Appendix 38

Meadowbank 2023 Habitat Compensation Monitoring Report

AGNICO EAGLE

MEADOWBANK COMPLEX

2023 HABITAT COMPENSATION MONITORING REPORT

In Accordance with

DFO Fisheries Authorizations NU-0190, NU-03-0191.3, NU-03-0191.4 and 14-HCAA-01046

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EXECUTIVE SUMMARY

According to Fisheries and Oceans Canada (DFO) *Fisheries Act* Authorizations (FAAs) NU-0190, NU-03-0191.3, NU-03-0191.4 and 14-HCAA-01046, Agnico Eagle maintains a Habitat Compensation Monitoring Plan (HCMP; Version 4, February, 2017) to demonstrate whether fish habitat compensation features at the Meadowbank Mine are constructed and functioning as intended.

In 2023, monitoring according to the HCMP was only required for the spawning pads compensation feature, constructed in 2009 at stream crossing R02 along the all-weather access road (AWAR) to Baker Lake (FAA NU-0190). Scheduled habitat compensation monitoring methods for these spawning pads include a visual assessment of spawning pad stability, as well biological monitoring to confirm adult fish presence and reproduction in this watercourse.

In 2023, detailed visual surveys were conducted and the constructed spawning pads were generally confirmed to be stable as designed. Some movement of the gravel spawning bed material has occurred within each pad, but on average surveyed plots still consist of 90% gravel and small cobble. A very early freshet inhibited biological monitoring efforts and impacted available results. Hoopnets were not set, since the migratory run appeared to have been completed by the time the Animal Use Protocol was received. However historically (e.g. Agnico Eagle, 2022), continued use of the R02 reach by Arctic grayling without major changes in population structure has been well demonstrated. Ahead of the field season, Agnico Eagle had proposed to DFO to pause this component of the HCMP program, and will confirm this change ahead of the next monitoring event (2025).

Adult fish presence within the spawning berms was demonstrated in 2023 through underwater camera methods, but the majority of observations were identified as lake trout rather than the target species, Arctic grayling. This is consistent with larval drift trapping results (none captured throughout the study period of June 17 – July 7), which suggested that the Arctic grayling migratory run had concluded well before study initiation.

Currently, monitoring of this compensation feature is scheduled to continue every other year until decommissioning of the AWAR (est. 2031), but Agnico anticipates discussions with DFO ahead of the next monitoring event (2025) to revise this approach.

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1.1 BACKGROUND

In accordance with *Fisheries Act* Authorizations (FAAs) NU-03-0190, NU-03-0191.3, NU-03-0191.4, and 14-HCAA-01046, Agnico Eagle maintains a Habitat Compensation Monitoring Plan (HCMP; February, 2017) for the Meadowbank Mine to ensure that fish habitat compensation described in the site's No Net Loss and Fish Habitat Offsetting Plans is constructed and functioning as intended. The HCMP pertains to fish habitat compensation for losses associated with the Meadowbank Mine, including Second Portage Lake, Third Portage Lake, Phaser Lake, Vault Lake, and AWAR stream crossings, as described in the following plans:

FAA NU-03-0190: Meadowbank Gold Project No-Net-Loss-Plan (NNLP), prepared by Azimuth Consulting Group Inc. – November 2006

- Losses and compensation for the AWAR stream crossings

FAAs NU-03-0191.3 and NU-03-0191.4: Agnico-Eagle Mines: Meadowbank Division No Net Loss Plan (NNLP) – October 15, 2012

- Losses and compensation for Second Portage Lake, Third Portage Lake, and Vault Lake

FAA 14-HCAA-01046: Agnico Eagle Mines: Meadowbank Division Fish Habitat Offsetting Plan: Phaser Lake – February, 2016 (draft)

- Losses and offsetting for Phaser Lake

The success of fish habitat offsetting for the Whale Tail site is monitored and reported separately under the Fish Habitat Offsets Monitoring Plan for the Whale Tail Site (V2 June, 2021), and is not discussed here.

1.2 SUMMARY OF COMPENSATION FEATURES

A brief description of habitat compensation features for each FAA is provided below. Further details are available in the most recent Habitat Compensation Monitoring Plan (Version 4, February, 2017).

