

FLIGHT REPORT
ShoreZone Aerial Video Imaging (AVI) Survey
Team Bay of Fundy (BF)
July 4-9 & August 1-3, 2023



Squally Point, Bay of Fundy (nb23_bf_08528)

Prepared for:
Department of Fisheries and Oceans

Prepared by:
Sea Change Marine Conservation Society



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This flight report summarizes the field activities of the ShoreZone aerial video imaging surveys conducted out of Saint Andrews and Moncton, New Brunswick on July 4-9, 2023, and Halifax, Nova Scotia on August 1-3, 2023. The surveys were conducted by SeaChange Marine Conservation Society (SC) for the Department of Fisheries and Oceans (DFO). A Bell 206 L4 helicopter was chartered from Breton Air based in Sydney, Nova Scotia for the two aerial surveys. Table 1 provides a summary of field crew affiliations and responsibilities.

Table 1. Flight Personnel and Responsibilities for Team Bay of Fundy (BF).

Crew Member	Individual / Affiliation	Responsibilities
<i>Geomorphologists</i>	Kalen Morrow & Sean Daley SC	Videography, geomorphological attribute commentary, survey planning & coordination, post-flight data processing
<i>Coastal Ecologists</i>	Sarah Cook & Cole Rader SC	Digital photography, biological attribute commentary, post-flight data processing
<i>In-Flight Navigators</i>	Sean Daley, Laurie McCormick & Seanie Malcolm SC	In-flight navigation, survey planning, post-flight data processing
<i>Pilot</i>	Tim Crowley Breton Air	Operation of Bell 206 L4 aircraft

The tables and figures on the following pages summarize the extent and location of the 1,891 km of shoreline imagery collected around the Bay of Fundy.

All imagery was collected according to the latest ShoreZone protocol (Cook *et al.* 2017). Imagery was collected looking at the shoreline from the left side of the aircraft with the doors removed for better field of view. The helicopter maintained a speed of approximately 100km/hr at an altitude of 100m while at a distance of 100m from the low water line, allowing the imagery to be collected at an oblique angle to the intertidal. The imagery is linked to the 1-second positional fixes collected by the GPS in the helicopter by a date-time code (yyyymmddhhmmss). That flightline shapefile will be provided with the imagery.

A total of 15.6 hours of HD video and 14,941 high resolution photos were collected during the survey. This report contains summary tables and maps for the survey illustrating locations, lengths, and key geographic points. The final deliverables will be provided to DFO on a hard drive and will be posted on the [East Coast ShoreZone ArcGIS site](#) which can also be found at www.ShoreZone.org.

Table 2. List of video segments for Team Bay of Fundy (BF) July 4-9 and August 1-3, 2023 ShoreZone aerial imaging surveys. Corresponds with Figure 1 on the following page.

Video Number	Location	Page No.
NB23_BF_01	St. Croix River, Oak Bay, Passamaquoddy Bay	4
NB23_BF_02	Bocabec Cove, St. George, Passamaquoddy Bay	6
NB23_BF_03	Campobello Island, Head Harbour Passage	8
NB23_BF_04	Deer Island, Macs Island	10
NB23_BF_05	Shepody Bay, Petitcodiac River, Memramcook River	12
NB23_BF_06	Memramcook River, Shepody Bay, Cumberland Basin	14
NB23_BF_07	Cumberland Basin, Maccan River, Hèbert River	16
NB23_BF_08	Cumberland Basin, Chignecto Bay, Apple River	18
NB23_BF_09	Cape Chignecto, Advocate Bay, Cape Spencer	20
NB23_BF_10	Parrsboro Harbour, Five Islands, Minas Basin	22
NB23_BF_11	Economy Point, Spencer Point, Cobequid Bay	24
NB23_BF_12	Cobequid Bay, Salmon River, Shubenacadie River	26
NB23_BF_13	Shubenacadie River, Cobequid Bay, Minas Basin	28
NB23_BF_14	Avon River, Kennetcook River, St. Croix River	30
NB23_BF_15	Cape Spencer, Greville Bay, Parrsboro Harbour	32
NB23_BF_16	Gaspereau River, Boot Island, Cornwallis River	34
NB23_BF_17	Cape Split, Minas Channel, Ile Haute	36

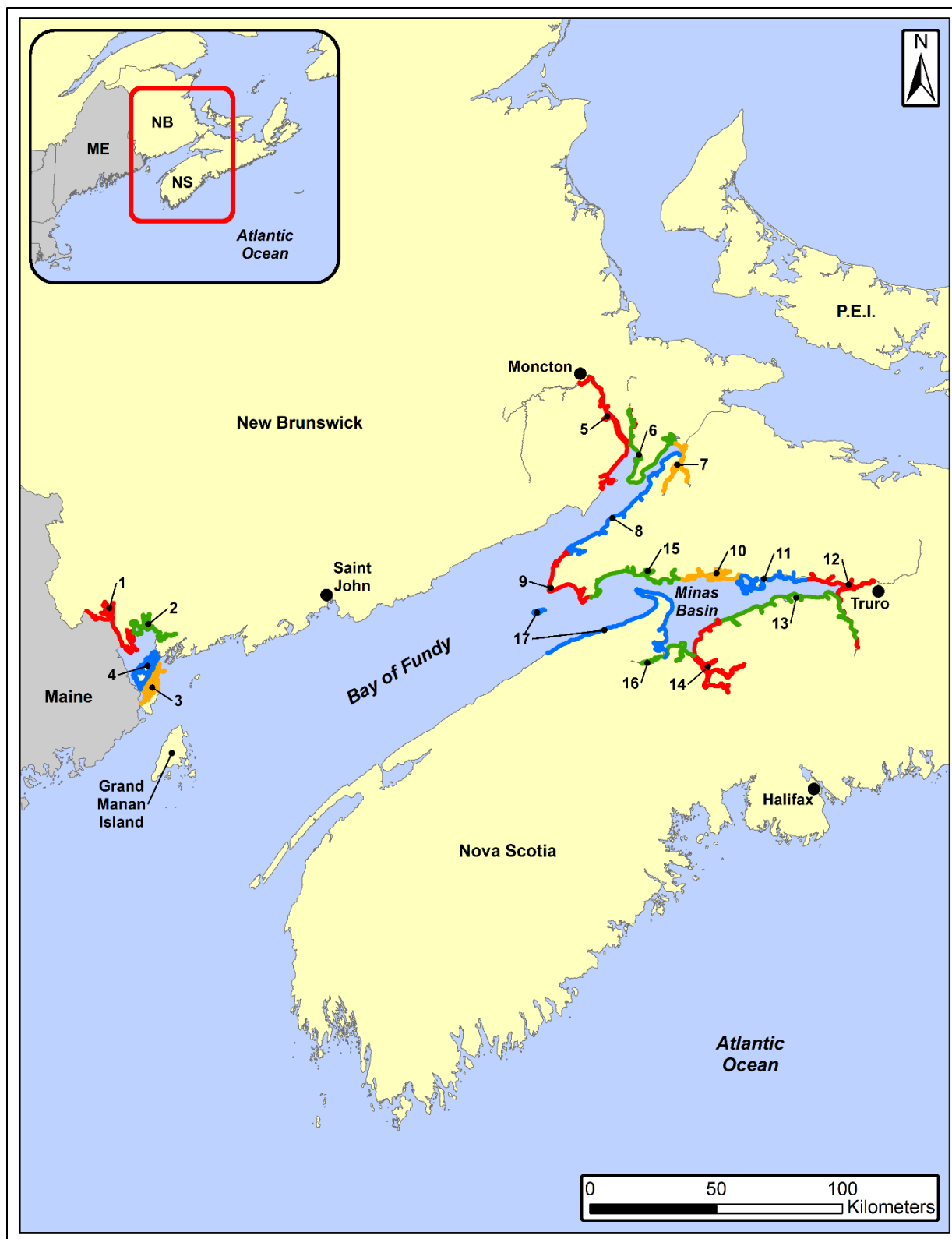


Figure 1. Video location map for the July 4-9 and August 1-3, 2023, Team Bay of Fundy (BF) ShoreZone aerial imaging survey conducted out of Saint Andrews and Moncton, New Brunswick and Halifax, Nova Scotia.

2023 New Brunswick & Nova Scotia Aerial Video Imaging Survey

Team Bay of Fundy (BF)

