NEW GOLD RAINY RIVER MINE
APPENDIX N
2018 ANNUAL MONITORING REPORT-OFFSET PLAN FOR FISHERIES ACT

Rainy River Mine

2018 Annual Monitoring Report – Offset Plan for Fisheries Act Section 35(2)(b) Authorization
Emo, Ontario
TC111504

Prepared for:

New Gold Inc.

5967 Highway 11/71, P.O. Box 5, Emo, Ontario P0W 1E0

December 2018

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December 22, 2018

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Rainy River Mine
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Dear Ms. St-Jean:

Re: 2018 Annual Monitoring Report
Offset Plan for Fisheries Act Section 35(2)(b) Authorization, Rainy River Mine
Emo, Ontario

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited (Wood) was retained by New Gold Inc. (New Gold) to complete the year-two annual performance monitoring of the *Fisheries Act* Authorization (the Authorization) No. 15-HCAA-00039 Offset Plan at the Rainy River Mine in Emo, Ontario. Teeple Pond and outlet channel are the offset measures constructed as per the Offset Plan. The purpose of this 2018 annual monitoring report is to summarize the second year of performance monitoring for the Teeple Pond and outlet channel as per condition 3.1 where it relates to measures and standards in condition 3, and condition 5.2.2 of the Authorization. Recommendations to improve future annual performance monitoring programs are outlined in the enclosed report.

Sincerely,
Wood Environment & Infrastructure
a Division of Wood Canada Limited

Prepared by:

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Mark Ruthven, C.E.T.
Head, Environmental Assessment

Rainy River Mine

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Executive Summary

The construction and development of New Gold Inc's (New Gold) Rainy River Mine (RRM) resulted in the unavoidable, but planned, serious harm to a commercial, recreational, or aboriginal fishery, or to fish that support such a fishery. This serious harm to fish required an Authorization from Fisheries and Oceans Canada (DFO) as per Section 35(2)(b) of the Fisheries Act. In order for DFO to authorize the serious harm to fish, development and implementation of fishery offset measures was necessary to ensure that overall fish production is maintained or enhanced (no reduction of fisheries productivity). In the case of the RRM, the impacted fishery, and therefore target fishery of the offset measures are baitfish (primarily minnow) species that inhabit the small creek systems associated with the site. A detailed No Net Loss Plan for the Section 35 fishery impacts (AMEC 2014) was prepared for the Mine and circulated to stakeholders during the Environmental Assessment process. The final Offset Plan (New Gold 2015) for monitoring the performance and measuring success of the offsetting measures was accepted by DFO, and Fisheries Act Authorization No. 15-HCAA-00039 was issued June 4, 2015. The purpose of this document is to summarize the 2018 monitoring results for the offsetting measures and provide comparison to the success criteria and conditions of the Authorization.

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited (Wood) was retained by New Gold to conduct the year-two performance monitoring to evaluate the success of the offsetting measures implemented under the Offset Plan and the Authorization. Implementation and effectiveness of the measures are determined by confirming that Teeple Pond and outlet channel have been constructed as per the approved plans and are functioning as intended using the success criteria in the Offset Plan.

The 2018 performance monitoring results showed the physical construction of offset measures achieved the required success criteria (due December 31, 2016) as follows:

- As-built survey demonstrates the offset measures are constructed as per the approved plans; and
- The area of replacement habitat is greater than the required 8.41 hectares;

Achieving the success criteria related to the physical function/structure stability and fisheries components of the Offset Plan are anticipated in 2019 and by 2021, the final year for the currently proposed monitoring. The 2018 performance monitoring results for these components are ahead of schedule and are on track for this monitoring period as described below:

- The outlet channel allows for fish passage under normal and high flow conditions and the Teeple Pond water levels are consistent with those specified in the design;
- Constructed habitat remains stable and in place. Shorelines and graded offset features are stable, and riparian vegetation cover and plantings have achieved good coverage and are greater than the success criteria of 80%;
- Eight fish species were present in the offset measures during the year-two monitoring period; however, two new species were encountered, and one previously documented species was not found. An inferred species richness of nine has been achieved in Teeple Pond, but not in the outlet channel. The fish community survey results show this metric is on track;
- Multiple year classes of several species, and many young-of-the year fish were encountered in the offset measures demonstrating full fish life cycle usage; and,

- Overall catch-per-unit-effort for all species combined was highest for seine netting; and meeting all gear-specific success criteria targets are on target to be met before 2021.

Biological systems such as Teeple Pond outlet channel are dynamic and will likely require several years to develop biological communities that meet the success criteria; however, the year-two monitoring results show very good progress toward these targets.

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1.0 Introduction

The construction and development of New Gold Inc's (New Gold) Rainy River Mine (RRM) resulted in the unavoidable, but planned, serious harm to a commercial, recreational, or aboriginal fishery, or to fish that support such a fishery. This serious harm to fish required an Authorization from Fisheries and Oceans Canada (DFO) as per Section 35(2)(b) of the Fisheries Act. In order for DFO to authorize the serious harm to fish, development and implementation of fishery offset measures was necessary to ensure that overall fish production is maintained or enhanced (no reduction of fisheries productivity). In the case of the RRM, the impacted fishery, and therefore target fishery of the offset measures are baitfish (primarily minnow) species that inhabit the small creek systems associated with the site. A detailed No Net Loss Plan for the Section 35 fishery impacts (AMEC 2014) was prepared for the RRM and circulated to stakeholders during the Environmental Assessment process. The final Offset Plan (New Gold 2015) for monitoring the performance and measuring success of the offsetting measures was accepted by DFO and Fisheries Act Authorization No. 15-HCAA-00039 was issued June 4, 2015.

Teeple Pond and outlet channel are the offset measures constructed per the Offset Plan. Construction of Teeple Pond was completed in early 2016 and construction of the Teeple Pond outlet channel was completed between the fall of 2015 and early winter 2016. The Teeple Pond and outlet channel As-Constructed report (condition 5.2.1 of the Authorization) was submitted December 2016 (Amec Foster Wheeler 2016a). The Year 1 annual performance monitoring report was submitted in December 2017. The purpose of this 2018 annual monitoring report is to summarize the second year of performance monitoring for the Teeple Pond and outlet channel per condition 3.1 where it relates to measures and standards in condition 3, and condition 5.2.2 of the Authorization.

2.0 Monitoring Criteria to Avoid or Mitigate Serious Harm to Fish

Condition 3.1 of the Authorization states:

> *Monitoring of avoidance and mitigation measures: The Proponent shall monitor the implementation of avoidance and mitigation measures referred to in condition 2 of this authorization and report to DFO, by March 31 following the year being reported on and indicated whether the measures and standards to avoid and mitigate serious harm to fish were conducted according to the conditions of this authorization.*

The As-Constructed report for Teeple Pond and outlet channel (as per condition 5.2.1 of the Authorization) issued December 19, 2016 (Amec Foster Wheeler 2016a) describes many of the measures and standards required per condition 3.1 of the Authorization. A summary of the As-Constructed report contents is provided in Section 4.0 of this document.

Monitoring criteria that relate to measures or standards to avoid or mitigate serious harm to fish not described in the Teeple Pond and outlet channel As-Constructed report are as follows:

- "Ramp up and down" flow takings in Pinewood River at intake and monitor and adjust water takings to avoid stranding of fish (condition 2.2.3 of the Authorization);
- Implement plan to monitor fish community in Pinewood River between the existing West Creek and Loslo Creek to confirm that the fish community and fish passage are maintained (condition 2.2.4 of the Authorization); and

- Screen or use other deterrents at any water intakes or outlet pipes to prevent entrainment or impingement of fish (condition 2.2.5 of the Authorization).

Further to the above, PTTW #8776-9W2QN2 Condition 4.1.3 issued on August 31, 2015, required that a biological monitoring plan be prepared for the Pinewood River:

> *The Permit Holder shall submit a Biological Monitoring plan to the Director for approval within 180 days of issuance of this permit and prior to direct water taking from the Pinewood River. The plan shall include, at minimum, the following:*
>
> a) Methods for monitoring and identifying fish kills and fish stranding that are acceptable to the Director.
>
> b) A contingency plan to address adverse conditions defined in Condition 4.1.3 a), including investigation into the adequacy of minimum flow thresholds to minimize impacts to aquatic communities.

The 2018 monitoring results and associated monitoring plans for the RRM related to the above measures or standards to avoid or mitigate serious harm to fish are described below:

- New Gold followed flow ramping protocols established to avoid stranding of fish during water taking from the Pinewood River as follows:
  - Immediately after the water taking pumps were energized, the recorded water level at the permanent hydrometric station was monitored to evaluate the rate of reduction;
  - A number of accessible locations downstream of the intake with broad floodplain-type riparian areas (susceptible to forming isolated pool conditions) were inspected for evidence of fish standing or death; and
  - Periodic monitoring of these locations continued until the pumps were ramped up to a steady level and the Pinewood River water level had adducted to the reduced flow, as determined by the hydrometric station instruments, during the water taking activities.
- The pump house intake structure includes fine-mesh screen around the intake channel to deter and prevent entrainment or impingement of fish as discussed in the hydraulics analysis technical memorandum (Amec Foster Wheeler 2015); and
- Monitoring of the Pinewood River fish community between the existing West Creek and Loslo Creek to confirm that the fish community and fish passage are maintained is addressed under the Pinewood River Biological Monitoring Plan per Environmental Compliance Approval (ECA) #5781-9VJQ2J, condition 10(5) and ECA #5178-6TUPD9, condition 8(7) (Amec Foster Wheeler 2016b). The 2018 results from the above biological monitoring plan will be submitted to the Ministry of Environment, Conservation and Parks (MECP) and DFO by March 31, 2019 per condition 3.1 of this Authorization.

3.0 Monitoring Criteria to Assess Offsetting Measures

Condition 5.2 of the Authorization was modified to align the RRM offsetting measures construction and commissioning schedule with the DFO Fisheries Protection Program monitoring (DFO 2016), which states;

List of reports to be provided to DFO: The Proponent shall report to DFO on whether the offsetting measures were conducted according to the conditions of this authorization by providing the following

5.2.1 As-constructed report due on or before March 31, 2016.

5.2.2 Annual monitoring report due on or before December 31 for 5 year post construction (2017-2021).

Implementation and effectiveness of the offset measures is determined by confirming that Teeple Pond and its outlet channel have been constructed as per the approved plans and are functioning as intended using the prescribed monitoring criteria presented below.

Criteria and Dates to Assess Offsetting Measures Implementation and Effectiveness Success

Attribute	Success Criteria	Date
Physical construction of offset measures	• As-built survey demonstrates that measures are constructed as per the approved plans • Area of replacement habitat is equal to or greater than 8.41 ha	December 31, 2016
Physical function of offset measures	• Water levels are consistent with those specified in the design • The outlet channel and pond allows for passage of fish	December 31, 2019
Stability of structures	• Constructed habitat features remain in place (log and boulder structures in place) • Shorelines and graded offset features are stable and not eroding (greater than 80% of features are considered stable) • Riparian vegetation cover and plantings achieve 80% coverage of area, and or survival of planted stock	December 31, 2019
Species presence	• Minimum of 9 species of fish are present in the offset measure.	December 31, 2021
Full life cycle usage	• Multiple year classes including young of the year fish are present in the offset feature.	December 31, 2021

Fish abundance	• Overall Catch per Unit Effort (CPUE) for all species combined, for at least two of following capture methods (electrofishing, Minnow Traps, Seine Nets). Minimum success criteria are:
	  • Minnow Trap CPUE ≥ 2 fish per trap hour
	  • Seine Net CPUE ≥ to 16 fish per 15 m net pull
	  • Electrofishing CPUE ≥ 44 fish per 1000 seconds
		December 31, 2021

Source: Table 5, New Gold 2015; includes revision of success criteria due dates per DFO 2016.