1.2.1 AWAR Compensation (NU-03-0190)

Construction of the 110 km All Weather Access Road (AWAR) between the Hamlet of Baker Lake and the Meadowbank Mine was completed in the spring of 2008, under DFO Authorization NU-03-0190. Four AWAR crossings were found to impact fish-bearing streams,

so habitat compensation was required by DFO to account for any potential reductions in productivity.

In 2009, a habitat compensation project consisting of four gravel spawning pads was constructed at crossing R02 according to design specifications that met biological criteria aimed at enhancing Arctic grayling (*Thymallus arcticus*) productivity (Figure 1). The construction focused on creating high value spawning and nursery habitat to compensate for the loss of the low and medium value habitat affected by bridge abutment construction at the four crossings.

According to the HCMP, monitoring to assess the stability and successful utilization of the AWAR compensation feature (spawning pads) was conducted in 2023, as further described in this report.

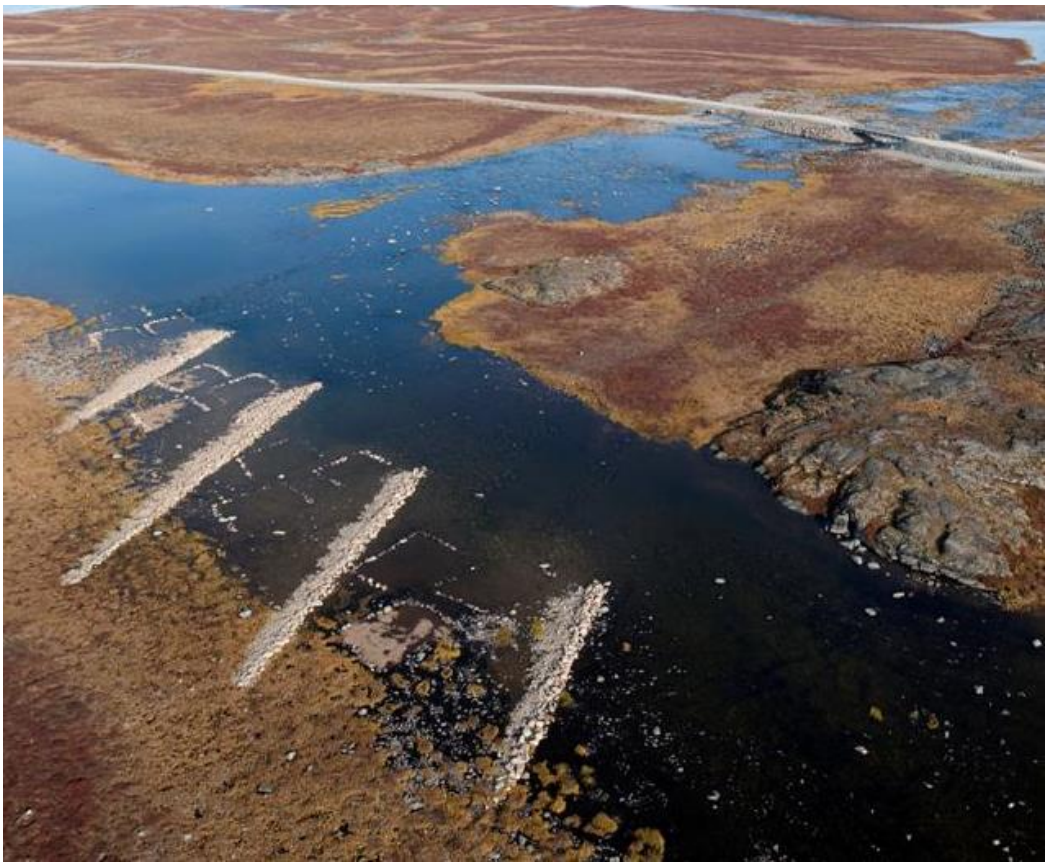

Figure 1. Arctic Grayling spawning pads constructed at Meadowbank all weather road crossing R02.

1.2.2 Portage Area Compensation (NU-03-0191.3)

Fish habitat losses in the Portage area are largely due to the dewatering of a portion of Second Portage Lake for the mine's tailings storage facility (TSF) and Portage Pit, and the Bay-Goose Basin of Third Portage Lake for construction of the Portage and Goose Island pits. These areas were impounded from the rest of their lakes using dewatering dikes constructed from material quarried onsite.

Habitat compensation features in the Portage Pit area are as follows.