Video: NB23_BF_01

Date: 4 July 2023

General Location: St. Croix River, Oak Bay, Passamaquoddy Bay

Time Start (UTC): 21:20:54

Geo: Morrow

Time End (UTC): 22:22:56

Bio: Cook

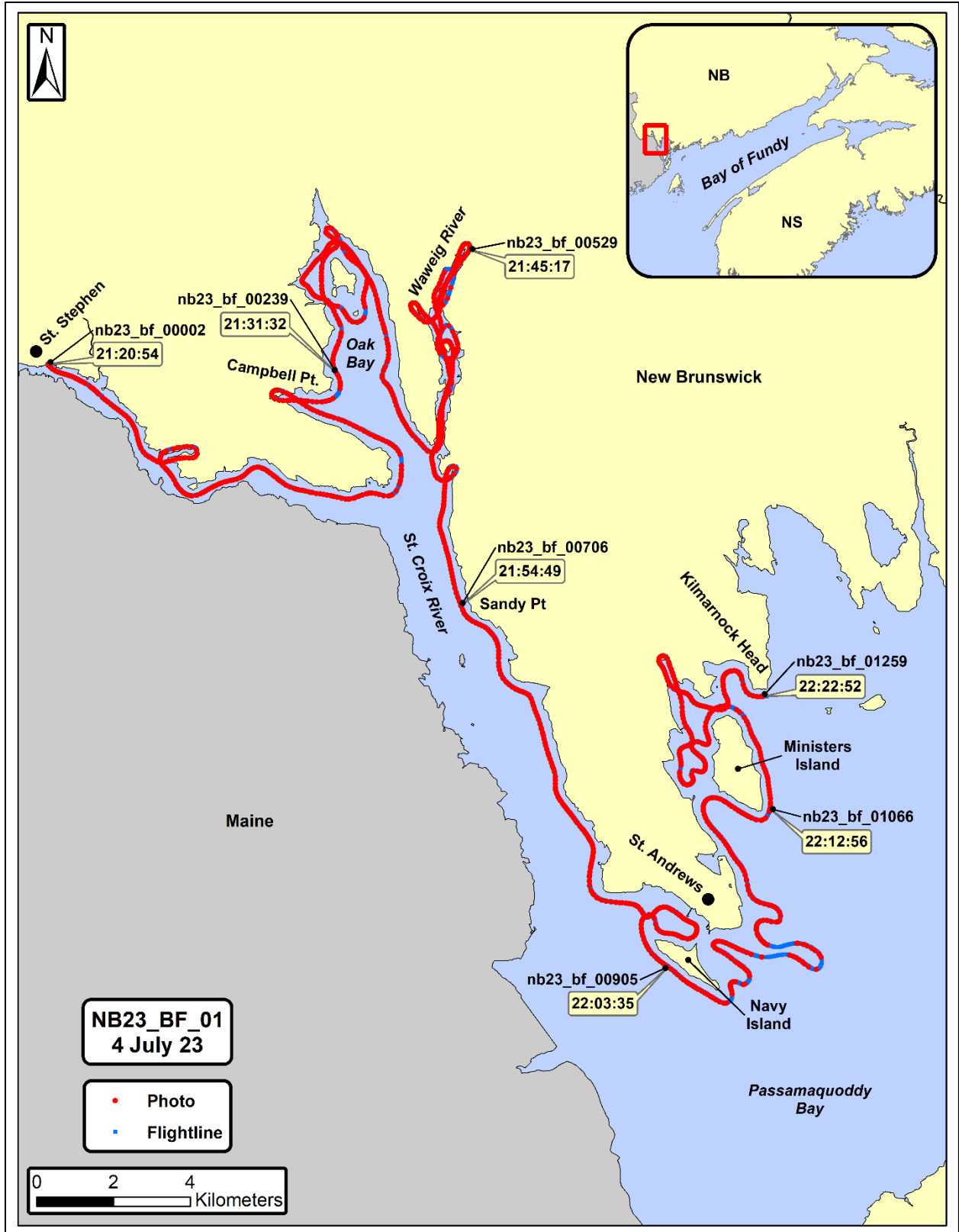
Video Length: 1 hr 2 min 3 sec

Nav: Daley

Weather: High overcast

Pilot: Crowley

Time (UTC)	Location	Photo
21:20:54	St. Stephen, St. Croix River	nb23_bf_00002
21:31:32	Campbell Pt., Oak Bay	nb23_bf_00239
21:45:17	Waweig River	nb23_bf_00529
21:54:49	Sandy Pt.	nb23_bf_00706
22:03:35	Navy Island	nb23_bf_00905
22:12:56	Ministers Island	nb23_bf_01066
22:22:52	Kilmarnock Head	nb23_bf_01259



2023 New Brunswick & Nova Scotia Aerial Video Imaging Survey

Team Bay of Fundy (BF)

Video: NB23_BF_02

Date: 4 July 2023

General Location: Bocabec Cove, St. George, Passamaquoddy Bay

Time Start (UTC): 22:23:32

Geo: Morrow

Time End (UTC): 23:30:42

Bio: Cook

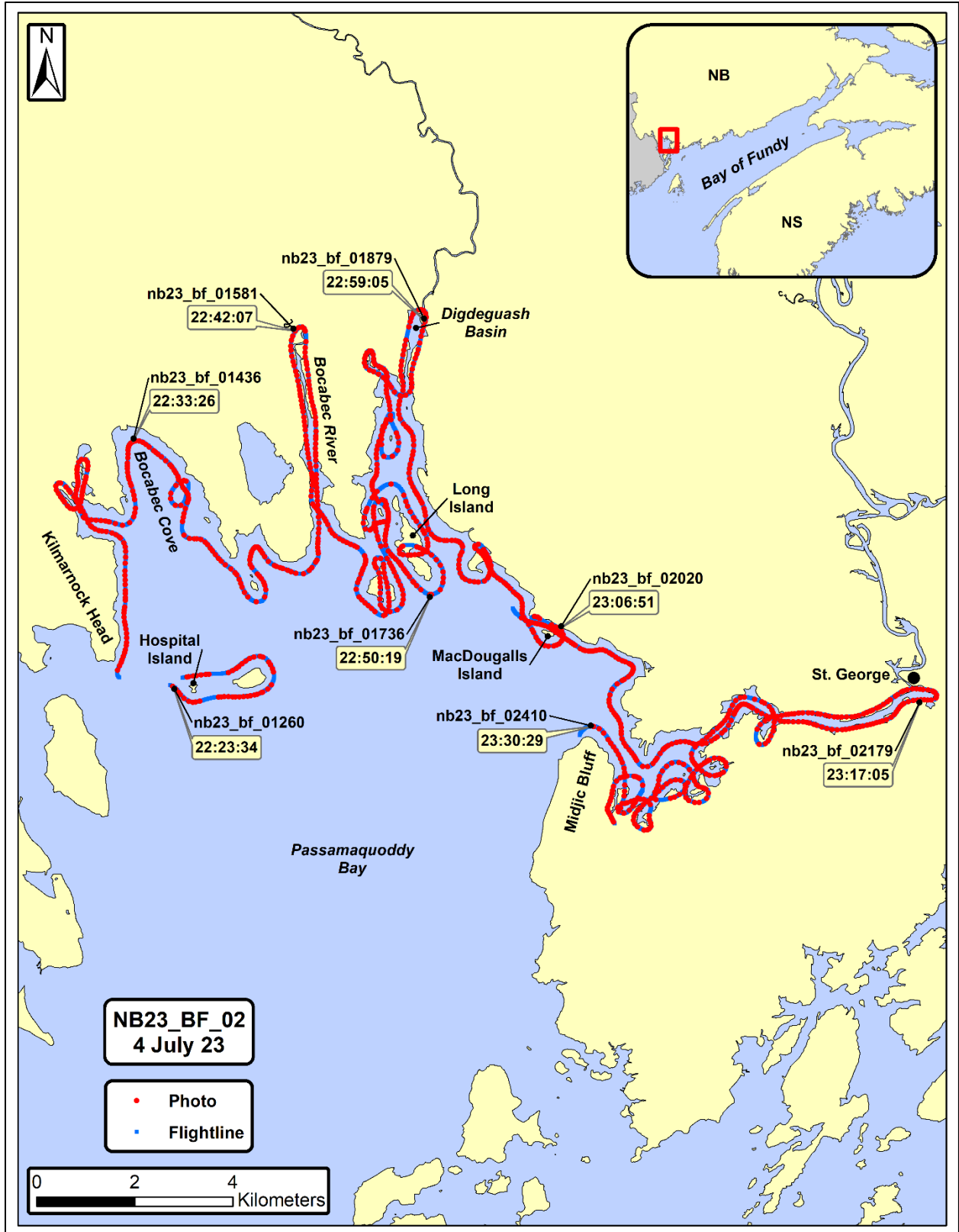
Video Length: 1 hr 5 min 3 sec

Nav: Daley

Weather: High overcast

Pilot: Crowley

Time (UTC)	Location	Photo
22:23:34	Hospital Island	nb23_bf_01260
	Video Break: 22:26:09 to 22:26:45	
22:33:26	Bocabec Cove	nb23_bf_01436
22:42:07	Bocabec River	nb23_bf_01581
22:50:19	Long Island	nb23_bf_01736
22:59:05	Digdeguash Basin	nb23_bf_01879
23:06:51	MacDougalls Island	nb23_bf_02020
	Video Break: 23:07:30 to 23:09:00	
23:17:05	St. George	nb23_bf_02179
23:30:29	Midjic Bluff	nb23_bf_02410



2023 New Brunswick & Nova Scotia Aerial Video Imaging Survey

Team Bay of Fundy (BF)

