



Maritime Link
Lobster and Snow Crab Habitat Utilization Study
Summary

September 8, 2026

This document summarizes the study conducted by Emera Newfoundland & Labrador to monitor lobster and snow crab around the Maritime Link submarine power cables across the Cabot Strait. It explains why the monitoring study was done, how scientists tracked marine animals, and what was learned about lobster and snow crab movement near the cables.

Overview

When high-voltage direct-current (HVDC) power flows through a cable, it creates a magnetic field which cannot be shielded. Some marine animals use natural magnetism to navigate. During the Environmental Assessment (2013), local fishers asked whether the Maritime Link cables could change the behavior of important species—lobster and snow crab. The ensuing Environmental Assessment release condition reads as follows: *“ENL [Emera Newfoundland and Labrador] will develop and implement a pre-construction study and [environmental effects] monitoring program (EEMP) in consultation with the FLCs [Fisheries Liaison Committee], which will continue through the operation phase of the Project, to verify potential effects of magnetic fields or other Project effects on migration of benthic organisms for relevant fisheries”*

The monitoring program required by the Environmental Assessment release conditions was designed to test that question, in real world conditions.

Over 10 years of study, scientists found that the Maritime Link cables do not affect how lobster or snow crab move in the area:

- Lobster and crab crossed the cable route normally after it was installed.
- Their movement did not change when the cables were turned on or carrying more power.
- Lobster and crab behaved the same near the cable as they did farther away.
- Their movements followed natural patterns, like changes in temperature and day/night cycles.

These results indicate that the Maritime Link HVDC submarine power cables do not act as barriers to movement and do not measurably alter local movement behaviour of lobster or snow crab within the study areas. The findings address concerns raised by local fishers during the Environmental Assessment process and fulfill the monitoring requirement established to verify potential effects. Although environmental conditions and species responses may differ among regions, the evidence from this study supports the continued normal use of fishing grounds near the cable route.

Study Details

Goals of the study

The study was designed to answer three key questions:

- 1) Do crab and lobsters hesitate or avoid crossing where the cables run?
- 2) Does more electricity (stronger magnetic field) change crossing success?
- 3) Do crab and lobsters speed up or slow down within 5m of the cables (defining the “zone of influence” for this study).

Study location

Two study areas were chosen with fishers and regulators:

- 1) Lobster grounds near Point Aconi, Cape Breton (about 12–20 m depth), and
- 2) Snow crab grounds ~35 km offshore east of Ingonish, Cape Breton (about 100–115 m depth).

The two study areas were designed to span the location of the installed cables and extend on either side to provide coverage of the cable approaches. Receivers were positioned so tagged crab and lobsters moving near the route could be tracked with meter-scale accuracy.