1.2.2.1 Bay-Goose/Portage Basin Re-Flooding & Dewatering Dike Faces

While the TSF area in Second Portage Lake represents a permanent loss of fish habitat, the impounded Goose and Portage Pit areas and surrounding former lake basins were planned to be re-flooded after mining operations ceased. This re-flooded area formed a significant part of the site's original fish habitat compensation under Fisheries Act Authorization NU-03-0191.3. However, since in-pit deposition of tailings material was permitted within the dewatered area in 2019, Agnico is working with DFO to adapt the habitat offsetting plan for NU-03-0191.3 as necessary. An addendum to the 2012 No Net Loss Plan for the Meadowbank Site which describes proposed changes in habitat compensation related to in-pit deposition of tailings material was submitted to DFO in December, 2020, and following review (received May, 2022), additional consultation and site selection studies are ongoing. These studies are not reported under the HCMP, but a summary of activities to date is provided in Section 8.8.1.1 of the Annual Report.

The exterior faces of the dewatering dikes (East Dike and Bay Goose Dike) are currently in place as constructed habitat compensation features, and monitoring was complete in 2021.

1.2.2.2 Dogleg Pond Enhancements

Dogleg Pond and the "North Portage" ponds, Dogleg North Pond (also called NP-1) and NP-2, were isolated ponds located near the waste rock area, just north of Second Portage Lake. Since drainage of NP-2 into Second Portage Lake became blocked by the waste rock pile on the northern edge of the TSF, a connecting channel was excavated (2013) to direct flow from NP-2 to Dogleg North Pond, effectively increasing the drainage area of Dogleg and Dogleg North Pond. The accompanying increase in wetted area was estimated at 5% for Dogleg Pond, 15% for Dogleg North Pond (NP-1), and 5% for NP-2. Through construction of a diversion channel, connectivity between the ponds has been improved, and previously inaccessible habitat in Dogleg North Pond has become available for use by fish inhabiting Dogleg Pond.

Monitoring for the Dogleg Ponds was last completed in 2021, and is next required in 2025.

1.2.2.3 Finger Dikes

As described in the 2012 NNLP for the Meadowbank Site, finger dikes are also planned to be constructed on the Bay-Goose Dike extending into Third Portage Lake. These features will provide additional “shoreline” habitat that is used by most species for spawning and will have a total area of 1 ha at their base.

The finger dikes are not yet constructed so no monitoring was required in 2023.

1.2.3 Vault Area Compensation (NU-03-0191.4, 14-HCAA-1046)

Vault Lake and Phaser Lake, located north of the Portage area, drained to the adjacent Wally Lake prior to construction activity, but the connection was not passable to fish. To allow construction of the Vault and Phaser pits, Vault Lake was separated from Wally Lake with the Vault Dike and both Vault and Phaser Lakes were dewatered.

Post-closure, Vault Lake will connect to Phaser Lake through the BB Phaser Pit. Both areas will be re-flooded and the connection to Wally Lake re-established with a deeper channel to permit better fish passage. Vault and Phaser Lakes will also be expanded by construction of the Vault and Phaser pits, a portion of which is in a terrestrial zone. Alterations of the de-watered basin area outside the pit will improve habitat through the development of shoals and mixed substrate areas.

No monitoring was required for Vault area compensation in 2023. Initial HCMP monitoring events for Vault area compensation (substrate surveys in the dry for Vault and Phaser Lake basins) were completed in 2022. Re-flooding is ongoing in Vault and Phaser Lakes, and this is estimated to continue until 2026. As scheduled, monitoring under the HCMP will resume at that time.

1.3 OBJECTIVES

The following sections describe the monitoring objectives for compensation features by location. These objectives are fulfilled according to the methods and schedule described in detail in Section 2, below, and in the HCMP.

1.3.1 AWAR Monitoring Objectives

Based on Condition 5.2 of DFO Authorization NU-03-0190, the objectives of the AWAR monitoring program are as follows:

- Assess the stability and successful utilization of all compensation features during the spawning and nursery period for Arctic Grayling (Condition 5.2.1)

Additional Conditions pertaining to monitoring of HADD sites were no longer required as per the 2014 HCMP Version 3 update (designed in consultation with DFO).

