Seasonal movements and habitat utilization of radio-tagged coastal cutthroat trout on the Copper River Delta of Alaska

David Saiget

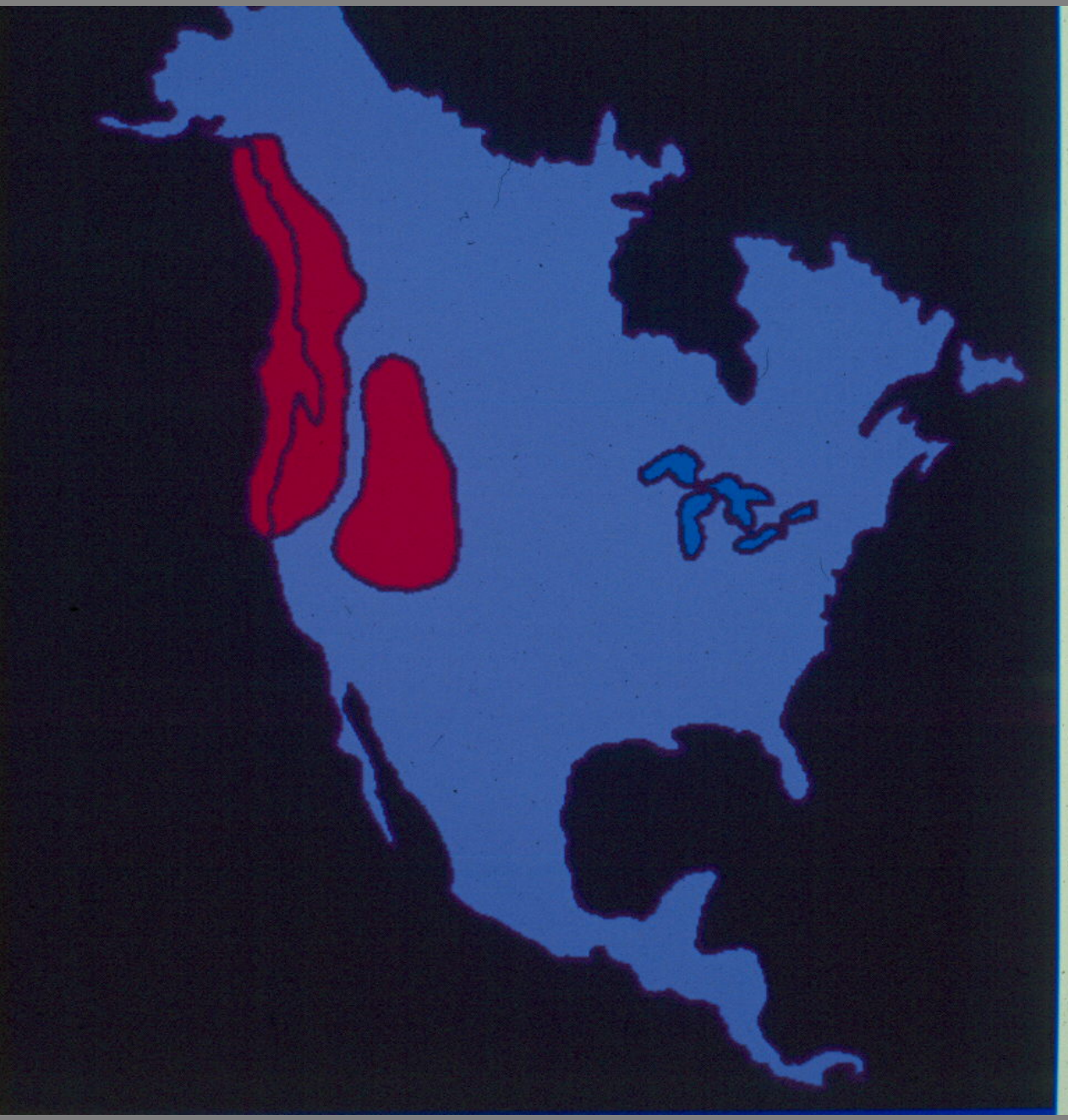
Mt Hood National Forest

Zigzag Ranger District

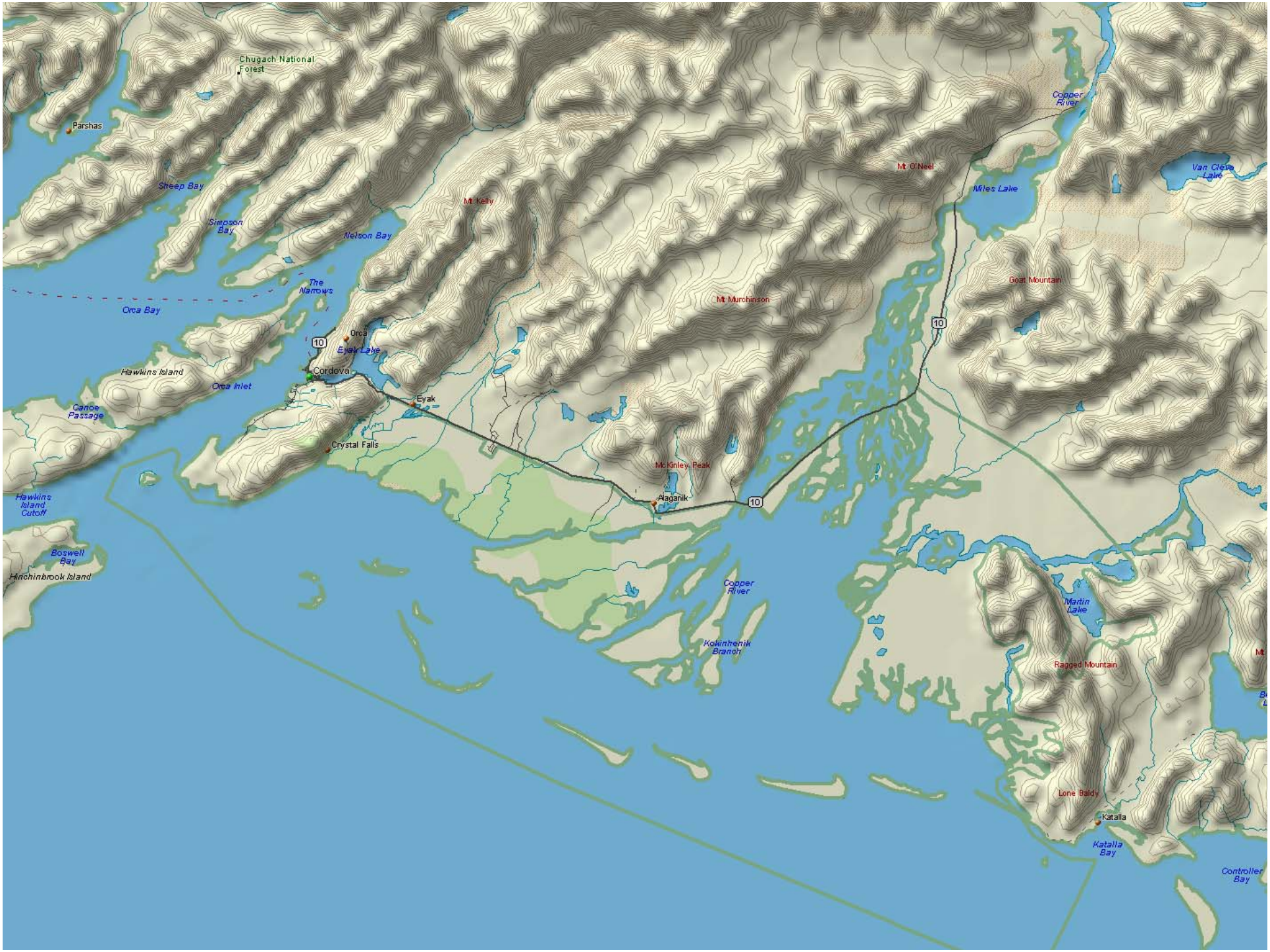
Gordon Reeves

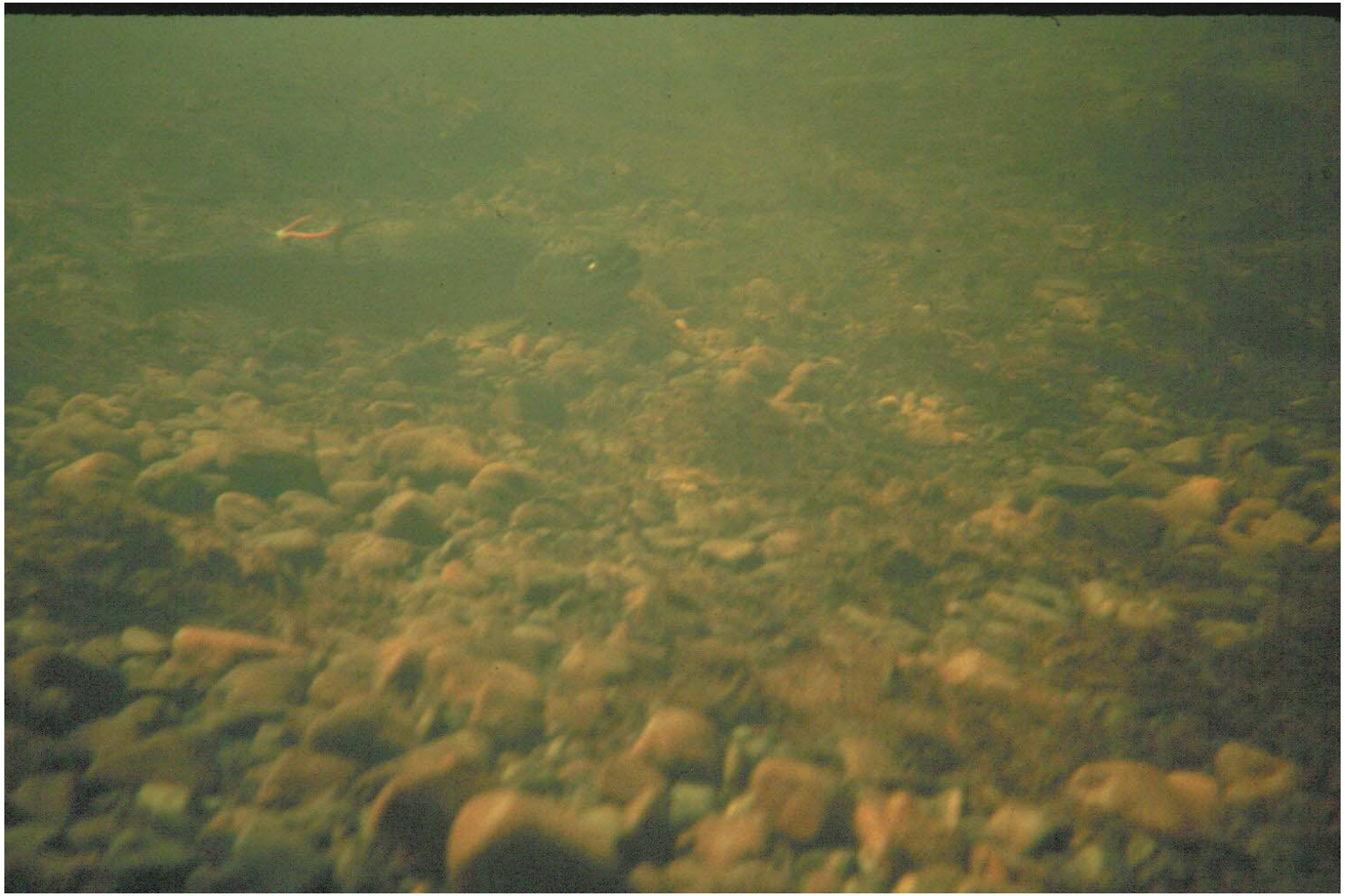
PNW Research Station

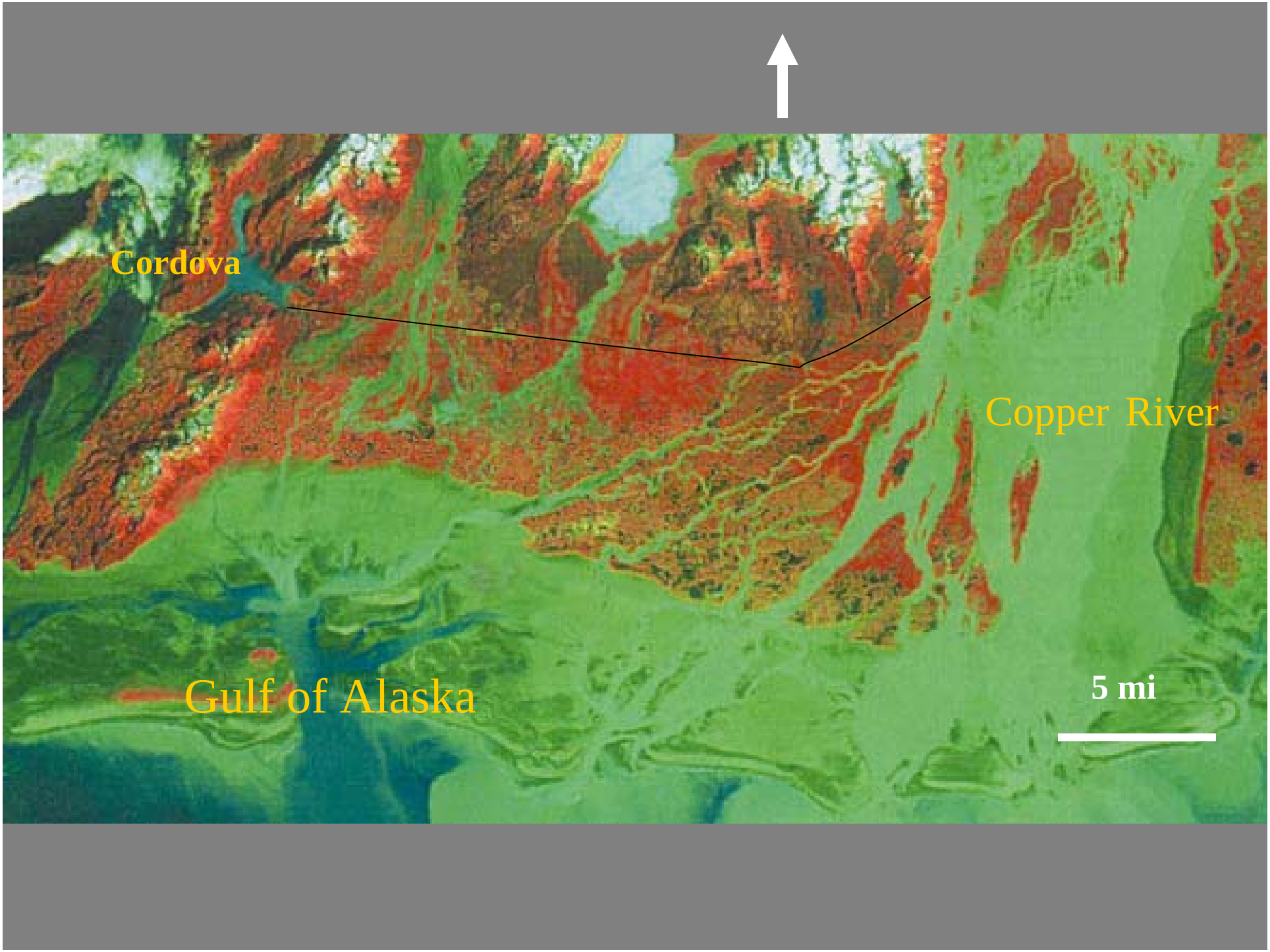
Cutthroat Range

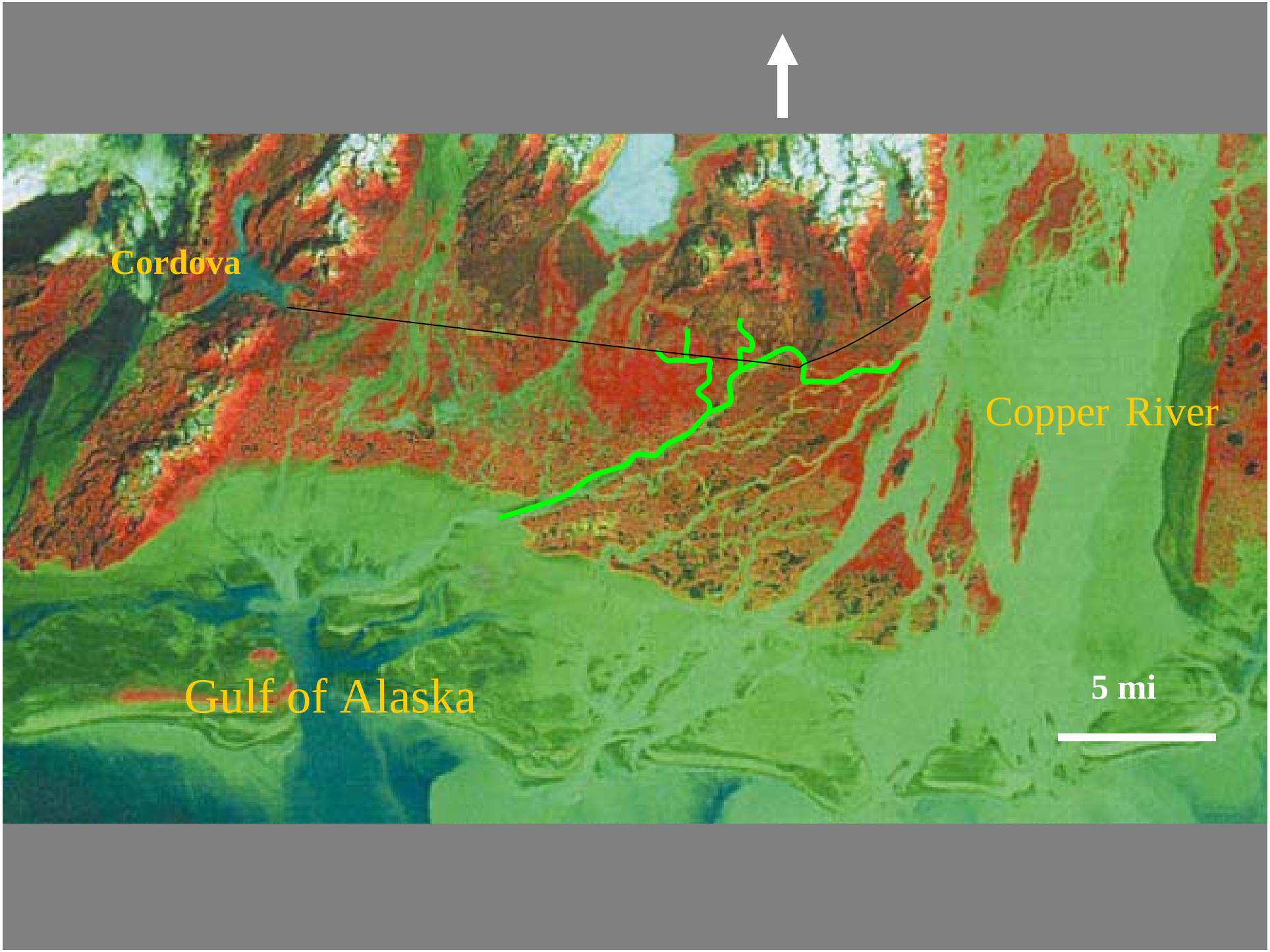


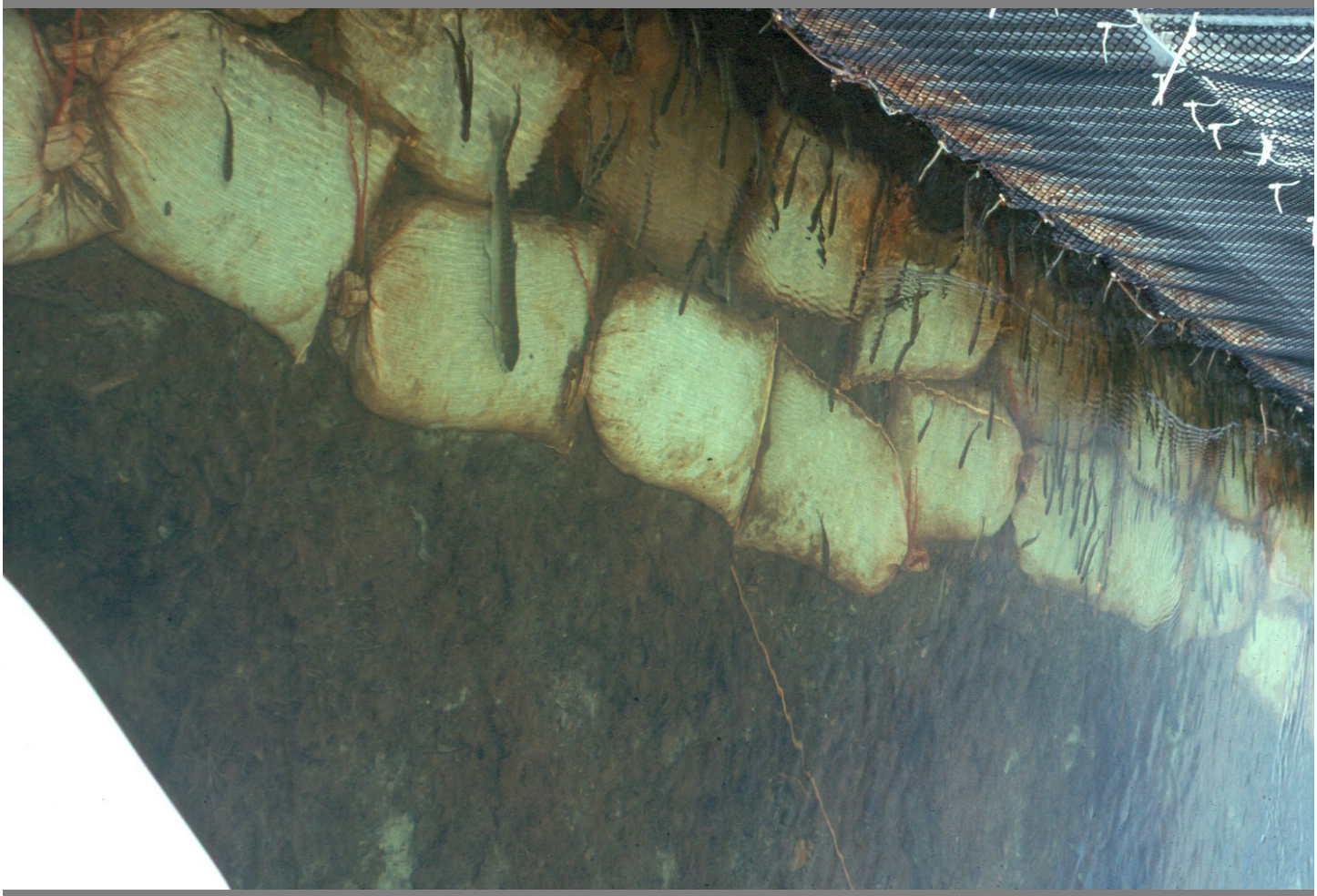
Cantwell
Denali
Mt Silverthrone
Mt McKinley
Mt Foraker
Tanacross
Tok
Northway
Talkeetna
Gakona
Mt Sanford
Copper Center
Willow
Sutton
Palmer
Mt Gerdine
Mt Blackburn
Chitina
Mt Marcus Baker
Mt Bona
Mt Spurr
Anchorage
Valdez
Old Tyonek
Tatitlek
Chugach National Forest
Whittier
Mt Tom White
Kenai
Sterling
Cordova
Soldotna
Seward
Montague Island
Cape Yakataga
Homer
Yakutat
Mt Crillon
Kodiak