Video: NB23_BF_03

Date: 6 July 2023

General Location: Campobello Island, Head Harbour Passage

Time Start (UTC): 21:30:52

Geo: Morrow

Time End (UTC): 22:33:26

Bio: Cook

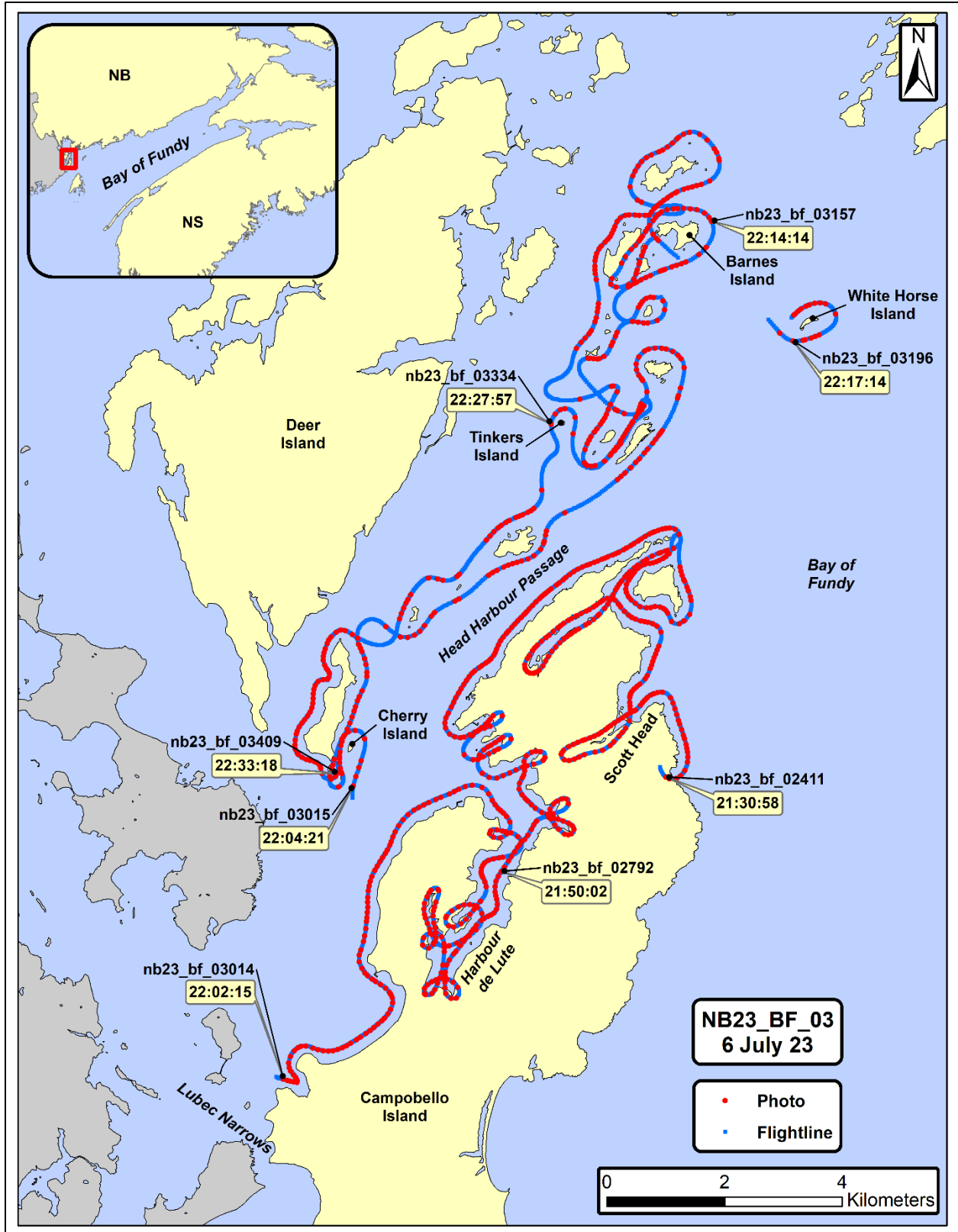
Video Length: 58 min 47 sec

Nav: Daley

Weather: High overcast, sunny breaks

Pilot: Crowley

Time (UTC)	Location	Photo
21:30:58	Scott Head, Campobello Island	nb23_bf_02411
21:50:02	Habour de Lute, Campobello Island	nb23_bf_02792
22:02:15	Lubec Narrows, Campobello Island	nb23_bf_03014
	Video Break: 22:02:21 to 22:04:15	
22:04:21	Cherry Island	nb23_bf_03015
22:14:14	Barnes Island	nb23_bf_03157
	Video Break: 22:16:05 to 22:16:59	
22:17:14	White Horse Island	nb23_bf_03196
	Video Break: 22:18:11 to 22:19:08	
22:27:57	Tinkers Island	nb23_bf_03334
22:33:18	Indian Island	nb23_bf_03409



2023 New Brunswick & Nova Scotia Aerial Video Imaging Survey

Team Bay of Fundy (BF)

Video: NB23_BF_04

Date: 6 July 2023

General Location: Deer Island, Macs Island

Time Start (UTC): 22:33:54

Geo: Morrow

Time End (UTC): 23:46:02

Bio: Cook

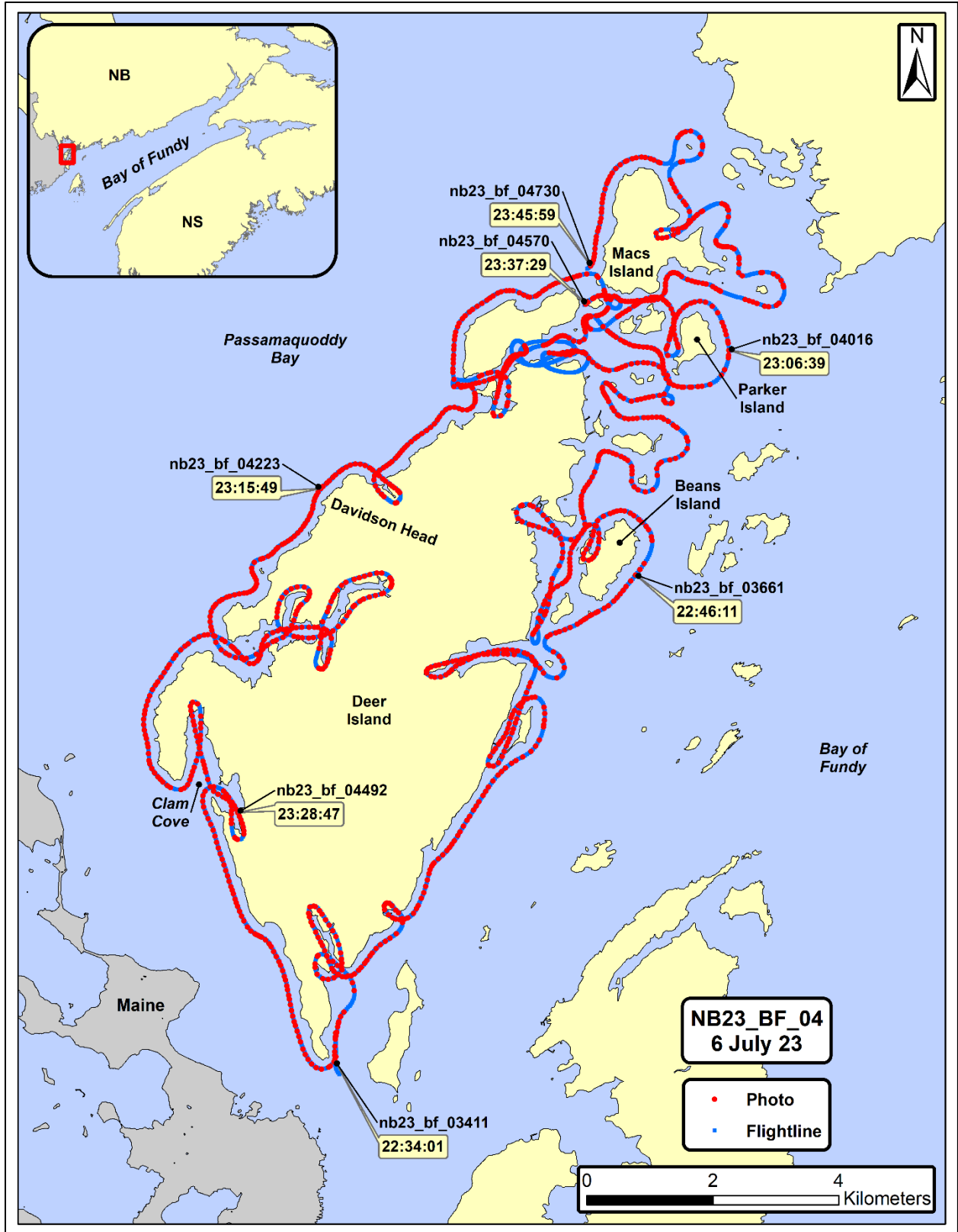
Video Length: 1 hr 7 min 2 sec

Nav: Daley

Weather: High overcast, sunny breaks

Pilot: Crowley

Time (UTC)	Location	Photo
22:34:01	Deer Island Pt.	nb23_bf_03411
22:46:11	Beans Island	nb23_bf_03661
23:06:39	Parker Island	nb23_bf_04016
23:15:49	Davidson Head	nb23_bf_04223
23:28:47	Clam Cove	nb23_bf_04492
	Video Break: 23:32:21 to 23:37:27	
23:37:29	Macs Island, Little Letete Passage	nb23_bf_04570
23:45:59	Macs Island, Little Letete Passage	nb23_bf_04730



2023 New Brunswick & Nova Scotia Aerial Video Imaging Survey

Team Bay of Fundy (BF)

