Stantec

Memo

To:	Kezar Lake Watershed Association	From:	Jake Riley Topsham ME Office
File:	Stantec PN 195600843	Date:	April 10, 2020

Reference: Summary of Cold Brook Habitat Reconnaissance Survey

Stantec Consulting Services Inc. (Stantec) conducted a 1-day visual brook trout (*Salvelinus fontinalis*) presence/absence survey and fisheries habitat reconnaissance survey in a section of Cold Brook on August 14, 2019. Cold Brook is in the Kezar Lake Watershed in western Maine. The objective of the survey was to characterize the available habitat for brook trout and observe their potential distribution in the surveyed sections of Cold Brook (Figure 1). The survey extended from Slide Inn Road upstream for approximately 2 river miles (RM) across Adams Road up into the White Mountain National Forest (WMNF) (Figure 1). The survey observations are presented below for the four different segments of Cold Brook depicted in Figure 1 from downstream to upstream, including:

Segment 1: Slide Inn Road upstream to right angle turn to the west
Segment 2: Right angle turn to west to confluence with Adams Brook
Segment 3: Adams Brook to Adams Road crossing
Segment 4: Adams Road crossing up into WMNF

Segment 1: Upstream of Slide Brook Road Crossing

Segment 1 was approximately 0.5 RM and extended from the Slide Brook bridge upstream to the right angle turn in Cold Brook to the west (Figure 1). This lower section of Cold Brook had good canopy cover and riparian vegetation consisting of mixed hardwood forest (Photo 1). The higher quality stream habitat in this lower segment included plunge pools with a stable boulder and bedrock dominated substrate with fine sediment settled out in the deeper pools (Photo 1). One brook trout young-of-year was observed in this steeper high-quality habitat, however, there was minimal evidence of appropriately sized gravel for brook trout spawning. Upstream of this lower section was a beaver-influenced long flatter reach dominated by deep pool and runs including a large pond feature that was too deep and dark to observe any fish (Photo 2). The pond habitat was at the confluence of the tributary draining Little Pond from the north (Figure 1). Above this reach, there was a long stretch of Cold Brook in an open meadow that was dominated by beaver activity with active lodges and multiple blown out beaver dams (Photo 3). The beaver dams held back some spawning substrate (i.e., gravel) but there was a lack of riffles and/or pool tails with well-oxygenated water preferred for spawning. Just before the right angle turn to the west at the upstream limit of Segment 1, there was a steeper reach with more canopy cover, cobble substrate, and two exposed blue PVC pipes in the stream channel, which could have been used for water irrigation for the historic golf course located adjacent and to the east of Cold Brook.

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Photo 1. Steep bedrock and boulder section of Cold Brook with fine sediment in the pools.

Photo 2. Slower moving section of Cold Brook dominated by deep pools and long runs.

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Photo 3. Section of Cold Brook dominated by beaver activity.

Segment 2: Right Angle Turn to West Upstream to Confluence with Adams Brook

This short segment (approximately 0.15 RM) of Cold Brook was dominated by slow moving pools and runs with sedimentation and large woody debris jams (Figure 1, Photo 4). At the junction of Adams Brook and Cold Brook, there was approximately twice as much flow in Adams Brook than Cold Brook (Photo 5). Both tributaries were dominated by fine sediment in the stream bed. This section of Cold Brook did not have preferred brook trout habitat and no fish were observed in this section.

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Photo 4. Slower section of Cold Brook with large woody debris jams holding back sand, gravel, and organic debris.

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Photo 5. Junction of Cold Brook (right) and Adams Brook (left).

Segment 3: Adams Brook Confluence Upstream to Adams Road

This segment was approximately 0.35 RM and extended from the confluence with Adams Brook to the culvert crossing under Adams Road (Figure 1). This section of Cold Brook had poor fish habitat with shallow pools with sedimentation and no or little large woody debris or habitat complexity (Photos 6 and 7). There were several active beaver dams observed which created slow and deep pools upstream. This section of Cold Brook appeared historically straightened, perhaps from historic development and construction of the old golf course adjacent to the brook. A berm was observed on the left stream bank constricting the floodplain downstream of Adams Road. There were blacknose dace (*Rhinichthys atratulus*) observed in this section; however, overall, it had low quality brook trout habitat. There was gravel present for brook trout spawning but minimal riffles or complex habitat and most of the section consisted of runs or pools.

Photo 6. Fine sediment dominating the stretch of Cold Brook from the confluence with Adams Brook upstream to the Adams Road crossing.

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Photo 7. Planebed and channel stream habitat downstream from the Adams Road crossing.

Segment 4: Adams Road to National Forest

This segment of Cold Brook extended 0.7 river miles from the crossing with Adams Road up into the WMNF (Figure 1). The segment began with three culverts conveying the brook under Adams Road, which showed signs of being undersized and impeding natural fluvial geomorphic processes with scour and stream substrate deposition at the culvert inlets (Photo 8). The lower reaches of this segment had lower quality brook trout habitat with a plan-bed stream channel and very little habitat complexity or heterogeneity (Photo 9). Throughout Segment 4, there was vegetated riparian buffers and forested canopy. The stream banks were historically armored with larger rocks along the western bank in proximity to some residential development. Farther upstream in the WMNF, Cold Brook steepened and the fish habitat improved into a typical step/pool system dominated by boulders (Photo 10). The second brook trout (a single adult approximately 5–6 inches) was observed in the upper reaches of this segment in an area with some deeper bedrock pools.