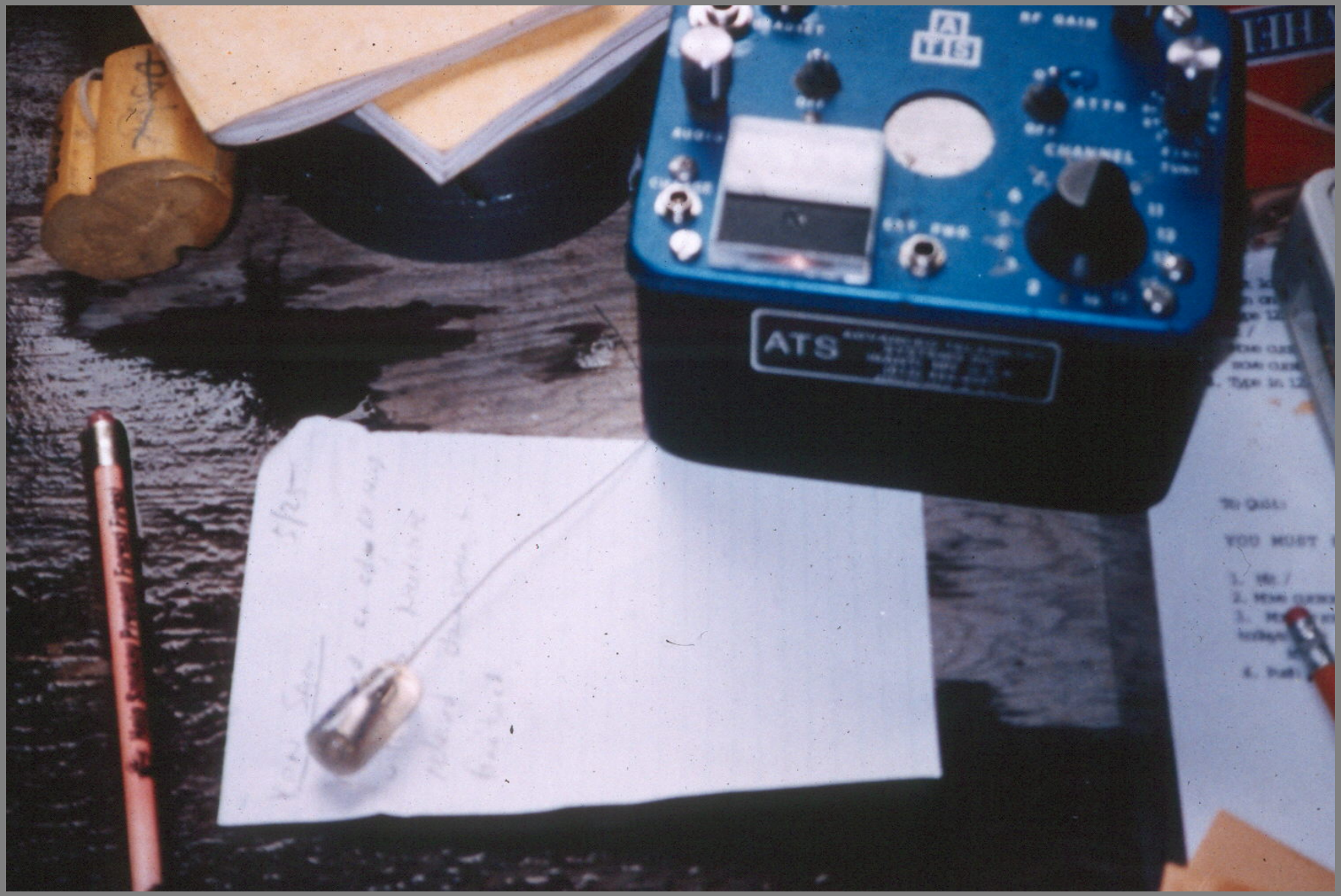

Chugach National Forest
Parshas
Sheep Bay
Simpson Bay
Nelson Bay
The Narrows
Orca Bay
Hawkins Island
Orca Inlet
Canoe Passage
Hawkins Island Cutoff
Boswell Bay
Hinchinbrook Island
Orca
Eyak Lake
Cordova
Eyak
Crystal Falls
Mt. Kelly
Mt. Murchinson
Mt. O'Neel
Miles Lake
Copper River
Van Cleve Lake
Goat Mountain
McKinley Peak
Alaganik
Copper River
Kokinhenik Branch
Martin Lake
Ragged Mountain
Lone Baldy
Katalla
Katalla Bay
Controller Bay
10
10
10