1.3.2 Portage and Vault Area Monitoring Objectives

Based on Condition 6 of DFO Authorizations NU-03-0190.3, NU-03-0191.4, and 14-HCAA-1046, the objectives of the Portage area monitoring program are as follows:

- Assess the stability and successful utilization of all fish habitat compensation features according to the methodology and schedule detailed in the Habitat Compensation Monitoring Plan

- Provide a photographic record before, during and after construction, during decommissioning and post-restoration to indicate that all works and undertakings have been completed according to the conditions of the Authorization and the NNLP

1.4 SCHEDULE OF MONITORING

The complete schedule of monitoring events is detailed in the HCMP (Version 4; February, 2017). Monitoring activities conducted in 2023 generally followed the schedule therein, with alterations as described in Section 2, below.

SECTION 2 • CURRENT-YEAR MONITORING METHODOLOGY

According to the HCMP schedule, monitoring was conducted in 2023 for the AWAR compensation feature (FAA NU-0190; Condition 5.2.1). As described above, no monitoring was required for the Portage area compensation features (FAA NU-0191.3; Condition 6) or the Vault area compensation features (FAA NU-0191.4 and 14-HCAA-01046; Condition 6), so those areas are not discussed further.

A complete description of the methods used to assess function and structure of the AWAR habitat compensation feature according to the objectives of the FAAs is provided in the HCMP. Specific details (e.g. dates, locations) and any adjustments to standard methods in the reporting year's monitoring events are described below.

2.1 AWAR MONITORING

2.1.1 Stability

The compensation features were visually assessed to determine general stability in comparison to previous years. In particular, signs of any significant movement of the berm material or spawning bed material were noted. Significant movement would be identified as any changes prohibiting the berms from functioning as intended to reduce water flow rates and improve spawning habitat in the constructed gravel area between the berms.

2.1.2 Larval Drift Traps

To demonstrate ongoing reproduction within the R02 reach, drift trap monitoring for Arctic grayling larvae proceeded in a manner similar to previous years. In total, 12 larval drift traps (DT) were set at R02 from June 17 through July 7, 2023 (UTM coordinates provided in Table 1; locations shown in Figure 2). Four traps (DT A1 to A4) were upstream of the R02 habitat compensation area. Four traps (DT B1 – B4) were immediately downstream of the R02 habitat compensation, and four traps (DT C1 – C4) were set further downstream, slightly upstream of the bridge in locations identical to previous monitoring events. Five of the larval drift traps consisted of a square sided metal cone with a rigid frame (~47 x 30 cm) that funnelled into a 0.5 mm nitex mesh bag. Attached at the back of the nitex bag was a Nalgene®-type container where the drift was collected. Seven traps consisted of a ~60cm x 30 cm square frame which has a 0.5 mm nitex mesh bag, attached to a hard plastic container where the drift was collected. The frames were submerged at least halfway under water (as water levels permitted) and secured by poles on each side. Drift traps were initially checked every three days, but since no larvae were captured after six days, they were then left unchecked for each of two seven-day periods prior to removal on July 7.

Table 1. UTM coordinates for drift traps at R02 in 2023.

Drift Trap ID	Date In	Date Out	UTM Coordinates (Zone 14)	
A1	June 17	July 7	643461	7143399
A2	June 17	July 7	643451	7143402
A3	June 17	July 7	643442	7143404
A4	June 17	July 7	643436	7143413
B1	June 17	July 7	643585	7143509
B2	June 17	July 7	643584	7143522
B3	June 17	July 7	643580	7143531
B4	June 17	July 7	643572	7143541
C1	June 17	July 7	643744	7143416
C2	June 17	July 7	643750	7143419
C3	June 17	July 7	643763	7143425
C4	June 17	July 7	643774	7143430

2.1.3 Angling & Underwater Video

To confirm presence of adult fish within the constructed spawning pads, angling and underwater camera methods were used. Consistent with previous years, minimal angling was conducted in 2023. Attempts were made for about 20 min on June 21 by casting with small lures with barbless hooks. While typically angling focusses on the spawning pads, angling in 2023 was conducted just upstream, near drift trap location A, where water levels were sufficiently deep. No fish were captured through angling, so this method is not discussed further.

As in previous years, underwater video cameras were set between two sets of the spawning pad berms, facing the shore. The cameras were mounted on a ½" x 12" L shaped piece of rebar which was welded to a 4" x 12" steel "C" beam. The "C" beam acted as a base for the camera mount. A rope with a buoy at one end was attached to the rebar and lowered into the water. The buoy was used as a locator once the camera was deployed under water. Cameras were set for approximately 20 min or 1.5 h on July 17 between (4 recordings total), and 3h43m of footage were recorded.