The 2018 monitoring results to assess offsetting measures are presented in the following sections as described below:

- Physical construction of offset measures;
- Physical function of offset measures;
- Stability of structures; and
- Fish community metrics including species presence, abundance, and full life cycle usage.

4.0 Physical Construction of Offset Measures

An As-Constructed report for Teeple Pond and outlet channel (as per condition 5.2.1 of the Authorization) was issued December 19, 2016 (Amec Foster Wheeler). The As-Constructed report provides the following:

- A summary of upset conditions and contingency response associated with the DFO Authorization;
- Comparisons between design parameters and as-constructed conditions of Teeple Pond;
- Comparisons between design parameters and as-constructed depths of Teeple Pond;
- A summary of deviations from design and recommended monitoring for Teeple Pond outlet channel; and
- Comparisons between design areas and as-constructed habitat area of Teeple Pond and outlet channel.

Comparison of the constructed habitat to the approved plan confirmed that 9.86 hectares (ha) area of replacement habitat was constructed, which is greater than the proposed minimum area of 8.41 ha of offsetting measures. The As-Constructed report demonstrated that the offset structures (pond and outlet channel) specified in DFO in Authorization 15-HCAA-00039 and the associated Offset Plan were met, in that minor deviations noted were not expected to impact the overall success of the plan.

5.0 Physical Function of Offset Measures

5.1 Physical Function of Teeple Pond

Teeple Pond was built to include permanent deeper water refuge pools, log and boulder structures, and highly productive emergent wetland margins with a normal water level of 378.50 metres above sea level (masl). The overwintering and summer refuge habitat were constructed to provide between 2.0 and 2.5 m of total water depth at static pond water level design elevation. Monitoring the physical function of Teeple Pond included:

- Installation of a Solinst 3001 LT Levelogger Edge, M10 water level logger with a direct read cable on June 10, 2017 (Figure 1, Appendix A);
- Installation of a Reconyx PC800 Hyperfire Professional Semi-Covert Camera with security enclosure to document Teeple Pond and outlet channel conditions using time lapse photo series (Figure 1, Appendix B); and
- Manual water depth measurements of the overwintering and summer refuge habitat during the summer (Table 1).

In 2017, the Teeple Pond water level logger pressure sensor malfunctioned shortly after installation and the recorded data were unusable. As noted in the 2017 Annual Monitoring Report, Clark Creek Pond is connected via the Clark Creek Diversion Channel that flows approximately 1.2 kilometers (km) with an elevation difference of approximately 1.25 m to its outlet into Teeple Pond, and as such provided a suitable proxy to represent the Teeple Pond water level during the 2017 period of record.

Wood field staff re-installed the Teeple Pond water level logger pressure sensor on April 24, 2018 near the beginning of spring freshet while only the nearshore margins of Teeple Pond were open water (>90% ice cover). The 2018 level logger data show Teeple Pond is functioning as intended (Figure 2), and survey data show the pond is maintaining adequate water depths per the design and providing overwinter refuge habitat for the resident fish community.

The time-lapse camera was programmed to store one image at 06:00, 09:00, 12:00, 15:00, 18:00 and 21:00 each day throughout the year, and was positioned at the edge of tree line near the pond outlet into the constructed outlet channel and fan area. Appendix B contains a photo record for the 2017 and 2018 monitoring seasons, illustrating weekly water level and vegetation growth conditions in the Teeple Pond and outlet fan (June to September 2017 and April to July 2018). The photo record primarily includes photos taken at 15:00 and 18:00, as these times appeared to be most consistent with regard to brightness, clarity and ability to distinguish changes in site conditions with minimal influence from shadows and light intensity. This time lapse photo record confirms static water levels were maintained within Teeple Pond throughout the observation period.

As specified in the Offset Plan, water depth measurements of the pond area are to be conducted once per year during the monitoring period to confirm refuge areas are maintained. The Offset Plan As-Constructed report for Teeple Pond (Amec Foster Wheeler 2016a) confirmed refuge areas were established per the design and in-field water depth checks during the 2018 summer field studies confirmed these areas maintained appropriate water depths within the refuge pool and connecting channels (Tables 1a and 1b; Appendix C). Handheld GPS location accuracy is approximately ±3.0 metres (m); therefore, comparisons of some 2018 field depth measurements to design depths varied. In general, the 2018 station measurements were shallower than the stations visited in 2017. Consequently, the measurement results suggest the deep areas were not visited in 2018. Water levels between 2017 and 2018 were not appreciably different, meaning Teeple Pond maintained sufficient water levels; however, subsequent annual performance monitoring (years three to five post-construction) will revisit the 2017 measurement locations to ensure depths are confirmed at consistent deep-water habitat locations.

Teeple Pond performance monitoring results show pond water levels were maintained per design throughout the 2018 monitoring period as documented by the water level logger data, manually surveyed water levels, time lapse photo documentation and manually measured water depths throughout the pond.

5.2 Physical Function of Teeple Outlet Channel

The Offset Plan physical function performance monitoring criteria require that water depth and velocity measurements in the outlet channel are collected in pools, flats and riffles during at least one low flow period and one high flow period each year (for 3yrs). Teeple Pond outlet channel high flow conditions measurements were conducted by Wood biological field staff April 24 to 27, 2018 and represented the spring freshet condition.

The observed conditions during April 2018 (Table 2b) show sufficient water depth existed during spring freshet to maintain fish passage between Teeple Pond and the outlet channel. The measured velocities with the outlet channel ranged from 0.001 to 0.871 metres per second (m/s) which is within the sustained swimming speeds for the resident species relative to body size and swim distance (Gervais & Katopodis 2013). The photo record provided in Appendix A.2 (Plate A.2-1) illustrates water level conditions throughout the channel during April 2018.

The low flow monitoring event on July 27, 2018 was also conducted by Wood biological field staff. Wetted widths, total depths and water velocity (Table 2a) in pools, flats and riffles were measured (where possible) throughout the pre-determined channel stability stations shown on Figure 1. Due to intermittent flow conditions, flat and pool morphology stations maintained sufficient water depth to provide fish habitat; while riffle areas were dry. This represents a temporary barrier to fish passage which is natural to the system during periods of intermittency, and 2018 represented drier than average conditions. Figure 3 shows a comparison between the 2017 and 2018 Barwick, Ontario monthly precipitation records to the 1981 to 2010 Canadian climate normal for this area, demonstrating the 2018 period of record was drier than 2017 and both years were drier than the normal values. Fish were found in all sampled pools, demonstrating the fish are passing through the channel during periods of higher flow. Similar isolated pool conditions were observed further downstream in the remnant Teeple Drain channel as discussed in Section 6.2. The in-field channel stability station measurements are presented in Tables 2a and 2b, with photo examples of these observations provided in Appendix A (Plate A.2-2 to A.2-5).

General monitoring events throughout the year were conducted by Wood ESC site staff and aquatic studies field staff. The ESC staff documented some areas of erosion in the low flow channel and inlet fan immediately downstream of the Teeple Pond outlet in 2017 (Amec Foster Wheeler 2017a). Observations from June 1, 2018 showed vegetation establishment had progressed, including areas along the low flow channel which was repaired in the summer/fall of 2017.

Beaver activity within Teeple Pond temporarily impacted function of the outlet by reducing flow into the outlet channel. The pond outlet was periodically monitored, and beaver debris was removed to maintain connectivity. Initially the beaver activity is being managed to ensure the channel and habitats stabilize and naturalize according to plan, but over time it is expected that beaver activity will be allowed to persist as it does in any natural system. Representative photos of the blocked outlet and removed debris are provided in Appendix A.

5.3 Physical Function Monitoring Recommendations

The following action items and recommendations from 2017 were implemented and followed during the 2018 period to improve physical function monitoring of Teeple Pond and outlet channel:

- Reinstallation of the Teeple Pond water level logger occurred after ice-off conditions (April 24th, 2018) to ensure open water conditions are monitored per the Offset Plan criteria. Reinstallation of the logger during winter was not recommended as it is likely that the level data recorded during the winter under ice conditions will not be reliable (New Gold 2016)

- The water level logger data were downloaded more frequently following installation of the new sensor and no equipment/instrument failures were detected;

- The 2017 hydraulic habitat monitoring transects/stations (wetted width, total depth and velocity) were utilized where possible for consistency among monitoring events to assess conditions in the outlet under high and low flow conditions.

The following recommendations are provided to improve physical function monitoring of Teeple Pond:

- Download the water level logger and barometric pressure sensors at Teeple Pond once every 30 days during the open water period (April to November);

- Survey the water level relative to the temporary benchmarks at least three times during the open water period (e.g., April, July, September) for comparison to the logger data; and

- Utilize consistent locations for annually monitoring water depths within Teeple Pond for comparison to design depths among monitoring years (utilize 2017 monitoring locations for future measurements).

6.0 Stability of Structures

The stability of structures monitoring took place from July 24 to 29, 2018, which included retrieval of time lapse camera photos in order to monitor long-term water level conditions, as well as opportunistic observations throughout the year to document vegetation cover and plantings, repair activities and general condition. Observations of the offset measures stability were also conducted during the low flow monitoring period, as this timing provided the best visibility to assess whether the constructed features were in place and functional. Photo vantage points were established along the perimeter of Teeple Pond and along the outlet channel to document stability of these features at consistent locations (Figure 1). Three channel stability stations were also established within the constructed outlet channel to further assess and document channel condition. Two additional channel stability stations were established downstream of Teeple Road in natural channel reaches to document channel condition further afield.

6.1 Teeple Pond

Photo stations P1, P2 and P3 were established to document the nearshore areas and open-water habitat of Teeple Pond (Figure 1). Appendix B (Plates B.1-1 to B.1-2) provides a photo record of these stations and the constructed habitat features.

The shoreline, as well as the observed constructed habitat features (tree piles and boulder clusters) appeared (where visible) to remain in place as identified in the As-Constructed report i.e., stable. The boulder clusters and most tree piles were submerged, with the exception of two tree piles positioned near the southwest corner of the pond. The exposed tree piles are meant to provide fish habitat subsurface, as well as perching areas for avian wildlife and basking structures suitable for turtles and other herptiles. Shorelines and graded offset features were stable and not eroding. Riparian vegetation was well established at most areas surrounding Teeple Pond, with the lowest percent ground coverage observed near the outlet fan area discussed in Section 5.2. Overall, these areas have greater than 80% coverage, which meets the success criteria (80% coverage) and will continue to improve over time.

6.2 Teeple Pond Outlet Channel

Photo stations P5, P6 and P7 and channel stability stations CSS-1, CSS-2 and CSS-3 were established to document stability of the outlet channel and immediately downstream of the constructed channel (Figure 1). Photo stations P8 to P11, as well as channel stability station CSS-4 and CSS-5 were established to document channel conditions further downstream of the constructed outlet channel in the original Teeple Channel. Appendix B (Plates B.1-3 to B.1-9) contain a photo record of these stations and constructed habitat features. Overall these areas have greater than 80% riparian vegetation coverage, with plantings showing good survival which meets the success criteria (80% vegetative coverage).