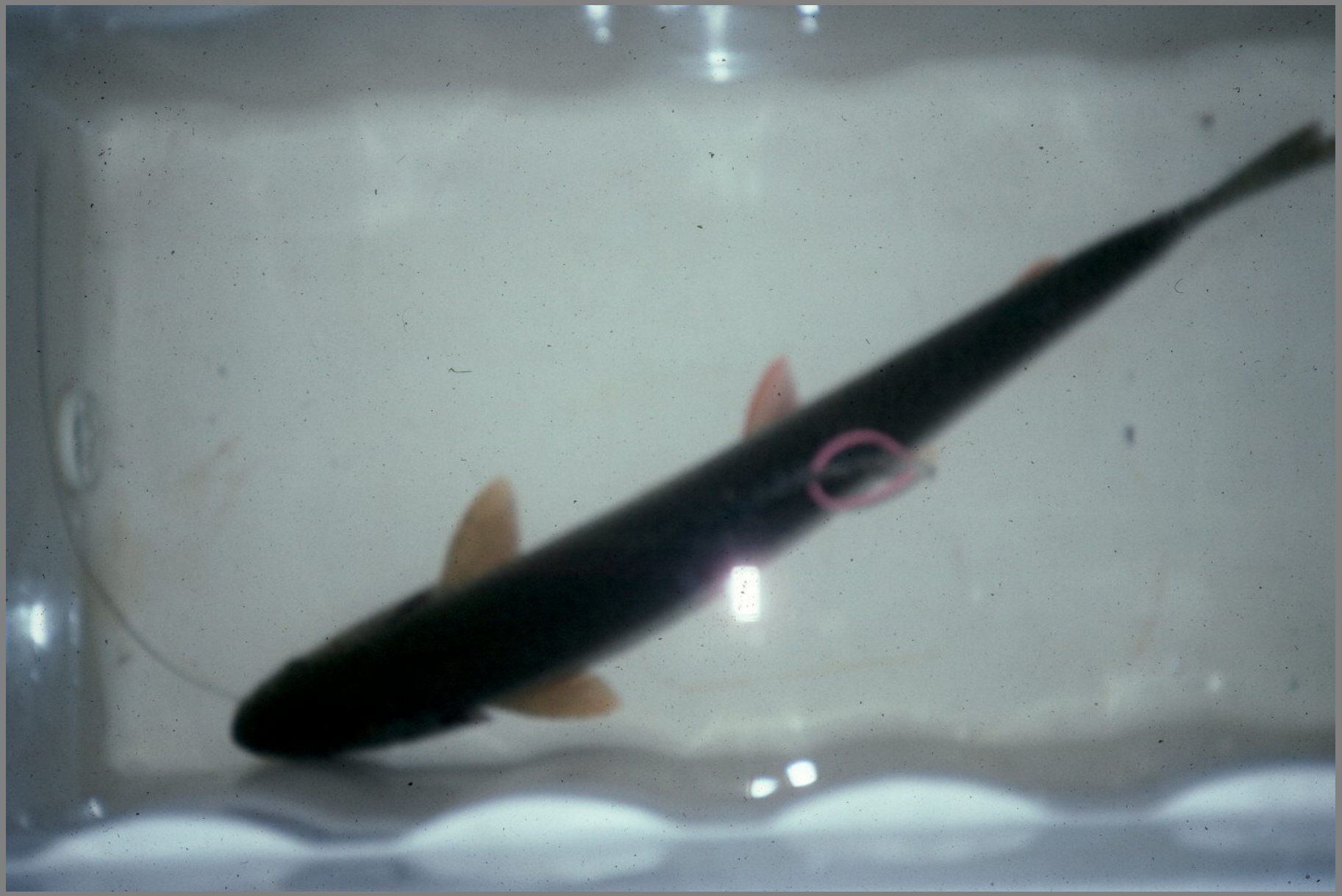



Cordova
Copper River
Gulf of Alaska
5 mi

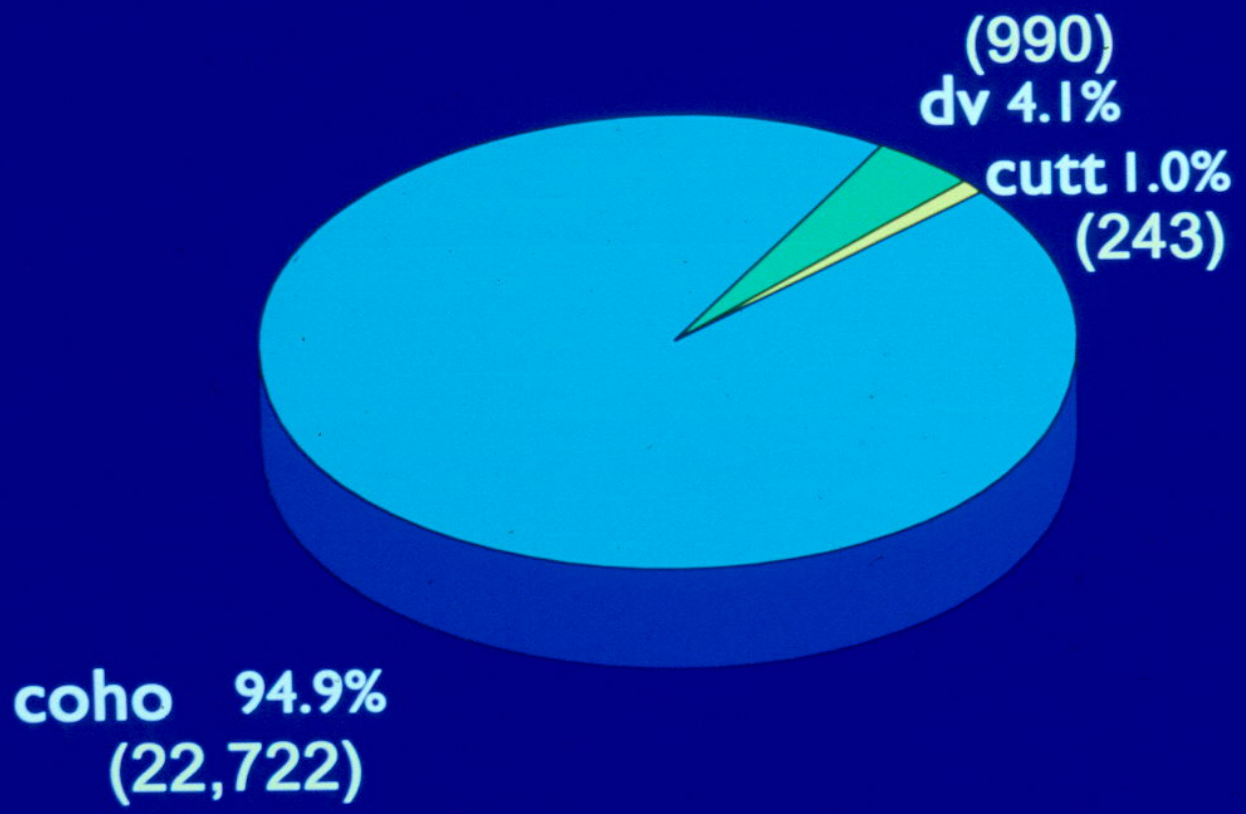

Cordova
Copper River
Gulf of Alaska
5 mi

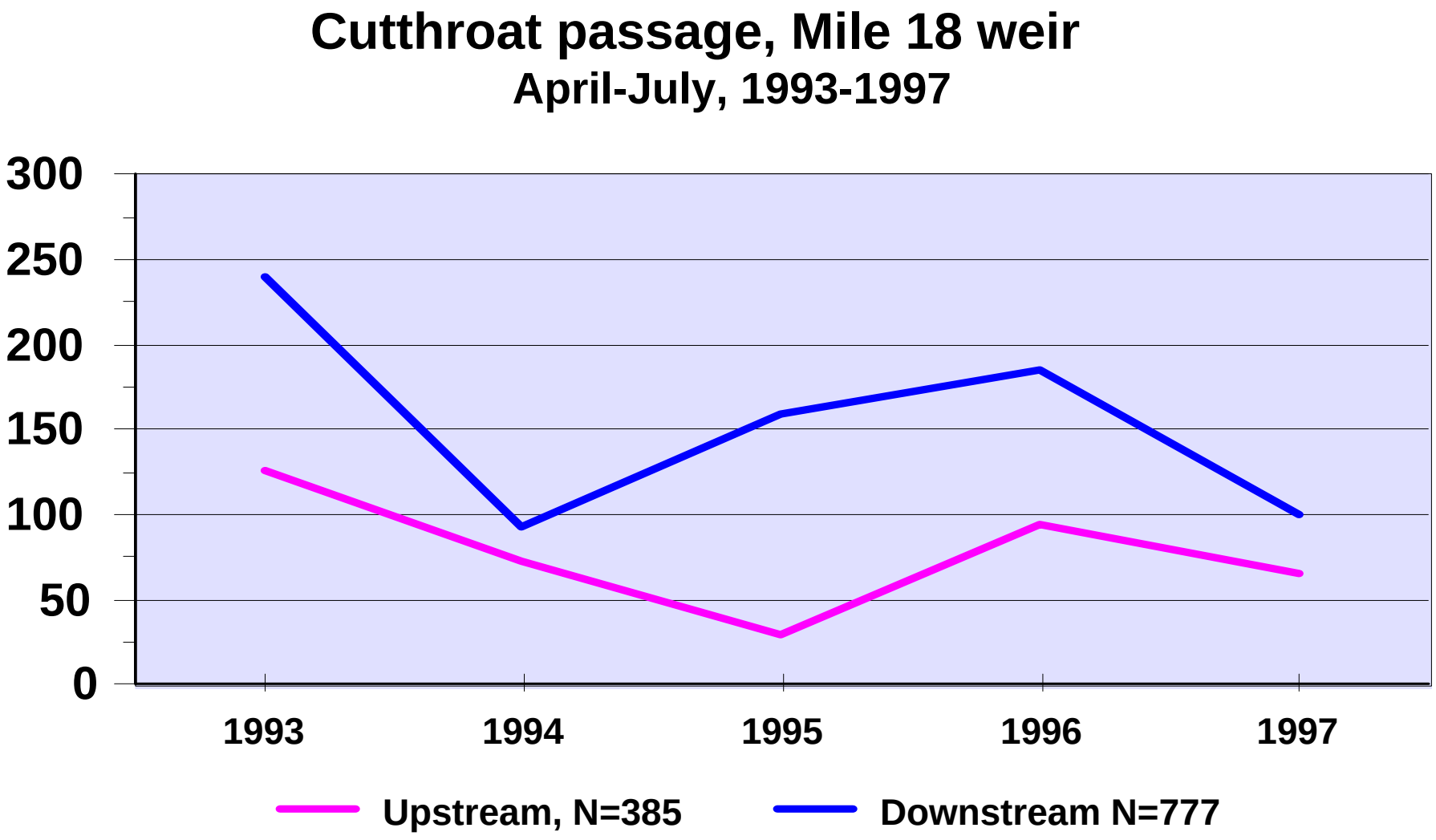



ATS
RF GAIN
ATTN
CHANNEL
ATS



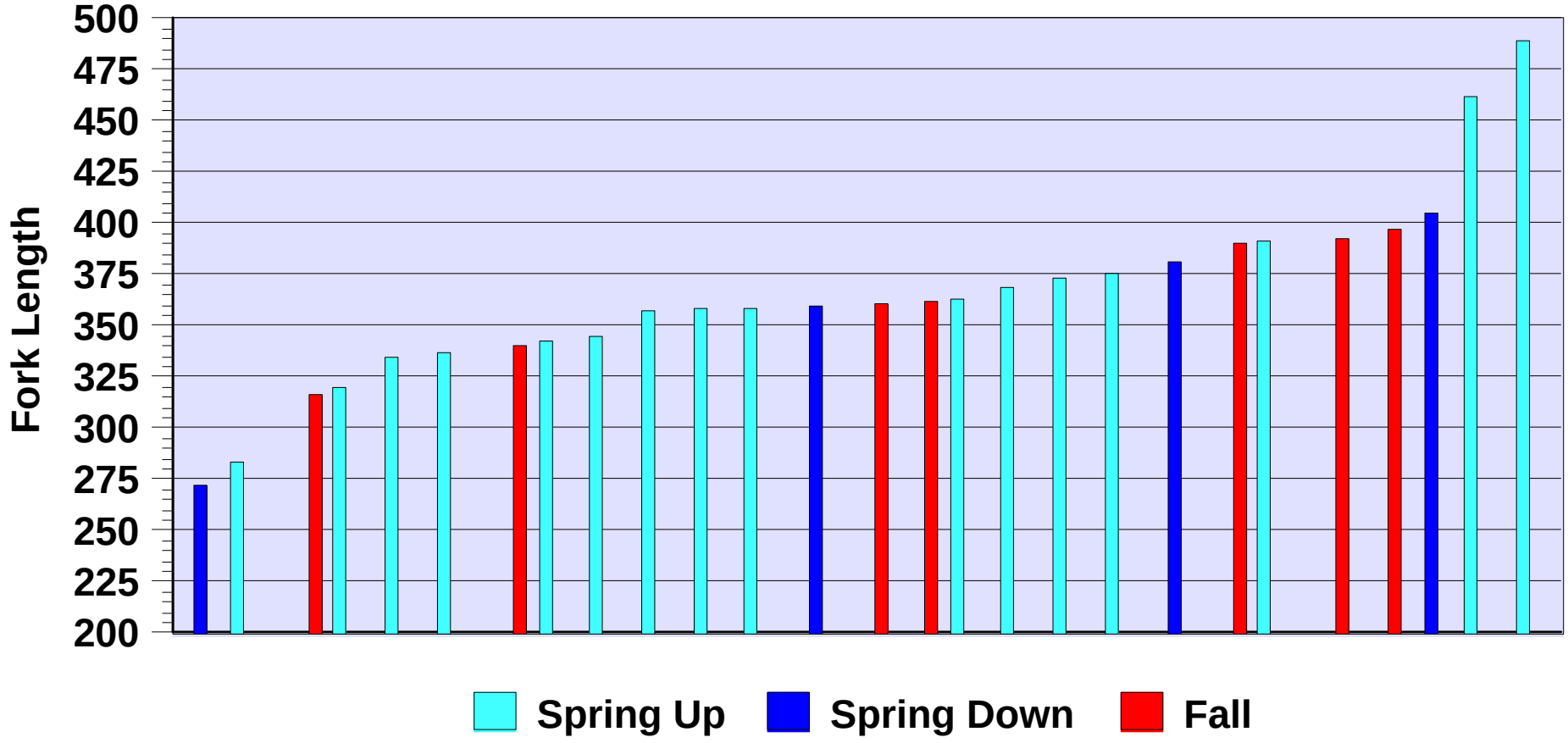
Mile 18 Weir Emigrants 1993

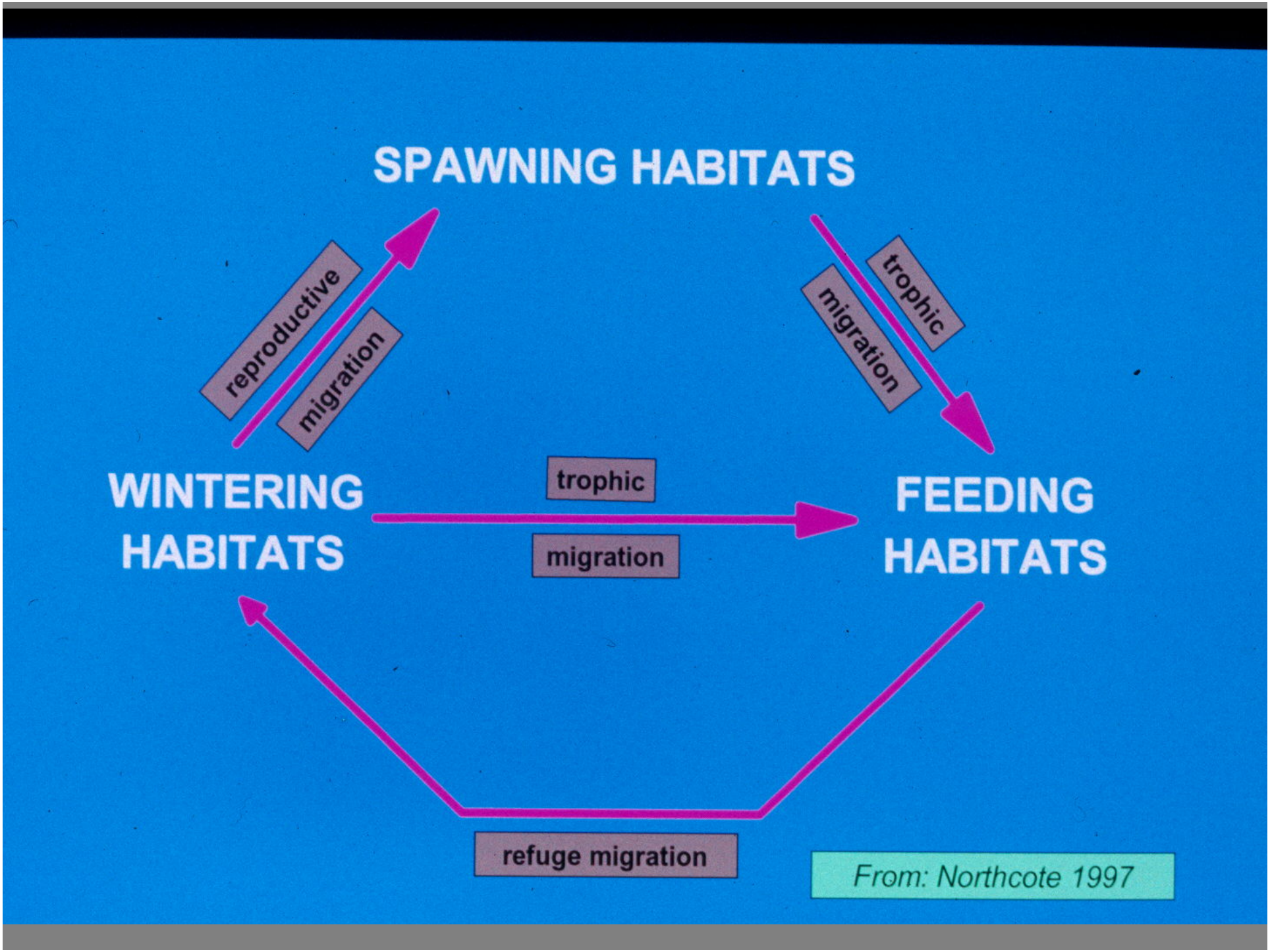



Cutthroat passage, Mile 18 weir
April-July, 1993-1997
300
250
200
150
100
50
0
1993
1994
1995
1996
1997
Upstream, N=385
Downstream N=777

Radio tagged fish, 1993-97

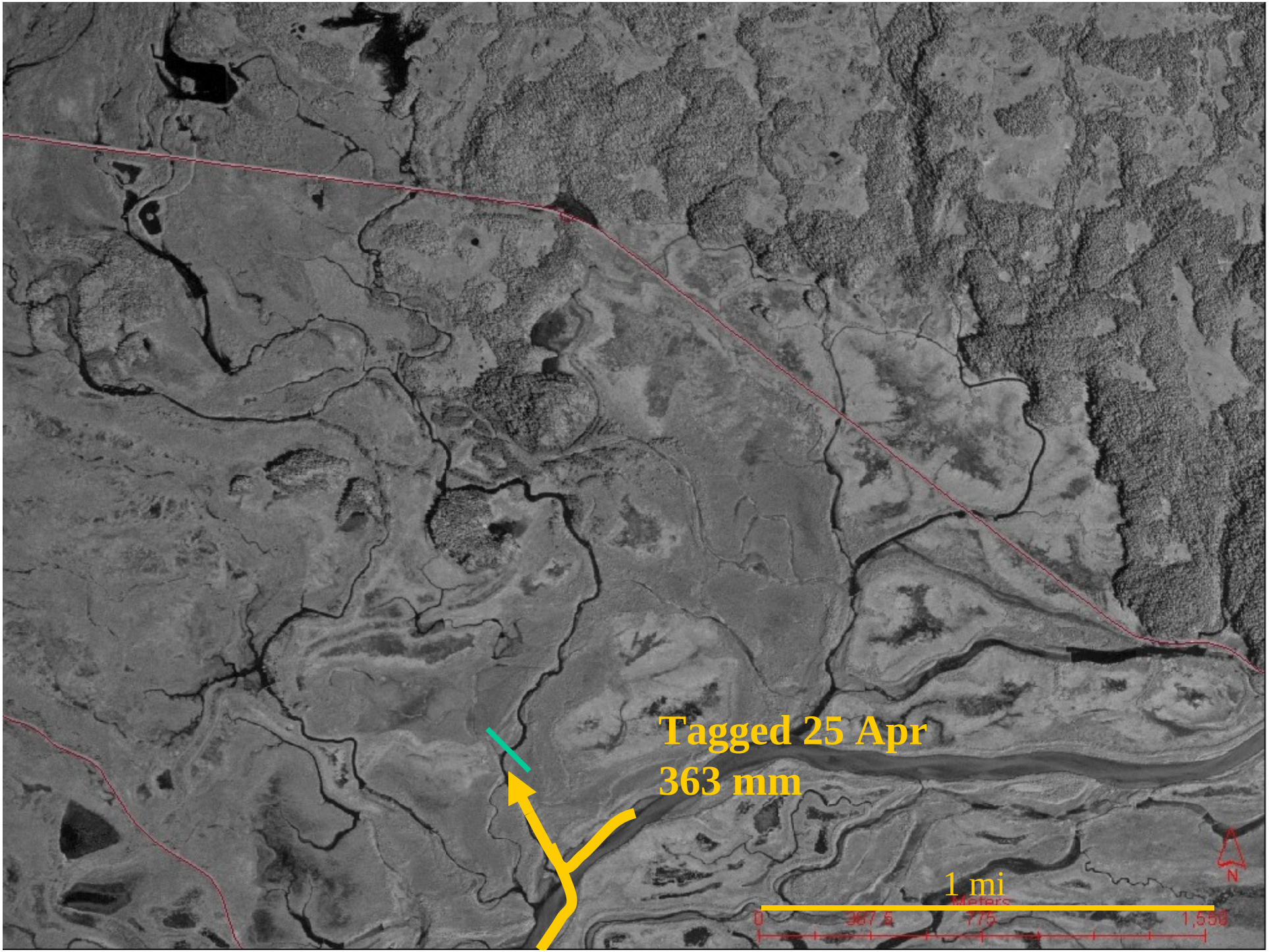
Copper River Delta

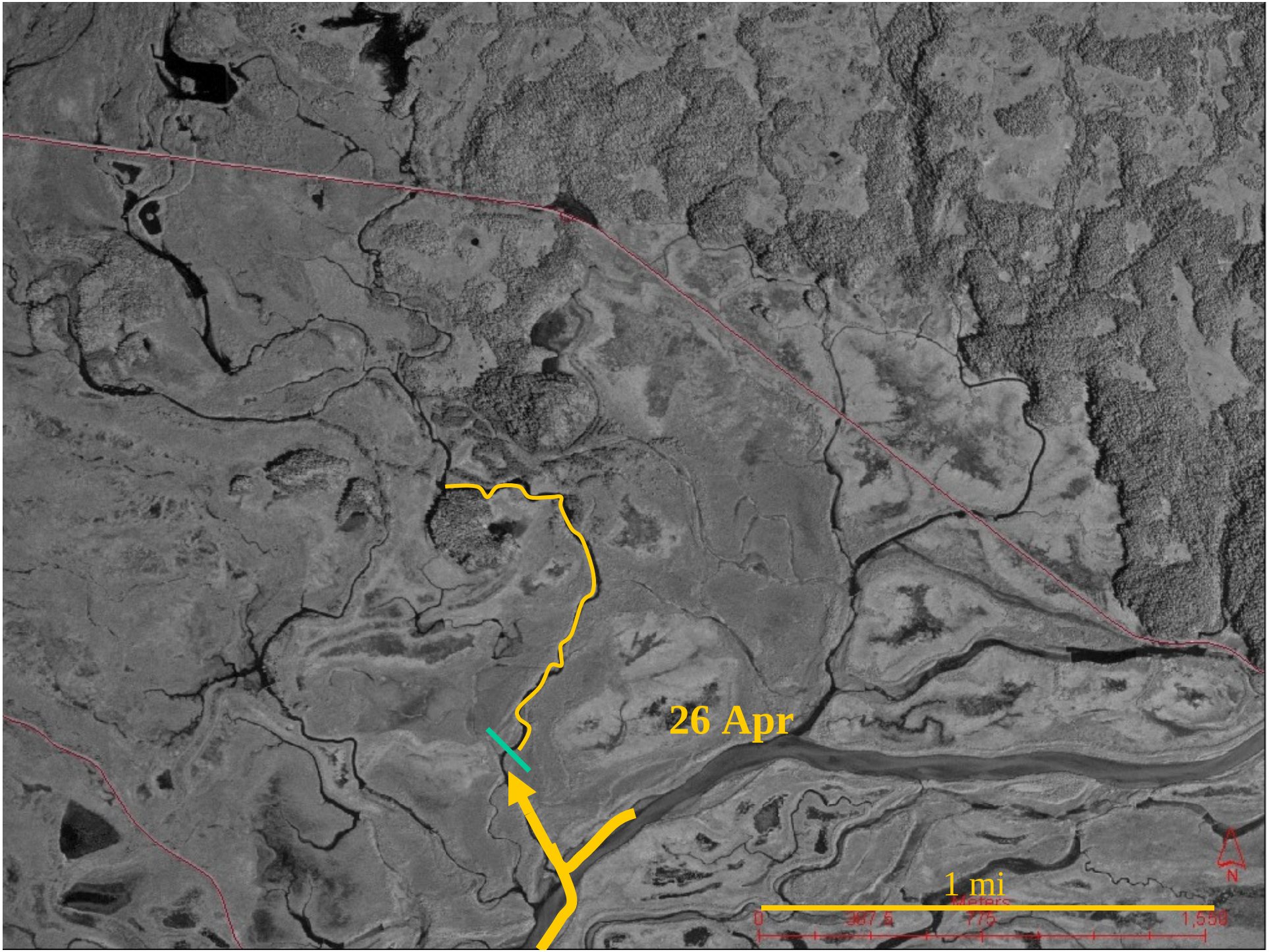


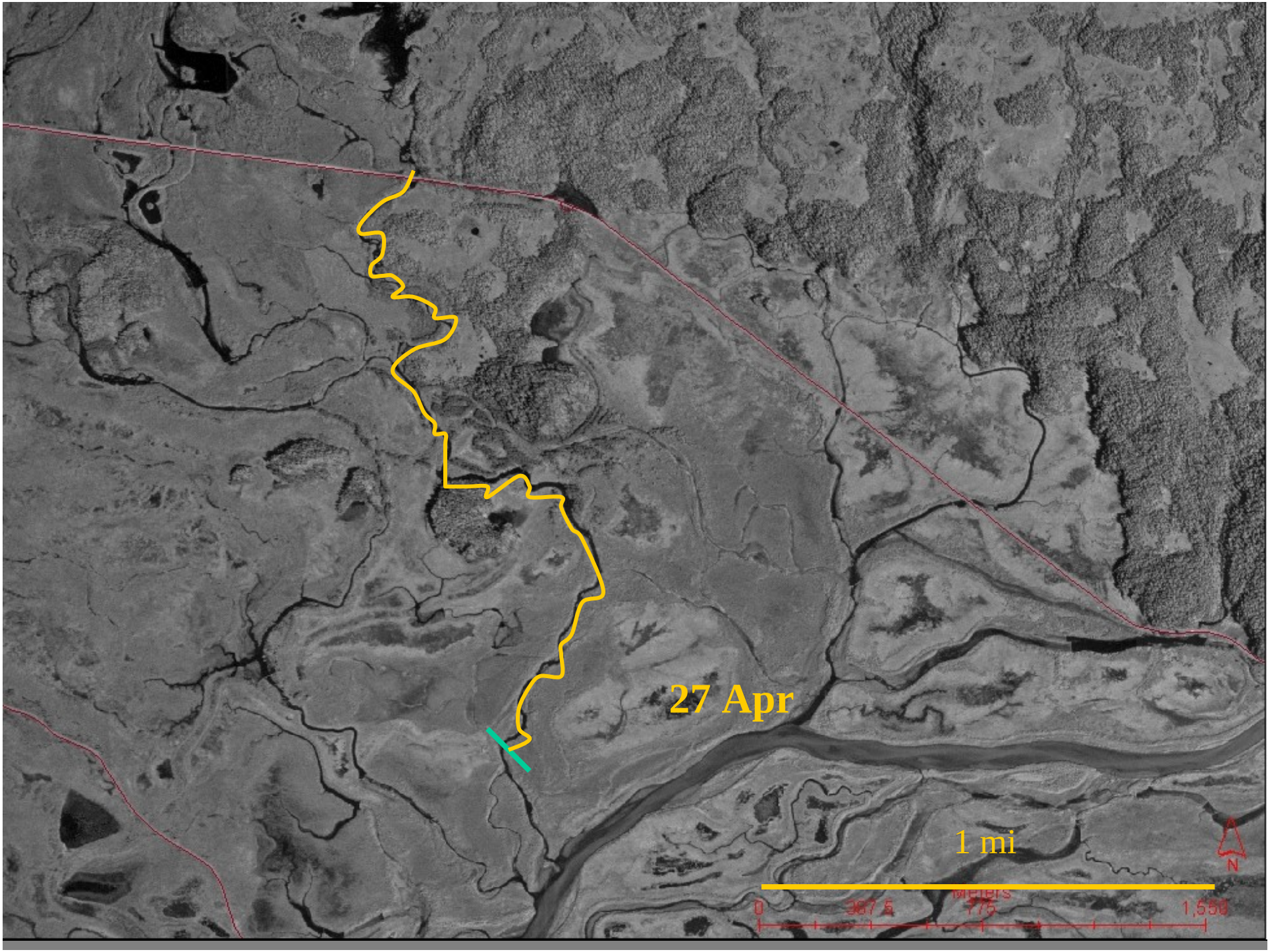

SPAWNING HABITATS
reproductive
migration
trophic
migration
WINTERING HABITATS
trophic
migration
FEEDING HABITATS
refuge migration
From: Northcote 1997

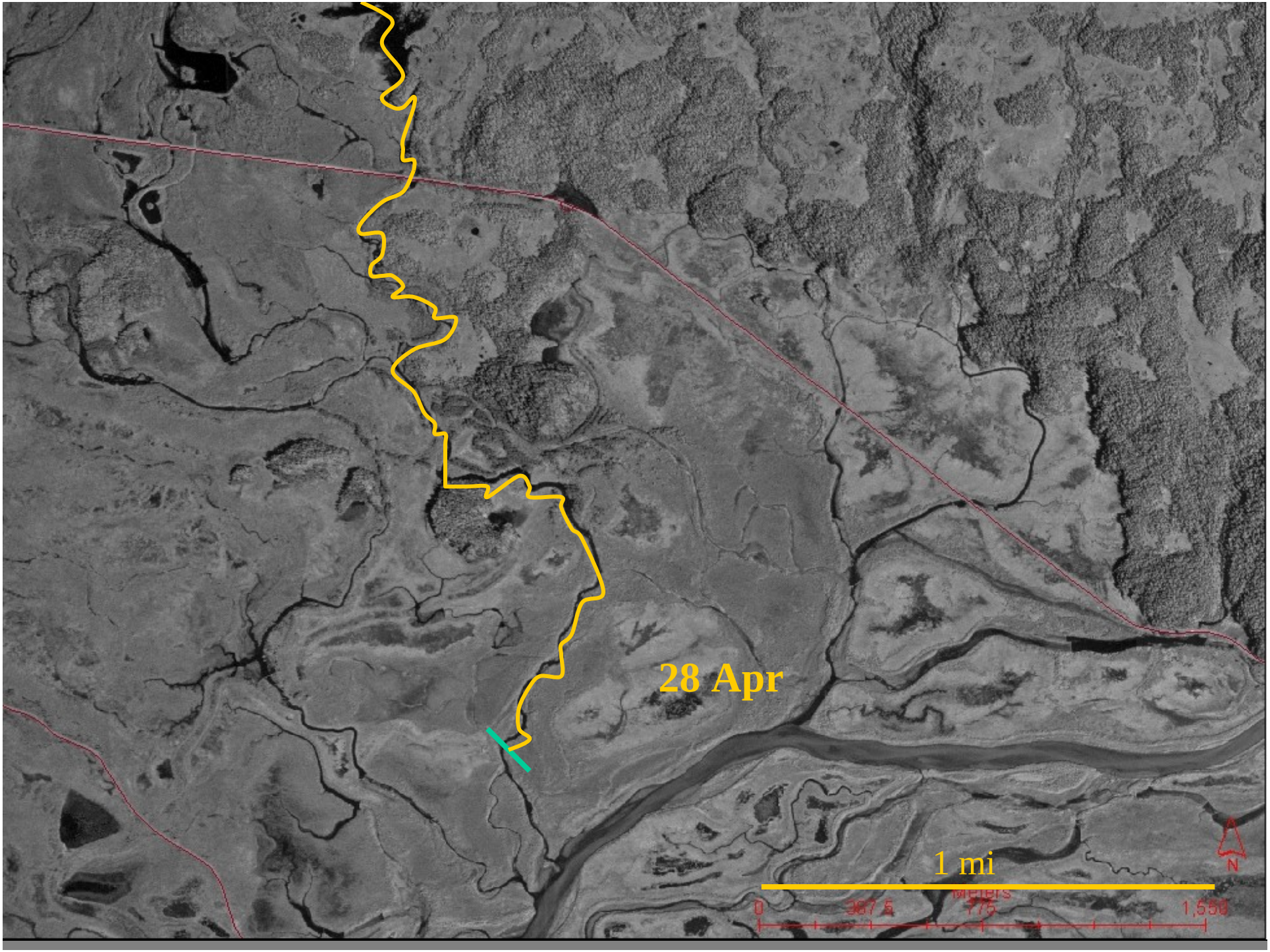
Two Mile 18 movement patterns:

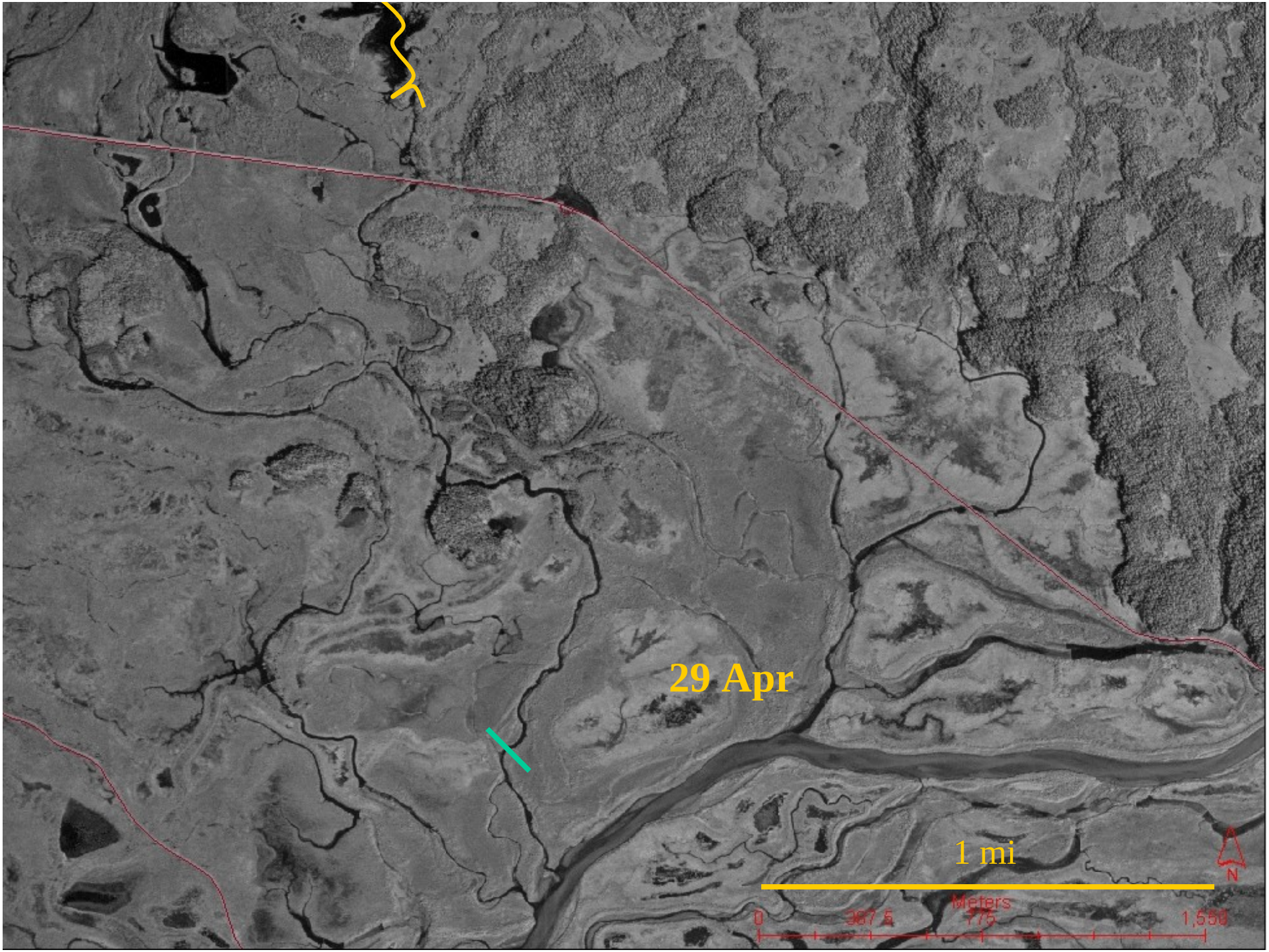
"Up and Stay"
"Up and Out"

