

South Fork Little Campbell Creek from Little Campbell Creek to Lake Otis Parkway

Land use is predominately developed, mixed commercial and industrial. The riparian vegetation is altered to the streambank in more than half of the sites observed. Possible sources of microbial contamination include dogs, moose, garbage facilities, and birds. (Photographs C1 to C15).

Little Campbell Creek at the confluence of the North and South Forks

The land use at the confluence of the North and South forks of Little Campbell Creek is approximately 80% residential and 20% commercial. The riparian vegetation is mowed to the streambank directly at the confluence (Photograph C1) and ~ 4 m upstream along the North fork. Intact riparian vegetation upstream along the North fork was mowed to the stream edge (Photograph C2). Downstream of the confluence and upstream along the South Fork, the riparian vegetation is intact from about 0-3 m on either side of the stream channel. No apparent microbial sources were detected.

Little Campbell Creek South Fork at Spring Street off 80th

Land use is 100% commercial. Riparian vegetation is intact from 0-4 m along both stream banks (Photograph C3). Dog waste observed ~2m from stream edge



Photograph C1. The confluence of the North and South Forks of Little Campbell Creek (N 61.15319, W 149.86589).



Photograph C2. Mowing of riparian vegetation along the North Fork Little Campbell Creek.



Photograph C3. South Fork of Little Campbell Creek at Spring St. off 80th.

(Photograph C4). Trails were present at the end of the street down to the stream. Microbial source inputs are likely from dogs.

Little Campbell Creek at E. 80th Ave. at Fire Station #12

Land use is 100% industrial with poor riparian vegetation cover on the right descending bank (RDB) upstream of fire department driveway with asphalt from parking lot encroaching on the creek (Photograph C5) and good riparian vegetation of the left descending bank (LDB) from 0-2 m along stream with good tree cover upstream of the fire department driveway. Garbage dumpsters are present within 2 m of stream and during high storm flow events microbial input is possible as there is evidence of run-off entering the stream at the culvert adjacent to the fire department driveway (Photographs C6 and C7). Riparian vegetation increases downstream of the fire department driveway with ~ 2 m of riparian vegetation along both streambanks between the driveway and E. 80th Ave. Evidence of bird waste is on rocks along stream edge (Photograph C8). Moose droppings found ~ 1.5 m from stream in multiple locations (Photograph C9). Microbial source inputs likely from dogs, moose, and garbage dumpsters.

Little Campbell Creek South Fork at Sandalwood Pl.

Downstream of the Sandalwood Pl. crossing (Photograph C10), land use is 75% industrial and the other 25% is a pond.



Photograph C4. Dog waste along the South Fork of Little Campbell Creek at Spring St. (N 61.15083, W 149.86200).



Photograph C5. South Fork of Little Campbell Creek at Fire Station #12.



Photograph C6. Garbage dumpsters adjacent to South Fork of Little Campbell Creek at Fire Station #12.



Photograph C7. Culvert adjacent to dumpsters on the South Fork Little Campbell Creek at Fire Station #12.



Photograph C8. Bird waste on rocks along the South Fork Little Campbell Creek at Fire Station #12.



Photograph C9. Moose droppings from the South Fork Little Campbell Creek near Fire Station #12.



Photograph C10. Little Campbell Creek South Fork looking downstream from Sandalwood Pl.



Photograph C11. Gull waste along the bank of Little Campbell Creek South Fork looking downstream from Sandalwood Pl. (N 61.14759, W 149.85307)



Photograph C12. The pond adjacent to the left bank of Little Campbell Creek South Fork looking upstream from Sandalwood Pl.

The culvert impounds the creek moderately at the road crossing. The riparian vegetation is comprised of large trees, but there is little riparian understory (mainly hard packed dirt). A copious amount of gull waste is present all around the creek (Photograph C11). The pond adjacent to the LDB hosts large numbers of gulls which are also using the creek (Photograph C12). Upstream of the road crossing, land use is 100% industrial (Photograph C13). The creek is also slightly impounded by the culvert. Riparian vegetation is intact 0- 4 m from creek on both banks. Vegetation likely is undisturbed because there is barb wire preventing access beyond the road crossing.