Video: NB23_BF_05

Date: 8 July 2023

General Location: Shepody Bay, Petitcodiac River, Memramcook River

Time Start (UTC): 13:09:30

Geo: Morrow

Time End (UTC): 14:27:50

Bio: Cook

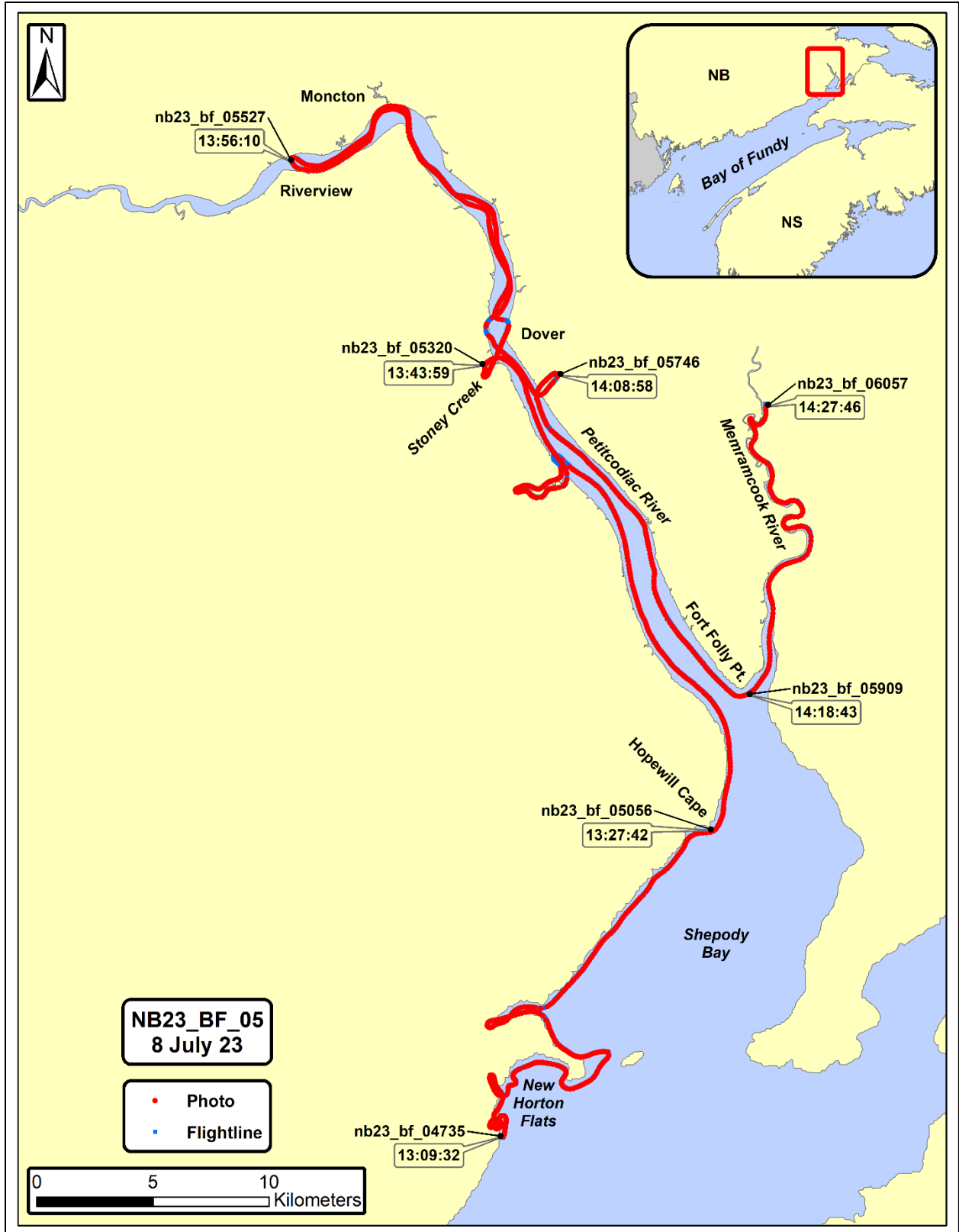
Video Length: 1 hr 18 min 21 sec

Nav: McCormick

Weather: Fog, high overcast, sunny breaks

Pilot: Crowley

Time (UTC)	Location	Photo
13:09:32	New Horton Flats	nb23_bf_04735
13:27:42	Hopewell Cape	nb23_bf_05056
13:43:59	Stoney Creek	nb23_bf_05320
13:56:10	Riverview area, Petitcodiac River	nb23_bf_05527
14:08:58	Dover area, east bank Petitcodiac River	nb23_bf_05746
14:18:43	Fort Folly Pt.	nb23_bf_05909
14:27:46	Memramcook River	nb23_bf_06057



2023 New Brunswick & Nova Scotia Aerial Video Imaging Survey

Team Bay of Fundy (BF)

Video: NB23_BF_06

Date: 8 July 2023

General Location: Memramcook River, Shepody Bay, Cumberland Basin

Time Start (UTC): 15:21:33

Geo: Morrow

Time End (UTC): 16:11:33

Bio: Cook

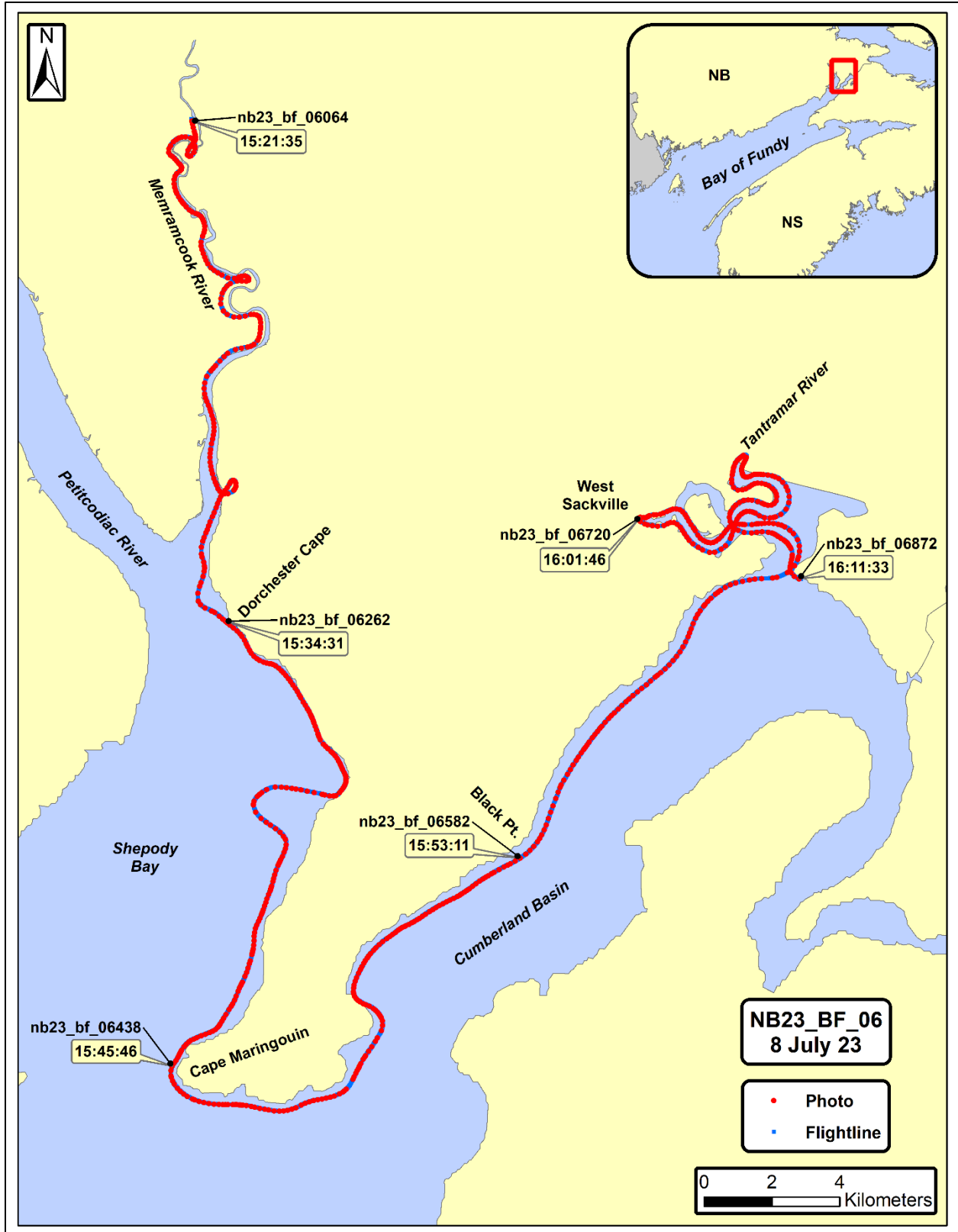
Video Length: 50 min 3 sec

Nav: McCormick

Weather: High overcast, patchy low haze

Pilot: Crowley

Time (UTC)	Location	Photo
15:21:35	Memramcook River	nb23_bf_06064
15:34:31	Dorchester Cape	nb23_bf_06262
15:45:46	Cape Maringouin	nb23_bf_06438
15:53:11	Black Pt.	nb23_bf_06582
16:01:46	West Sackville	nb23_bf_06720
16:11:33	Tantramar River mouth, Cumberland Basin	nb23_bf_06872



2023 New Brunswick & Nova Scotia Aerial Video Imaging Survey

Team Bay of Fundy (BF)