2.1.4 Hoopnets

Previously, Agnico has proposed to discuss with DFO the possibility of pausing the hoop-netting component of this program. The proposed changes were described in Agnico's Technical Memorandum (Re: *2023 Fish Habitat Offsets Monitoring Plan Revisions*) dated May 12, 2023 and emailed to DFO. Although a meeting to discuss these revisions was requested by Agnico, a response was not received prior to the 2023 field season, so Agnico prepared to carry out this component. However, due to an extremely early freshet, water levels were very low by the time the Animal Use Protocol was received (June 12), and the migration appeared to have passed, so ultimately nets were not set. Agnico will meet with DFO to discuss the R02 monitoring program and proposed changes ahead of the next planned monitoring event (2025).

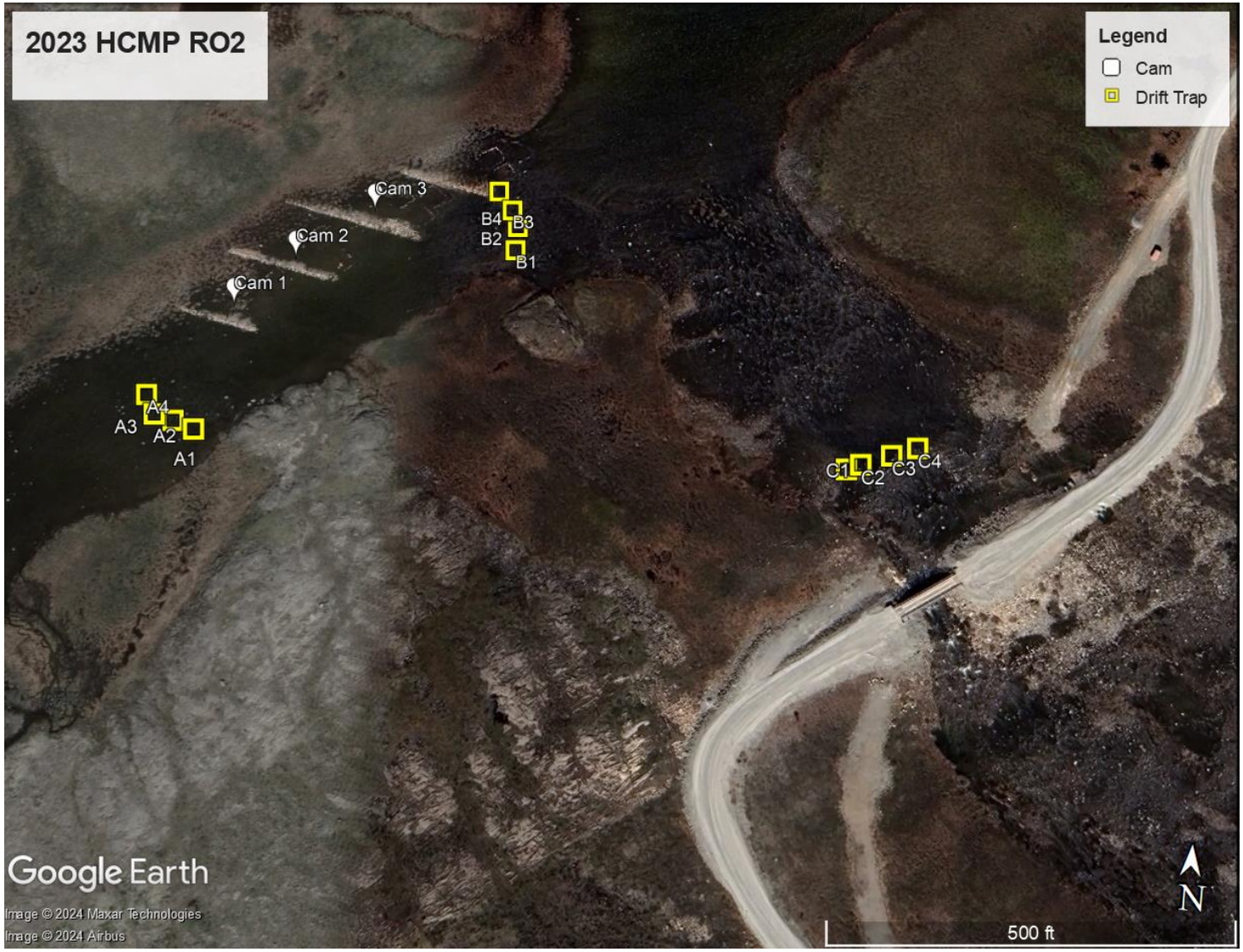

Figure 2. Locations of cameras (Cam) and larval drift traps in 2023 at the R02 habitat compensation feature.