Photo station P7 was positioned immediately downstream of the constructed outlet channel and remnant Teeple Drain channel confluence. During the dry summer conditions little to no flow was observed from either the constructed outlet or remnant channel.

As noted in section 5.2, the shallow conditions under very low flow are considered typical during periods of intermittency, and 2018 represented drier than average conditions (Figure 2). Photo station P8 was positioned immediately upstream of the Teeple Road culvert crossing and includes two bedrock controls within the natural channel alignment. These features had no flow over the rocks at the time of assessment, thereby posing a barrier to fish passage. Again, isolated pools are expected during intermittent flows such as those observed during the summer of 2018. No evidence of erosion was observed between the constructed outlet channel confluence with the original Teeple Drain and photo station P8.

The original Teeple Drain, downstream of Teeple Road, is in an actively used cattle pasture. Consequently, the cattle have destabilized the channel near station P9 and P10 causing severe bank erosion and degradation. The flow path transitions to a broad wet meadow downgradient of this location. Station P10 was located in the wet meadow with surface drainage through the grasses, and no defined central channel. These wet meadow conditions exist further downstream until a channelized flow path enters a woodlot at station P11. No observable channel erosion or instability from the realigned channel flows were noted.

6.3 Contingency Measures for Structure Stability

The Offset Plan (Section 8.4; New Gold 2015) and condition 3.1.2 of the Authorization requires that New Gold will implement contingency measures and associated monitoring if the offsetting measures are not constructed or do not function according to the success criteria.

The following structural stability metrics were identified as not yet meeting their specified success criteria:

- Riparian vegetation throughout the constructed outlet channel was well established, but with small areas of sparse cover in the constructed Teeple outlet fan area. However, substantive improvements in vegetation cover and establishment can be seen between July of 2017 and July of 2018 (Plate B.1-4); and

- The Teeple Pond outlet and sections of the channel experienced bank erosion and some displacement of riffle cobble after spring freshet flow.

In the case of both metrics described above, the observed conditions are in-line with the expected ongoing development of the realigned channel. No additional contingency measures are recommended at this time.

7.0 Fish Community Metrics

Fish community sampling was conducted during July 2018, meeting or exceeding the minimum gear-specific effort specified in Table 7 of the Offset Plan performance monitoring criteria for pond and channel habitats (New Gold 2015). These sampling activities documented species presence, relative abundance and confirmed presence of multiple fish life stages for some species. Fish community results are discussed below for each offset measure habitat type. The comparison of year-one and year-two monitoring results to the success criteria are presented in Tables 3a and 3b, with detailed gear-specific results discussed below and presented in Tables 4 and 5.

7.1 Teeple Pond Fish Community Monitoring Results

Teeple Pond was sampled using the prescribed non-lethal fish collection methods including; minnow traps, seine net and a backpack electrofishing, with gear-specific and catch-per-unit effort (CPUE) results presented in Table 4. Eight fish species were documented in Teeple Pond during the 2018 studies, compared to seven species in 2017. The presence of two new species (Brassy Minnow and Creek Chub) were detected

in 2018, but Common Shiner were not found (previously caught in 2017). These results suggest that nine fish species exist within Teeple Pond, and the low abundance of Common Shiner in 2017 (n=11) may mean they are still present but were not caught during the 2018 field studies. Many young-of-the-year (YOY) individuals were encountered, which were likely members of the Phoxinus genus but were too small to non-lethally confirm species. Most fish were captured by the fine mesh seine net, the majority of which were YOY individuals. Consequently, the high proportion of YOY individuals within Teeple Pond influenced the CPUE of the gear-specific catch results since those smaller individuals were only catchable using seine netting.

A subsample of individuals from each species and from each gear type were measured for fork or total length for those species with rounded caudal fins (e.g., Brook Stickleback and Central Mudminnow). Species-specific results of these measurements, where a minimum of 100 individuals were measured, are presented in Figure 4 illustrating multiple age classes of Brook Stickleback, Fathead Minnow, Northern Redbelly Dace and Brassy Minnow were found in the pond. The abundant presence of YOY Phoxinus sp. indicates a high likelihood that multiple age classes of Finescale Dace are also present. These results confirm that Teeple Pond functions as overwintering and summer refuge, spawning, rearing and foraging habitat for these species.

The 2018 year-two performance monitoring results do not meet all success criteria targets (See Table 4) but show the physical habitat supports all life history stages for the fish species present; and, indicates that the offsetting measures are progressing as expected for achieving all success criteria by year-five of the monitoring program.

7.2 Teeple Pond Outlet Channel Fish Community Monitoring Results

All available habitat within the Teeple outlet channel was sampled using baited minnow traps and backpack electrofishing methods, with most effort concentrated in pools and flats where sufficient depth allowed sampling. Low water levels during this sampling event concentrated fish into these refuges, but also reduced the overall sampling area. The relatively small sample area required that both fish collection gear types were used throughout the entire outlet channel to satisfy the minimum sampling efforts per the Offset Plan. Gear-specific and catch-per-unit effort (CPUE) results for the outlet channel are presented in Table 5 along with the success criteria CPUE values expected by year-five of monitoring.

Minnow trapping was conducted first, and the captured individuals were released into Teeple Pond to avoid re-capture of those individuals using electrofishing. Electrofishing was conducted after minnow trapping and captured far fewer fish. This was expected due to the removal of fish by minnow trapping thereby understating the actual electrofishing CPUE. The electrofished individuals were also released into Teeple Pond, since low water conditions were likely to persist through August and further limit available habitat within the outlet channel (as observed in the natural Teeple Drain channel).

A total of six fish species were encountered in Teeple outlet channel during the 2018 studies, compared to seven in 2017. Two fish species encountered in 2017 that were not captured in 2018 were Northern Redbelly Dace and Pearl Dace. Additionally, Brassy Minnow were encountered in the outlet channel and was not previously encountered in 2017. The changes in species occurrence could be attributed to extremely dry conditions which resulted in isolated pools offering the only refuge for fish trapped within the outlet channel.

8.0 Performance Summary

Implementation and effectiveness of the compensation measures are determined by confirming that the pond and outlet channel have been constructed as per the approved plans and are functioning as intended using the success criteria and dates in Table 5 of the Offset Plan (New Gold 2015). Biological systems such as Teeple Pond and the outlet channel are dynamic and will likely require several years to develop full biological communities that meet the success criteria; however, the year-one and year-two monitoring results show very good progress toward these targets.

The physical construction of offset measures, as well as the physical function and stability of structures post monitoring success criteria have been achieved for Teeple Pond and outlet channel. Presence of multiple year classes of fish have been demonstrated within these offset measures and the inferred richness of nine fish species within Teeple Pond, thereby achieving those success criteria. The remaining species presence (richness) within the outlet channel and abundance (overall CPUE) success criteria are not yet achieved.

Further to the above, the fish catch results show thousands of YOY cyprinid individuals (seine netting catch), which will likely substantively improve the species-specific CPUE for each gear type in future studies as these individuals grow and mature into larger, spawning individuals within the population. It is anticipated that the majority of these fish will survive overwinter in refuge pools, and as such will help the population sooner attain the carrying capacity and productivity of this habitat. The performance monitoring results comparison to success criteria for Teeple Pond and outlet channel are summarized in Tables 6a and 6b, respectively.

9.0 Closing

We trust the information provided in this report meets the performance monitoring obligations with respect to Offset Plan. Should you require further details or wish to discuss any aspect of this information, please do not hesitate to contact us at your convenience.

Sincerely,
Wood Environment & Infrastructure Solutions
a Division of Wood Canada Limited

Prepared by:

Dale Klodnicki, M.E.Sc., C.E.T.
Senior Aquatic Ecologist

Reviewed by:

Mark Ruthven, C.E.T.
Head, Environmental Assessment

10.0 References

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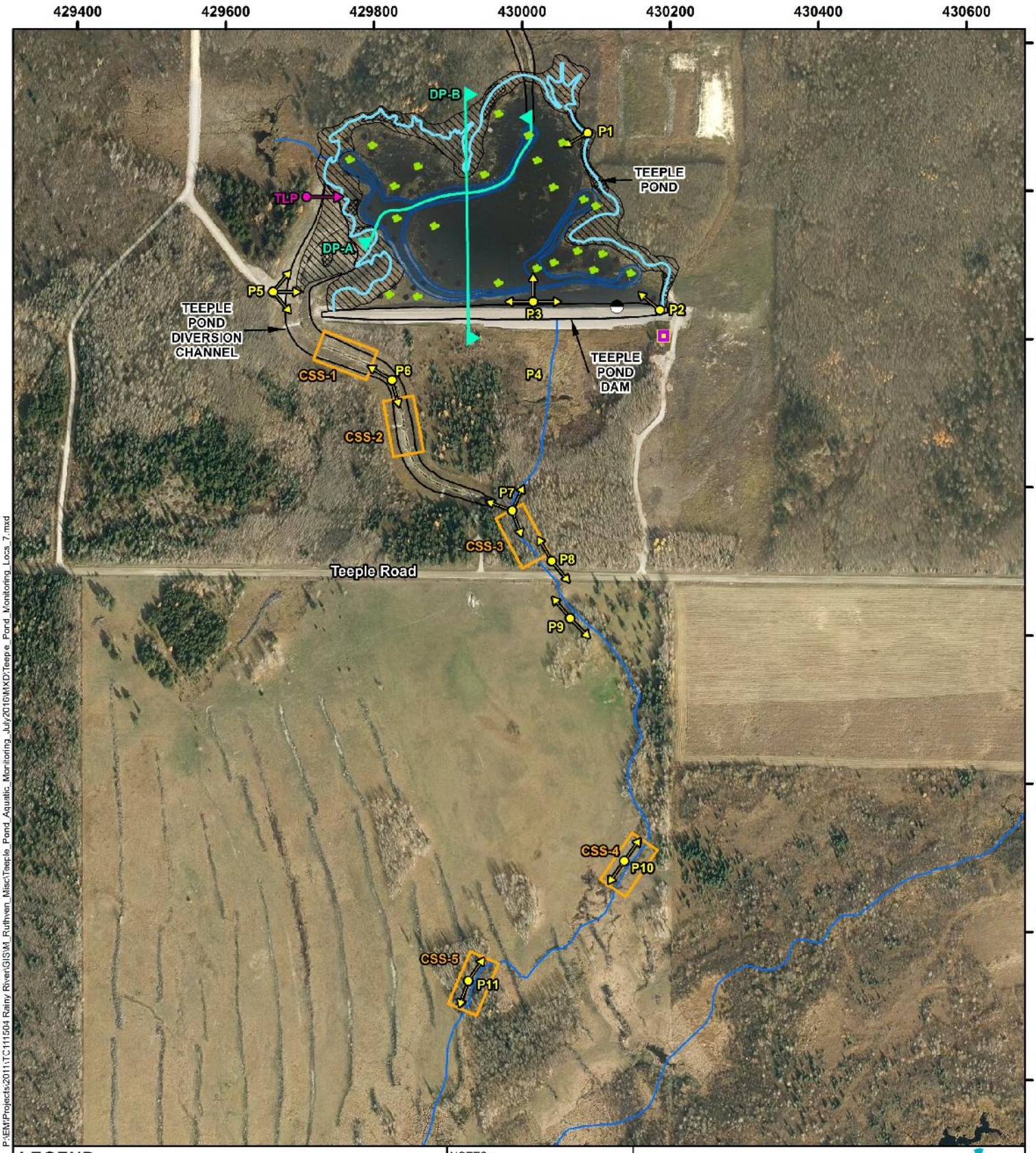