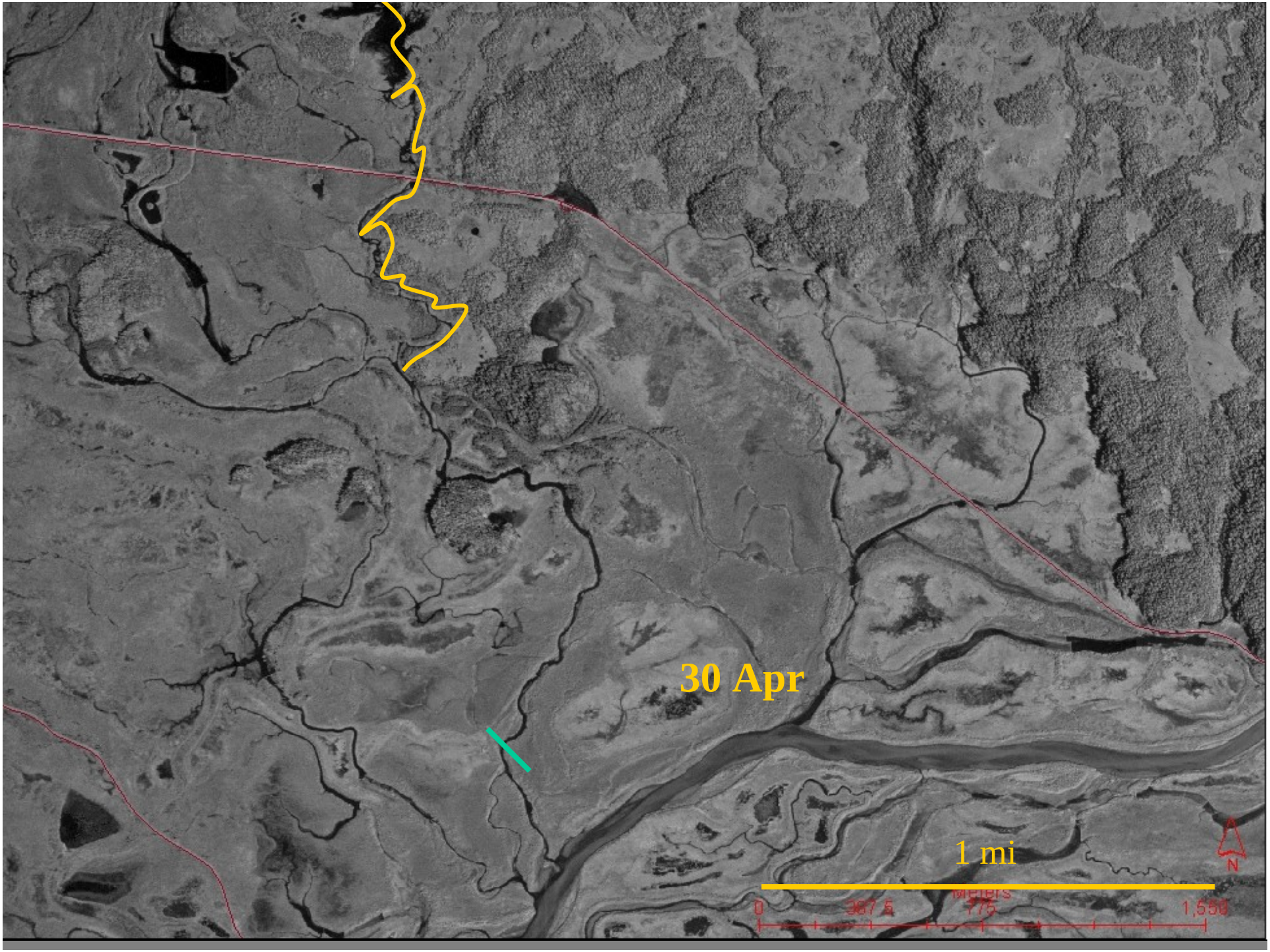

Tagged 25 Apr
363 mm
1 mi
Meters
0
387.5
775
1,550
N

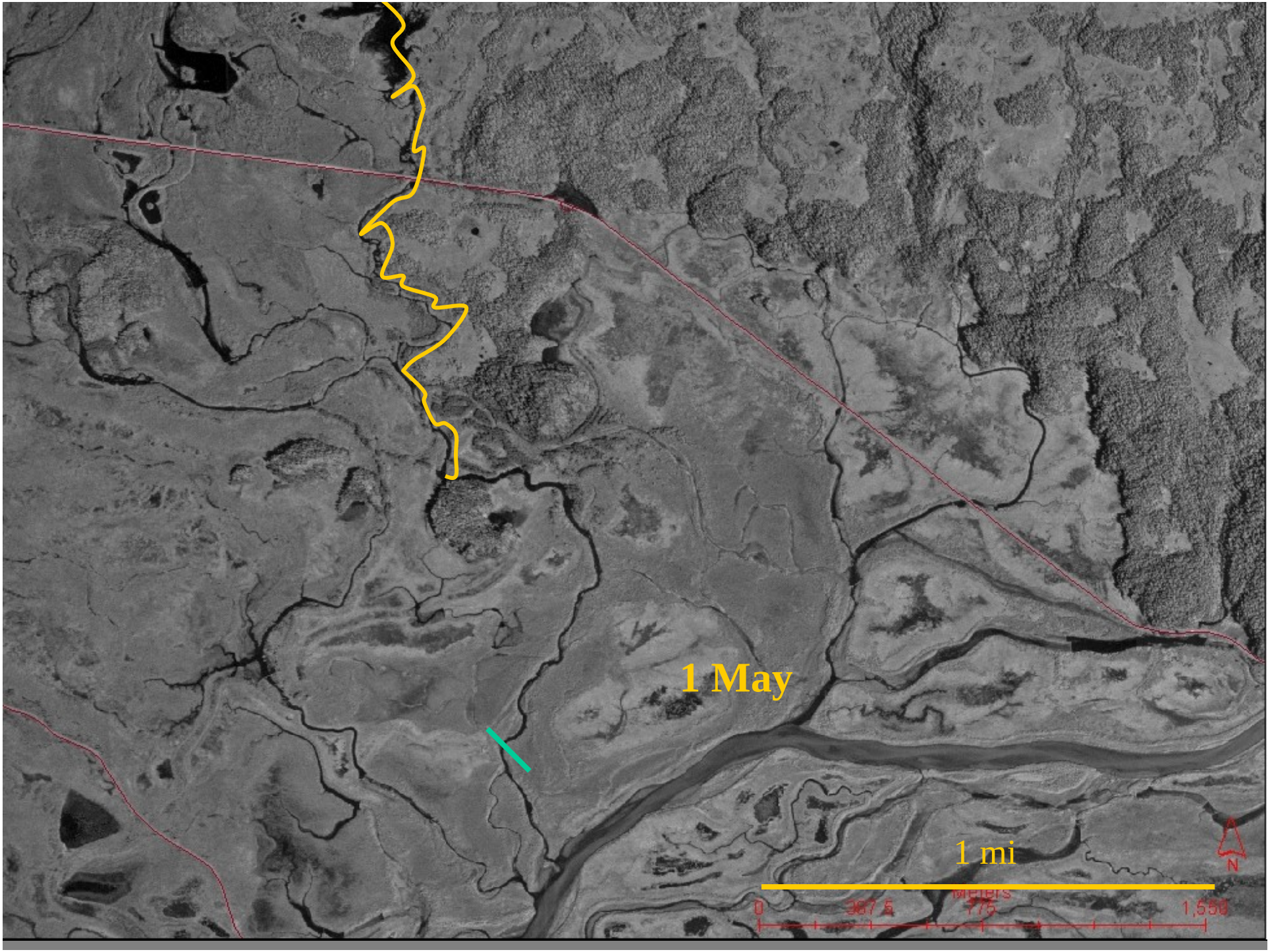

26 Apr
1 mi
Meters
0
387.5
775
1,550
N

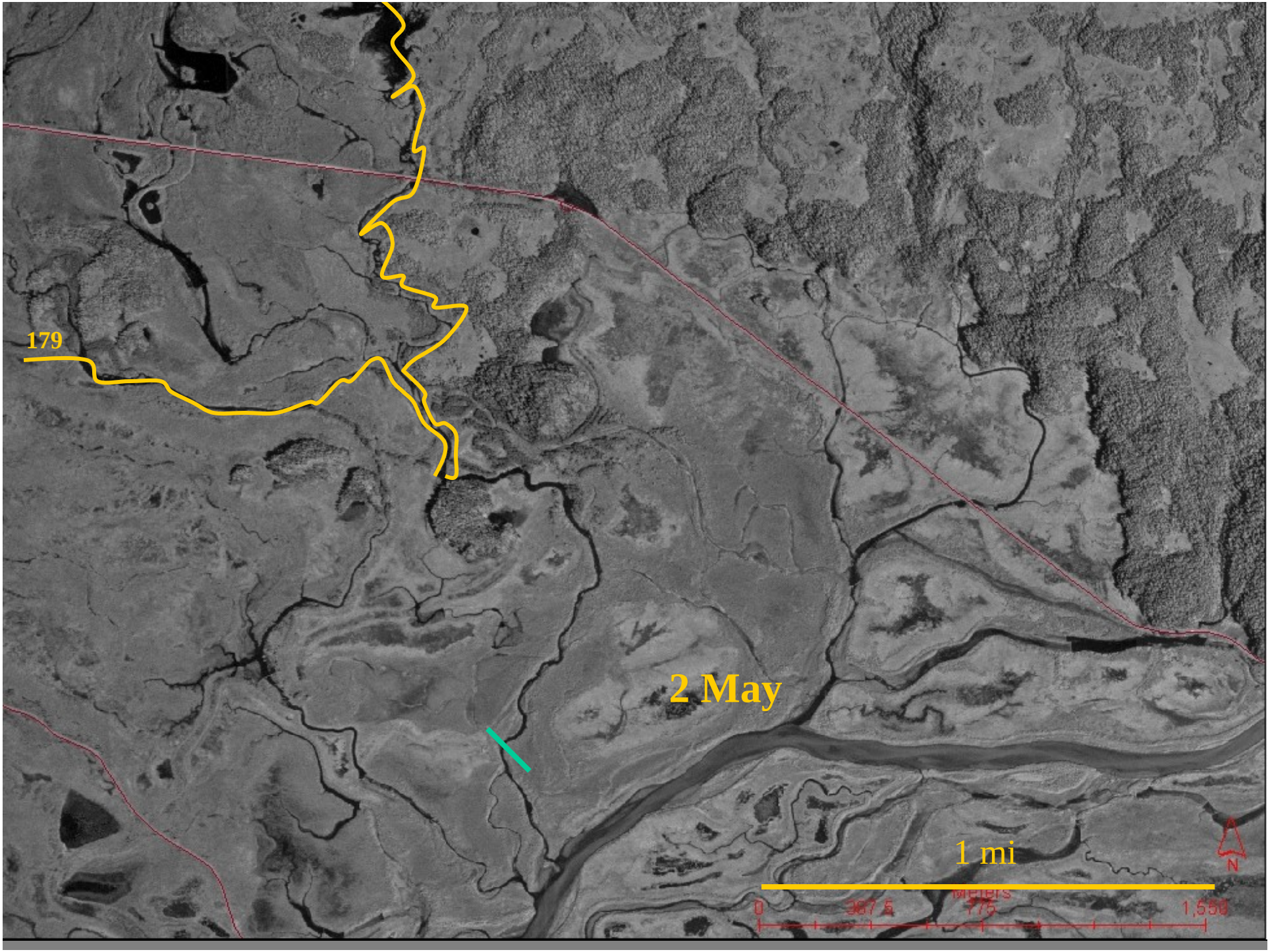

27 Apr
1 mi
N
Meters
0
387.5
775
1,550

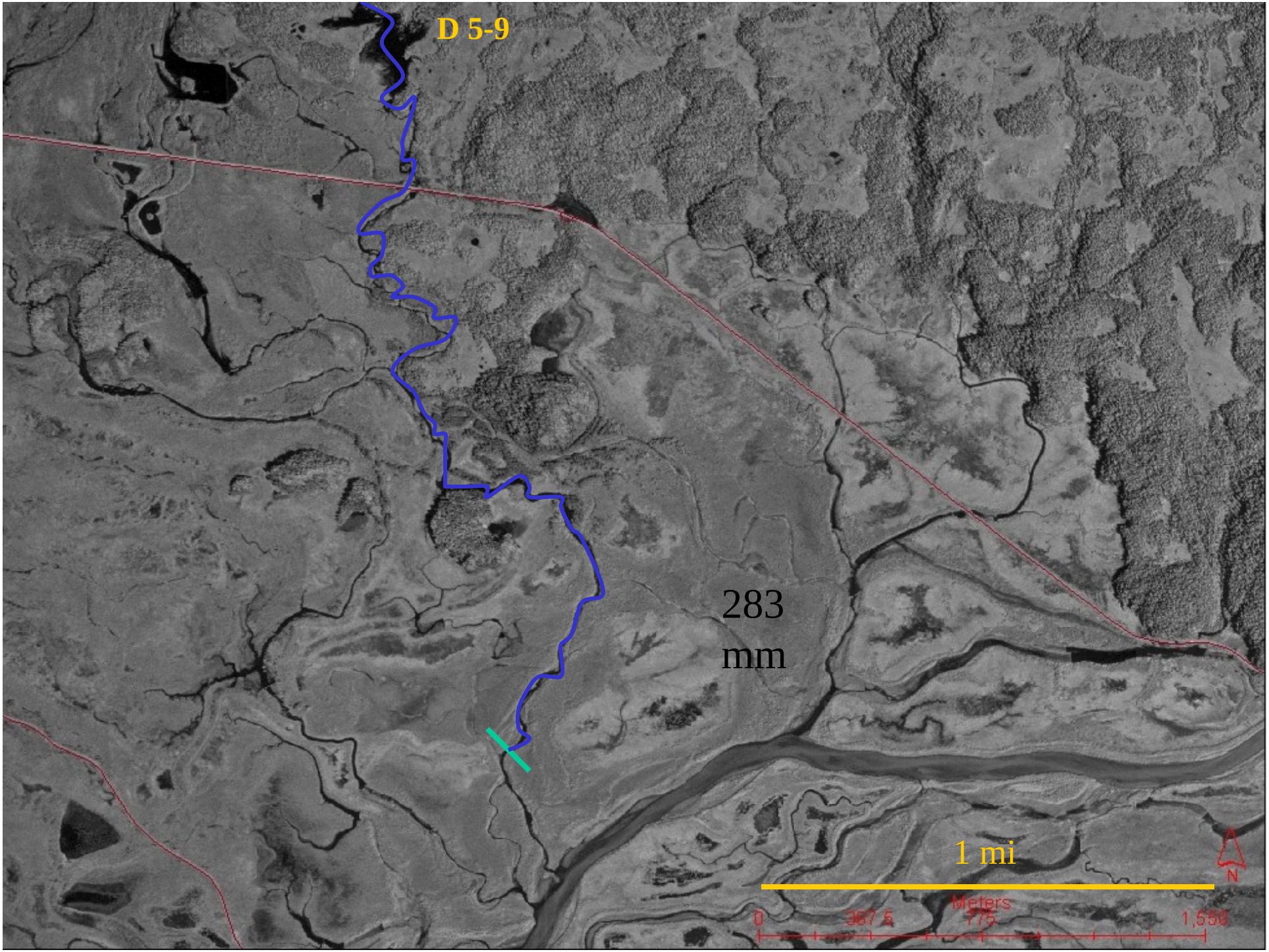

28 Apr
1 mi
Meters
0
387.5
775
1,550
N

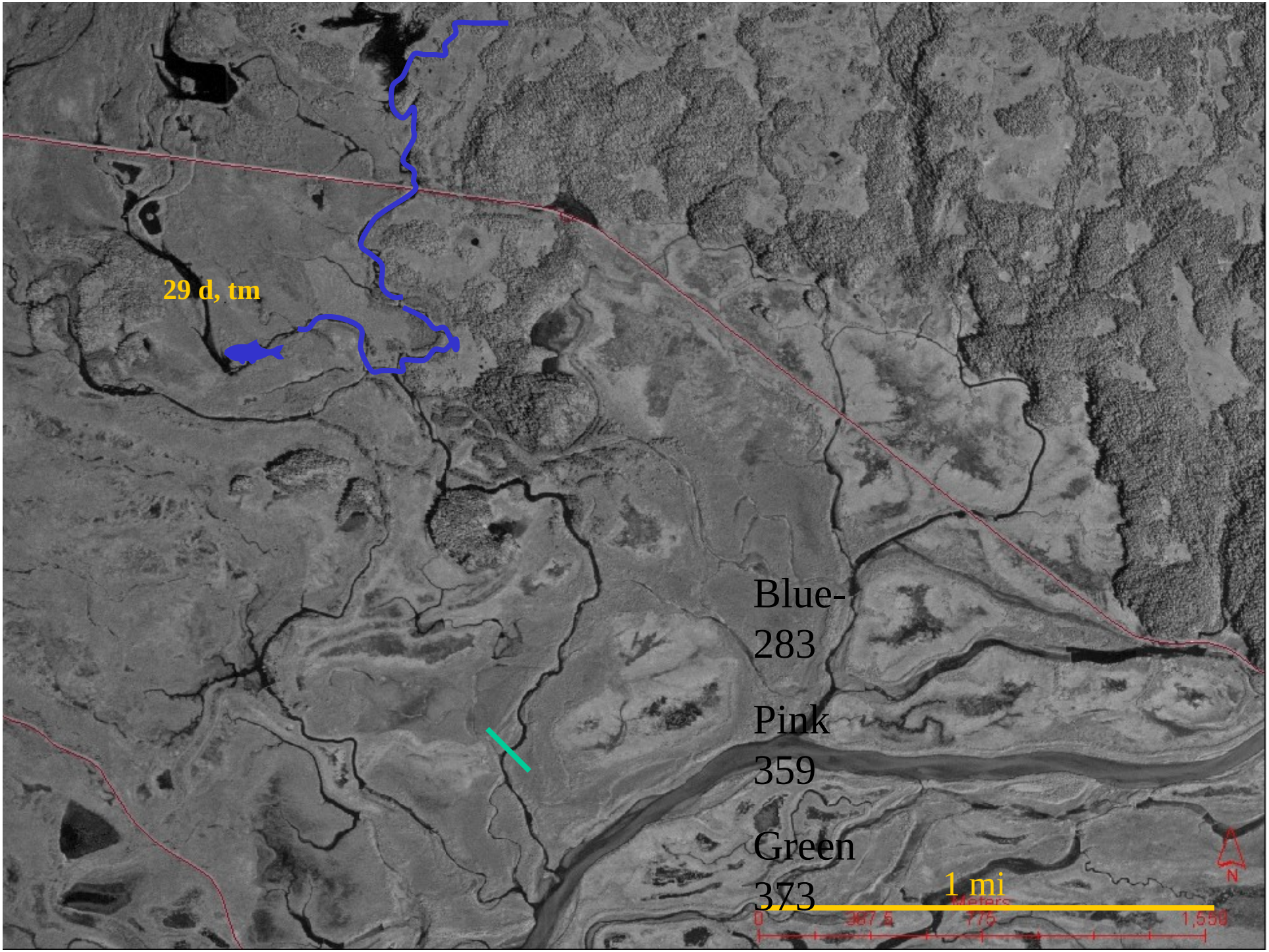

29 Apr
1 mi
N
Meters
0
387.5
775
1,550

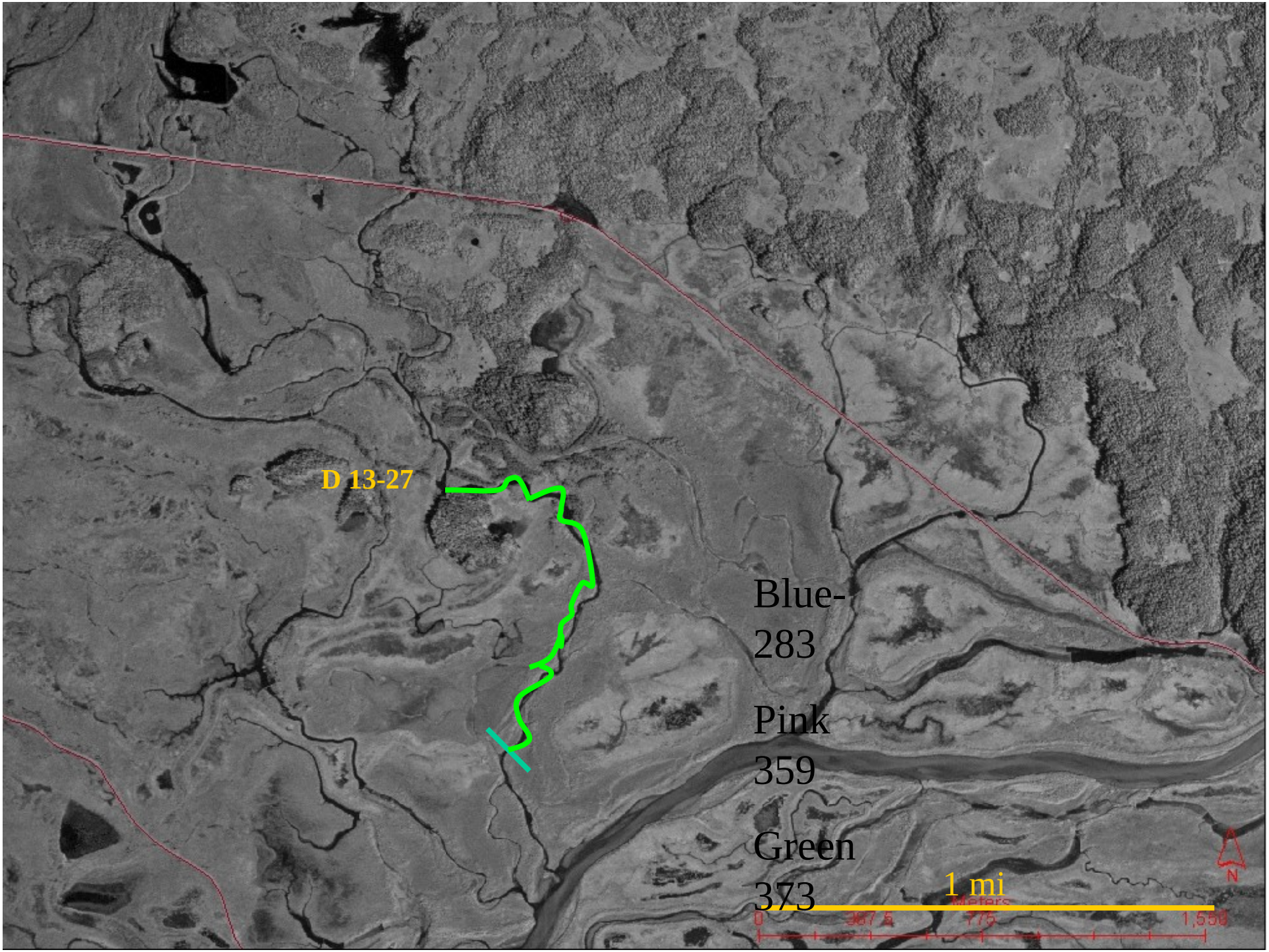

30 Apr
1 mi
N
Meters
0
387.5
775
1,550

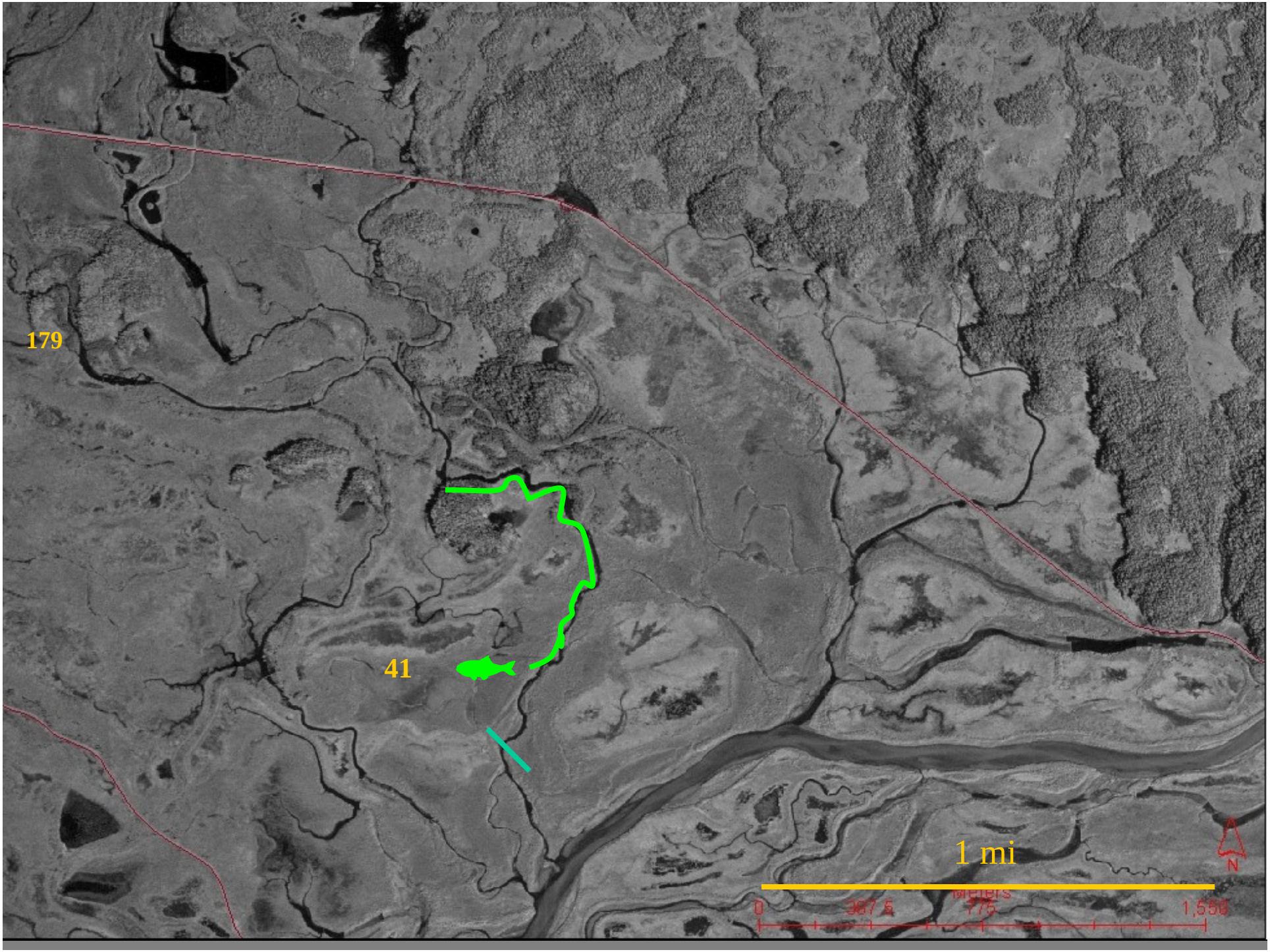

1 May
1 mi
N
Meters
0
387.5
775
1,550

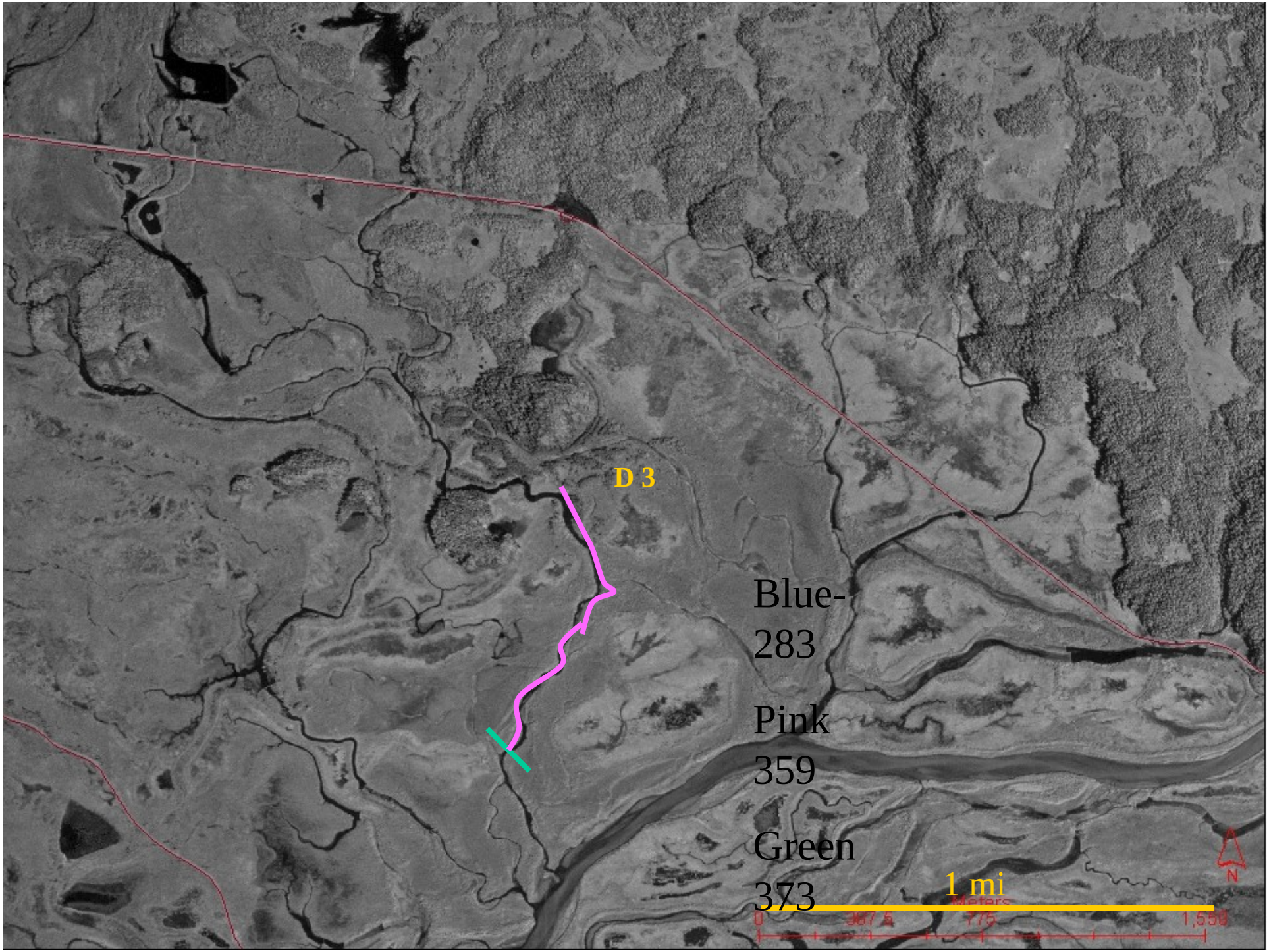