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Photo 8. Three barrel culverts under Adams Road.

Photo 9. Lower section of Segment 4 with a planbed stream channel and very little habitat complexity.

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Photo 10. Better trout habitat in the WMNF with step-pool boulder steeper system and no human disturbances.

Conclusions

Segments 1 and 4 had the highest quality brook trout habitat observed in the survey. These sections also have the least amount of development from the historic golf course or residential buildings. Only two brook trout were observed in the survey (in Segments 1 and 4) but brook trout are difficult to see visually especially in the darker and deeper pools. There is likely brook trout throughout the Cold Brook watershed, concentrated in the higher quality habitats.

Stantec Consulting Services Inc.

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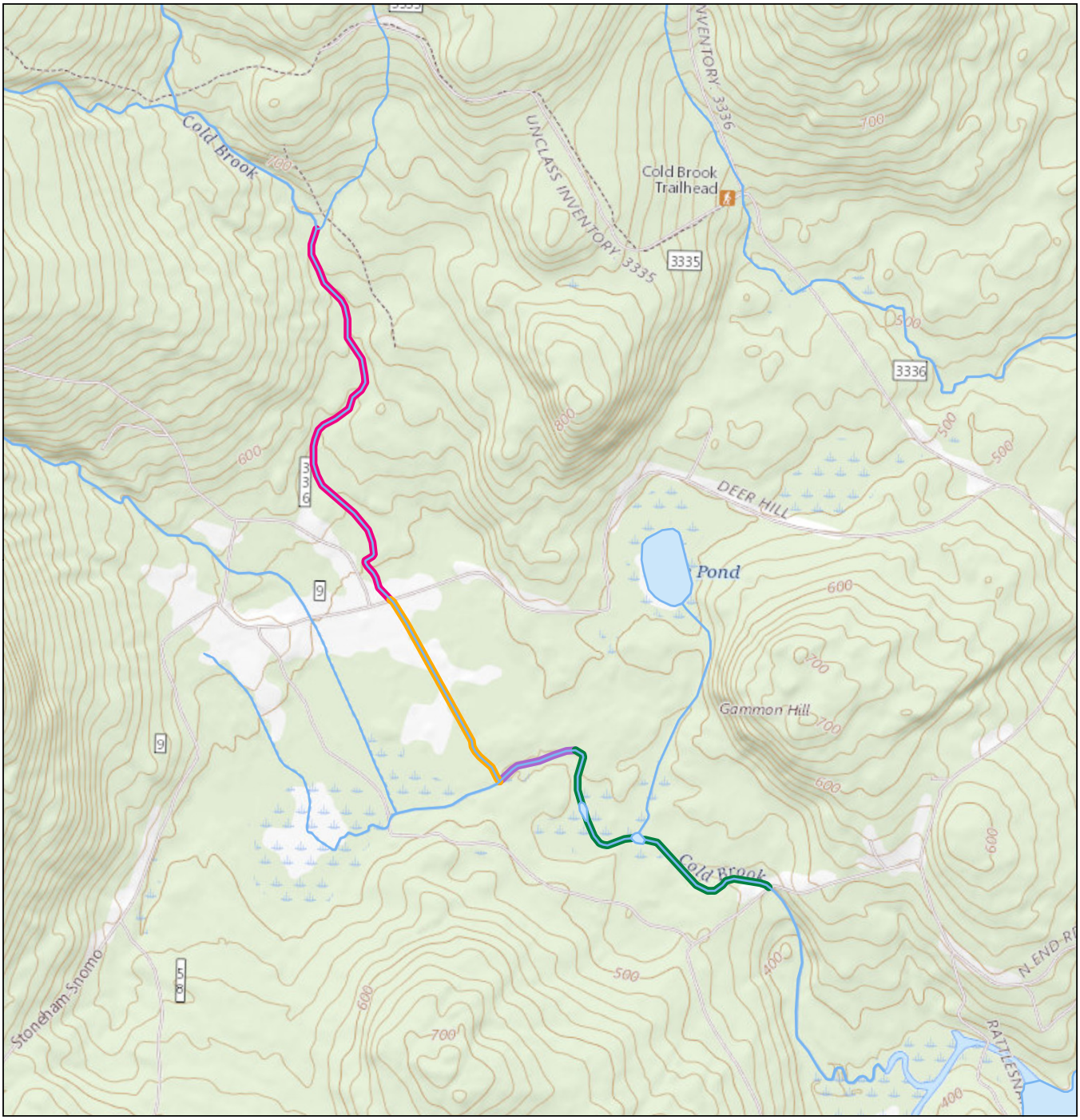
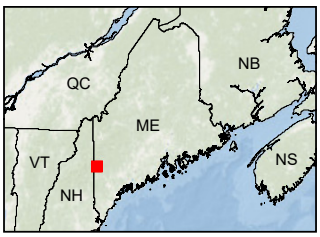
Attachment: Figure 1





Legend

Cold Brook Stream Segments

- Segment 1
- Segment 2
- Segment 3
- Segment 4

0 0.25 Miles

(At original document size of 8.5x11)
1:15,840

N

Stantec

Project Location
Stoneham, Maine

Prepared by GC on 2020-04-02
Reviewed by JR on 2020-04-02

Client/Project
Kezar Lake Watershed Association

195600843

Figure No.
1

Title
Cold Brook Habitat Reconnaissance

Notes
1. Coordinate System: NAD 1983 UTM Zone 19N
2. Data Sources: USGS, Stantec
3. Background: The National Map USGS Topographic base map

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