Little Campbell Creek South Fork at Petersburg

Land use is 100% industrial. Downstream of road crossing there is a good riparian buffer 0-4 m on either side. The stream may experience high run-off input during rain events washing the abundant trash in the area into the stream (Photograph C14). The creek flows under the road through double culverts. Upstream of the road crossing the riparian buffer is thickly vegetated from 0 – 4 m (Photograph C15).

Little Campbell Creek South Fork at Hook Dr. and Dimond, off Cinnabar.

Land use is 75% industrial and 25% commercial. At the road crossing the riparian vegetation is lacking, but returns to good coverage ~ 2 m from road crossing both up- and downstream.



Photograph C13. Little Campbell Creek South Fork looking upstream from Sandalwood Pl.



Photograph C14. Trash in the South Fork at Petersburg (N 61.14556 W 149.84560).



Photograph C15. Little Campbell Creek South Fork at Petersburg.

South Fork Little Campbell Creek Lake Otis Parkway to Abbott Road.

Land use is 100% residential. Some alteration to the riparian vegetation was observed. Possible microbial contamination is predominately from dogs, but also likely from moose and birds. (Photographs C16-C21).

Little Campbell Creek South Fork at Lake Otis and 84th at Abbott Loop Elementary School

Land use is 100% residential which includes the elementary school property. The riparian zone is largely intact from 0 – 4 m on either side of the creek (Photograph C16). The elementary school abuts the creek along the LDB while the road abuts along the RDB. Moose droppings are found in multiple locations within 0 - 2 m from the streambank (Photograph C17). There is lots of trash in the stream. A dry culvert with dog tracks in the mud enters the stream from the road side. The riparian vegetation is interrupted for approximately 50 m giving way to a trail along the RDB. Dog waste was also found. Foam is present in the stream (Photograph C18). Many trails from houses lead to the stream upstream from the elementary school. The stream goes under Atkins Rd. further upstream (Photograph C19). This road crossing seems new as grass seed has been planted. Microbial source inputs are likely from dogs, moose, and birds.



Photograph C16. South Fork at Abbott Loop Elementary School (N 61.14463, W 149.83179).



Photograph C17. Moose droppings at Little Campbell Creek South Fork at Abbott Loop Elementary.



Photograph C18. Foam in the South Fork at Abbott Loop Elementary School (N 61.14376 W 149.82942).

**South Fork Little Campbell Creek at
Rosalind Dr.**

Land use is 100% residential. Riparian cover extends from the bank to over 4 m. A dog was seen in the creek, so a possible source of microbial input is canine (Photograph C20).

South Fork Little Campbell Creek at 88th St.

Land use is 100% residential. Riparian cover extends from the bank to over 5 m (Photograph C21).

**South Fork Little Campbell Creek
from Abbott Road to Elmore
Road.**

Land use is predominately undeveloped park land. The major cause of changes to vegetation is the power line right of way between the two Elmore Roads. Horses are prevalent in the area and are likely to be the major source of microbial contamination in combination with dogs. (Photographs C22-C26)

**South Fork Little Campbell Creek at Abbott
Rd.**

Land use is 100% undeveloped (forested). The section of the stream is in a park. A trail crosses the stream about a ¼ mile from the road via small footbridge (Photograph C22). Dog waste was observed near the trail and birds were observed in the stream (Photograph C23). The riparian cover open up near the bridge but is otherwise intact over 1 mile from stream edge.



Photograph C19. Culvert on Little Campbell Creek South Fork at Atkins Rd. (N 61.14376, W 149.82942).



Photograph C20. Dog in Little Campbell Creek South Fork at Rosalind (N 61.14251, W 149.82368).



Photograph C21. Little Campbell Creek South Fork at 88th St. (N 61.14109, W 149.82150).

South Fork Little Campbell Creek at Elmore Rd.

Land use is 85% undeveloped and 15% power line right of way. Riparian cover is lacking along the right of way of the power lines with evidence of recent alteration as restoration materials are new (Photograph C23). Beyond the right of way, riparian cover extends from the bank to over 1 mile (Photograph C24). Dog tracks were observed in the mud in the right of way crossing of the stream (Photograph C25). Horse activity is present in the area, however neither tracks nor waste were found directly near the stream. Possible sources of microbial input are equine and canine.