179
2 May
1 mi
N
Meters
0
387.5
775
1,550

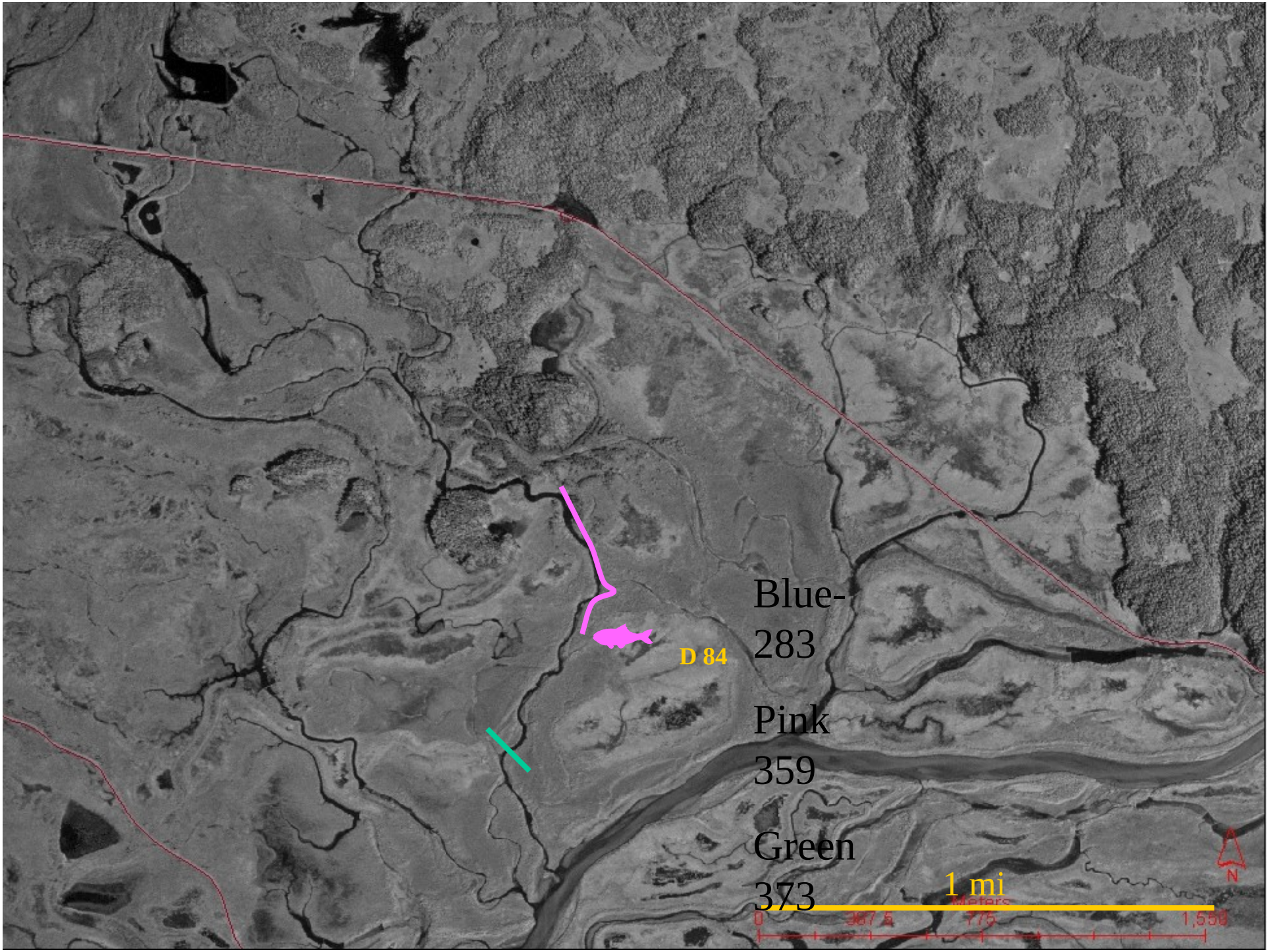

D 5-9
283
mm
1 mi
N
Meters
0
387.5
775
1,550


29 d, tm
Blue-
283
Pink
359
Green
373
1 mi
N

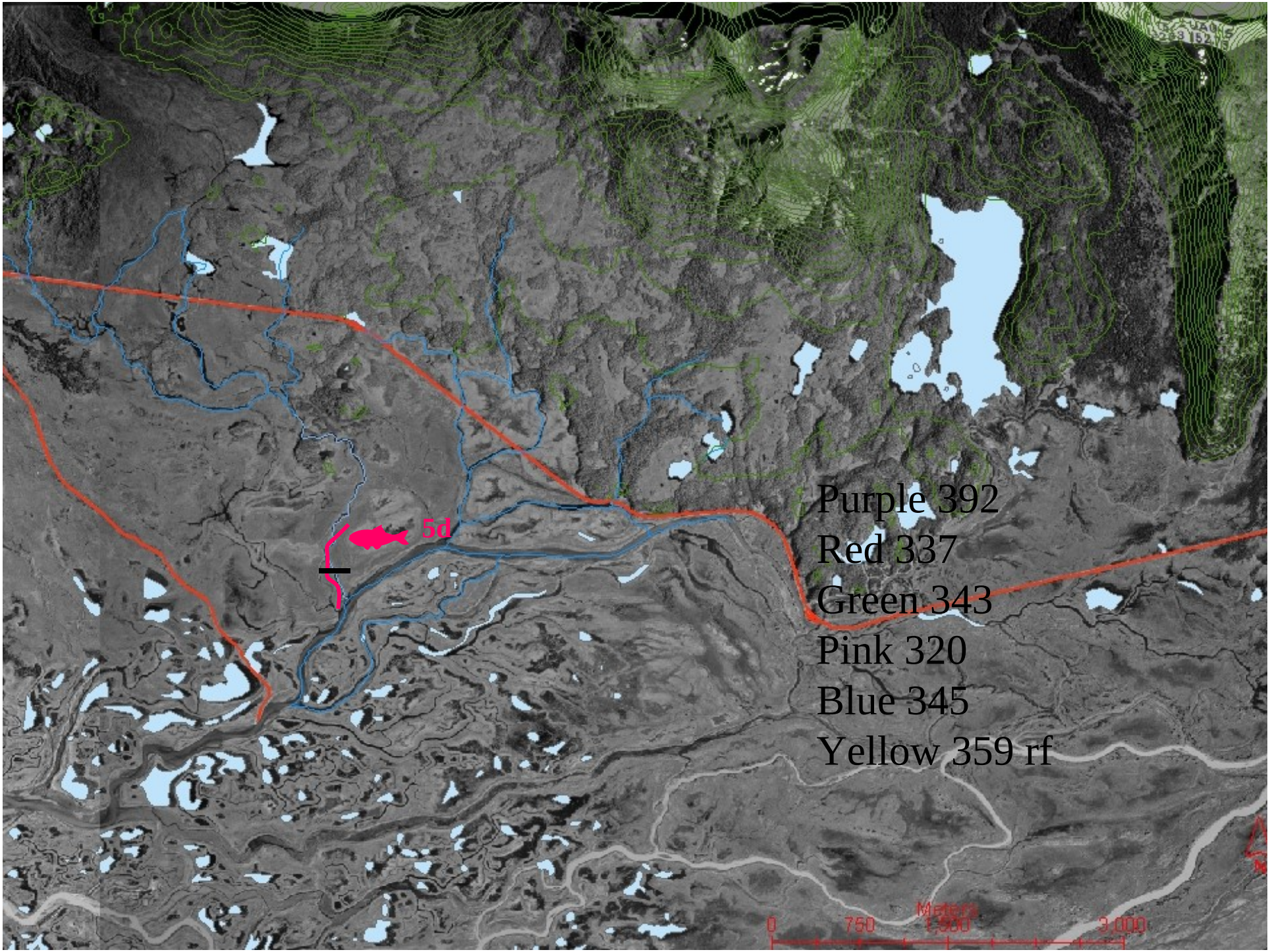

D 13-27
Blue-
283
Pink
359
Green
373
1 mi
Meters
0
387.5
775
1,550
N

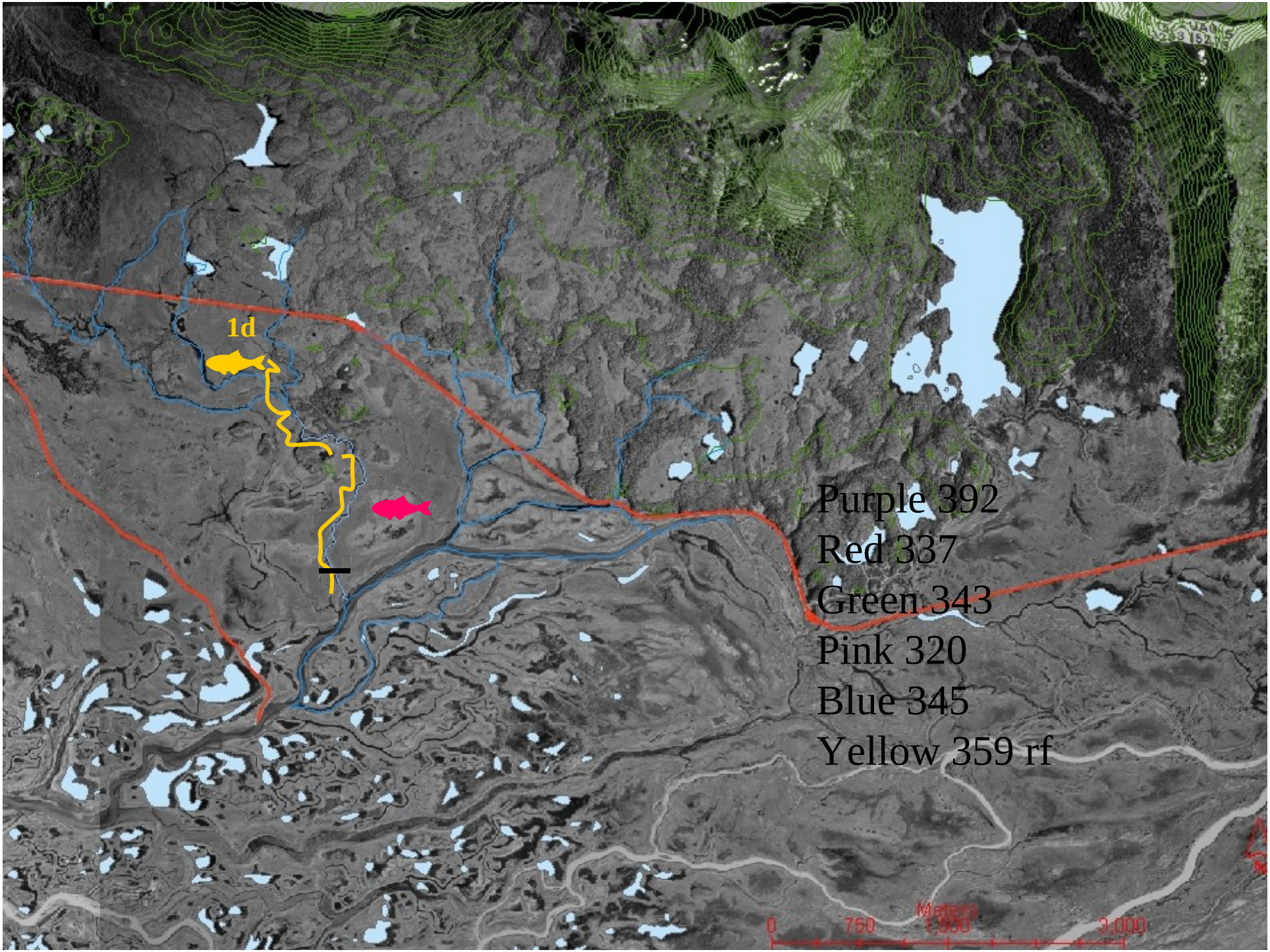

179
41
1 mi
Meters
0
387.5
775
1,550
N

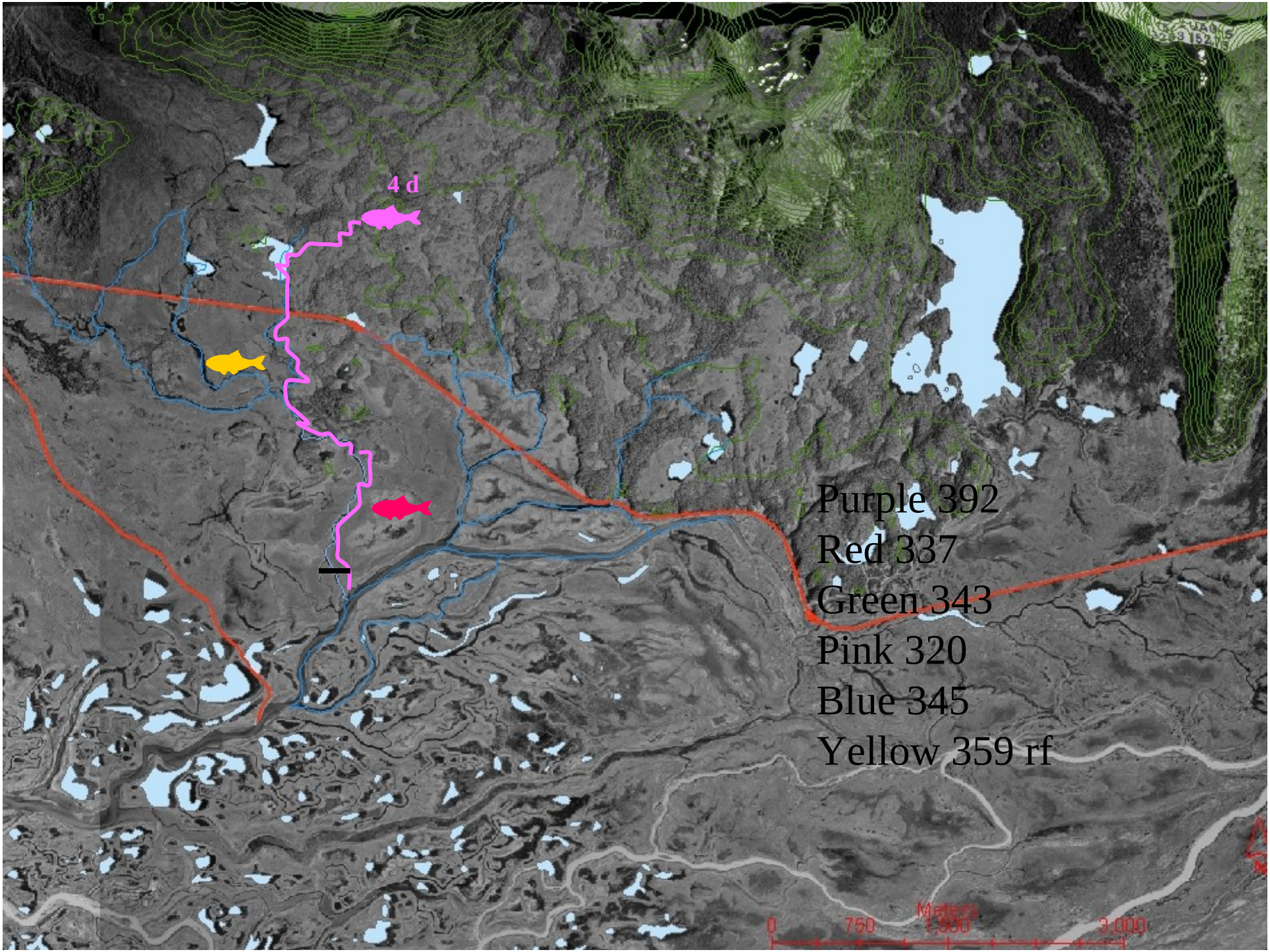

D 3
Blue-
283
Pink
359
Green
373
1 mi
Meters
0
387.5
775
1,550
N

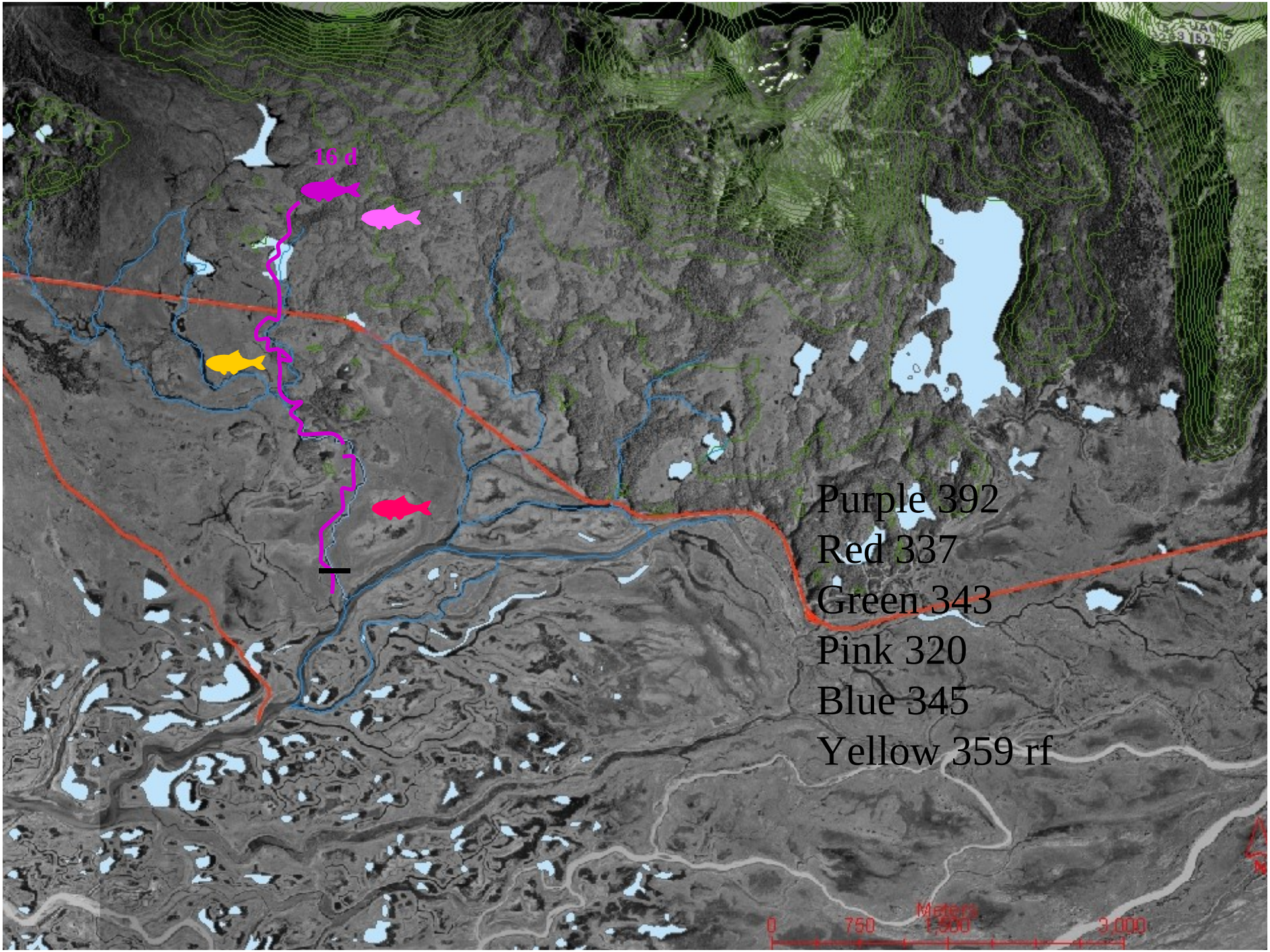

D 84
Blue-
283
Pink
359
Green
373
1 mi
N

Up and out fish


5d
Purple 392
Red 337
Green 343
