Lake and directs groundwater leaving Hamar Marsh and Sequalitchew Lake to flow down a rehabilitated Spanaway Creek to Edmonds Marsh and on to Puget Sound.

Using the existing Fort Lewis ditch that runs northwest and empties into Puget Sound at Tatsolo Point as a means of draining off groundwater discharge that is in excess of Sequalitchew Creek's safe maximum capacity. Groundwater flooding events occur only occasionally and after periods of extreme and prolonged periods of precipitation.

Developing a saltwater marsh and estuary at the mouth of Stequalitchew Creek to provide a suitable salt-to-fresh water acclimation habitat for returning mature salmon and fresh-to-salt water acclimation and rearing habitat for outbound salmon smolts. The Nisqually Tribe has lots of experience doing this sort of thing at the Nisqually Delta. Their expertise and contribution would be invaluable in the restoration of the historic Sequalitchew Lake to Puget Sound salmon and wildlife corridor.

The Benefits of Restoration of the Historic Sequelitchew Creek Corridor

Restoration of the historic Sequelitchew Lake to Puget Sound salmon and wildlife corridor would provide the following benefits.

- Salmon access to their historic and natural spawning grounds and over-the-dry season salmon smolt rearing habitats (i.e., groundwater fed marshes).
- In addition to restoration of chum and coho salmon runs there exists the possibility of restoration of sockeye salmon populations once access to groundwater fed Sequelitchew Lake is re-established.
- A restored and functioning salmon bearing stream running through the heart of the City of Dupont would enhance the City's attractiveness for residents and a major draw for tourists.
- The natural hydrology of the American Lake subwatershed would be restored which would assure healthy and natural functioning of the many springs, streams, wetlands and lakes that comprise this watershed.
- Groundwater quantity and quality would improve as a result of restoration of the natural functioning of the extensive wetland areas than are characteristic of this subwatershed. These wetlands function to remove pollutants from surface water prior to its infiltrating to recharge underlying aquifers. They provide over-the-dry season refugia for salmon smolts. And they store and release surface water to recharge the aquifers upon which domestic water supplies depend during the dry season.
- The certainty that salmon would return, and much sooner, to a restored historic Sequelitchew Creek would be greater vis-a-vis a manmade North Sequelitchew Creek as proposed by Glacier Northwest and currently embraced by the Nisqually Tribe.

In Conclusion

The needs and desires of Fort Lewis, residents of the City of DuPont, the Nisqually Tribe, salmon and wildlife will be better served by restoring the natural functioning of the historic Sequelitchew Lake to Puget Sound salmon and wildlife corridor than would occur should Glacier Northwest be allowed to dewatering the aquifer that sustained this corridor's natural condition.

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SALMONID HABITAT LIMITING FACTORS ANALYSIS

CHAMBERS-CLOVER CREEK WATERSHED

**(Including Sequelitchew Creek and Independent
Tributaries)**

WATER RESOURCE INVENTORY AREA

12

**Judy Runge
Marc Marcantonio
Monty Mahan
Pierce Conservation District**

June 2003

Sequalitchew Creek

The Sequalitchew Creek watershed lies south of Tacoma between the communities of DuPont, Fort Lewis, and Lakewood and drains an area of 38.4 square miles (Clothier, et al 2003).

Kinsey Marsh, which lies south of McChord Air Force Base, is the beginning of the upper watershed. Murray Creek drains this marsh and flows south and west through the center of Fort Lewis. It flows under I-5 and through the Camp Murray National Guard Station. Then, after 3.8 miles, it enters American Lake

(1,162 surface acres) on the southeast shoreline. One section of the creek was modified and deepened in the 1940s so that soldiers could be trained to cross 6 foot deep streams. The creek is currently experiencing flows much lower than historic levels, and invasive, non-native plant species have overrun the creek (PCPWU 1997).

The overflow from American Lake historically drained into Sequalitchew Lake (80.9 surface acres) (Wolcott 1973). Though it appears that this connection is now severed and the only connection between the two lakes is underground, Fort Lewis officials report that a connection remains through a canal system constructed by Pierce County (Crown, Pers. comm., 2003). Sequalitchew Lake has its own overflow outlet that forms the beginning of Sequalitchew Creek. The water level of both lakes is maintained year round by springs and water table seepage (PCPWU 1997).