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LEGEND

- TLP — Time Lapse Photo Station
- P5 — Photo Station
- Depth Profiles
- CSS-# — Channel Stability Station
- Teeple Pond Extent
- Dam / Diversion Channel
- In Pond Channels
- Tree Pile
- Boulder Clusters
- Emergent Wetland
- Scrub / Shrub Wetland
- Water Level Logger
- Barometric Pressure Logger
- Watercourse

0 50 100 200 300 400 500 Metres

NOTES:
- Aerial imagery - October 2017

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold™ Rainy River Project

amec foster wheeler

RAINY RIVER MINE

Teeple Pond and Outlet Channel Monitoring Locations

PROJECT N°: TC111504 | **FIGURE: 1**

SCALE: 1:7,000 | DATE: December 2017

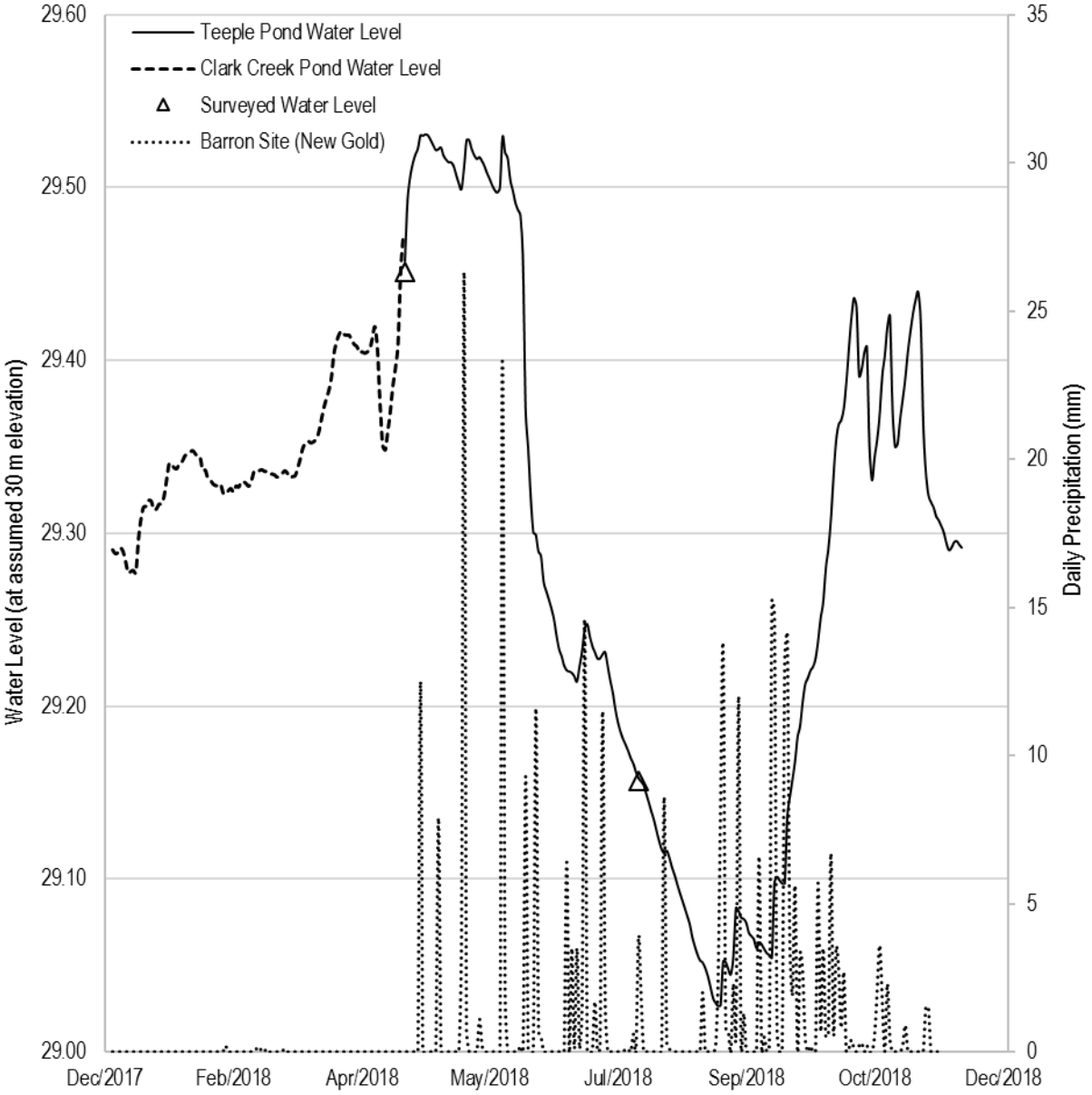


Figure 2: Teeple Pond Water Level and Manual Survey Data

Notes:

1. Clark Creek Pond daily water level data shown for 2018 period prior to Teeple Pond water level logger sensor reinstallation.
2. Teeple Pond water level data show a maximum difference between high and low water levels of 50.3 cm during the 2018 period of record.
3. Environment and Climate Change Canada, Barwick Climate Station ID 6020559 daily precipitation period of record shown in relation to water level fluctuations.

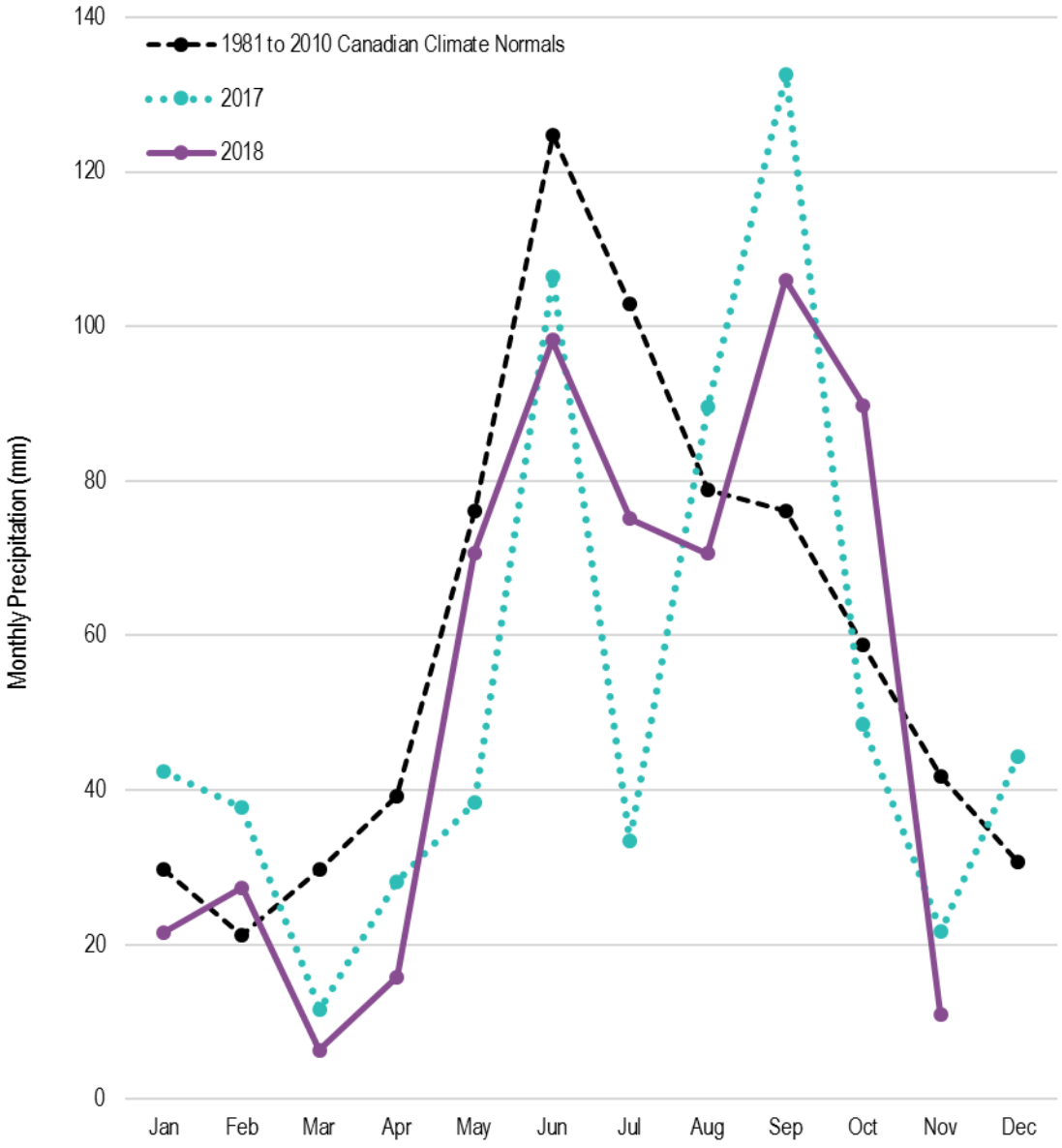


Figure 3: Barwick Monthly Precipitation Record

Notes:

1. Environment and Climate Change Canada, Barwick Climate Station ID 6020559 monthly precipitation records for 2017, 2018 and the 1981 to 2010 Canadian Climate Normals shown to demonstrate 2017 and 2018 were generally drier than average during the open water period.
2. Partial data for November 2018 (ending 26-Nov) shown and December 2018 data were unavailable for inclusion in this report.