Pink 320
Blue 345
Yellow 359 rf
Meters
0
750
1,500
3,000


1d
Purple 392
Red 337
Green 343
Pink 320
Blue 345
Yellow 359 rf
Meters
0
750
1,500
3,000


4 d
Purple 392
Red 337
Green 343
Pink 320
Blue 345
Yellow 359 rf
Meters
0
750
1,500
3,000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Red 337
Green 343
Pink 320
Blue 345
Yellow 359 rf
Meters
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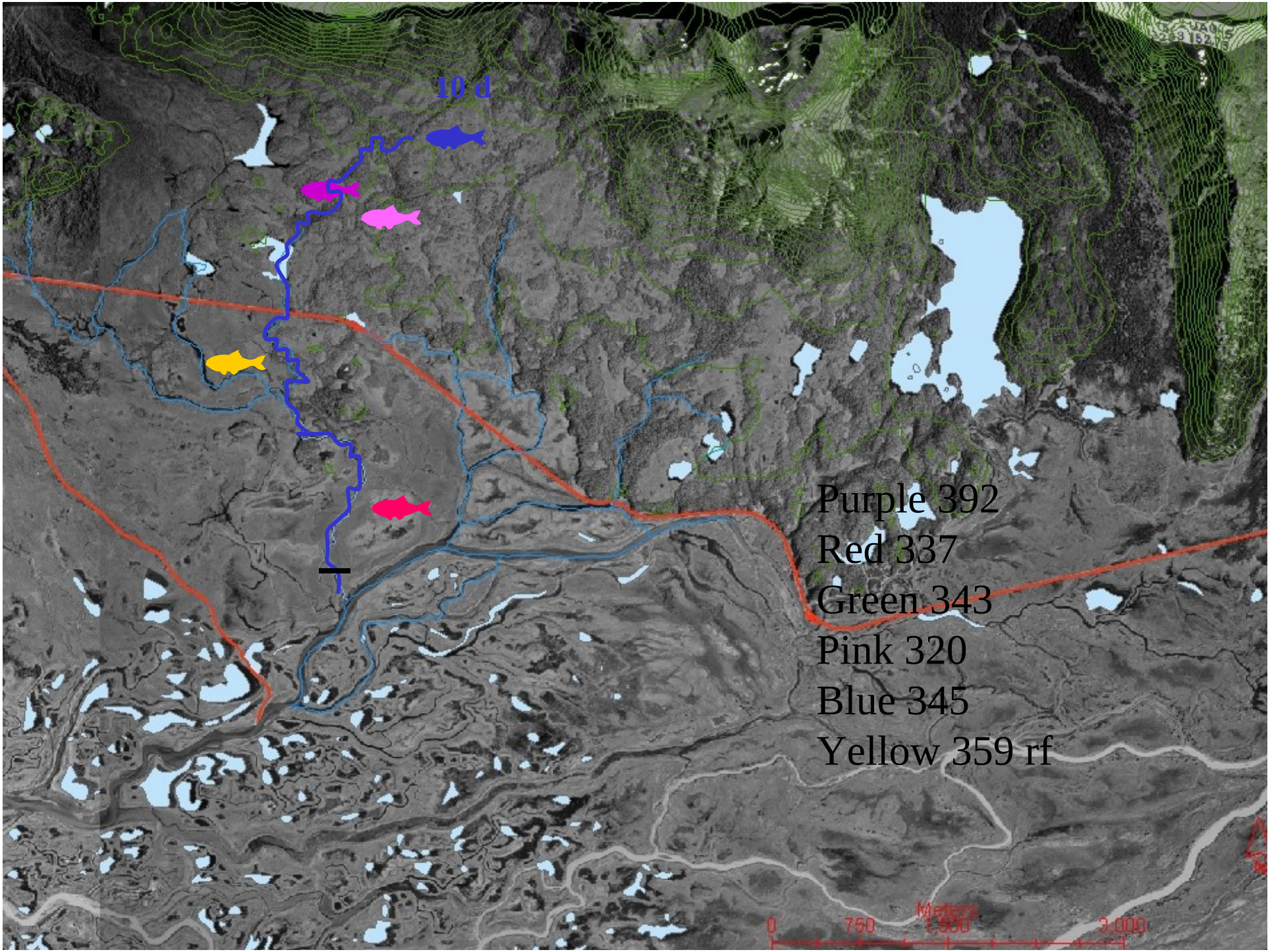
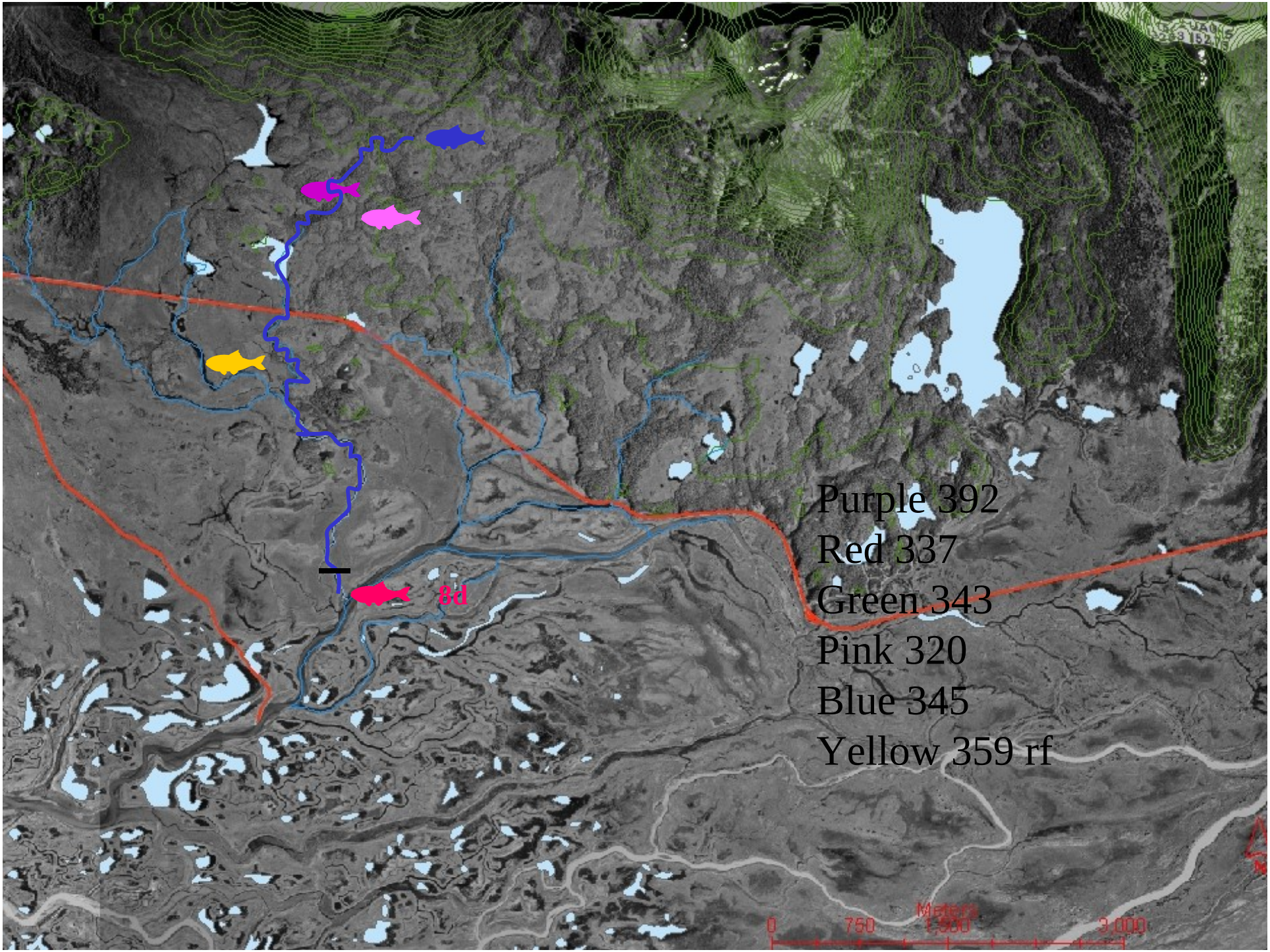
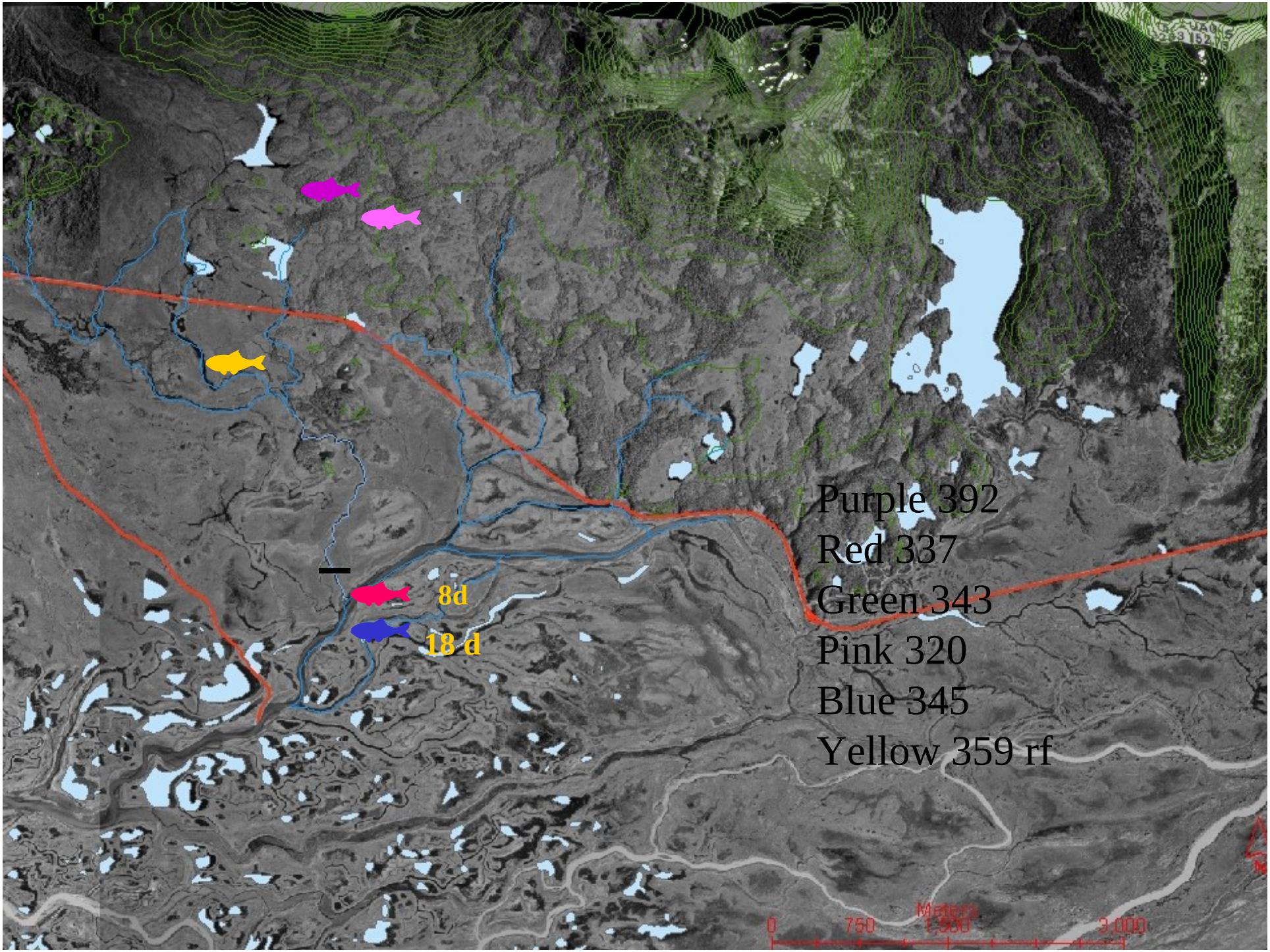
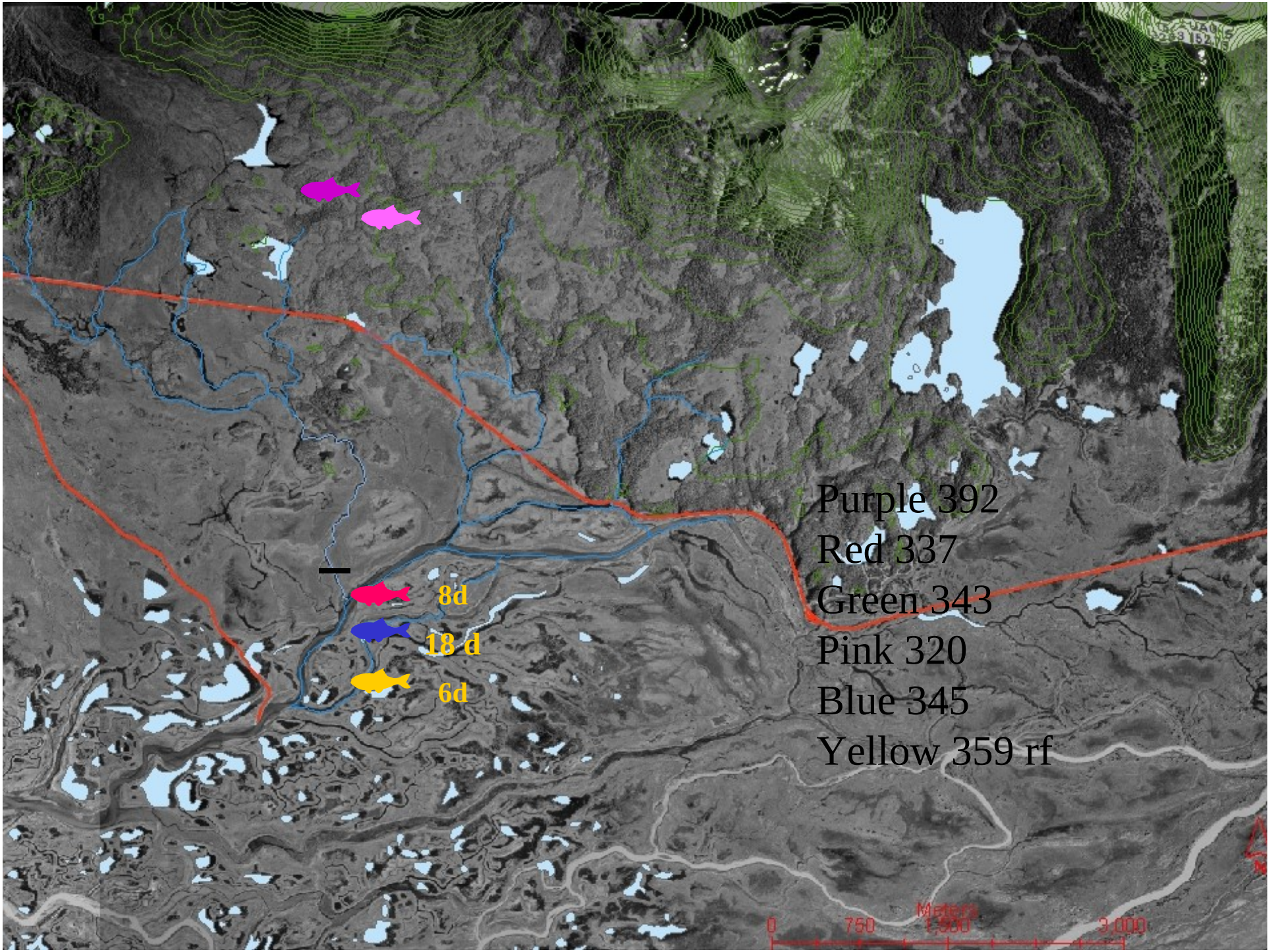
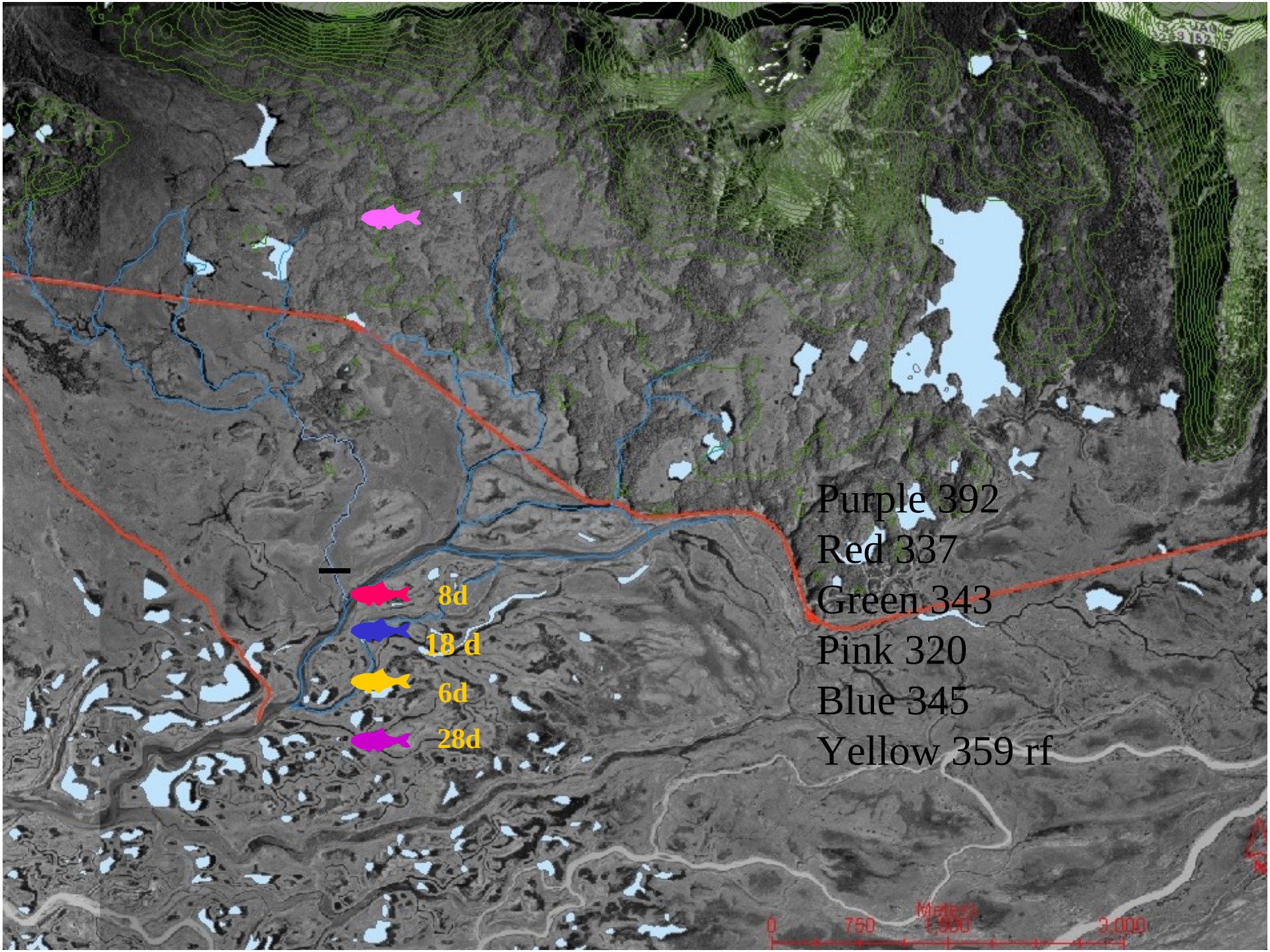
750
1,500
3,000