Video: NB23_BF_07

Date: 8 July 2023

General Location: Cumberland Basin, Maccan River, Hèbert River

Time Start (UTC): 16:11:36

Geo: Morrow

Time End (UTC): 16:51:18

Bio: Cook

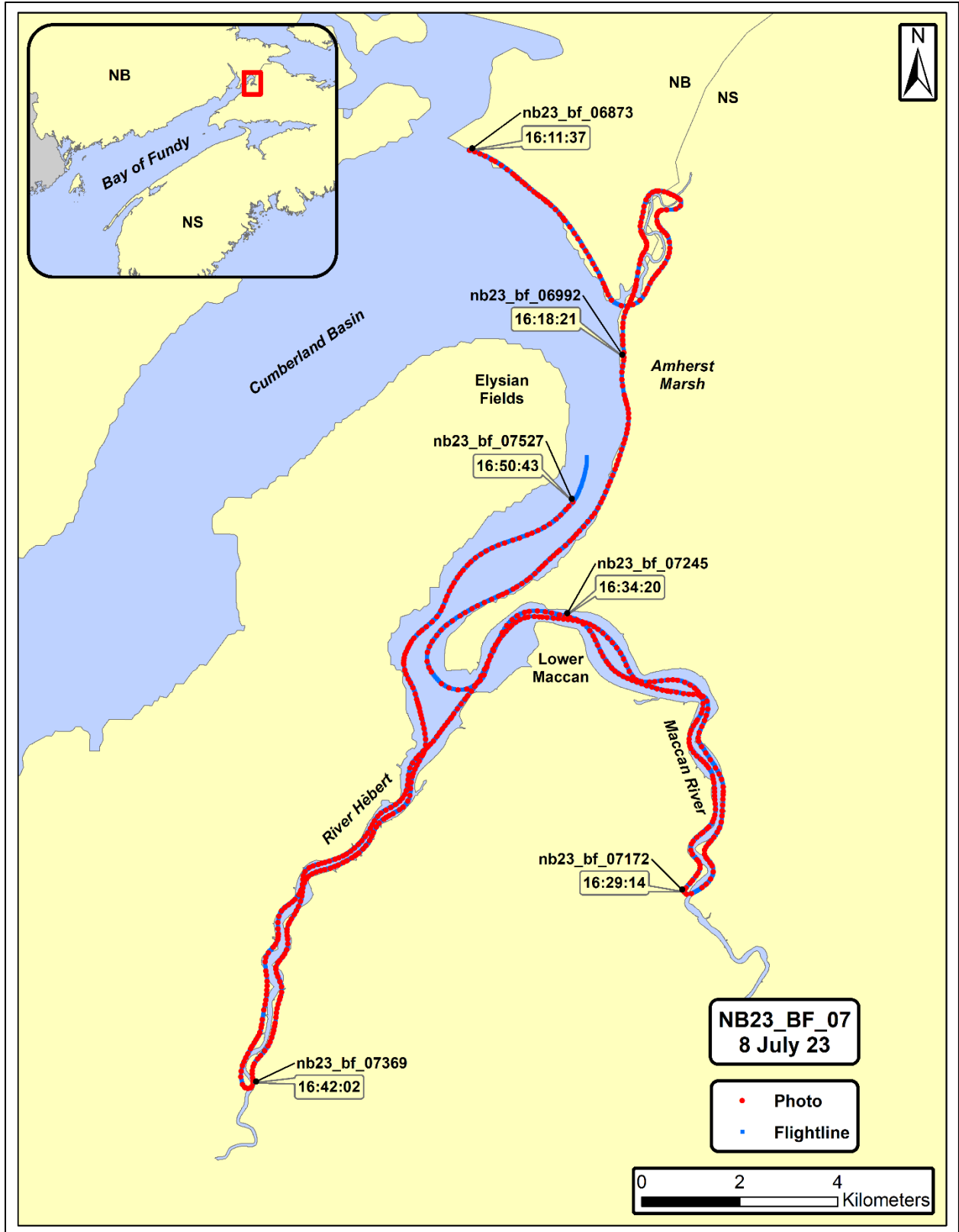
Video Length: 39 min 43 sec

Nav: McCormick

Weather: High overcast

Pilot: Crowley

Time (UTC)	Location	Photo
16:11:37	Tantramar River mouth, Cumberland Basin	nb23_bf_06873
16:18:21	Amherst Marsh	nb23_bf_06992
16:29:14	Maccan River	nb23_bf_07172
16:34:20	Lower Maccan	nb23_bf_07245
16:42:02	River Hèbert	nb23_bf_07369
16:50:43	Elysian Fields	nb23_bf_07527



2023 New Brunswick & Nova Scotia Aerial Video Imaging Survey

Team Bay of Fundy (BF)

Video: NB23_BF_08

Date: 9 July 2023

General Location: Cumberland Basin, Chignecto Bay, Apple River

Time Start (UTC): 13:03:30

Geo: Daley

Time End (UTC): 13:59:40

Bio: Cook

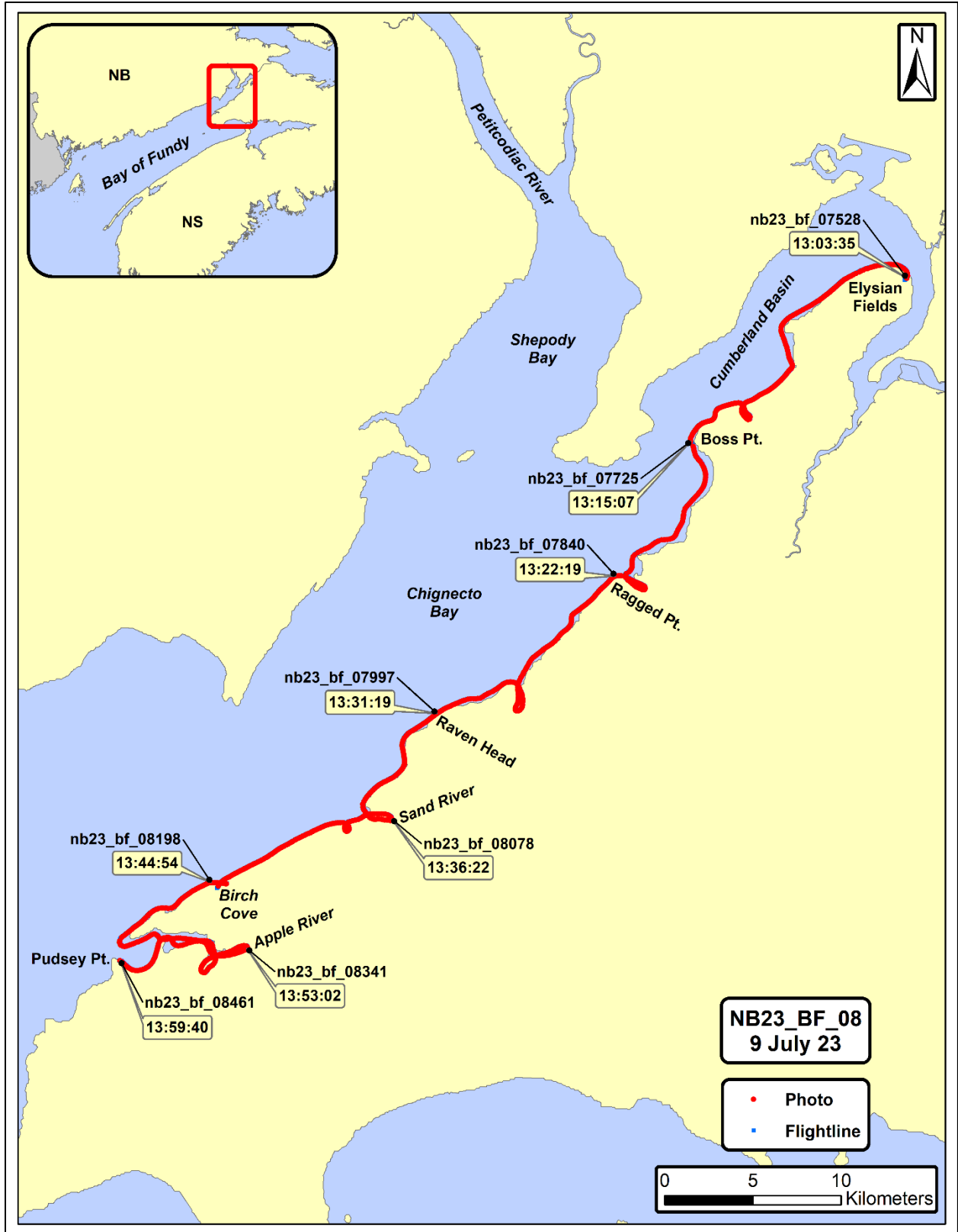
Video Length: 54 min 36 sec

Nav: McCormick

Weather: High overcast

Pilot: Crowley

Time (UTC)	Location	Photo
13:03:35	Elysian Fields	nb23_bf_07528
13:15:07	Boss Pt.	nb23_bf_07725
13:22:19	Ragged Pt.	nb23_bf_07840
13:31:19	Raven Head	nb23_bf_07997
13:36:22	Sand River	nb23_bf_08078
	Video Break: 13:42:47 to 13:44:23	
13:44:54	Birch Cove	nb23_bf_08198
13:53:02	Apple River	nb23_bf_08341
13:59:40	Pudsey Pt.	nb23_bf_08461



2023 New Brunswick & Nova Scotia Aerial Video Imaging Survey

Team Bay of Fundy (BF)

Video: NB23_BF_09

Date: 9 July 2023

General Location: Cape Chignecto, Advocate Bay, Cape Spencer

Time Start (UTC): 14:00:26

Geo: Daley

Time End (UTC): 14:34:50

Bio: Cook

Video Length: 34 min 25 sec

Nav: McCormick

Weather: High overcast, sunny breaks

Pilot: Crowley

Time (UTC)	Location	Photo
14:00:26	Pudsey Pt.	nb23_bf_08465
14:03:56	Squally Pt.	nb23_bf_08527
14:13:07	Cape Chignecto	nb23_bf_08711
14:18:15	Advocate Bay	nb23_bf_08826
14:24:49	Advocate Harbour	nb23_bf_08954
14:30:17	Cape d'Or	nb23_bf_09054
14:34:36	Cape Spencer	nb23_bf_09147



2023 New Brunswick & Nova Scotia Aerial Video Imaging Survey

Team Bay of Fundy (BF)