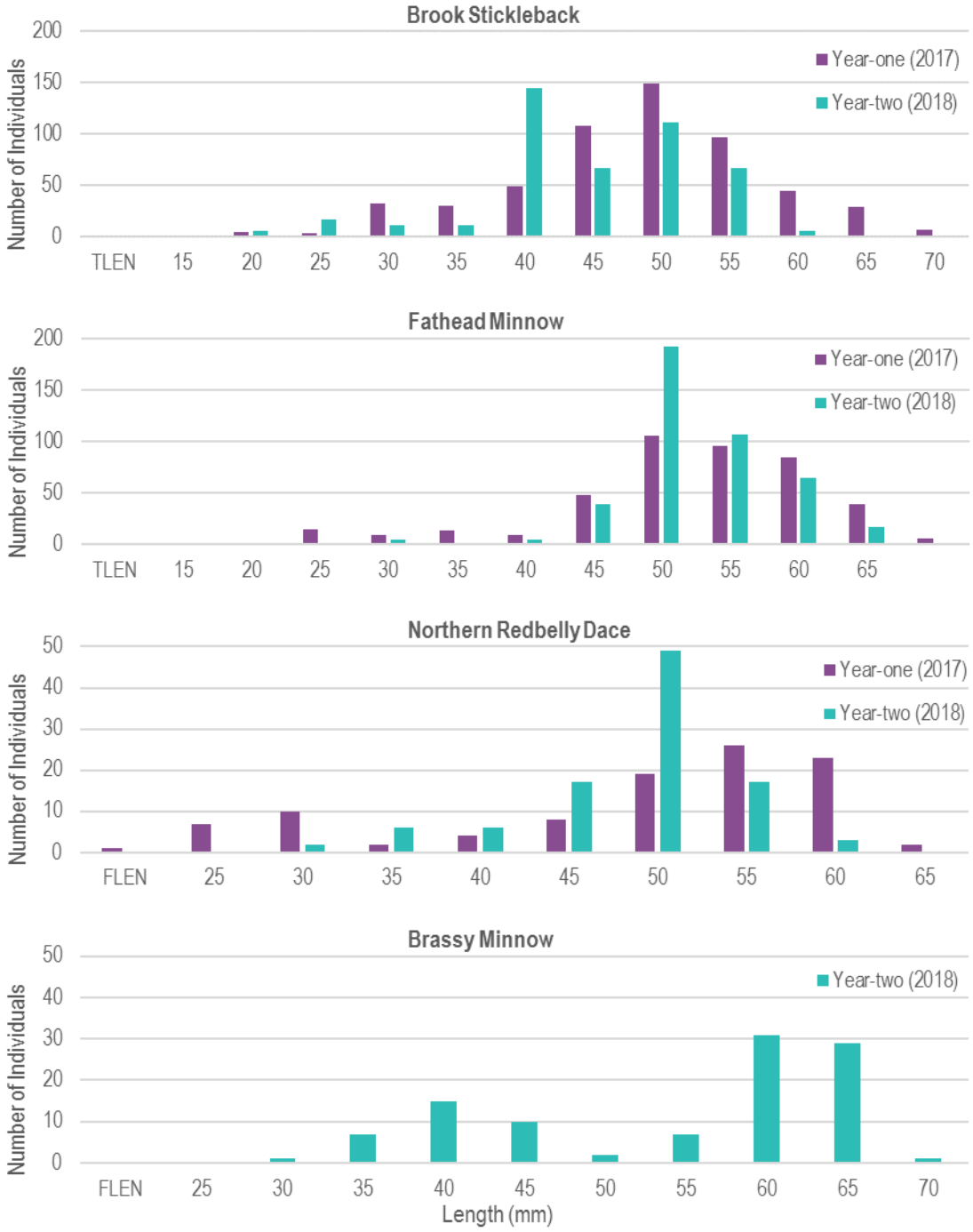


Figure 4: Teeple Pond Species-Specific Length-Frequency Summary

Notes:

1. Brook Stickleback values are total length, all other species values are fork lengths.
2. 2018 Brook Stickleback and Fathead Minnow catch numbers were standardized to represent proportion of individuals caught relative to the number of individuals caught during the 2017 studies.

Table 1a. Teeple Pond 2017 Water Depth Measurement Summary

Location No.	Design Water Depth	Total Water Depth (m)	UTM Easting (m)	UTM Northing (m)	Location/ Observations
1	1.5-2.0	1.55	429,795	5,409,016	NW channel, abundant macrophyte nearshore
2	2.0	2.05	429,769	5,409,036	NW refuge pool
3	2.0-2.5	2.32	429,802	5,408,984	W refuge pool, abundant macrophytes nearshore
4	2.0-2.5	2.45	429,810	5,408,966	W refuge pool
5	2.0-2.5	2.40	429,828	5,408,978	W refuge pool
6	1.5-2.0	2.37	429,904	5,408,994	NE channel
7	1.5-2.0	2.28	429,958	5,409,003	NE channel
8	1.5-2.0	1.60	429,985	5,409,028	NE channel, tree piles observed
9	2.0-2.5	2.15	430,013	5,409,080	NE refuge pool
10	1.5-2.0	2.28	429,836	5,408,919	SW channel
11	2.0-2.5	2.60	430,017	5,408,896	SE refuge pool
12	2.0-2.5	1.95	430,146	5,408,887	E refuge pool

Notes:

1. Data collected June 15, 2017 by Amec Foster Wheeler field staff
2. UTM – Universal Transverse Mercator, Zone 15U, NAD 83
3. Locations accurate to approximately 3 metres, design water depth ranges provided per relative sample location within design drawings
4. Appendix C includes the as-built conditions of Teeple Pond

Table 1b. Teeple Pond 2018 Water Depth Measurement Summary

Location No.	Design Water Depth (m)	Total Water Depth (m)	UTM Easting (m)	UTM Northing (m)
DP-B-01	1.1	1.1	429945	5408850
DP-B-02	1.2	1.2	429948	5408870
DP-B-03	1.1	1.2	429946	5408886
DP-B-04	1.1	1.8	429945	5408900
DP-B-05	1.1	1.1	429944	5408914
DP-B-06	1.1	1.5	429944	5408927
DP-B-07	1.1	0.8	429942	5408941
DP-B-08	1.1	0.9	429941	5408953
DP-B-09	1.0	0.8	429939	5408967
DP-B-10	1.0	0.6	429938	5408976
DP-B-11	0.9	0.5	429936	5408987
DP-B-12	0.8	0.4	429937	5408994
DP-B-13	0.7	0.8	429931	5409004
DP-A-14	0.9	0.6	430010	5409100
DP-A-15	0.9	1.5	430007	5409076
DP-A-16	0.9	1.2	430001	5409053
DP-A-17	0.8	1.3	429987	5409036
DP-A-18	0.8	1.3	429977	5409017
DP-A-19	0.8	1.4	429968	5409006
DP-A-20	0.8	1.6	429946	5409000
DP-A-21	0.8	1.6	429930	5408997
DP-A-22	0.8	1.5	429906	5408994
DP-A-23	0.9	1.7	429884	5408989
DP-A-24	0.8	1.8	429857	5408985
DP-A-25	0.8	1.9	429840	5408978
DP-A-26	0.8	1.6	429823	5408980
DP-A-27	0.7	1.7	429813	5408975
DP-A-28	0.5	1.7	429808	5408966
DP-A-29	0.1	0.8	429798	5408954

Notes:

1. Data collected July 28, 2018 by Wood field staff
2. UTM – Universal Transverse Mercator, Zone 15U, NAD 83
3. Locations accurate to approximately 3 metres, design water depth ranges provided per relative sample location within design drawings
4. Appendix C includes the as-built conditions of Teeple Pond

Table 2a. Teeple Outlet Channel 2017 Low Flow Stability Monitoring Summary

Channel Stability Station ID	Morphology	Wetted Width (m)	Total Depth (m)			Velocity (m/s)			Comments
			Left	Centre	Right	Left	Centre	Right	
CSS-1	Flat	1.20	0.095	0.170	0.110	0	0	0	downstream extent
	Pool	1.56	0.195	0.250	0.230	0	0	0	mid-downstream pool
	Pool	1.72	0.135	0.180	0.180	0	0	0	mid-upstream pool
	Pool	1.70	0.050	0.235	0.195	0	0	0	upstream extent
	Riffle	N/A	0.000	0.020	0.000	N/A	N/A	N/A	water depth <0.02 m; too shallow for velocity measurement
CSS-2	Flat	0.87	0.080	0.100	0.100	0	0	0	downstream extent of CSS
	Riffle	N/A	0.000	0.020	0.000	N/A	N/A	N/A	water depth <0.02 m; too shallow for velocity measurement
	Pool	2.04	0.195	0.210	0.200	0	0	0	upstream of boulder in downstream pool
	Pool	2.93	0.215	0.210	0.195	0	0	0	pool at bottom of rock
	Flat	1.30	0.075	0.090	0.080	0	0	0	upstream extent, immediately upstream of riffle
	Riffle	N/A	0.000	0.020	0.000	N/A	N/A	N/A	water depth <0.02 m; too shallow for velocity measurement
	Flat	1.36	0.100	0.130	0.110	0	0	0	upstream extent
CSS-3	Flat	0.20	0.058	0.037	0.037	N/A	0.045	N/A	upstream of remnant channel confluence
	Pool	0.97	0.300	0.295	0.155	0.015	N/A	N/A	first pool downstream of confluence
	Flat	0.75	0.120	0.110	0.050	0	0.025	0.08	mid-upstream flat
	Pool	1.30	0.160	0.220	0.190	0	0.003	0	mid-downstream pool

Notes:

1. Data collected June 10, 2017 by Amec Foster Wheeler field staff
2. N/A – value not able to be recorded
3. Velocity measurements collected using a Marsh McBirney FloMate Model 2000 portable velocity meter
4. Pool and flat stream morphology was only encountered throughout the CSS-3 station reach

Table 2b. Teeple Outlet Channel 2018 High Flow Stability Monitoring Summary

Channel Stability Station ID	Morphology	Wetted Width (m)	Total Depth (m)			Velocity (m/s)		
			Left	Centre	Right	Left	Centre	Right
CSS-1	Riffle	1.30	0.090	0.080	0.080	0.323	0.315	0.155
	Run	3.30	0.100	0.180	0.140	0.011	0.149	0.041
	Run	2.45	0.230	0.260	0.200	0.183	0.127	0.016
	Riffle	0.73	0.040	0.100	0.090	0.673	0.546	0.394
	Pool	1.80	0.210	0.330	0.220	0.141	0.083	0.034
	Pool	2.25	0.190	0.380	0.240	0.182	0.037	-0.010
CSS-2	Riffle	1.33	0.070	0.100	0.080	0.608	0.871	0.278
	Run	2.17	0.170	0.200	0.080	0.026	0.158	0.120
	Pool	2.40	0.310	0.340	0.290	0.096	0.063	0.037
	Riffle	0.23	0.050	0.060	0.040	0.332	0.657	0.303
	Pool	2.70	0.320	0.360	0.250	0.138	-0.004	0.040
	Run	3.00	0.110	0.320	0.150	0.001	0.012	0.125
CSS-3	Run	0.88	0.150	0.200	0.230	0.119	0.220	0.189
	Pool	1.18	0.270	0.395	0.980	0.065	0.079	0.142
	Run	0.99	0.220	0.350	0.280	0.111	0.126	0.155
	Pool	1.08	0.430	0.430	0.340	0.123	0.079	0.076
	Riffle	0.94	0.090	0.140	0.040	-0.015	0.479	0.313

Notes:

1. Data collected April 25, 2018 by Wood field staff
2. N/A – value not able to be recorded
3. Velocity measurements collected using a Marsh McBirney FloMate Model 2000 portable velocity meter
4. Pool and flat stream morphology was only encountered throughout the CSS-3 station reach

Table 2c. Teeple Outlet Channel 2018 Low Flow Stability Monitoring Summary

Channel Stability Station ID	Morphology	Wetted Width (m)	Total Depth (m)			Velocity (m/s)			Comments
			Left	Centre	Right	Left	Centre	Right	
CSS-1	Pool	0.87	0.080	0.110	0.060	0.000	0.000	0.000	Stagnant pool - no flow
	Pool	0.73	0.055	0.110	0.090	0.000	0.000	0.000	
CSS-2	Pool	1.39	0.125	0.190	0.150	0.000	0.000	0.000	
	Pool	1.47	0.140	0.170	0.085	0.000	0.000	0.000	
CSS-3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Station dry=no water/flow

Notes:

1. Data collected July 27, 2018 by Wood field staff
2. N/A – value not able to be recorded
3. Velocity measurements attempted using a Marsh McBirney FloMate Model 2000 portable velocity meter
4. Pool stream morphology were only encountered throughout CSS-1 and CSS-2

Table 3a. Teeple Pond Fish Species Presence Summary 2017 to 2018

Expected Species[1] Clark Creek (Teeple Drain) Sub-watershed	Success Target of 9 Species	
	Year-One (2017)	Year-Two (2018)
Blacknose Dace		
Blackside Darter		
Brassy Minnow		X
Brook Stickleback	X	X
Central Mudminnow	X	X
Common Shiner [3]	X	X
Creek Chub		X
Emerald Shiner		
Fathead Minnow [2]	X	X
Finescale Dace	X	X
Golden Shiner		
Lake Chub		
Northern Redbelly Dace	X	X
Pearl Dace	X	X
Spottail Shiner		
White Sucker		
Species Richness [4]	**7**	**9**

Notes:

1. List of expected species from the Fish Habitat No Net Loss Plan Section 35(2) Waterbodies, Table 3-3 (AMEC 2015)
2. Fathead Minnow were not previously listed to occur within the sub-watershed but were encountered during the year-one and year-two performance monitoring studies.
3. Common Shiner were not caught during the 2018 studies; however, the low abundance in 2017 (n=11) suggested they are likely still present and can be considered "present" for the purposes of this monitoring.
4. The 2018 species richness includes the inferred presence of Common Shiner, therefore, the inferred species richness satisfies the success target identified in the Offset Plan.