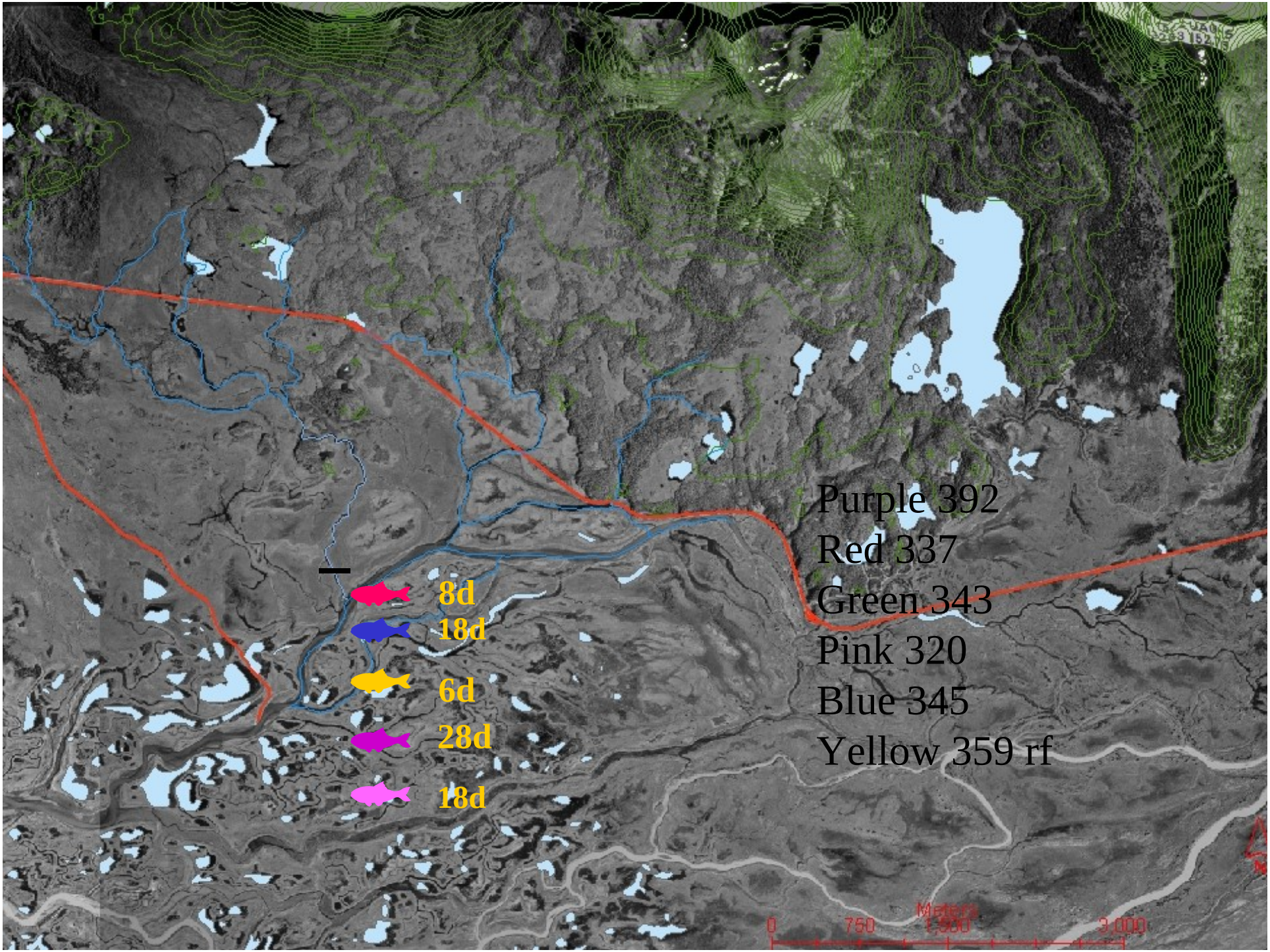

10 d
Purple 392
Red 337
Green 343
Pink 320
Blue 345
Yellow 359 rf
Meters
0
750
1,500
3,000

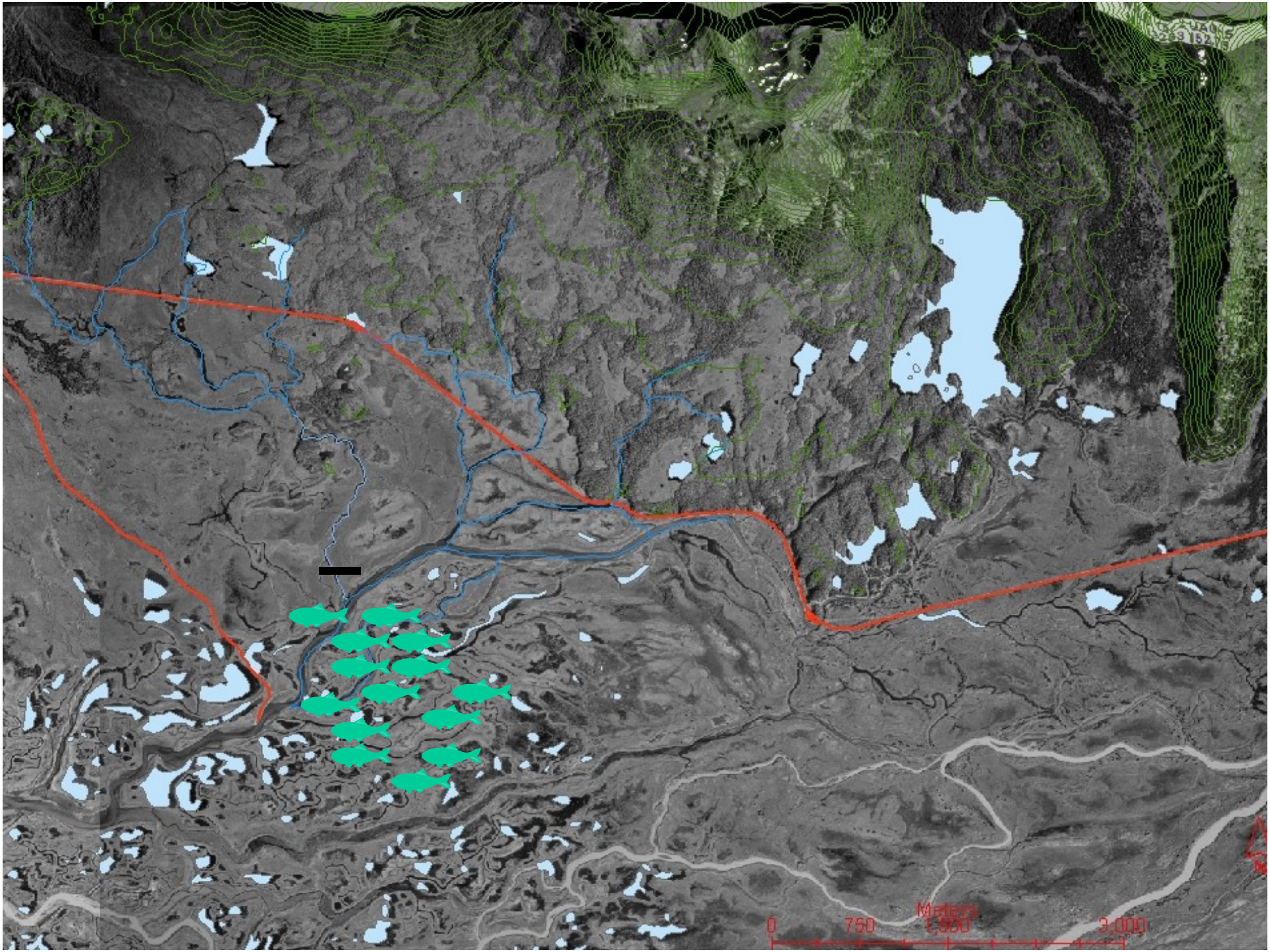

8d
Purple 392
Red 337
Green 343
Pink 320
Blue 345
Yellow 359 rf
Meters
0
750
1,500
3,000


8d
18 d
Purple 392
Red 337
Green 343
Pink 320
Blue 345
Yellow 359 rf
Meters
0
750
1,500
3,000


8d
18 d
6d
Purple 392
Red 337
Green 343
Pink 320
Blue 345
Yellow 359 rf
Meters
0
750
1,500
3,000


8d
18 d
6d
28d
Purple 392
Red 337
Green 343
Pink 320
Blue 345
Yellow 359 rf
Meters
0
750
1,500
3,000


