

3.2 HAMM CREEK SUBBASIN

Physical Description	2
Subbasin	2
Stream Course Morphology	2
Salmonid Use.....	2
Factors of Decline.....	3
Fish Passage	3
Riparian Condition	3
Hydrology.....	4
Sediment Condition.....	5
Water Quality	5
Land Use.....	5
Non-Native Species	6
Hydromodification	6
Key Findings and Identified Habitat-limiting Factors.....	7
Data Gaps	7
Early Action Recommendations.....	7

3.2 HAMM CREEK SUBBASIN

PHYSICAL DESCRIPTION

SUBBASIN

Located immediately south of the Seattle City limits, locally named Hamm Creek (09.0002) is a small left-bank tributary to the Duwamish River. Draining an area of approximately 1,408 acres, the Hamm Creek subbasin is composed of four unofficially named perennial tributaries:

- South Fork;
- Middle Fork,
- Lost Fork; and
- North Fork.

STREAM COURSE MORPHOLOGY

The North, South and Middle Forks have their origins from a diverse series of groundwater seeps and springs that surface in roadside ditches in the hills west of the Duwamish River. These then drop through ravines along the western bluff line of the Duwamish River onto the valley floor. Historically, the lands downstream of this point were thought to have been a series of wetlands with largely undefined stream channels that connected to the Duwamish River.

The Middle Fork and North Fork join near S. 96th Street west of State Highway 99. When flows in these forks exceed the five-year interval storm event, they overflow into the Lost Fork. The Lost Fork originates from a diverse series of seeps and springs on the valley floor. The South Fork joins the combined three forks via a culvert at S. 95th Street. Hamm Creek then flows about 200 feet to the confluence with the Duwamish River at RM 4.95.

SALMONID USE

The known freshwater distribution of anadromous salmonids is depicted in the report Appendix. Hamm Creek historically was believed to contain populations of coho salmon, cutthroat trout and steelhead trout.

Currently, only the South Fork is thought to contain significant numbers of anadromous salmonids. At least one salmonid was reported observed in the spring-fed area of 96th Street ditch that is connected to the South Fork via culvert under Highway 99 (Tom Nelson, pers. comm.). During July, 2000, 322 cutthroat trout juveniles and 222 coho juveniles were estimated to have been removed from an approximately 400-meter reach in the area of construction downstream of Highway 99 near RM 0.3 (D. Eastman 2000, King County unpublished summary of Hamm Creek fish removal). Coho adults have been observed spawning in the South Fork up to RM 0.7. Coho and cutthroat juveniles were captured during 1998 project fish relocation near RM 0.5 and observed up to RM 1.0 (Tom Nelson, pers. comm.) Coastal cutthroat have been located in the

upper reaches of Middle and North Forks and throughout the upper and lower reaches of the South Fork.

Some marginal salmonid habitat potential exists in the upper reaches of the North, Middle and South Forks above the valley floor.

FACTORS OF DECLINE

FISH PASSAGE

Fish passage into the Middle, North and Lost forks is partially obstructed at the perched outfall into the Duwamish River. The outfall is located within a reach of the Duwamish River that is subject to tidal influence, and adult and juvenile salmonids can only enter the system when the tide reaches approximately +6.5 feet (Cagney pers. comm.). The lower 190 feet of this stream is fully contained in a 6-foot-diameter pipe, which may also inhibit salmonid migration. While the gradient is relatively flat (approximately 1 percent), the lack of suitable holding areas and darkness may inhibit some upstream salmonid migration.

The South Fork converges with the other three forks via a 6-foot corrugated culvert. This culvert is integrated into the toe of a riprapped bank within the Duwamish Yacht Club boat basin. It is perched above the river at low tides.

A fish and wildlife restoration project was completed on the South Fork in 2000. A root complex forming at the channel nick point at RM .7 was creating a migration barrier in 1997 (Nelson, 1997). A new, fish-friendly outlet to the Duwamish River was constructed that should allow unrestricted salmonid access.

RIPARIAN CONDITION

The lower 190 feet of the South, Middle, North and Lost Forks is encased within a 190-foot-long, 6-foot-diameter pipe. Moving upstream, the pipe opens into a 60-foot-long stream reach of channel that is between buildings and paved surfaces. This channel has a less than 1 percent gradient, is roughly 8 feet deep, and has a bank width of 10 feet.

At approximately RM 0.1 the combined Middle, North and Lost Forks are again within a culvert until they reach the State Route (SR) 99 cloverleaf. It then emerges into a 225-foot-long trapezoidal channel where riparian vegetation consists of deciduous trees, Himalayan blackberry, reed canarygrass and nightshade. Upstream of the SR 99 cloverleaf, the creek traverses through a 50-foot-long open channel before it enters a 450-foot-long straight channel lined with Himalayan blackberries. At the upper end of this reach the creek enters a 1,010-foot-long culvert until it reaches the confluence of the North and Middle Forks.