Table 3b. Teeple Pond Outlet Channel Fish Species Presence Summary 2017 to 2018

Expected Species[1] Clark Creek (Teeple Drain) Sub-watershed	Success Target of 9 Species	
	Year-One (2017)	Year-Two (2018)
Blacknose Dace		
Blackside Darter		
Brassy Minnow		X
Brook Stickleback	X	X
Central Mudminnow	X	X
Common Shiner	X	
Creek Chub		X
Emerald Shiner		
Fathead Minnow[2]	X	X
Finescale Dace	X	X
Golden Shiner		
Lake Chub		
Northern Redbelly Dace	X	
Pearl Dace	X	
Spottail Shiner		
White Sucker		
Species Richness	**7**	**6**

Notes:

1. List of expected species from the Fish Habitat No Net Loss Plan Section 35(2) Waterbodies, Table 3-3 (AMEC 2015)
2. Fathead Minnow were not previously listed to occur within the sub-watershed but were encountered during the year-one and year-two performance monitoring studies.

Table 4. Teeple Pond Fish Community Monitoring Results Summary

Gear	Sample ID	Sample Date (DD/MM/YY)	No. of Gear	Total Effort	Species Specific Catch and CPUE												
					Brassy Minnow	Brook Stickleback	Central Mudminnow	Common Shiner	Creek Chub	Fathead Minnow	Finescale Dace	Northern Redbelly Dace	Pearl Dace	YOY Cyprinid	Catch Total (n)	Catch CPUE	Ultimate (5-year) Target CPUE
Minnow Trap	TCP-MT1	12/07/17	75	1,550	0	243	26	0	0	413	14	84	1	0			**>2**
	Gear-Specific Total			**1,550**	**0**	**243**	**26**	**0**	**0**	**413**	**14**	**84**	**1**	**0**	**781**	**0.5**	
	TCP-MT1	26/07/18	75	1,763	514	74	22	0	29	418	525	1,463	173	0			
	Gear-Specific Totals			**1,763**	**514**	**74**	**22**	**0**	**29**	**418**	**525**	**1,463**	**173**	**0**	**3218**	**1.8**	
Seine Net	TCP-SN1	12/07/17	1	3	0	72	0	2	0	0	1	9	8	320			**>16**
	TCP-SN2	13/07/17	1	7	0	8	1	9	0	5	17	8	0	1,700			
	Gear-Specific Total			10	**0**	**80**	**1**	**11**	**0**	**5**	**18**	**17**	**8**	**2,020**	**2,160**	**216**	
	TCP-SN1	13/07/18	1	10	8	9	1	0	0	0	22	0	0	940			
	Gear-Specific Totals			10	**8**	**9**	**1**	**0**	**0**	**0**	**22**	**0**	**0**	**940**	**980**	**98**	
Electrofishing	TCP-EF1	13/07/17	1	5,018	0	2	2	0	0	3	5	1	0	32			**>44**
	TCP-EF2	14/07/17	1	5,005	0	3	2	0	0	0	5	0	1	2			
	Gear-Specific Total			**10,023**	**0**	**5**	**4**	**0**	**0**	**3**	**10**	**1**	**1**	**34**	**58**	**5.8**	
	TCP-EF1	14/07/18	1	10,117	0	6	16	0	0	4	15	7	7	0			
	Gear-Specific Totals			**10,117**	**0**	**6**	**16**	**0**	**0**	**4**	**15**	**7**	**7**	**0**	**55**	**5.4**	
	2017 All-Gear Catch Total				**0**	**328**	**31**	**11**	**0**	**421**	**42**	**102**	**10**	**2,054**	**2,999**	**-**	**-**
	2018 All-Gear Catch Total				**522**	**89**	**39**	**0**	**29**	**422**	**562**	**1,470**	**180**	**940**	**4,253**	**-**	**-**

Notes:

1. CPUE = catch-per-unit-effort, expressed as the number of fish caught per gear-specific effort type
2. Minnow trap effort presented as the number of fish caught per minnow trap hour; Offset Plan minimum effort required for monitoring (1,500 hours)
3. Seine net effort presented as the number of fish caught per 15 metre net haul; Offset Plan minimum effort required for monitoring (10 individual 15 m net hauls)
4. Backpack electrofishing effort presented as the number of fish caught per 1,000 electrofishing seconds; Offset Plan minimum effort required for monitoring (10,000 seconds)
5. All gear-specific minimum required efforts were met or exceeded

Table 5. Teeple Pond Outlet Channel Fish Community Monitoring Results Summary

Gear	Sample ID	Sample Date (DD/MM/YY)	No. of Gear	Total Effort	Species Specific Catch and CPUE												
					Brassy Minnow	Brook Stickleback	Central Mudminnow	Common Shiner	Creek Chub	Fathead Minnow	Finescale Dace	Northern Redbelly Dace	Pearl Dace	YOY Cyprinid	Catch Total (n)	Catch CPUE	Ultimate (5-year) Target CPUE
Minnow Trap	TCD-MT1	13/07/17	13	374.8	0	109	4	0	0	1	0	4	3	0			>2
	Gear-Specific Total			**374.8**	**0**	**109**	**4**	**0**	**0**	**1**	**0**	**4**	**3**	**0**	**121**	**0.32**	
	TP-DC-MT1	25/07/18	13	283	0	10	0	0	0	2	3	0	0	**0**			
	Gear-Specific Total			**283**	**0**	**10**	**0**	**0**	**0**	**2**	**3**	**0**	**0**	**0**	**15**	**0.05**	
Electrofishing	TCD-EF1	14/07/17	1	1,036	0	16	10	1	0	0	1	0	0	15			>44
	Gear-Specific Total			**1,036**	**0**	**16**	**10**	**1**	**0**	**0**	**1**	**0**	**0**	**15**	**43**	**41.5**	
	TP-DC-EF1	26/07/18	1	1,082	6	5	3	0	9	1	4	0	0	0			
	Gear-Specific Total			**1,082**	**6**	**5**	**3**	**0**	**9**	**1**	**4**	**0**	**0**	**0**	**28**	**25.9**	
2017 All-Gear Catch Total					**0**	**125**	**14**	**1**	**0**	**1**	**1**	**4**	**3**	**15**	**164**	**-**	**-**
2018 All-Gear Catch Total					**6**	**15**	**3**	**0**	**9**	**3**	**7**	**0**	**0**	**0**	**43**	**-**	**-**

Notes:

1. CPUE = catch-per-unit-effort, expressed as the number of fish caught per gear-specific effort type.
2. Minnow trap effort presented as the number of fish caught per minnow trap hour; Offset Plan minimum effort required for monitoring (250 hours).
3. Backpack electrofishing effort presented as the number of fish caught per 1,000 electrofishing seconds; Offset Plan minimum effort required for monitoring (1,000 seconds).
4. All gear-specific minimum required efforts were exceeded.

Table 6a. Comparison of Performance Monitoring Results to Success Criteria for Teeple Pond

Attribute and Due Date	Success Criteria	Year-one	Year-two	Ultimate (5-year) Post Monitoring Success Criteria
Physical Construction of Offset measures (December 31, 2016)	As-built survey demonstrates that measures are constructed as per the approved plans	Yes	Yes	**Achieved**
	Area of replacement habitat is equal to or greater than 8.41 ha	Yes	Yes	**Achieved**
Physical Function of Offset Measures (December 31, 2019)	Water levels are consistent with those specified in the design	Yes	Yes	**Achieved**
	The outlet channel and pond allows for passage of fish	Yes	Yes	**Achieved**
Stability of Structures (December 31, 2019)	Constructed habitat features remain in place (log and boulder structures in place)	Yes	Yes	**Achieved**
	Shorelines and graded offset features are stable and not eroding (greater than 80% of features are considered stable)	>80%	>80%	**Achieved**
	Riparian vegetation cover and plantings achieve 80% coverage of area, and or survival of planted stock	Approx.70%	>80%	**Achieved**
Species Presence (December 31, 2021)	Minimum of 9 species of fish are present in the offset measure.	7	9*	**Achieved**
Full Life Cycle Usage (December 31, 2021)	Multiple year classes including young of the year fish are present in the offset feature.	Yes	Yes	**Achieved**
Fish Abundance (December 31, 2021)	Overall Catch per Unit Effort (CPUE) for all species combined, for at least two of following capture methods (electrofishing, Minnow Traps, Seine Nets). Minimum success criteria are:			
	Minnow Trap CPUE ≥ 2 fish per trap hour	0.5	1.8	On track
	Seine Net CPUE ≥ to 16 fish per 15 m net pull	216	98	**Achieved**
	Electrofishing CPUE ≥ 44 fish per 1,000 seconds	5.8	5.4	On track

Notes:

1. CPUE = catch-per-unit-effort, expressed as the number of fish caught per gear-specific effort type
2. Achieved = planned success criteria already achieved
3. On track = within the expected progress for the performance monitoring period
4. High proportion of YOY individuals within Teeple Pond influenced CPUE of gear-specific results since those fish were only catchable using seine netting
5. (*) Species richness includes inferred presence of Common Shiner previously encountered in low abundance during the 2017 studies.