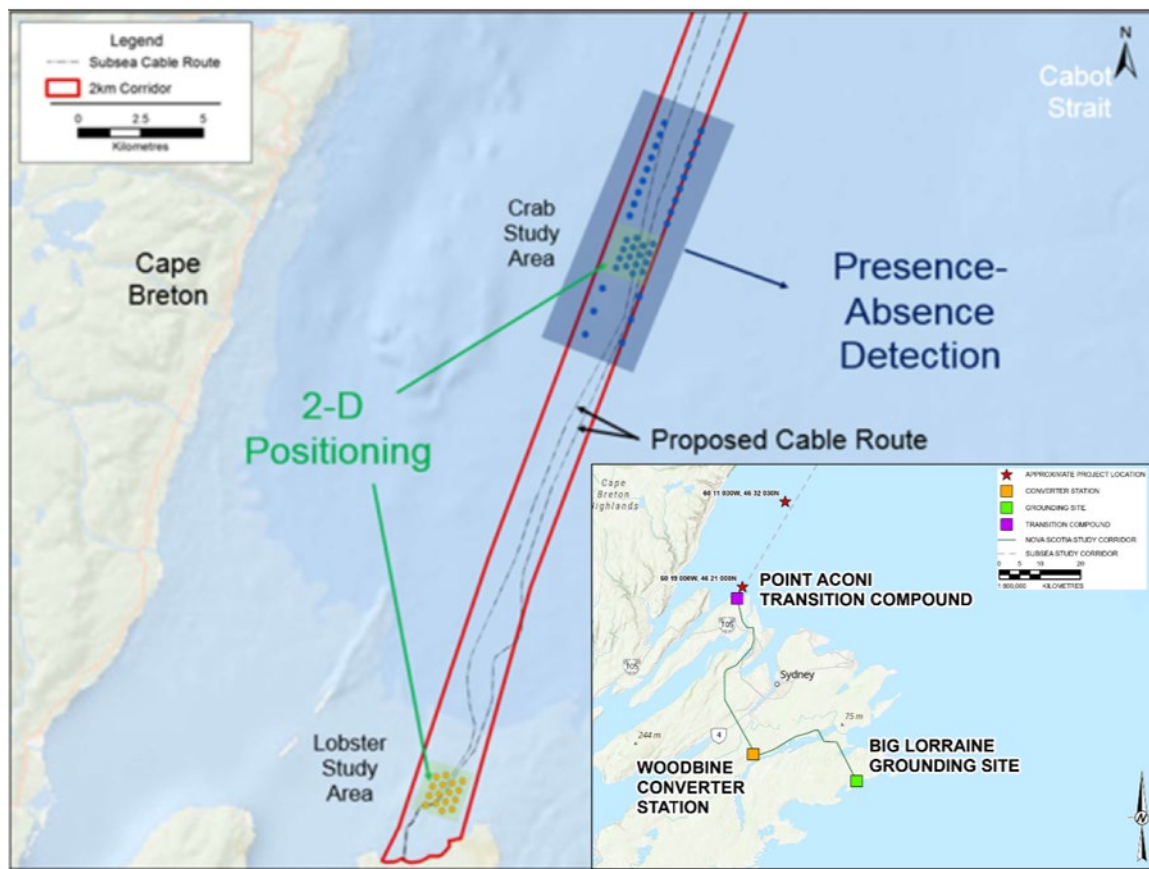


Figure: Locations of lobster and snow crab study areas

Year-by-year deployments

- 2014/15 (baseline): First deployments; method validation and habitat video mapping.
- 2015/16 (baseline): Expanded arrays; balanced male/female lobster tagging.
- 2018/19 (post-install): Cables energized but low, intermittent transfers; storms displaced some lobster receivers (partial dataset).
- 2023/24 (post-install, steady state): Normal cable operations; full analyses of crossings, current load, and crab and lobster movement rates.

Arrays were deployed in four multi-month seasons: 2014/15 and 2015/16 (before cables), and 2018/19 and 2023/24 (after installation, with the cables energized and limited transfers and 2023/24 representing steady, normal operation).

How tracking technology works

Underwater receivers (hydrophones) listen for “pings” from small acoustic tags attached to the crab and lobsters. When at least three receivers hear the same ping, software can triangulate the tag’s position. By linking many positions through time, scientists reconstruct an animal’s path. The receivers are arranged in a grid called an array, with overlapping detection ranges to maximize the chances of getting simultaneous detections of each ping.

Arrays used 16 receivers in a grid for fine-scale positioning, with additional “gate” lines for presence/absence in the deep crab area. Initially set at 250 m, receiver spacing was increased to 400 m after the first year, after range tests showed better than expected performance. This allowed tracking of tagged crab and lobsters over a larger area. Positions with high error were filtered out; crab and lobster movement speeds above conservative thresholds were removed; and statistics accounted for repeated measures per individual to avoid bias.

Lobster and crab tagging

Each season, about 40 lobsters were tagged and released inside the lobster array. Similarly, 48–116 snow crabs were tagged per season, initially only adult males; no female or juvenile snow crabs were captured in the study area in 2014/2015 as the study area is not within their normal habitat. Subsequent consultations with DFO and the fishers indicated that juveniles and female crabs should be included in the study and were primarily found in hard-bottom habitats, prompting modifications to the study design to include the targeted capture and translocation of these crabs. Each tagged Crab and lobster received a uniquely identifiable acoustic transmitter which was attached to their shell with a marine adhesive. The crab and lobsters were handled briefly and returned to the bottom in small groups on both sides of the cable route to encourage natural crossings.