A diversion dam for overflow water from the lake, built by Fort Lewis around 1950, lies near the outflow of Sequalitchew Lake. The dam directs water through a canal that originates in Hamer Marsh, east of the creek. Just south of Sequalitchew Lake, the canal passes under the creek through a series of culverts. The canal continues west for one mile, and turns north to empty into Puget Sound at Tatsolo Point. There is disagreement as to the effect of this canal system upon the Creek. Andrews and Swint (1994) reported that the diversion dam and canal structure is a tangled arrangement (See Figure 4: Diagram of Diversion Dam / Canal Structure at Outlet of Sequalitchew Lake) and the effects of this structure on the creek are significant. Fort Lewis officials report that the effects of this structure on Sequalitchew Creek are not significant, and that the structure was constructed to maintain the lake level and flow to Sequalitchew Creek (Crown, Pers. comm., 2003).

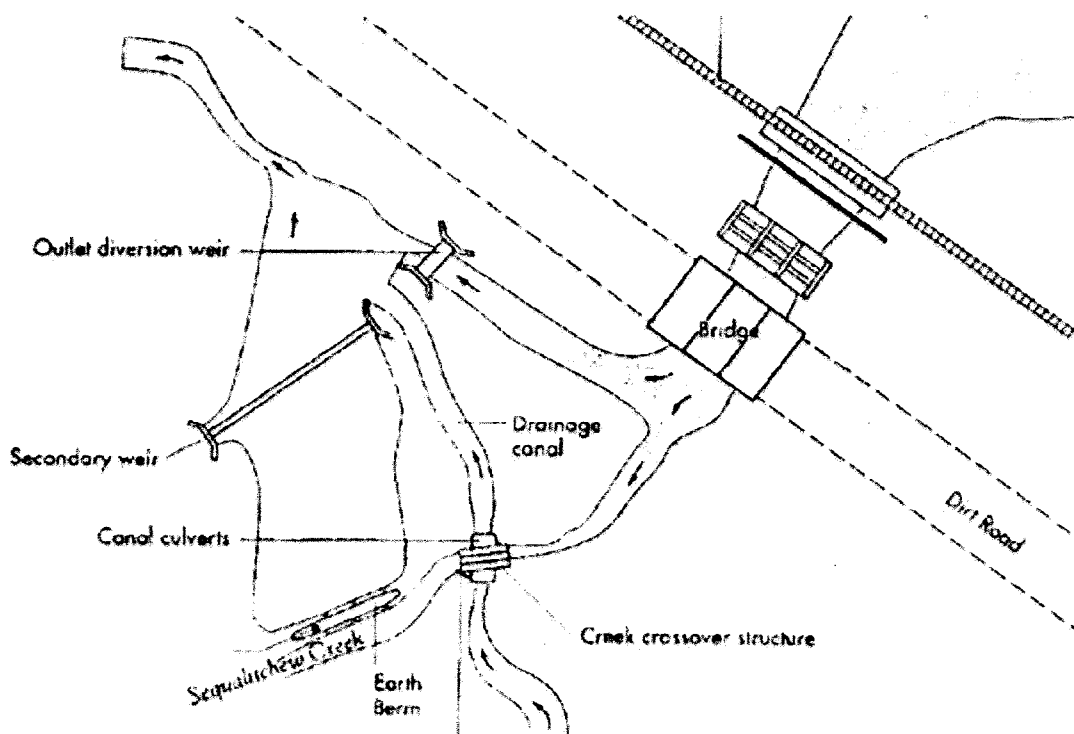


Figure 4: Diagram of Diversion Dam / Canal Structure at Outlet of Sequalitchew Lake
(Courtesy Dave Clouse, Ft. Lewis Army Base)

From its origins at the lake, Sequalitchew Creek drains westerly for 0.5 miles in a dredged channel along the edge of Hamer Marsh on the Fort Lewis Military Reservation. The creek then flows through Edmond Marsh and across more than 1 mile of former DuPont Powder Company – now Weyerhaeuser – property. Each of these marshes has more than 100 surface acres. The creek descends 200 feet in elevation through a steep-sided ravine in the lower 1.5 miles, where it abruptly enters salt water south of the old DuPont Wharf location (PCPWU 1997), which has recently been removed.

At this junction with the marine environment, the stream passes through a large culvert under the dike supporting the Northern Pacific and Burlington Northern railroad tracks. Little natural estuary is present, but the extensive Nisqually Flats that lie immediately to the south of the creek mouth provide estuarial rearing for salmon smolts from this system (Williams 1975). Sequalitchew Creek has historically supported runs of Coho salmon up to approximately RM 3.0 and chum salmon have been observed spawning in the lower 200 yards (Williams 1975).