Table 6b. Comparison of Performance Monitoring Results to Success Criteria for Teeple Outlet Channel

Attribute and Due Date	Success Criteria	Year-one	Year-two	Ultimate (5-year) Post Monitoring Success Criteria
Physical Construction of Offset measures (December 31, 2016)	As-built survey demonstrates that measures are constructed as per the approved plans	Yes	Yes	**Achieved**
	Area of replacement habitat is equal to or greater than 8.41 ha	Yes	Yes	**Achieved**
Physical Function of Offset Measures (December 31, 2019)	Water levels are consistent with those specified in the design	Yes	Yes	**Achieved**
	The outlet channel and pond allows for passage of fish	Yes	Yes	**Achieved**
Stability of Structures (December 31, 2019)	Constructed habitat features remain in place (log and boulder structures in place)	Yes	Yes	**Achieved**
	Shorelines and graded offset features are stable and not eroding (greater than 80% of features are considered stable)	>80%	>80%	**Achieved**
	Riparian vegetation cover and plantings achieve 80% coverage of area, and or survival of planted stock	Approx.70%	>80%	**Achieved**
Species Presence (December 31, 2021)	Minimum of 9 species of fish are present in the offset measure.	7	6	On track
Full Life Cycle Usage (December 31, 2021)	Multiple year classes including young of the year fish are present in the offset feature.	Yes	Yes	**Achieved**
Fish Abundance (December 31, 2021)	Overall Catch per Unit Effort (CPUE) for all species combined, for at least two of following capture methods (electrofishing, Minnow Traps, Seine Nets). Minimum success criteria are:			
	Minnow Trap CPUE ≥ 2 fish per trap hour	0.32	0.05	On track
	Electrofishing CPUE ≥ 44 fish per 1,000 seconds	41.5	25.9*	On track

Notes:

1. CPUE = catch-per-unit-effort, expressed as the number of fish caught per gear-specific effort type
2. (*) Electrofishing CPUE artificially reduced due to removal of fish during minnow trapping effort conducted prior to electrofishing.
3. Achieved = planned success criteria already achieved
4. On track = within the expected progress for the performance monitoring period

Appendix A

Physical Function of Offset Measures Photograph Record

A.1 Teeple Pond

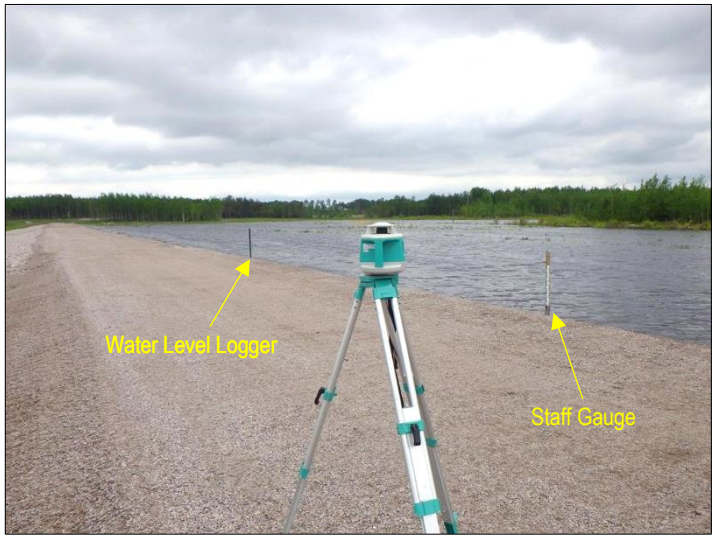
A.2 Teeple Outlet Channel

Appendix A.1

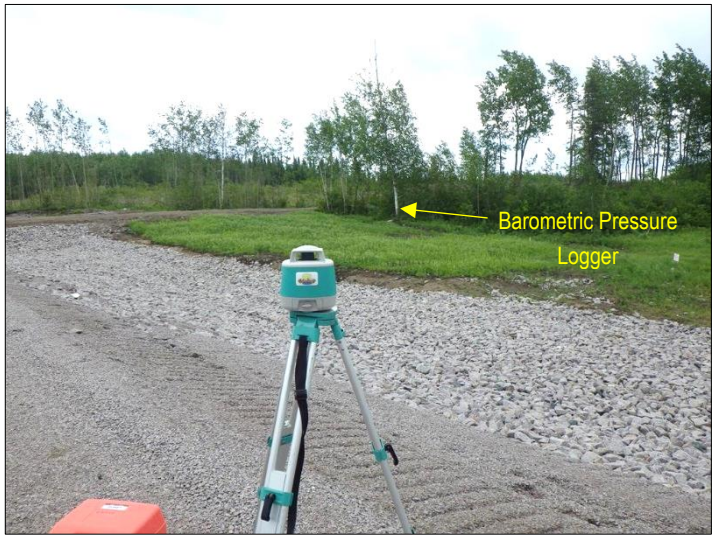
Teeple Pond

Water level logger facing west on dam (June 10, 2017)

Water level logger facing east on dam (June 10, 2017)



Water level logger facing northwest (June 10, 2017)



Barometric pressure logger mounted on tree (June 10, 2017)

Plate A.1-1: Teeple Pond Water Level Logger Installation

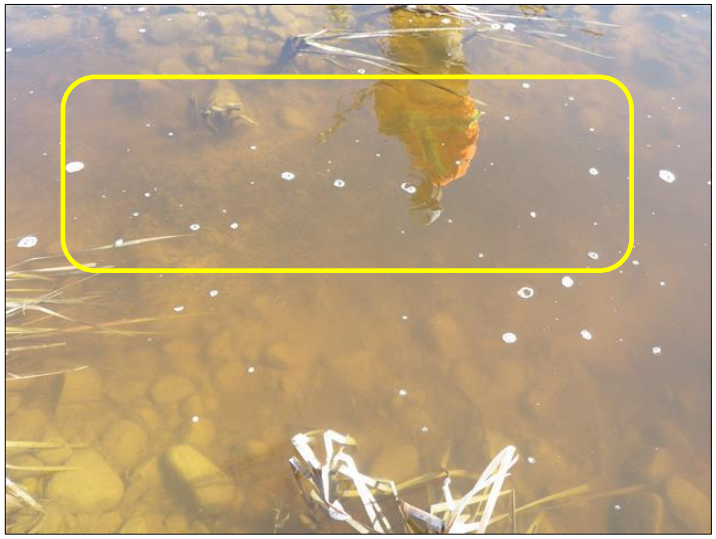
Appendix A.2

Teeple Outlet Channel

CSS-1, facing upstream during high flow conditions (April 25, 2018)

CSS-1 run during high flow conditions (April 25, 2018)

CSS-2, facing downstream toward remnant channel (April 25, 2018)



Large school of juvenile cyprinids in CSS-2 pool (April 25, 2018)

Plate A.2-1: Teeple Outlet Channel – High Flow Monitoring

CSS-1, facing upstream during low flow conditions (July 27, 2018)

CSS-1, facing downstream (July 27, 2018)

Dry riffle/run in CSS-1 (July 27, 2018)

Dry run/pool in CSS-1 (July 27, 2018)

Plate A.2-2: Teeple Outlet Channel – Low Flow Monitoring

CSS-2, facing upstream (July 27, 2018)

CSS-2 facing downstream (July 27, 2018)

Refuge pool in CSS-2, during low flow conditions (July 27, 2018)

Dry run in CSS-2 (July 27, 2018)

Plate A.2-3: Teeple Outlet Channel – Low Flow Monitoring

Dry plunge pool in CSS-3 (July 27, 2018)

Erosion from cattle destabilization and exposed soil; CSS-3 (July 27, 2018)

Undefined channel from cattle destabilization; CSS-3 (July 27, 2018)

Dry channel at CSS-11 (July 27, 2018)

Plate A.2-4: Teeple Drain – Low Flow Monitoring

Appendix B

Stability of Structures Photograph Record

B.1 Photo Stations
B.2 Time Lapse Photo Series (2018)
B.3 Time Lapse Photo Series (2017)

Appendix B.1

Photo Stations

Station P1 facing southwest (July 7 27, 2018)

Station P1 facing southwest (April 25, 2018)

Station P2 facing west (April 25, 2018)

Station P2 facing west (July 25, 2018)

Plate B.1-1: Stability of Structures Photo Stations P1 and P2

Station P3 facing west from stake (July 25, 2018)

Station P3 facing north (July 25, 2018)

Station P3 facing east from stake (July 25, 2018)

Station P4 facing northwest to dam (July 25, 2018)

Plate B.1-2: Stability of Structures Photo Stations P3 and P4

Station P4 facing northeast (July 25, 2018)

Station P4 facing northeast to dam (April 25, 2018)

Station P4, facing south (July 25, 2018)

Station P4, facing south (April 25, 2018)

Plate B.1-3: Stability of Structures Photo Station P4

Station P5 facing northeast; low flow condition (July 8, 2017)

Station P5 facing northeast; note vegetation progress (July 27, 2018)

Station P5 facing north; high flow condition (April 25, 2018)

Station P5 facing east; low flow condition (July 27, 2018)

Plate B.1-4: Stability of Structures Photo Station P5

Station P5 facing southeast; high flow condition (April 25, 2018)

Station P5 facing southeast; low flow condition (July 27, 2018)

Station P6 facing northwest; upstream (April 25, 2018)

Station P6 facing northwest; upstream (July 27, 2018)

Plate B.1-5: Stability of Structures Photo Stations P5 and P6

Station P6 facing south; downstream (April 25, 2018)

Station P6 facing south; downstream (July 27, 2018)

Station P7, natural channel facing north; upstream (April 25, 2018)

Station P7, natural channel facing north; upstream (July 29, 2018)

Plate B.1-6: Stability of Structures Photo Stations P6 and P7

Station P8 facing south; downstream (April 25, 2018)

Station P8 facing south; downstream (July 29, 2018)

Station P8, natural channel, during high flow (April 25, 2018)

Station P8, natural channel during low flow (July 29, 2018)

Plate B.1-7: Stability of Structures Photo Station P8

Station P9 facing northwest; upstream (April 25, 2018)

Station P9 facing northwest; upstream – no flow (July 29, 2018)

Station P9 facing southeast, during high flow (April 25, 2018)

Station P9 facing southeast, during low flow (July 29, 2018)

Plate B.1-8: Stability of Structures Photo Station P9

Station P10 facing north; upstream (April 25, 2018)

Station P10 facing northeast; upstream (July 29, 2018)

Station P10 facing southwest; downstream (April 25, 2018)

Station P10 facing southwest; downstream (July 29, 2018)

Plate B.1-9: Stability of Structures Photo Station P10

Station P11 facing northeast; upstream (April 25, 2018)

Station P11 facing northeast; upstream (July 29, 2018)

Station P11 facing southwest; downstream (April 25, 2018)

Station P11 facing southwest; downstream (July 29, 2018)

Plate B.1-9: Stability of Structures Photo Station P11

Appendix B.2

Time Lapse Photo Series (2018)

Teeple Pond outlet; ice still present on pond (April 25, 2018)

Teeple Pond outlet; ice absent from pond next day (April 26, 2018)

May 4, 2018

May 6, 2018

Plate B.2-1: Time Lapse Photo Series (April and May 2018)

May 11, 2018

May 18, 2018

May 25, 2018

May 30, 2018

Plate B.2-2: Time Lapse Photo Series (May 2018)

June 6, 2018

June 13, 2018

June 27, 2018

July 4, 2018

Plate B.2-3: Time Lapse Photo Series (June and July 2018)

July 4, 2018

July 10, 2018

July 18, 2018

July 23, 2018

Plate B.2-4: Time Lapse Photo Series (July 2018)

Large white bird on pond (July 31, 2018)

August 4, 2018

August 15, 2018

August 28, 2018

Plate B.2-5: Time Lapse Photo Series (July and August 2018)

September 5, 2018

Large congregation of birds on pond (September 10, 2018)

Large white birds on pond (September 18, 2018)

September 30, 2018

Plate B.2-6: Time Lapse Photo Series (September 2018)

October 4, 2018

First observed snowfall occurred one day prior (October 11, 2018)

October 20, 2018

October 30, 2018

Plate B.2-7: Time Lapse Photo Series (October 2018)

Ice forming on pond since Nov. 2 (November 4, 2018)

Ice cover absent from pond since November 5 (November 7, 2018)