The North Fork is completely encased in a culvert that is approximately 2,175 feet long that emerges in the vicinity of the west side of SR 509. At this point the North Fork ascends a steep ravine with riparian habitat consisting of immature deciduous trees, Himalayan blackberry, stink and red current.

The Middle Fork, upstream from the confluence with the North Fork, is encased within a 825-foot-long culvert. It then emerges in a reed- and canarygrass-lined 300-foot-long ditch that is fed by surface drainage through smaller culverts from the Rasmussen Wire Rope facility. Upstream of this point, the stream travels alternatively through reed- canarygrass-lined roadside ditches and culverts until it ascends the bluff via a 750-foot-long ravine where riparian habitat consists of deciduous trees and Himalayan blackberries.

The area of the South Fork enhancement project from Highway 99 to the Duwamish (RM 0.0 -0.5) will be revegetated with a variety of native plants including fresh and salt water emergents, shrubs and trees. In the Point Rediscovery reach (about RM 0.5 to 0.6), the adjacent stream corridor is dominated by red alder and Himalayan blackberry with some big leaf maple, recent small red cedar plantings, indian plum, horsetails, snowberry and ivy. Upstream of Des Moines Way at RM 0.6 to RM 0.7, the one- to two-percent-gradient stream enters a 600-foot-wide ravine. The ravine provides a good vegetative buffer from the top-of-slope residential development. Large deciduous trees (big leaf maple, alder and cottonwood) with some sporadic large conifers (red cedar and douglas fir) provide the canopy. The understory is composed of vine maple, salmon berry, ferns, blackberry, ivy, nettles, skunk cabbage, sedge and devils club. From RM 0.7 to 1.1, the ravine narrows to 200 - 500 feet but still provides a significant buffer from residences and a golf course. In this reach, the one- to three-percent-gradient stream flow diminishes by about one third, and the channel is devoid of pools (as was the adjacent lower reach). Landslides are apparent through this reach and the vegetation is similar to the previous but much more dense, especially near the flowing channel. A landslide has formed a large pond (in 1997 it was 120 feet long x 40 feet wide x 3 -6 feet deep) at RM 1.0. In 1997, this slide material was considered a significant risk to downstream habitat because of the potential that it could remobilize and create a dam break event (Nelson, 1997).

LARGE WOODY DEBRIS

LWD is virtually absent in all Hamm Creek tributaries. Given the state of riparian zone, any near-term natural recruitment is precluded.

HYDROLOGY

The changes in the flow regime of all forks of Hamm Creek have been extensively altered by a variety of anthropogenic impacts. These include increases in impervious surfaces associated with industrial development and urbanization, channelization and piping, dredging, and removal of wetlands, riparian vegetation and LWD. All of the forks of Hamm Creek exhibit flows typical of lowland western Washington streams in urbanized settings. Stream flows increase quickly to rainfall events and decrease quickly upon the cessation of rainfall. Some of the reaches that are not confined in pipelines show evidence of stormwater impacts, such as the lower mile of the Middle Fork where streambed incision and channel widening has been observed (King County 1995a).

The Rainier Golf and County Club diverts water from the South Fork Hamm Creek out of a ditch into two ornamental ponds. A pump house located adjacent to the lower of these two ponds then supplies water to an ornamental concrete-lined pond on a golf course fairway.

Flows were measured at 1.3 cfs on January 11, 1996 and 1.5 cfs on May 21, 1997 (King County 1995a).

SEDIMENT CONDITION

Long reaches of all forks are contained in pipes and culverts, and many of the stream reaches outside the pipes are in highly channelized ditches. This is particularly true of the reaches that are on the valley floor. The low gradient of all forks once they reach the valley floor has resulted in the accumulation of large quantities of fine gravels, sands and silts which dominate the substrate (King County 1994, King County 1995a). In locations where moderate or larger gravels are located, they are cemented with considerable amounts of fines. The lack of suitable spawning gravels is a habitat-limiting factor to natural salmonid production.

WATER QUALITY

Stream flows in all forks of Hamm Creek have exhibited evidence of water quality degradation typical of streams in urbanized settings during storm events. Metals such as zinc, copper, and lead have been measured at high concentrations during these storm events. In addition to the high metal concentrations, high concentrations of total suspended solids and total petroleum hydrocarbons (TPH) have been measured at sampling locations throughout the streams with only minor exceptions (King County 1994, King County 1995a).

Elevated pH with values up to 8.72, sampled during base flow conditions, have been attributed to runoff from a cement kiln dust pile located in the vicinity of South 96th Street and 10th Avenue South (King County 1994).