Video: NB23_BF_10

Date: 9 July 2023

General Location: Parrsboro Harbour, Five Islands, Minas Basin

Time Start (UTC): 14:53:56

Geo: Daley

Time End (UTC): 15:38:58

Bio: Cook

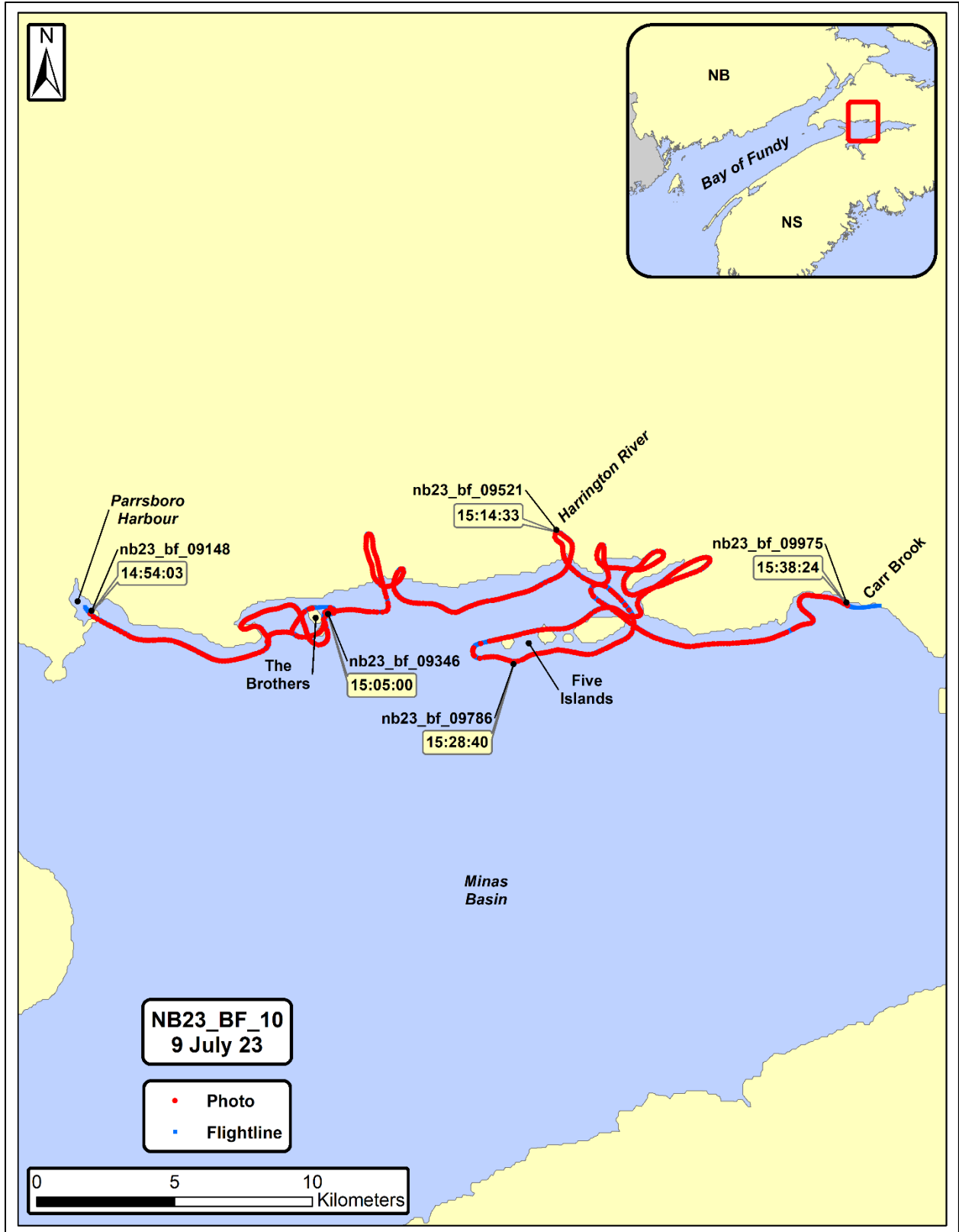
Video Length: 44 min 28 sec

Nav: McCormick

Weather: Partly cloudy, sun

Pilot: Crowley

Time (UTC)	Location	Photo
14:54:03	Parrsboro Harbour	nb23_bf_09148
	Video Break: 15:02:21 to 15:02:55	
15:05:00	The Brothers	nb23_bf_09346
15:14:33	Harrington River	nb23_bf_09521
15:28:40	Five Islands	nb23_bf_09786
15:38:24	Carr Brook	nb23_bf_09975



2023 New Brunswick & Nova Scotia Aerial Video Imaging Survey

Team Bay of Fundy (BF)

Video: NB23_BF_11

Date: 1 August 2023

General Location: Economy Point, Spencer Point, Cobequid Bay

Time Start (UTC): 21:33:20

Geo: Morrow

Time End (UTC): 22:21:40

Bio: Rader

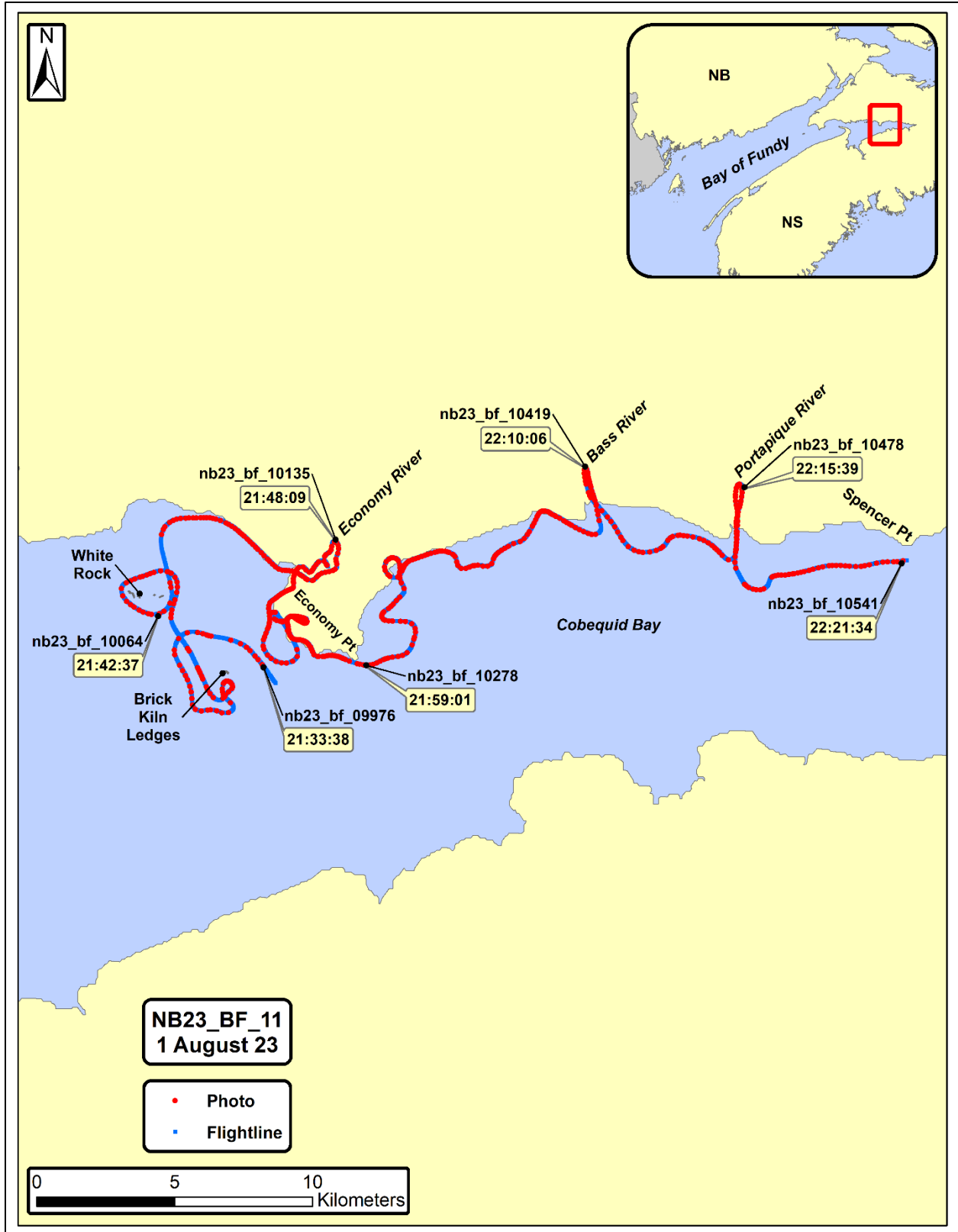
Video Length: 48 min 21 sec

Nav: Malcolm

Weather: Sun

Pilot: Crowley

Time (UTC)	Location	Photo
21:33:38	Brick Kiln Ledges	nb23_bf_09976
21:42:37	White Rock	nb23_bf_10064
21:48:09	Economy River	nb23_bf_10135
21:59:01	Economy Pt.	nb23_bf_10278
22:10:06	Bass River	nb23_bf_10419
22:15:39	Portapique River	nb23_bf_10478
22:21:34	Spencer Pt.	nb23_bf_10541



2023 New Brunswick & Nova Scotia Aerial Video Imaging Survey

Team Bay of Fundy (BF)