Continuous ice cover documented (November 9, 2018)

Ice coverage remained unchanged since Nov. 9 (November 30, 2018)

Plate B.2-8: Time Lapse Photo Series (November 2018)

Appendix B.3

Time Lapse Photo Series (2017)

June 11, 2017

June 16, 2017

June 23, 2017

June 30, 2017

Plate B.3-1: Time Lapse Photo Series June 2017

July 7, 2016

July 14, 2017

July 21, 2017

July 28, 2017

Plate B.3-2: Time Lapse Photo Series July 2017

August 4, 2017

August 11, 2017

Note debris mound removed; August 18, 2017

August 24, 2017

Plate B.3-3: Time Lapse Photo Series August 2017

September 2, 2017

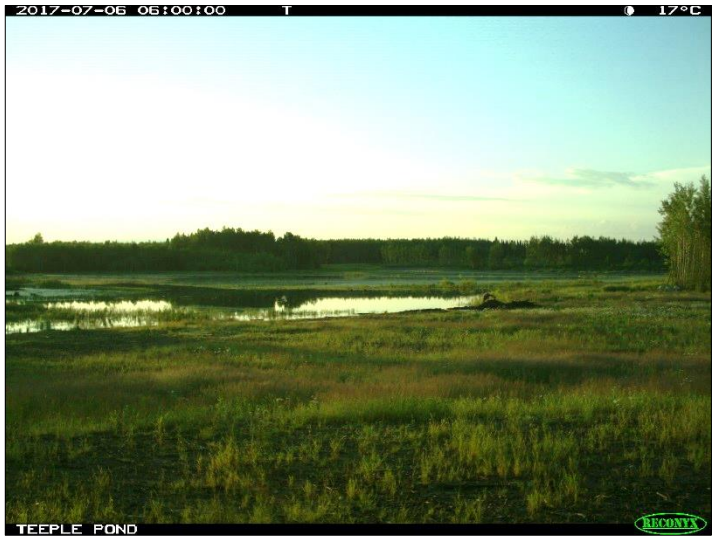
Note large white birds on pond; September 8, 2017

September 15, 2017

September 21, 2017

Plate B.3-4: Time Lapse Photo Series September 2017

Note geese in foreground; June 12, 2017



Unknown animal/object at outlet; July 6, 2017

Water level before 22 mm rain; June 13, 2017

Water level after 22 mm rain; June 14, 2017

Plate B.3-5: Time Lapse Photo Series Other Supporting Photos

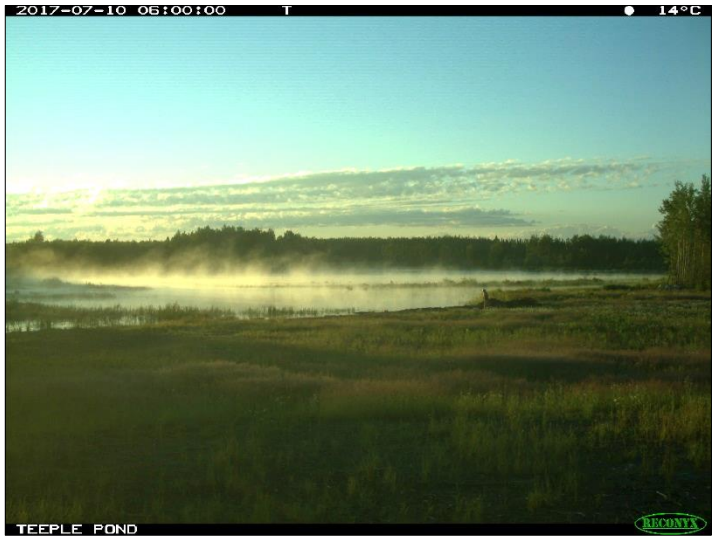
Rain in distance; June 25, 2017

Example of shadow/lighting influence; June 25, 2017

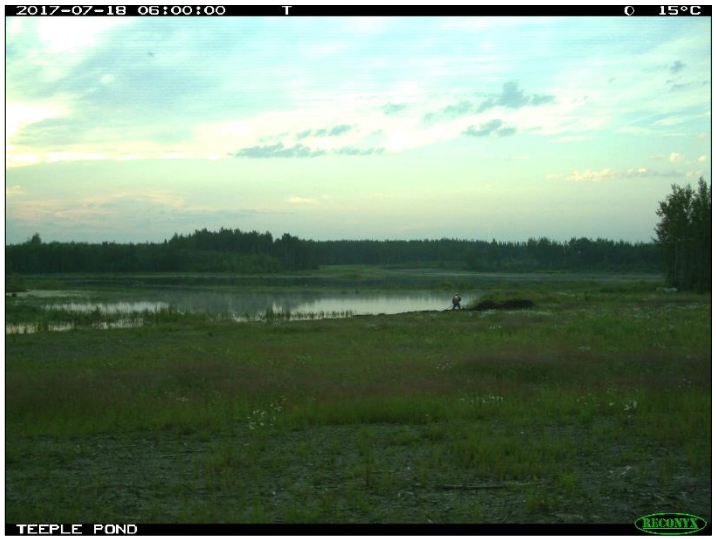
Water level before 33 mm rain; July 4, 2017

Water level after 33 mm rain; July 5, 2017

Plate B.3-6: Time Lapse Photo Series Other Supporting Photos

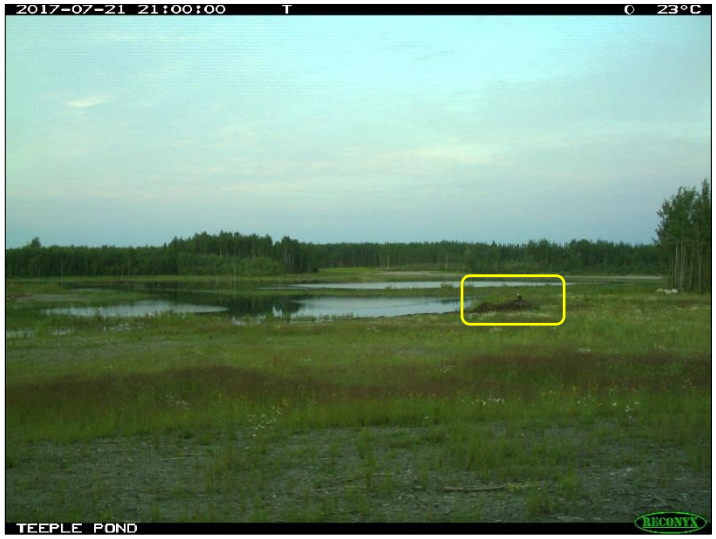


Trapper onsite managing beaver in pond; July 10, 2017



Trapper working near outlet; July 18, 2017

Teeple Pond outlet repairs, note machinery; August 18, 2017



Bald Eagle on outlet debris mound; July 21, 2017

Plate B.3-7: Time Lapse Photo Series Other Supporting Photos

Appendix C

Attachments

LEGEND

BOULDER CLUSTER

TREE PILE

NWL NORMAL WATER LEVEL

ZONE A - SCRUB-SHRUB WETLAND - 3,248 m²

ZONE B - EMERGENT WETLAND - 34,693 m²

2017 MANUAL WATER DEPTH MEASUREMENTS					
LOCATION NO.	DESIGN WATER DEPTH (m)	TOTAL WATER DEPTH (m)	UTM EASTING (m)	UTM NORTHING (m)	LOCATION/OBSERVATION
1	1.5-2.0	1.55	429,795	5,409,016	NW CHANNEL, ABUNDANT MACROPHYTE NEARSHORE
2	2.0	2.05	429,769	5,409,036	NW REFUGE POOL
3	2.0-2.5	2.32	429,802	5,408,984	W REFUGE POOL, ABUNDANT MACROPHYTES NEARSHORE
4	2.0-2.5	2.45	429,810	5,408,966	W REFUGE POOL
5	2.0-2.5	2.40	429,828	5,408,978	W REFUGE POOL
6	1.5-2.0	2.37	429,904	5,408,994	NE CHANNEL
7	1.5-2.0	2.28	429,958	5,408,003	NE CHANNEL
8	1.5-2.0	1.60	429,985	5,409,028	NE CHANNEL, TREE PILES OBSERVED
9	2.0-2.5	2.15	430,013	5,409,080	NE REFUGE POOL
10	1.5-2.0	2.28	429,836	5,408,919	SW CHANNEL
11	2.0-2.5	2.60	430,017	5,408,896	SE REFUGE POOL
12	2.0-2.5	1.95	430,146	5,408,887	E REFUGE POOL

TEEPLE ROAD POND INLET FROM CLARK CREEK DIVERSION CHANNEL

EXISTING UNNAMED TRIBUTARY 8 CHANNEL

EXISTING BEAVER POND

TEEPLE ROAD POND OUTLET TO EXISTING UNNAMED TRIBUTARY 8

REFUGE POOL BTM. ELEV. 376.50

LOC. NO. 1 DEPTH: 1.55m

LOC. NO. 2 DEPTH: 2.05m

LOC. NO. 3 DEPTH: 2.32m

LOC. NO. 4 DEPTH: 2.45m

LOC. NO. 5 DEPTH: 2.40m

LOC. NO. 6 DEPTH: 2.37m

LOC. NO. 7 DEPTH: 2.28m

LOC. NO. 8 DEPTH: 1.6m

LOC. NO. 9 DEPTH: 2.15m

LOC. NO. 10 DEPTH: 2.28m

LOC. NO. 11 DEPTH: 2.6m

LOC. NO. 12 DEPTH: 1.95m

TYPICAL TREE PILE (SEE DRAWING NO. 3098004-004400-A1-D50-0001-AB)

TYPICAL BOULDER CLUSTER (SEE DRAWING NO. 3098004-004400-A1-D50-0001-AB)

NWL 378.50

TOTAL WETTED AREA UNDER NORMAL WATER LEVEL 9.22 HECTARES

TOP OF DAM (CREST ELEV. 379.00)

ARMOURED SEGMENT SEE DRAWING 3098004-004400-A1-D70-0003

TEEPLE ROAD DAM SEE DRAWING 3098004-004400-A1-D70-0003

TEEPLE ROAD POND PLAN VIEW

SCALE : 1:1000

0m 10 20 30 40

1 : 1000

3098004-004400-A1-D50-0006

REV	D	M	Y	ISSUE/REVISION DESCRIPTION	DES.	APPR.
A	18	12	2017	AS-BUILT	NSH	MCR

Client Logo: newgold™ Rainy River Project

Client: NEW GOLD INC.

AMEC Foster Wheeler Environment & Infrastrature
160 Traders Boulevard East
Mississauga, Ontario, Canada L4Z 3K7

amec foster wheeler

DRAWN BY:	NSH
DESIGNED BY:	NSH
CHECKED BY:	MCR
REVIEWED BY:	MCR
APPROVED BY:	MCR

PROJECT: RAINY RIVER PROJECT DETAILED DESIGN

TITLE: TEEPLE ROAD POND PLAN VIEW

PROJECT NO.:	TC133921
REVISION NO.	A
DATE:	DEC. 2017
SCALE:	AS SHOWN
ATTACHMENT NO.:	1

C:\Working Folders\RRPLCAD\As Built\Teeple Pond\211_212 - TP - Pond_Attachment1_10.dwg — Overview — Dec. 19, 2017 4:44pm — nathan.dellings