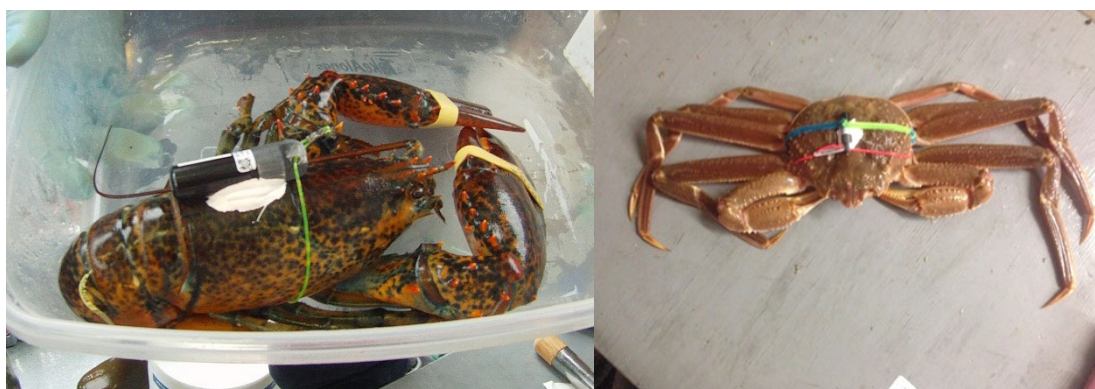


Figure: Tagged lobster and snow crab

Data analysis

To make comparisons fair, the analysis only used high-quality positions and focused on track segments that interacted with the “zone of influence”, i.e. within 5 m on either side of the cables. For crossing tests, each approach to the zone was labeled “crossed” or “did not cross”. For movement-rate tests, speeds inside the 5 m zone were compared to speeds just outside. The team also tested whether electricity transfer at the time of crossing changed outcomes.

Study results

- Lobster and snow crab crossed the route before installation and continued to do so after installation and during steady state operations.
- Crossing success rates were statistically indistinguishable before vs. after.
- Crossing success did not vary with the level of power flow across the Maritime Link.
- Average movement speeds within 5 m of the cables were similar to speeds outside that zone.
- Normal factors influencing behavior were evident: lobsters moved faster during daytime and in warmer water; snow crab moved faster at night and in warmer water.
- The 2018/19 partial dataset for lobsters (which had been affected by storms and low power transfers) showed similar qualitative patterns and did not contradict the main results.

What this means for the fisheries and regulators

The Maritime Link HVDC submarine power cables do not act as barriers and do not measurably alter local movement behavior for lobster or snow crab in these study areas. This addresses concerns raised by local fishers' during the Environmental Assessment and the condition that required verification monitoring. While conditions differ among regions and species, the evidence here supports continued normal fishing use near the route.

Key questions

Q: Can crab and lobsters “feel” the cables?

A: The magnetic field generated by the operating cables is a similar order of magnitude to the Earth's background magnetic field within a few meters of the cable; it weakens quickly with distance. The study specifically looked at behavior within 5 m and found no effect on snow crab and lobster.

Q: Did electricity level in the cables matter?

A: No. Crossing success did not change with higher current flow.

Q: Could the physical trench or rock berms be an issue for the crab and lobsters rather than magnetism?

A: In the study areas, cables were trenched/buried and seabed habitat remained similar; crab and lobsters crossed the route frequently, suggesting no physical barrier.

Q: Did tagging itself change behavior?

A: Analyses accounted for the first 24 hours after release (an acclimation period) to avoid study bias; i.e. the first 24 hours of data were excluded from the analysis. Patterns after acclimation were consistent with normal behavior drivers (day/night, temperature).



Conclusion

The monitoring program concluded that there was no statistically detectable effect of the presence and operations of the Maritime Link submarine cables on lobster or snow crab movement behavior in the monitored areas. This conclusion is consistent across multiple years, species, and tests.

Acknowledgements

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