During mid 1997, a fish kill occurred from the flushing of chlorinated water from the local water purveyor pipeline into the South Fork Hamm Creek near Des Moines Way.

LAND USE

Land use within the basin is dominated by residential and commercial/industrial uses. Open space is typically occupied by public right-of-ways (i.e.: Seattle City Light transmission lines) or golf course property. There are some mixed deciduous/coniferous second growth forests, especially in the bluffs that the tributaries transect. Table Hamm-2 shows land use acreage and percent of basin occupied by these land uses.

Table Hamm-2: Land Use in Hamm Creek (Source: King County 1994).		
Residential	Commercial/Industrial	Open Space
850 acres (61%)	242 acres (17%)	316 acres (22%)

The percent of effective impervious surface was not located during the course of this investigation. But because in excess of 88 percent of the land was in either residential or commercial/industrial use as determined in 1994, it is expected that the percent of impervious surfaces in this basin is quite high.

NON-NATIVE SPECIES

ANIMALS

There are no known non-native aquatic animal species in Hamm Creek.

PLANTS

There are numerous plant species associated with ornamental plantings throughout all of the forks. Thickets of reed canarygrass, ivy, Himalayan blackberry, and bittersweet nightshade dominate numerous stream reaches (King County 1994). The thicket in these reaches serves to constrict stream channel flow and present a lack of channel complexity and habitat necessary for salmonid production.

HYDROMODIFICATION

As detailed previously in this chapter, the stream channels of all forks of Hamm Creek have been extensively modified (table Hamm-2) from historic uses. The insufficient amounts of stream associated structure and the habitats it would create that are necessary for support of various life phases of salmonids effectively limits their natural production.

Stream Name	Piped (feet)	Confined Ditch (feet)	Otherwise Modified (feet)	Unmodified (feet)
Mainstem of Middle, North & Lost Forks	1,925	785	0	0
South Fork	770	1,350	1,470	3,885
Middle Fork	825	1,160	2,500	750
North Fork	2,875	0	500	0
Lost Fork	1,800	300	0	0

* Distances are approximate.

OFF CHANNEL HABITAT

Several South Fork Hamm Creek stream enhancement efforts have occurred recently. An off-channel wetland-pond and stream channel enhancement project at “Point Rediscovery” has been constructed in 1996 and 1998 between Highway 99 and Des Moines Memorial Drive (about RM .5) at the old Rainier Vista treatment plant site.

FLOODPLAIN CONNECTIVITY

Many of the stream reaches have been disconnected from the floodplain and tightlined or channelized by development. Low-gradient riffles and shallow pools dominate the lower reaches of all forks that might have been utilized by salmonids for natural production.

The condition of the channels of all of the forks of Hamm Creek limit natural salmonid production.

KEY FINDINGS AND IDENTIFIED HABITAT-LIMITING FACTORS

- Naturally producing anadromous salmonids may be absent from most of this subbasin. Presently, only the lower 0.7 of South Fork Hamm Creek contains any potential spawning habitat for anadromous salmon for the subbasin.
- There is utilization by coho salmon of only the South Fork Hamm Creek.
- All forks of Hamm Creek suffer from an particularly severe system of piping and channelization.
- A combination of stream sediment load, stream channel characteristics, and high flows during storm events adversely impact anadromous fish success.
- Water quality in the lower stream reaches is particularly degraded by metals, TSS and TPH.
- Outside of the bluff-associated ravines, the riparian habitat (where present) is composed of numerous non-native plant communities.
- The stream channels generally lack complexity due to the lack of LWD, vertical channel migration, and bank armoring. Instream structures are needed to produce channel complexity for successful salmonid production.
- The quality and quantity of gravels in the stream limits anadromous and resident salmonid spawning potential juvenile rearing success.
- There are only limited amounts of off-channel habitat suitable for juvenile salmonid rearing and holding.
- Access to the Middle and North Forks is limited by the outlet into the Duwamish River and the amount of piping present throughout these streams.
- While the percent of effective impervious surfaces in these streams was not found as a part of this investigation, the amount and type of land use in this subbasin indicates that the percent would quite high.

EARLY ACTION RECOMMENDATIONS

- The water quality, sediment regime, and hydrology of this subbasin has been severely degraded and could undermine stream enhancement efforts. A thorough, scientific evaluation of the production potential of this system for a naturally sustaining stock of salmonids should be conducted prior to further resource expenditure.

LIST OF TABLES

Table Hamm-1: Hamm Creek (09.0002) Stream Channel Types and Distances* (Source: King County 1995a).

Table Hamm-2: Land Use in Hamm Creek (Source: King County 1994).