2.1.5 Water Temperature

Water temperature measurements were recorded at each site visit using a standard digital thermometer. Although these are not a component of compensation monitoring, they help to provide a record of the environmental setting under which migrations are occurring.

SECTION 3 • RESULTS

3.1 STABILITY

Visual observations in 2023 indicated limited movement of the spawning berm material. The baffle berms appear to be functioning as intended to reduce water flow rates and depths, and the cobble U-berms constructed to retain the spawning material (gravel/cobble mix) remain generally intact. Substrate surveys of the spawning pads themselves (area within the U-berms), indicated that in most pads, gravel substrate has eroded in some areas compared to the 90% design criteria (Table 2). However, gravel and small cobble combined continue to form on average 90% of substrate with survey plots. Across all plots, average substrate types consisted nominally of: 1% sand/silt/clay, 33% small gravel, 45% large gravel, 12% small cobble, 7% large cobble, and 2% boulder.

Table 2. Proportion of substrate types in random 1 m^2 plots within spawning pads 1A – 4C at the R02 location. Surveys were repeated on June 17, 23, 30, and July 7, but selected plots within each spawning pad differed between dates.

Substrate	**Estimated Proportion of Substrate Types**											
Date	*17-Jun-23*											
Spawning Pad	*1A*	*1B*	*1C*	*2A*	*2B*	*2C*	*3A*	*3B*	*3C*	*4A*	*4B*	*4C*
Sand/silt/clay	0	25	0	0	0	0	0	0	0	0	0	0
Small gravel	30	25	40	0	50	0	10	40	50	10	0	0
Large gravel	30	25	60	10	50	0	0	0	50	90	0	0
Small cobble	40	20	0	0	0	45	45	5	0	10	70	60
Large cobble	0	5	0	30	0	45	45	55	0	0	25	20
Boulder	0	0	0	60	0	10	0	0	0	0	5	20
Date	*23-Jun-23*											
Spawning Pad	*1A*	*1B*	*1C*	*2A*	*2B*	*2C*	*3A*	*3B*	*3C*	*4A*	*4B*	*4C*
Sand/silt/clay	0	0	0	0	0	0	0	0	20	0	0	0
Small gravel	10	90	90	0	90	90	0	70	70	40	40	10
Large gravel	10	10	10	10	10	10	0	30	10	60	60	70
Small cobble	30	0	0	10	0	0	80	0	0	0	0	20
Large cobble	30	0	0	70	0	0	10	0	0	0	0	0
Boulder	10	0	0	0	0	0	10	0	0	0	0	0
Date	*30-Jun-23*											
Spawning Pad	*1A*	*1B*	*1C*	*2A*	*2B*	*2C*	*3A*	*3B*	*3C*	*4A*	*4B*	*4C*

Sand/silt/clay	-	0	0	0	0	-	-	0	0	-	-	-
Small gravel	-	30	75	20	20	-	-	40	30	-	-	-
Large gravel	-	60	25	75	65	-	-	40	60	-	-	-
Small cobble	-	10	5	5	15	-	-	20	10	-	-	-
Large cobble	-	0	0	0	0	-	-	0	0	-	-	-
Boulder	-	0	0	0	0	-	-	0	0	-	-	-
Date	*07-Jul-23*											
Spawning Pad	*1A*	*1B*	*1C*	*2A*	*2B*	*2C*	*3A*	*3B*	*3C*	*4A*	*4B*	*4C*
Sand/silt/clay	0	-	-	0	0	-	0	0	-	0	-	-
Small gravel	50	-	-	30	30	-	10	10	-	10	-	-
Large gravel	50	-	-	70	70	-	90	90	-	90	-	-
Small cobble	0	-	-	0	0	-	0	0	-	0	-	-
Large cobble	0	-	-	0	0	-	0	0	-	0	-	-
Boulder	0	-	-	0	0	-	0	0	-	0	-	-
Size classes: sand/silt/clay (<2 mm); small gravel (2 – 16 mm); large gravel (16 – 64 mm); small cobble (62 – 128 mm); large cobble (128 – 256 mm); boulder (> 256 mm)												