Photograph C22. Little Campbell Creek South Fork near Abbott Rd. (N61.08217, W 149.49226)



Photograph C23. Dog waste at Little Campbell Creek South Fork near Abbott Rd. (N 61.08217, W 149.49226).



Photograph C24. Little Campbell Creek South Fork between Elmore Rd. and Elmore Rd. (N 61.13119, W 149.80435).



Photograph C25 South Fork Little Campbell Creek between Elmore Rd. and upstream of power line right of way.



Photograph C26. Tracks in the mud on the banks of South Fork Little Campbell Creek between Elmore Rd. and Elmore Rd. (N 61.13119, W 149.80435).



Photograph C27. Little Campbell Creek South Fork at Pacer Pl. between 102 and 104 Ave.



Photograph C28. Little Campbell Creek South Fork at 104th Ave. (N 61.12674, W 149.79466).

South Fork Little Campbell Creek upstream of Elmore Road

Land use is 50% zoo and 50% residential. Riparian vegetation is largely intact. Possible sources of microbial contamination are zoo

animals, horses, birds, and garbage.
(Photographs C27 to C32).

**South Fork Little Campbell Creek at Pacer
Pl. between 104 and 102 Ave.**

Land use is 100% residential. Stream flows under road through very large, newly installed culvert (Photograph C27). Upstream of culvert tree cover is good. Downstream, the understory of the riparian cover is impacted from residential use. Bird waste was observed on rocks near stream. Possible microbial source inputs are avian and canine.

**South Fork Little Campbell Creek at 104
Ave.**

Land use is 100% residential and the creek flows through well forested private property with good riparian cover (Photograph 28). Upstream is an impoundment flowing into the creek (Photograph C29), a garbage dump, and a horse stable (Photograph C30). Garbage dump area is gravel that likely drains into the impoundment during rain events. A horse stable is directly adjacent to garbage dump and impoundment and also upstream of the stream. The stream further upstream was unable to be accessed due to a locked gate. Possible microbial contamination includes garbage, zoo animals, and equine sources.

South Fork Little Campbell Creek at Our Rd.

Land use is 100% residential. Stream crosses under road through culvert. Good riparian vegetation. A “no dogs” sign was present at stream edge. A pipe entered stream upstream of road crossing which drained a small impoundment, or duck pond (Photographs C31 and C32). Possible



Photograph 29. Impoundment flowing into South Fork Little Campbell Creek at 104th Ave. (N 61.12643, W 149.79506).



Photograph C30. Garbage site adjacent to South Fork Little Campbell Creek at 104th Ave. (N 61.12643, W 149.79506).

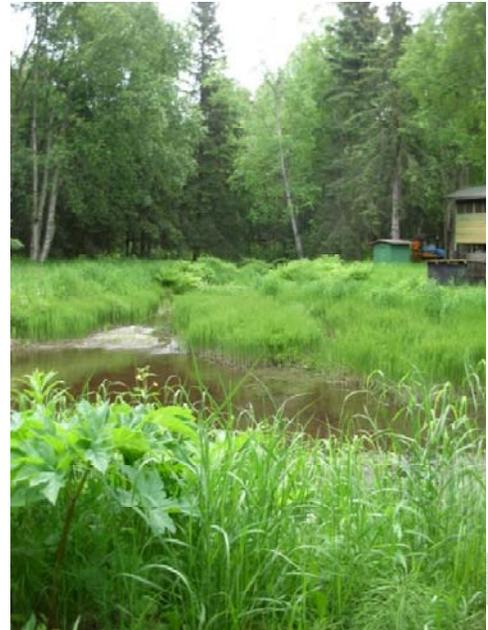


Photograph 31. Pipe entering South Fork Little Campbell Creek at Our Rd. (N 61.12548, W

sources of microbial contamination are ducks.

Tributary to Little Campbell Creek South Fork

Land use is 100% residential. Some riparian alteration from homeowner's mowing to stream edge. Bird waste is the only observed source of microbial source contamination. (Photographs C33 to C35).



Photograph C32. Impoundment draining into to South Fork Little Campbell Creek at Our Rd. (N 61.12548, W 149.78923).

Tributary to Little Campbell Creek South Fork at Spring Hill Dr.