Video: NB23_BF_12

Date: 1 August 2023

General Location: Cobequid Bay, Salmon River, Shubenacadie River

Time Start (UTC): 22:21:41

Geo: Morrow

Time End (UTC): 23:25:44

Bio: Rader

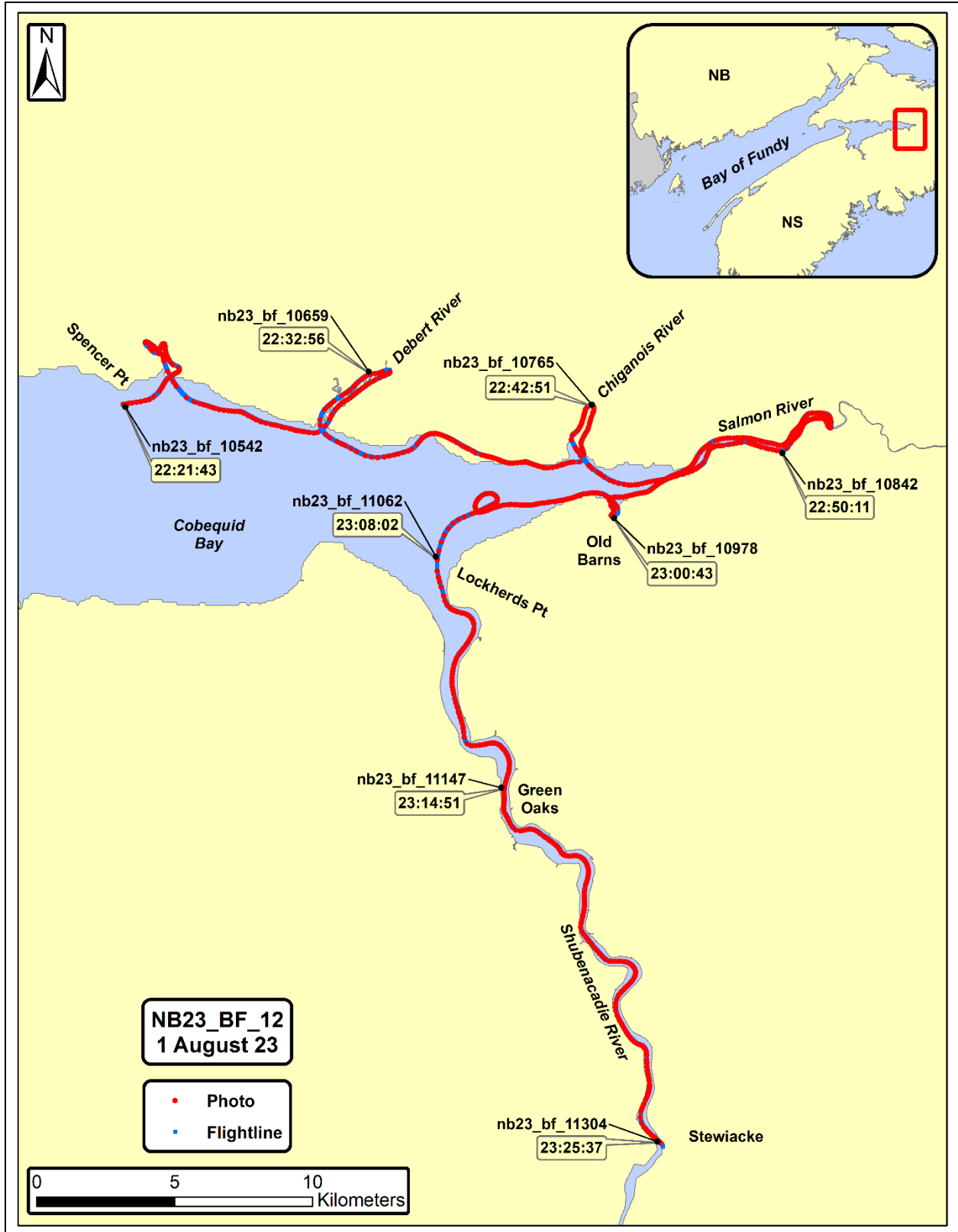
Video Length: 1 hr 4 min 4 sec

Nav: Malcolm

Weather: Sun

Pilot: Crowley

Time (UTC)	Location	Photo
22:21:43	Spencer Pt.	nb23_bf_10542
22:32:56	Debert River	nb23_bf_10659
22:42:51	Chiganois River	nb23_bf_10765
22:50:11	Salmon River	nb23_bf_10842
23:00:43	Old Barns area	nb23_bf_10978
23:08:02	Lockherds Pt.	nb23_bf_11062
23:14:51	Green Oaks area, Shubenacadie River	nb23_bf_11147
23:25:37	Stewiacke area, Shubenacadie River	nb23_bf_11304



2023 New Brunswick & Nova Scotia Aerial Video Imaging Survey

Team Bay of Fundy (BF)

Video: NB23_BF_13

Date: 2 August 2023

General Location: Shubenacadie River, Cobequid Bay, Minas Basin

Time Start (UTC): 09:22:16

Geo: Morrow

Time End (UTC): 10:19:08

Bio: Rader

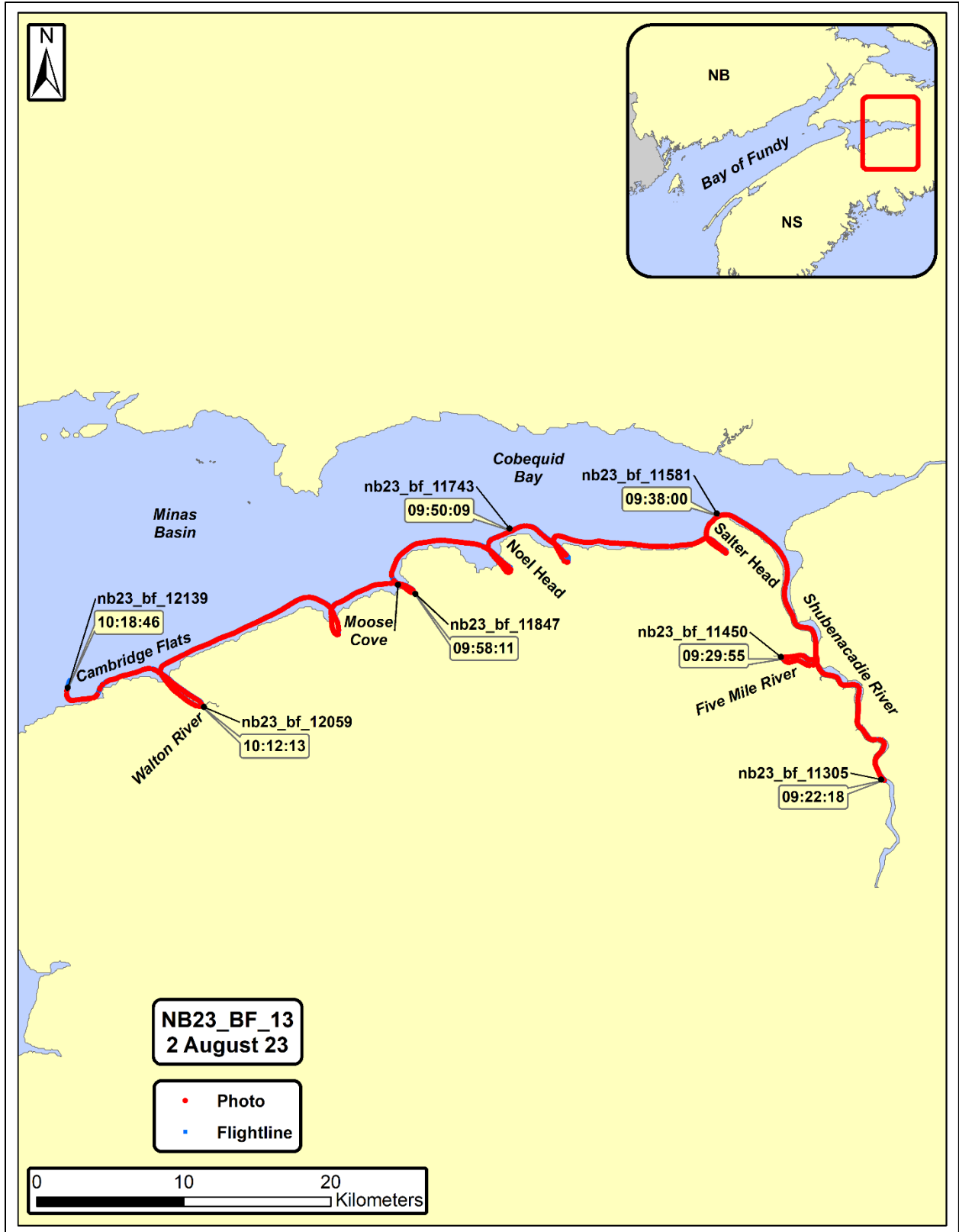
Video Length: 56 min 53 sec

Nav: Malcolm

Weather: Sun

Pilot: Crowley

Time (UTC)	Location	Photo
09:22:18	Shubenacadie River	nb23_bf_11305
09:29:55	Five Mile River	nb23_bf_11450
09:38:00	Salter Head	nb23_bf_11581
09:50:09	Noel Head	nb23_bf_11743
09:58:11	Moose Cove	nb23_bf_11847
10:12:13	Walton River	nb23_bf_12059
10:18:46	Cambridge Flats, Minas Basin	nb23_bf_12139



2023 New Brunswick & Nova Scotia Aerial Video Imaging Survey

Team Bay of Fundy (BF)