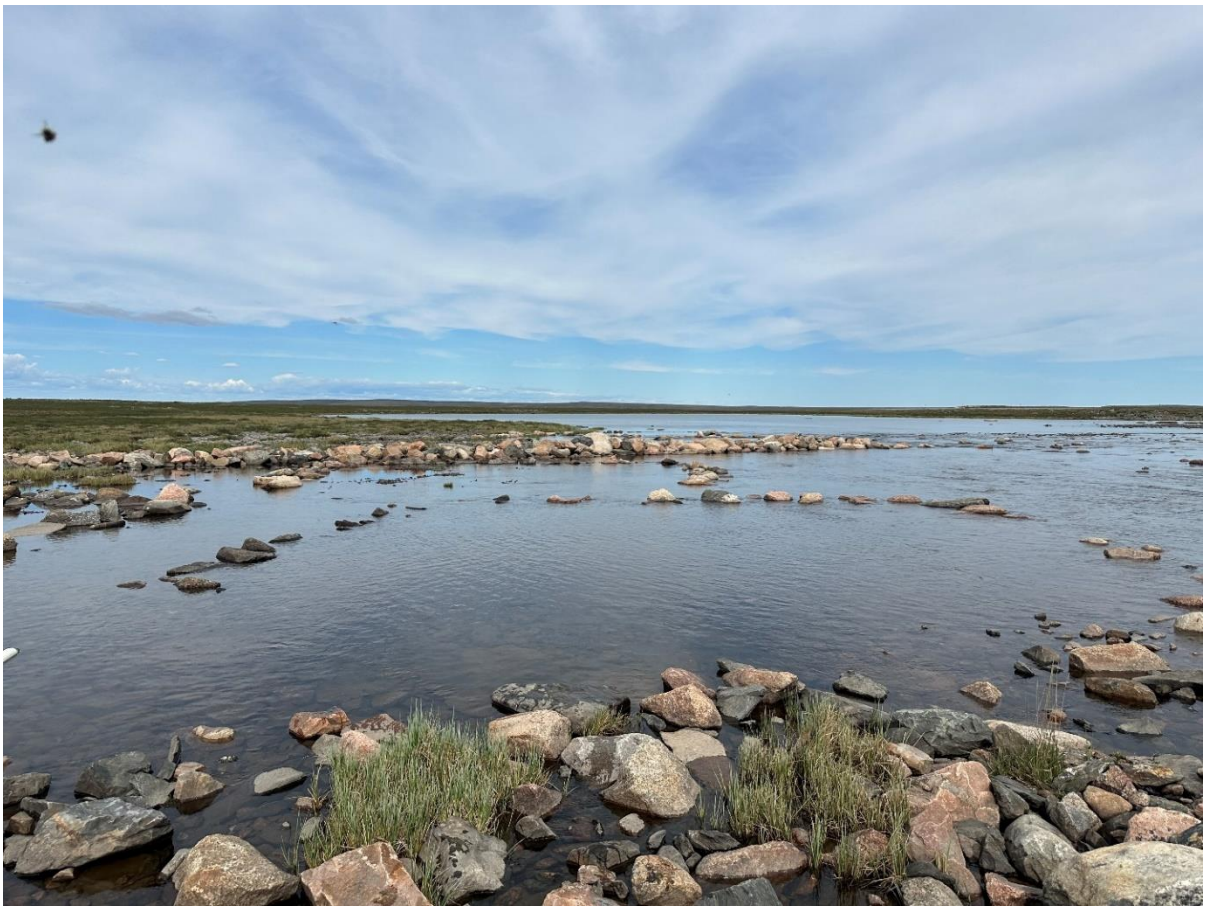

Figure 3. Spawning pad 2 area showing the outline of one of the three U-berms (June 30, 2023).

3.2 LARVAL DRIFT TRAPS

In 2023, drift traps were set on June 17, which is several days earlier than 2021 and earlier than many previous years (Table 3). However, no fish larvae were captured and traps were ultimately removed on July 7. This is a significant change from other monitoring years, when larvae have always been caught immediately upon study initiation, and hundreds have been observed during the study period (e.g. 2337 larvae in 2021). The observations in 2023 are potentially due to the extremely early freshet, resulting in an earlier migratory run, spawning, and egg hatch than previously seen. Upon study initiation, water temperature was already measured at 5.7°C, which is near the end of the range for peak drift in previous years (2 – 6°C; Agnico Eagle, 2022).