This is a very small creek that goes under the road through a double small culvert (Photograph C33). Land use is 100% residential. The riparian vegetation is mowed to the stream edge at the road crossing. There was evidence of bird waste at the stream edge. Microbial contamination possible from avian sources.



Photograph C33. Double culvert South Fork Little Campbell Creek at 104th Ave. (N 61.12643, W 149.79506).

Tributary to South Fork Little Campbell Creek at Golden Spring Rd.

Land use is 100% residential. A small foot bridge crosses creek. Good riparian vegetation around stream. Some footpaths are evident. Birds observed in stream. Downstream the creek flows through a front yard and the riparian vegetation is mowed to the bank (Photographs C34 and C35). No apparent sources of microbial contamination.



Photograph 34. Tributary to South Fork Little Campbell Creek below Golden Spring Rd. (N 61.13197, W 149.79289).



Photograph 35. Tributary to South Fork Little Campbell Creek above Golden Spring Rd. (N 61.13197, W 149.79289).

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North Fork Little Campbell Creek from Old Seward Highway to Lake Otis Parkway

Land use is a mix of residential, commercial, and industrial. Riparian vegetation improves from downstream to upstream. Birds were the main possible source of microbial input. (Photographs C36 to C45)



Photograph C36. North Fork Little Campbell Creek at Spring St off 74th Ave. (N 61.15411, W 149.86259).

North Fork Little Campbell Creek at Spring St. off 74th Ave.

Land use is 100% industrial. The creek goes under Spring St. through culverts and is fenced off completely up-and downstream of the road (Photograph C36). No obvious sources of microbial input.



Photograph C37. North Fork Little Campbell Creek upstream from Briarwood and 72nd Ave. (N 61.15482, W 149.86055).

North Fork Little Campbell Creek at Briarwood and 72nd.

Land use is 50% industrial and 50% residential. Upstream of the road crossing the riparian vegetation is mowed to bank and the stream is slightly impounded (Photograph C37). A small bridge also crosses the stream upstream. Downstream of the road crossing (Photograph 38) the land is cleared adjacent to the stream used by domestic fowl (ducks and chickens). Ducks were observed in the stream. Possible sources of microbial input are avian.

North Fork Little Campbell Creek between 71st and 72nd Aves.

Land use is 50% industrial and 50% residential. Upstream of the road crossing bird waste was observed in and around the stream (Photograph C39) and riparian

vegetation extends from 0-3 m. Downstream riparian vegetation is mowed to the stream edge. Possible microbial input is avian.

North Fork Little Campbell Creek at Driftwood

Land use is 100% industrial. Riparian vegetation extends to 2-3 m from stream. Dog waste (Photograph C40) observed at stream crossing contributing to microbial input.



Photograph C38. North Fork Little Campbell Creek downstream from Briarwood and 72nd Ave. (N 61.15482, W 149.86055)

North Fork Little Campbell Creek at Brayton Dr.

Land use is 100% commercial. The riparian vegetation is intact (Photograph C41). Downstream of the road crossing there are burms/abutments to stop parking lot run off from entering the stream. No apparent fecal sources.

North Fork Little Campbell Creek at Brayton Dr. and 68th

Land use is 100% industrial. The riparian vegetation is intact (Photograph C42). No apparent fecal sources.



Photograph C39. Bird waste in North Fork Little Campbell Creek at Briarwood between 71st and 72nd Aves. (N 61.15553, W 149.86017).

North Fork Little Campbell Creek at Askeland

Land use is 100% residential. Upstream, the riparian vegetation is intact from stream edge to ~2 m. Downstream the riparian vegetation is mowed from crossing to 4 m. Avian fecal sources found.

North Fork Little Campbell Creek at 66th Ave.

Land use is 90% residential and 10% industrial. The riparian vegetation is intact along road (Photograph C43). No apparent fecal sources found.



Photograph C40 Dog waste in North Fork Little Campbell Creek at Driftwood (N 61.15643, W 149.85742).



Photograph C41. North Fork Little Campbell Creek at Brayton Dr. (N 61.15849, W 149.85468)



Photograph C42. North Fork Little Campbell Creek at 68th and Brayton Dr. (N 61.15911, W 149.85474).