Video: NB23_BF_14

Date: 2 August 2023

General Location: Avon River, Kennetcook River, St. Croix River

Time Start (UTC): 10:19:24

Geo: Morrow

Time End (UTC): 11:31:00

Bio: Rader

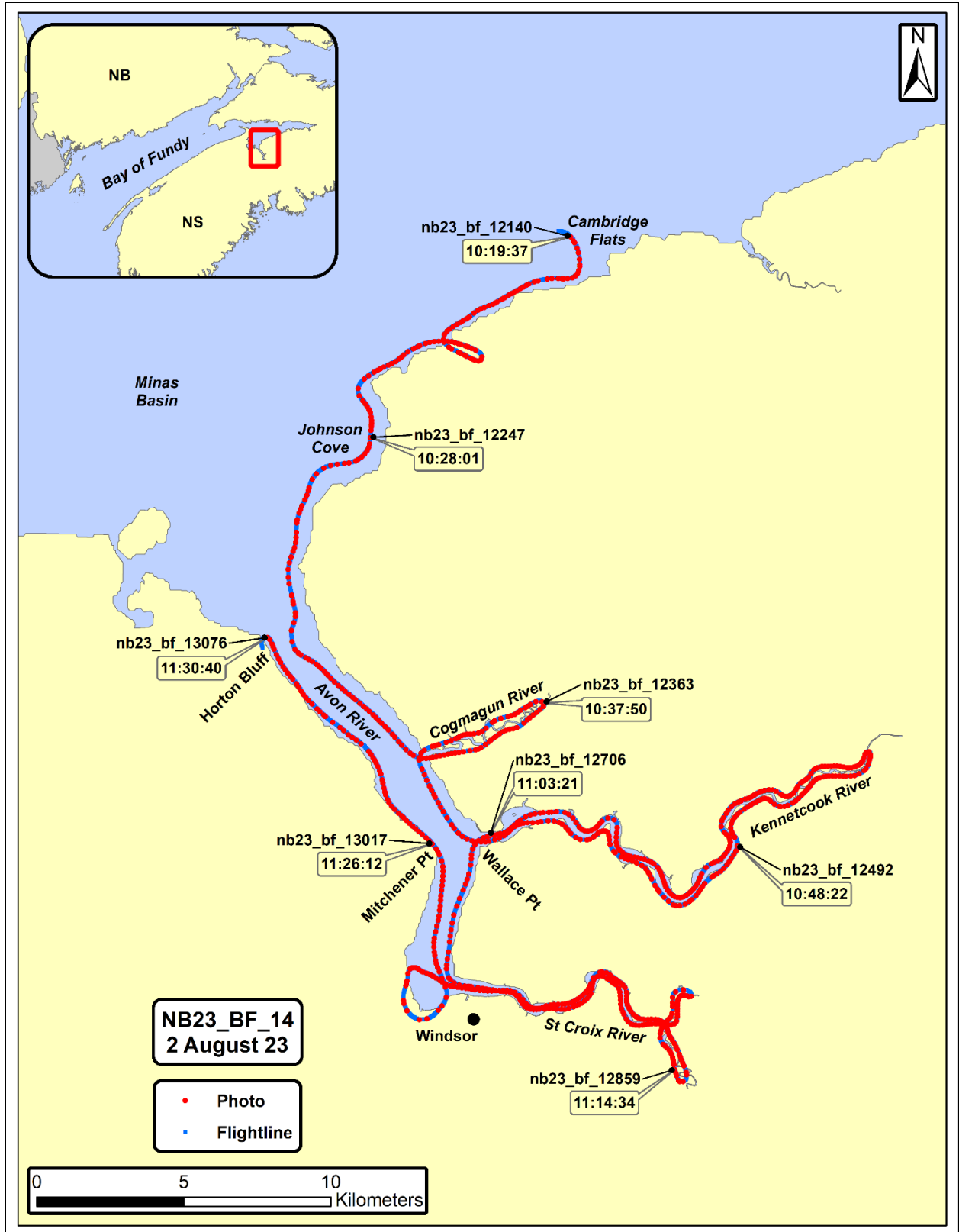
Video Length: 1 hr 11 min 37 sec

Nav: Malcolm

Weather: Sun

Pilot: Crowley

Time (UTC)	Location	Photo
10:19:37	Cambridge Flats, Minas Basin	nb23_bf_12140
10:28:01	Johnson Cove	nb23_bf_12247
10:37:50	Cogmagun River	nb23_bf_12363
10:48:22	Kennetcook River	nb23_bf_12492
11:03:21	Wallace Pt., Avon River	nb23_bf_12706
11:14:34	St. Croix River	nb23_bf_12859
11:26:12	Mitchener Pt., Avon River	nb23_bf_13017
11:30:40	Horton Bluffs, Avon River	nb23_bf_13076



2023 New Brunswick & Nova Scotia Aerial Video Imaging Survey

Team Bay of Fundy (BF)

Video: NB23_BF_15

Date: 2 August 2023

General Location: Cape Spencer, Greville Bay, Parrsboro Harbour

Time Start (UTC): 20:50:26

Geo: Morrow

Time End (UTC): 21:34:02

Bio: Rader

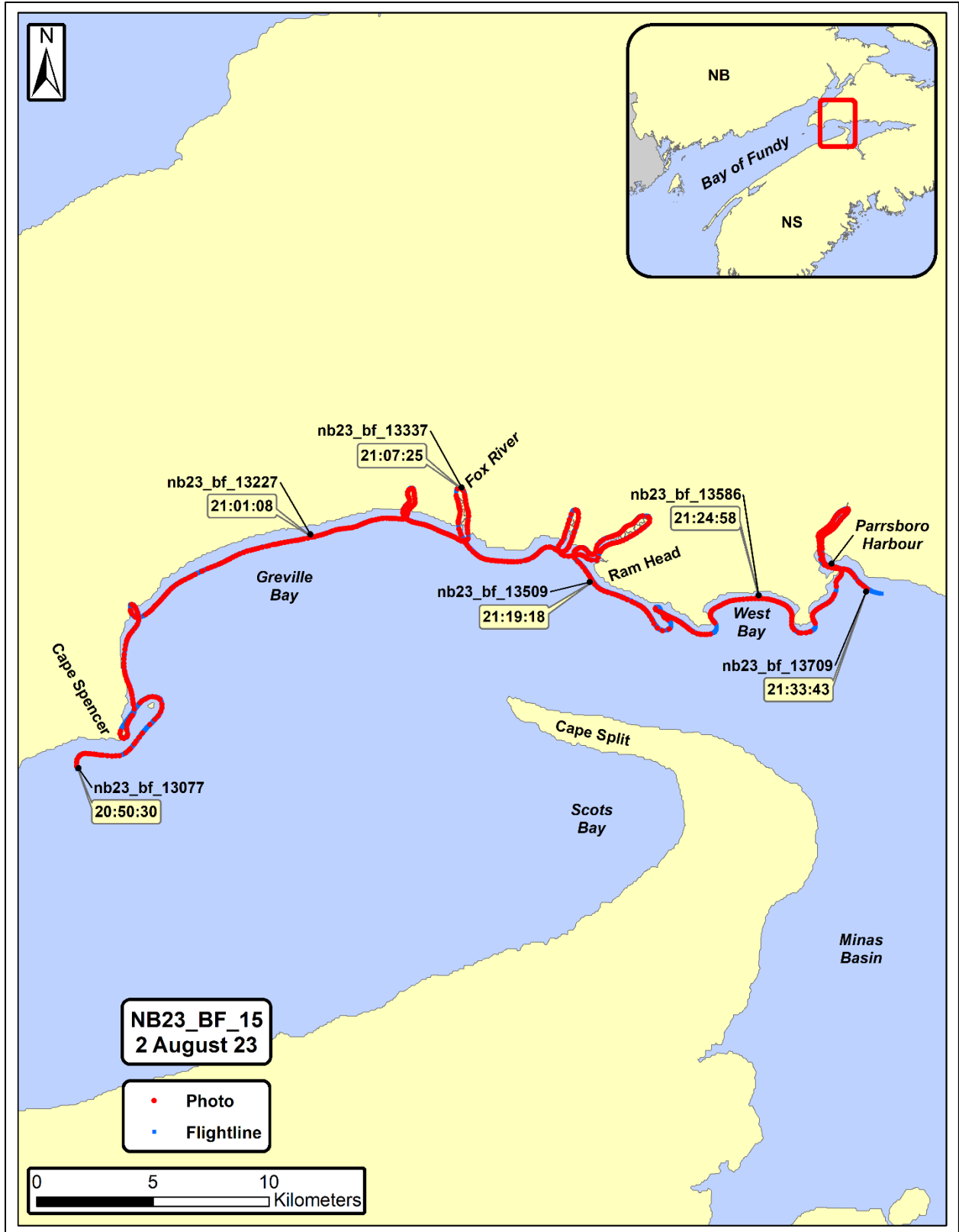
Video Length: 43 min 37 sec

Nav: Malcolm

Weather: Sun

Pilot: Crowley

Time (UTC)	Location	Photo
20:50:30	Cape Spencer	nb23_bf_13077
21:01:08	Greville Bay	nb23_bf_13227
21:07:25	Fox River	nb23_bf_13337
21:19:18	Ram Head	nb23_bf_13509
21:24:58	West Bay	nb23_bf_13586
21:33:43	Parrsboro Harbour	nb23_bf_13709



2023 New Brunswick & Nova Scotia Aerial Video Imaging Survey

Team Bay of Fundy (BF)

Video: NB23_BF_16

Date: 2 August 2023

General Location: Gaspereau River, Boot Island, Cornwallis River

Time Start (UTC): 21:45:48

Geo: Morrow

Time End (UTC): 22:19:42

Bio: Rader

Video Length: 33 min 55 sec

Nav: Malcolm

Weather: Sun

Pilot: Crowley

Time (UTC)	Location	Photo
21:45:57	Horton Bluff, Avon River	nb23_bf_13710
21:53:19	Gaspereau River	nb23_bf_13820
21:59:23	Boot Island	nb23_bf_13882
22:09:56	Cornwallis River	nb23_bf_14015
22:19:32	Cornwallis River mouth, south of Starrs Pt.	nb23_bf_14131



2023 New Brunswick & Nova Scotia Aerial Video Imaging Survey

Team Bay of Fundy (BF)

Video: NB23_BF_17

Date: 3 August 2023

General Location: Cape Split, Minas Channel, Ile Haute

Time Start (UTC): 09:31:12

Geo: Morrow

Time End (UTC): 10:45:30

Bio: Rader

Video Length: 60 min 45 sec

Nav: Malcolm

Weather: Sun

Pilot: Crowley

Time (UTC)	Location	Photo
09:31:15	Cornwallis River mouth, south of Starrs Pt.	nb23_bf_14132
09:40:55	Longspell Pt.	nb23_bf_14231
09:50:29	Cape Blomidon	nb23_bf_14352
09:57:31	Cape Split	nb23_bf_14427
10:08:30	Baxters Harbour	nb23_bf_14580
10:19:05	Black Rock	nb23_bf_14746
	Video Break: 10:19:07 to 10:26:21	
10:29:54	Ile Haute	nb23_bf_14796
	Video Break: 10:30:37 to 10:36:55	
10:37:00	Black Rock	nb23_bf_14810
10:45:21	Morden	nb23_bf_14941



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References

Cook, S.E., Daley, S., Morrow, K. and Ward, S. 2017. ShoreZone Coastal Imaging and Habitat Mapping Protocol. Prepared for NOAA Fisheries, Alaska Regional Office, Juneau, Alaska. 78p.

Acknowledgments

The ShoreZone program is a partnership of scientists, GIS specialists, web specialists, First Nations, non-profit organizations, and governmental agencies. We gratefully acknowledge the support of organizations working in partnership for the ShoreZone effort, including: Department of Fisheries and Oceans (OPP Coastal Environmental Baseline Program, PIER Program, and DFO Science), BC Ministry of Environment & Climate Change Strategy, Prince Rupert Port Authority, Pacific Northwest LNG, Metlakatla First Nation, Nisga'a Lisims Government, Gitxaala Nation, Tsleil-Waututh Nation and Musqueam Indian Band.

Access and Use Constraints

Any hardcopies or published data sets utilizing ShoreZone products shall clearly indicate their source. If the user has modified the data in any way, the user is obligated to describe the types of modifications performed. The user specifically agrees not to misrepresent ShoreZone data, nor to imply that changes made were approved by the ShoreZone program or its partners.

To ensure distribution of the most current public information or for correct interpretation, contact the ShoreZone project manager at Sea Change Marine Conservation Society (www.seachangesociety.com). At the time of publication, that person is Kalen Morrow (kalen@seachangesociety.com).

To effectively and appropriately use ShoreZone data, the user shall refer to the current ShoreZone Coastal Imaging and Habitat Mapping Protocol (Cook *et al.* 2017).



Cape Blomidon, Minas Basin (nb23_bf_14324)