Table 3. Historical set dates and total catch of fish larvae for drift nets at the R02 location.

Year	Earliest Date In	Last Date Out	Max # Traps	# Fish Larvae
2005	29-Jun	17-Jul	1	0
2006	24-Jun	19-Jul	2	56
2007	23-Jun	29-Jul	7	327
2008	21-Jun	16-Jul	8	158
2009	24-Jun	07-Aug	9	508
2010	24-Jun	01-Aug	12	1136
2011	22-Jun	17-Jul	12	1831
2013	14-Jun	29-Jun	9	479
2015	18-Jun	17-Jul	12	2272
2017	10-Jun	02-Jul	11	636
2019	13-Jun	15-Jul	12	2536
2021	20-Jun	16-Jul	12	2176
2023	17-Jun	7-Jul	12	0

3.3 UNDERWATER VIDEO

Of the four videos recorded (all on June 17), fish were only observed on one recording (camera 1; see Figure 2). Throughout the 1h29m recording, 48 observations of fish on screen were noted, and in any one case between one and six fish were seen. In 21 observations, the fish were identified as lake trout, and in one observation, the fish was identified as an Arctic grayling. In previous years, very few observations have been made through underwater imagery (e.g. three observations in 6h of footage in 2021, all Arctic grayling or unidentified).

SECTION 4 • SUMMARY

The intent of the constructed spawning pad feature was to provide optimal conditions (flow rates, substrate) for Arctic grayling spawning in the R02 reach. Monitoring of this feature occurs every two years, and according to the HCMP, is planned to include assessments of: stability (visual observations), adult fish population metrics (hoopnets), adult presence on the spawning pads (underwater video, angling), and evidence of reproduction (larval drift traps).

Stability of the feature was visually confirmed in 2023, with some shifting of spawning bed gravel material since construction in 2009, as anticipated. However, on average, 90% of spawning bed material consists of gravel and small cobble.

Adult fish population data through hoopnetting was not collected in 2023. However, continued use of the R02 reach by Arctic grayling without major changes in population structure has been well demonstrated historically (e.g. Agnico Eagle, 2022).

Adult fish presence within the spawning berms was demonstrated in 2023 through underwater camera methods, but the majority of observations were lake trout rather than the target species, Arctic grayling. This is consistent with larval drift trapping results (none captured), which suggested that the Arctic grayling migratory run had concluded prior to study initiation.

In the HCMP, no specific criteria for success of the spawning pads are associated with fish use metrics (hoopnet catch, larval drift). Currently, monitoring is planned to continue every other year until decommissioning of the AWAR crossing, according to Condition 5.2 of the FAA (NU-03-0190). Since the timeline for road decommissioning (est. 2031) is now significantly extended compared to NNLP assumptions (est. 2018-2020), Agnico anticipates working with DFO to revise this monitoring schedule with potential adjustments to methods moving forward (see Section 5.1).

SECTION 5 • ACTIONS

The following actions were planned after the last (2021) monitoring event. Agnico's responses are indicated below each action along with any plans for actions prior to or during the next monitoring event.

- Action: Prior to the 2023 monitoring event, Agnico will look to update the HCMP to better evaluate successful utilization of the constructed spawning pads. Any updated plans will be provided to DFO for review and approval prior to implementation.
    - Response: In May, 2023, Agnico provided a proposal to DFO to pause the hoopnetting component of the AWAR spawning pads monitoring program, but a meeting to discuss this proposal could not be scheduled ahead of the field season. Agnico will discuss these changes with DFO ahead of the next scheduled monitoring year (2025).

REFERENCES

Agnico Eagle (Agnico Eagle Mines Ltd.), 2022. Meadowbank Complex 2021 Habitat Compensation Monitoring Report. March, 2022.

Agnico Eagle (Agnico Eagle Mines Ltd.), 2014. Meadowbank Gold Project Habitat Compensation Monitoring Plan. Version 2. March, 2014.

Auer, N.A. (ed.). 1982. Identification of larval fishes of the Great Lakes basin with emphasis on the Lake Michigan drainage. Great Lakes Fishery Commission, Ann Arbor, MI 48105. Special Publication 82-3: 744pp