Photograph C43. North Fork Little Campbell Creek at 66th Ave. (N 61.16113, W 149.83652)

North Branch North Fork Little Campbell Creek from Lake Otis Parkway to BLM land

Land use is residential to undeveloped from downstream to upstream and riparian vegetation improves along the same gradient. Canines are the main source of possible microbial input. (Photographs C44 to C50)



Photograph C44. North Branch North Fork Little Campbell Creek upstream from Lake Otis Parkway (N 61.16116, W 149.83459)

North Branch North Fork Little Campbell Creek at Lake Otis Parkway.

Land use is 70% commercial and 30% forested. Up- and downstream the riparian vegetation is intact (Photographs C44 and C45). Some trash was seen in the stream downstream of road crossing. No apparent fecal sources found.

North Branch North Fork Little Campbell Creek at Tiffany Terrace.

Land use is 100% residential. Riparian vegetation is good from 0-2 m along stream. Downstream, a pipe enters the stream with a heavy iron load (Photograph C46). A storm water pipe also enters the stream. A large pond with geese and ducks empties into creek (Photographs C47 and C48). Heavy human recreational use is in the area. An unknown animal fecal source was found. Possible fecal sources are canine and avian.



Photograph C45. North Branch North Fork Little Campbell Creek downstream from Lake Otis Parkway (N 61.16116, W 149.83459)

North Branch North Fork Little Campbell Creek at 68th Ave. and Baby Bear Dr.

Land use is 100% residential. Good riparian vegetation cover. No apparent fecal sources observed.

North Branch North Fork Little Campbell Creek at 68th and Bugle Rd.

Land use is 100% residential. Sewer pothole noted upstream of Bugle Rd. No apparent fecal sources found but if human waste is quantified in samples a possible sewer leak could be examined.



Photograph C46. Pipe entering the North Branch North Fork at Tiffany Terrace (N 61.16126, W 149.82513)

North Branch North Fork Little Campbell Creek at Elmore Rd. between 68th and 72nd Aves.

Downstream of the road crossing land use is 50% residential and 50% undeveloped (forested). Riparian cover good with lots of macrophytes in stream channel. Algal growth is apparent at mouth of culvert. Upstream of road crossing the land use is 100% undeveloped (forested). The stream opens upstream of Elmore Road, expanding into open wetland area forested with spruce. Waterfowl waste was found near creek (Figure C49). Storm drain empties into creek.



Photograph C47. Impoundment outflow into the North Branch North Fork at Tiffany Terrace (N 61.16126, W 149.82513).

North Branch North Fork Little Campbell Creek on BLM property.

About 40 years ago a lagoon system/leach field was abandoned. Approximately 2 years ago, the lagoons were removed and two monitoring wells were sunk. No microbial contaminants were observed to be leaching into the groundwater (Figure C50).



Photograph C48. Impoundment on North Fork Little Campbell Creek at Tiffany Terrace (N 61.16126, W 149.82513).



Photograph C49. North Branch North Fork Little Campbell Creek downstream of Elmore between 68th and 72nd Ave. (N 61.15741, W 149.80455).



Photograph C50. North Branch North Fork Little Campbell Creek upstream of Elmore between 68th and 72nd Ave. (N 61.15741, W 149.80455).

Cottonwood Creek from Wasilla Lake to Old Matanuska Road

Land use is 25% residential and 75% commercial. The riparian vegetation is altered to the streambank in some of the sites observed. Sources of microbial contamination are septic systems, dogs and birds. (Photographs C51 to C54).



Photograph C51. Cottonwood Creek between Wasilla Lake and Parks Highway (between N 61.58025, W 149.39657 and N 61.57790, W 149.40009).

Cottonwood Creek from Wasilla Lake to the Parks Highway Bridge

The land use is 50% residential and 50% commercial (Photographs C51 and C52). The stream is impounded at the Parks Highway bridge crossing (Photograph C53). The riparian vegetation is altered to the streambank in some areas. Avian waste was observed (Photograph C54).



Photograph C52. Cottonwood Creek between Wasilla Lake and Parks Highway (N 61.58025, W 149.39657).

Cottonwood Creek from Parks Highway Bridge to Old Matanuska Rd.

The land use is 100% commercial. The riparian vegetation is intact along most of the streambank and macrophytes are abundant in the stream channel (Photographs C55).

Cottonwood Creek from Old Matanuska Road to Marble Way

Development is 100% residential. Riparian modification has occurred at locations where private property encroaches on the stream. The main potential source of microbial contamination is from septic systems, and birds. (Photographs C56 to C67).



Photograph C53. Cottonwood Creek at the Parks highway (N 61. 57556, W 149. 40347).



Photograph C54. Avian waste on a rock in Cottonwood Creek (N 61.57613, W 149.40260).



Photograph C55. Cottonwood Creek upstream from Old Matanuska Rd



Photograph C56. Cottonwood Creek downstream from Old Matanuska Rd.



Photograph C57. Cottonwood Creek at Glenwood.



Photograph C58. ARR crossing of Cottonwood Creek upstream of Glenwood.



Photograph C59. Foam in Cottonwood Creek between Old Matanuska Rd and Glenwood.

Cottonwood Creek from Old Matanuska Rd. to Glenwood Ave.

The land use is 100% residential. The riparian vegetation is altered to the streambank in several places. Macrophytes are abundant in the stream channel (Photograph C56, C57 and C58). Algae cover many rocks in the stream as well. There is a vehicle stream crossing upstream of Glenwood. Foam is present (Photograph C59). Fresh dead mussel shells were observed. Some trash was in the stream. Possible sources of microbial input are canine, avian and human.



Photograph C60. Cottonwood Creek between Glenwood Ave and Fern St.

Cottonwood Creek from Glenwood Ave. to Fern St.

The land use is 100% residential. The riparian vegetation is altered to the stream bank in several places (Photograph C60 and C61). Macrophytes are abundant in the stream channel (Photograph C62).



Photograph C61. Cottonwood Creek between Glenwood Ave. and Fern St.

Cottonwood Creek from Fern St. to Edlund Rd.

The land use is 90% undeveloped and 10% residential. Macrophytes are abundant in the stream channel (Photographs C63 to C65). The riparian vegetation is altered to the streambank in several places including a full sized vehicle stream crossing (Photograph C66).



Photograph C62. Cottonwood Creek upstream of Fern St.

Cottonwood Creek from Edlund Rd. to Marble Way

The land use is 70% undeveloped and 30% residential. The riparian vegetation is altered to the streambank in several places. Macrophytes are abundant in the stream channel (Photographs C67 and C68). Some trash and foam were observed. No apparent sources of microbial input observed.



Photograph C63. Macrophytes in Cottonwood Creek upstream from Fern St.



Photograph C64. Macrophytes in Cottonwood Creek at Fern St (N 61.55440 W 149.48815).



Photograph C65. Cottonwood Creek between Fern St. and Edlund Rd.

Cottonwood Creek from Marble Way to Surry Road

Land use is predominately developed, residential with some undeveloped sections. The riparian vegetation is altered to the streambank in some areas from residential use. Possible sources of microbial contamination include moose and birds. (Photographs C68 to C71).



Photograph C66. Full sized vehicle crossing on Cottonwood Creek between Fern St and Edlund (N 61.55885, W 149. 46029).

Cottonwood Creek from Marble Way to Riverdell

The land use is 100% residential. The riparian vegetation is altered to the stream bank in several places (Photograph C69). Macrophytes and some trash are abundant in the stream channel. A moose carcass was in the stream channel (Photograph C70). Sources of microbial input are from birds or moose.



Photograph C67. Cottonwood Creek between Edlund Road and Marble Way.

Cottonwood Creek from Riverdell to Fairview Loop

The land use is 100% residential. Macrophytes and foam are abundant in the stream channel. A bucket with toilet paper was found near the stream channel possibly contributing to microbial contamination (Photograph C71).



Photograph C69. Cottonwood Creek between Marble Way and Riverdell Drive.

Cottonwood Creek from Fairview Loop to Surry Rd.

The land use is primarily undeveloped with some residential development (Photograph C72). No apparent microbial sources observed.



Photograph C68. Cottonwood Creek at Marble Way Bridge from upstream.



Photograph C70. Moose carcass in Cottonwood Creek between Marble Way and Riverdell (N 61.53271, W 149. 52631).



Photograph C71. Latrine at Cottonwood Creek between Riverdell and Fairview Loop (N 61.53028 W 149.52746).



Photograph C72. Cottonwood Creek downstream from Fairview Loop showing intact riparian and lack of development.