8d
18d
6d
28d
18d
Purple 392
Red 337
Green 343
Pink 320
Blue 345
Yellow 359 rf
Meters
0
750
1,500
3,000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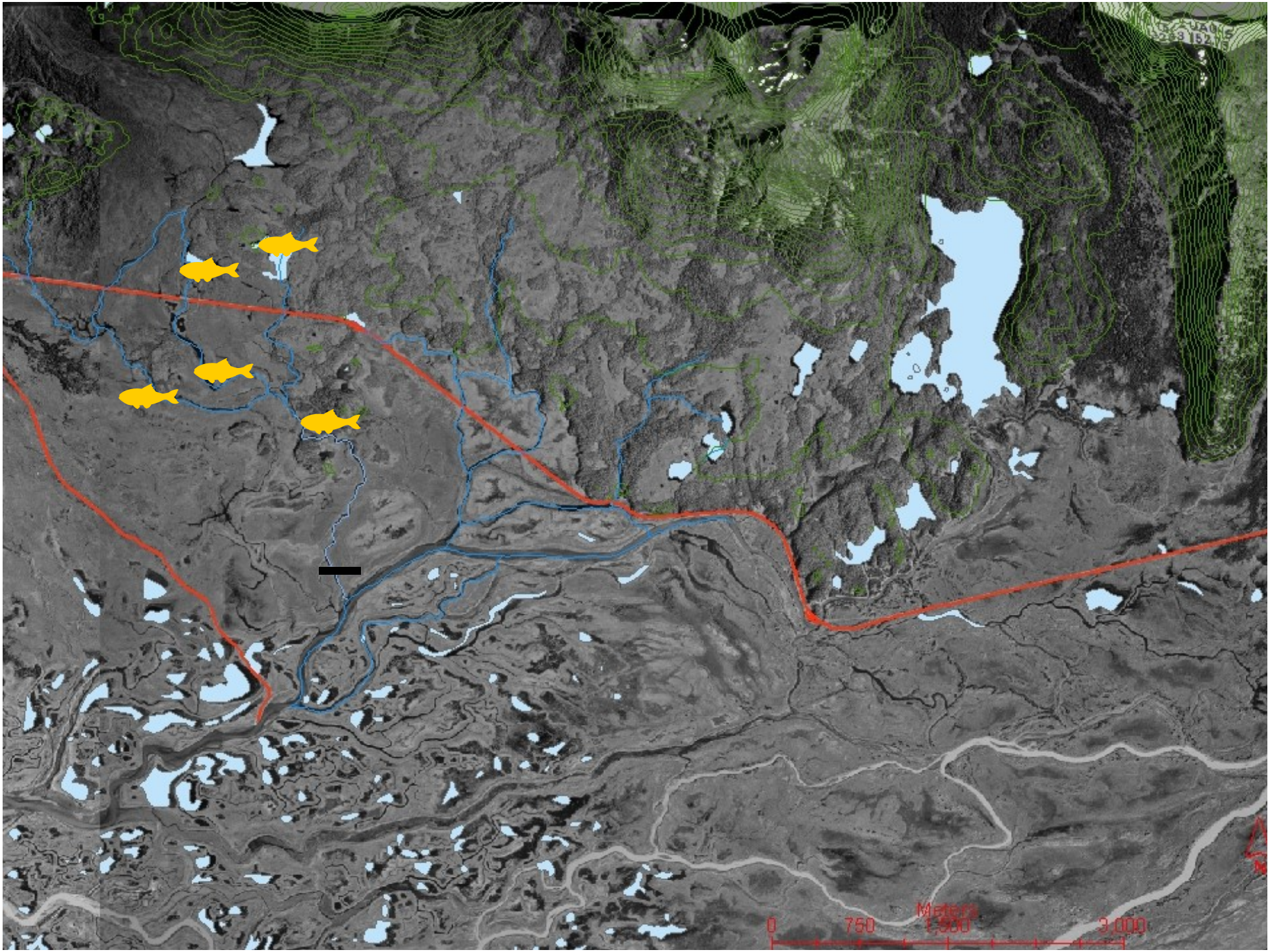
Meters
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750
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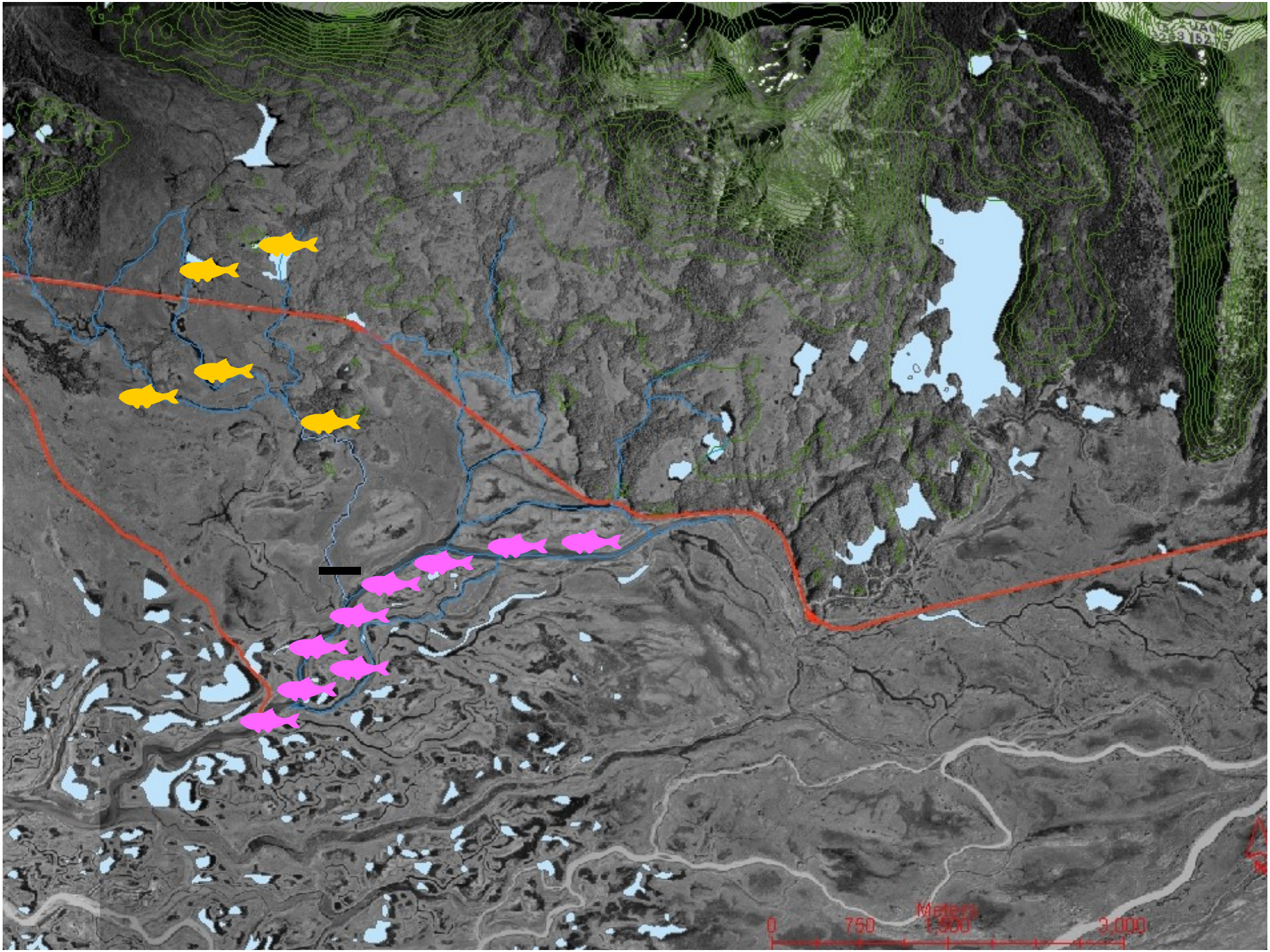
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750
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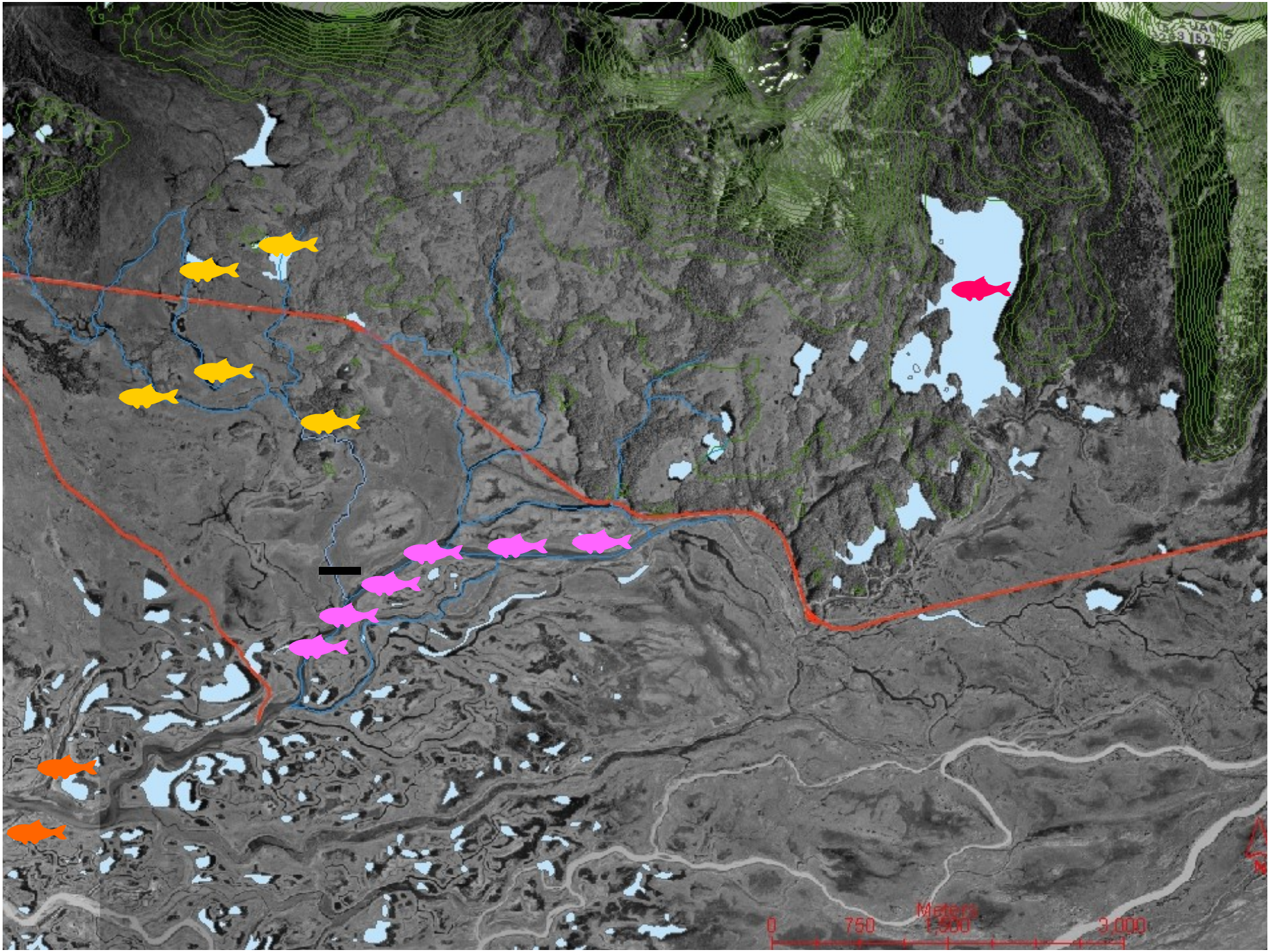
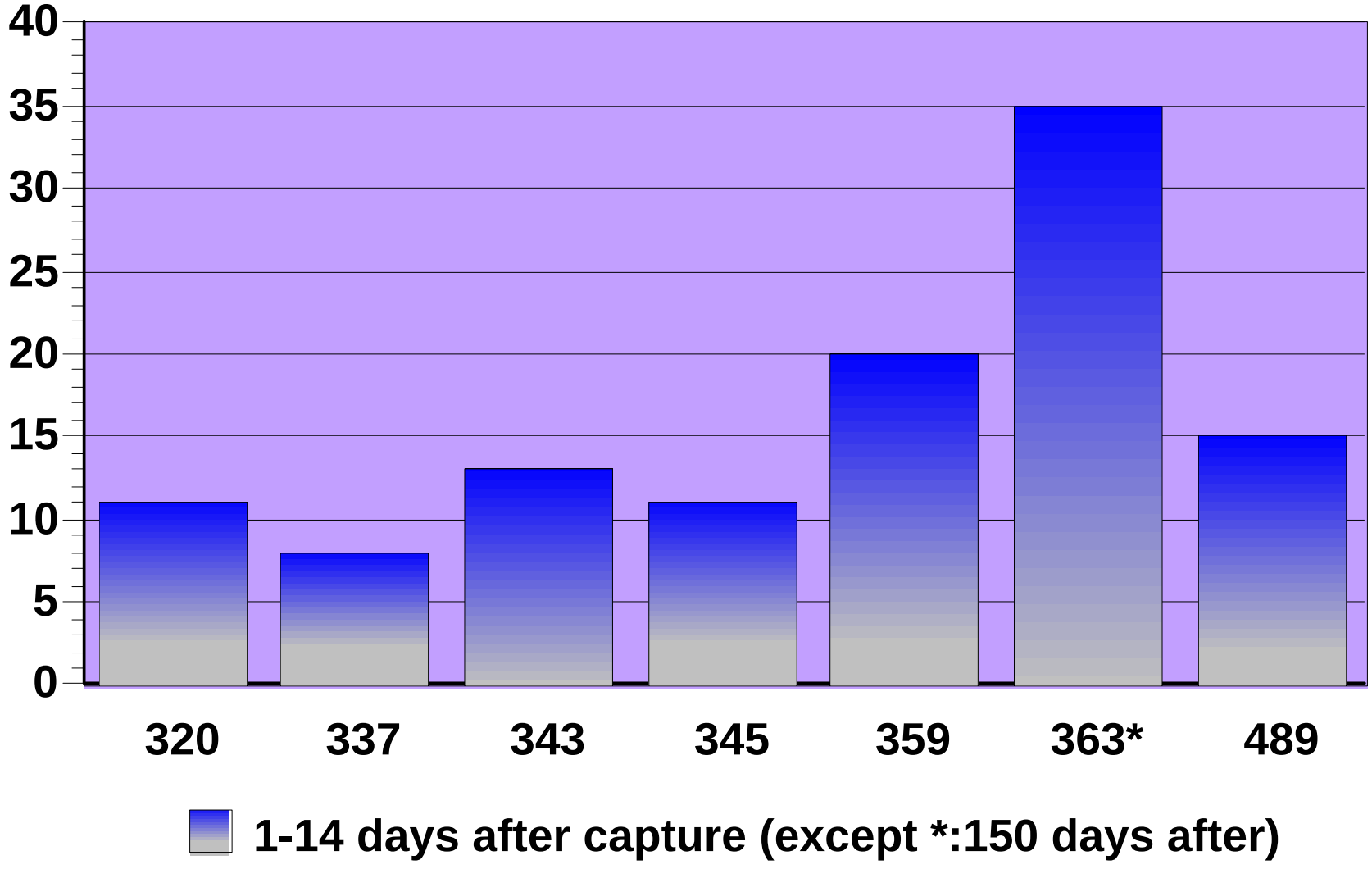
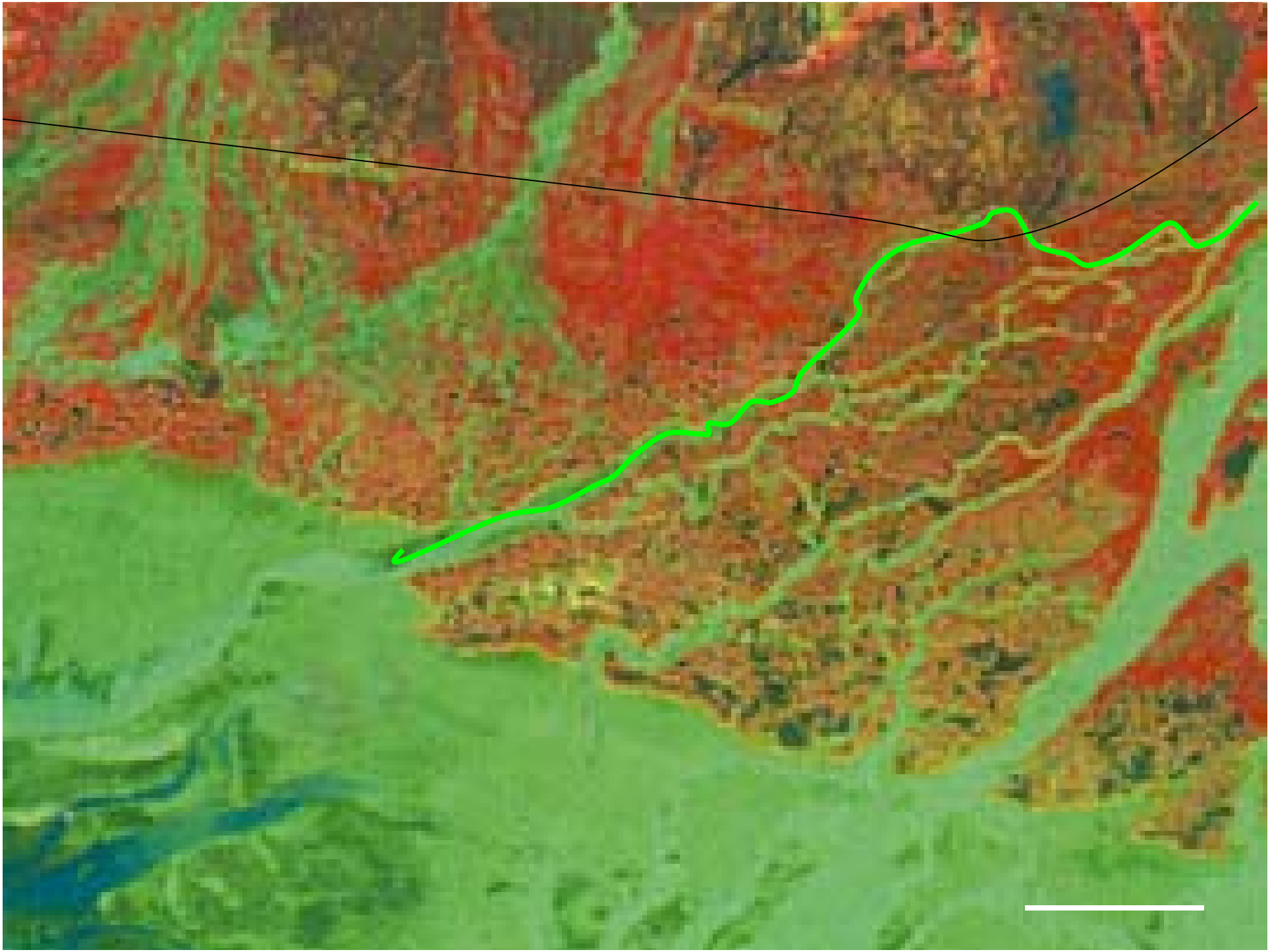
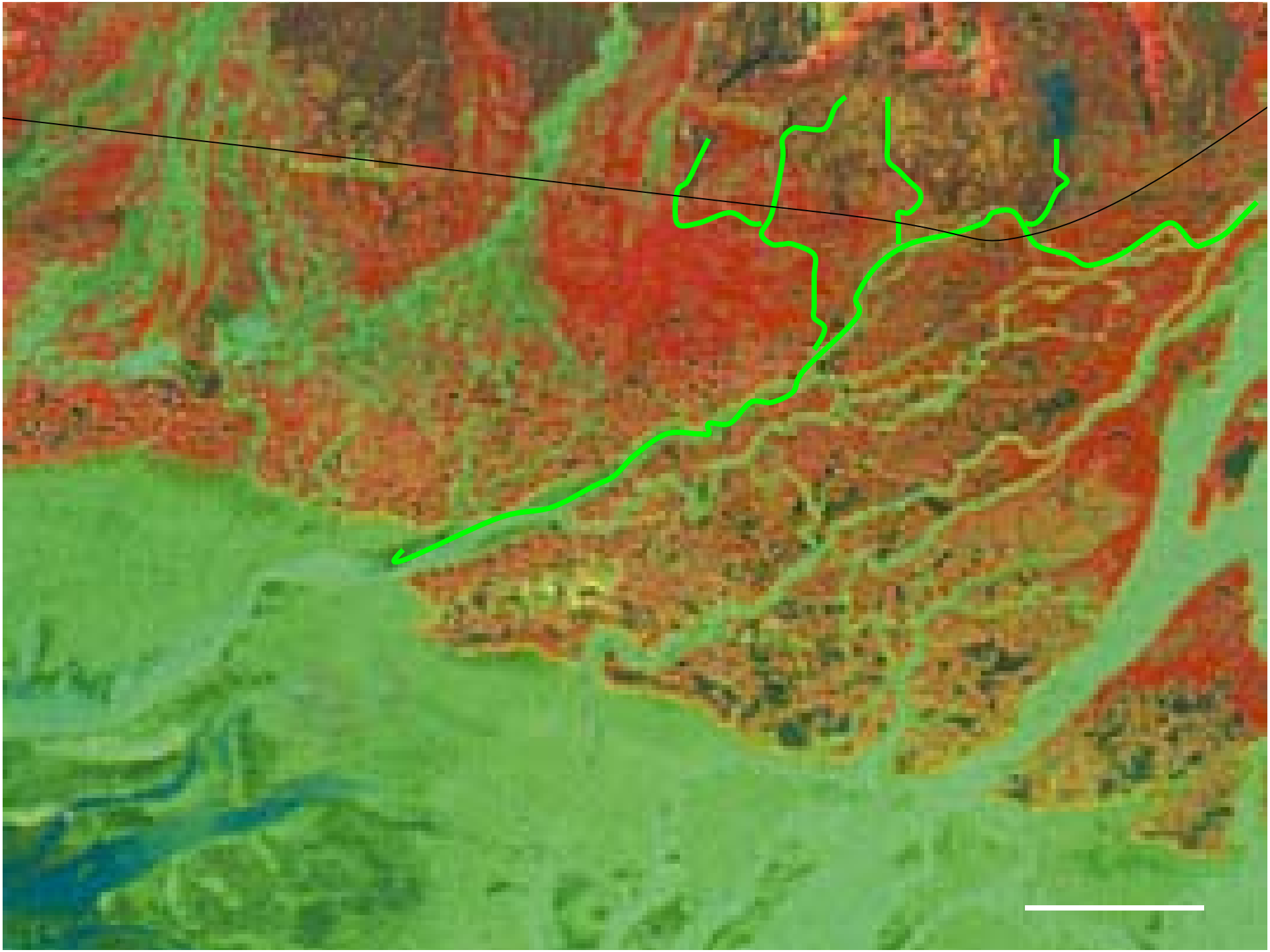

Meters
0
750
1,500
3,000

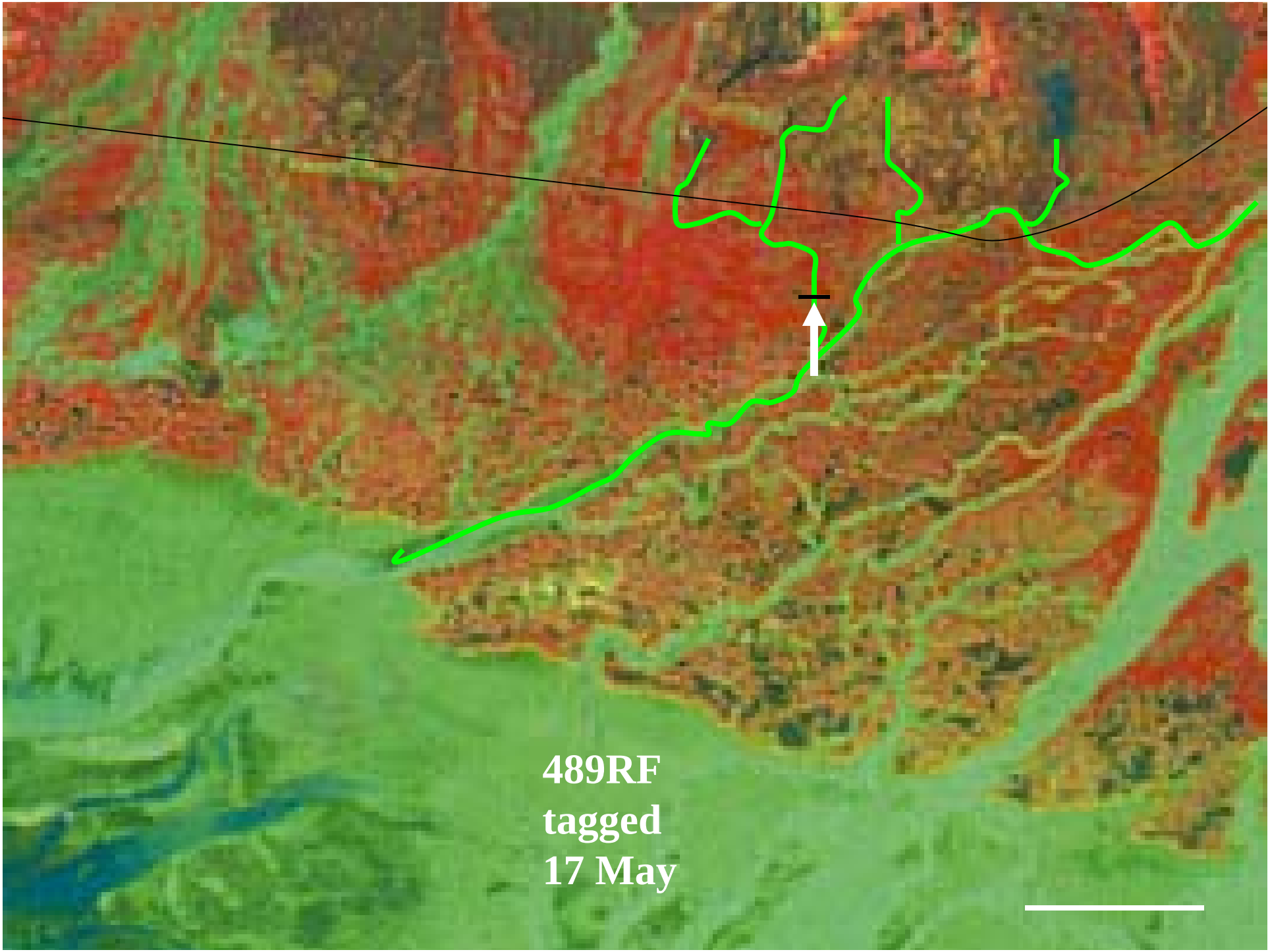
Percent Weight loss, recaptured fish

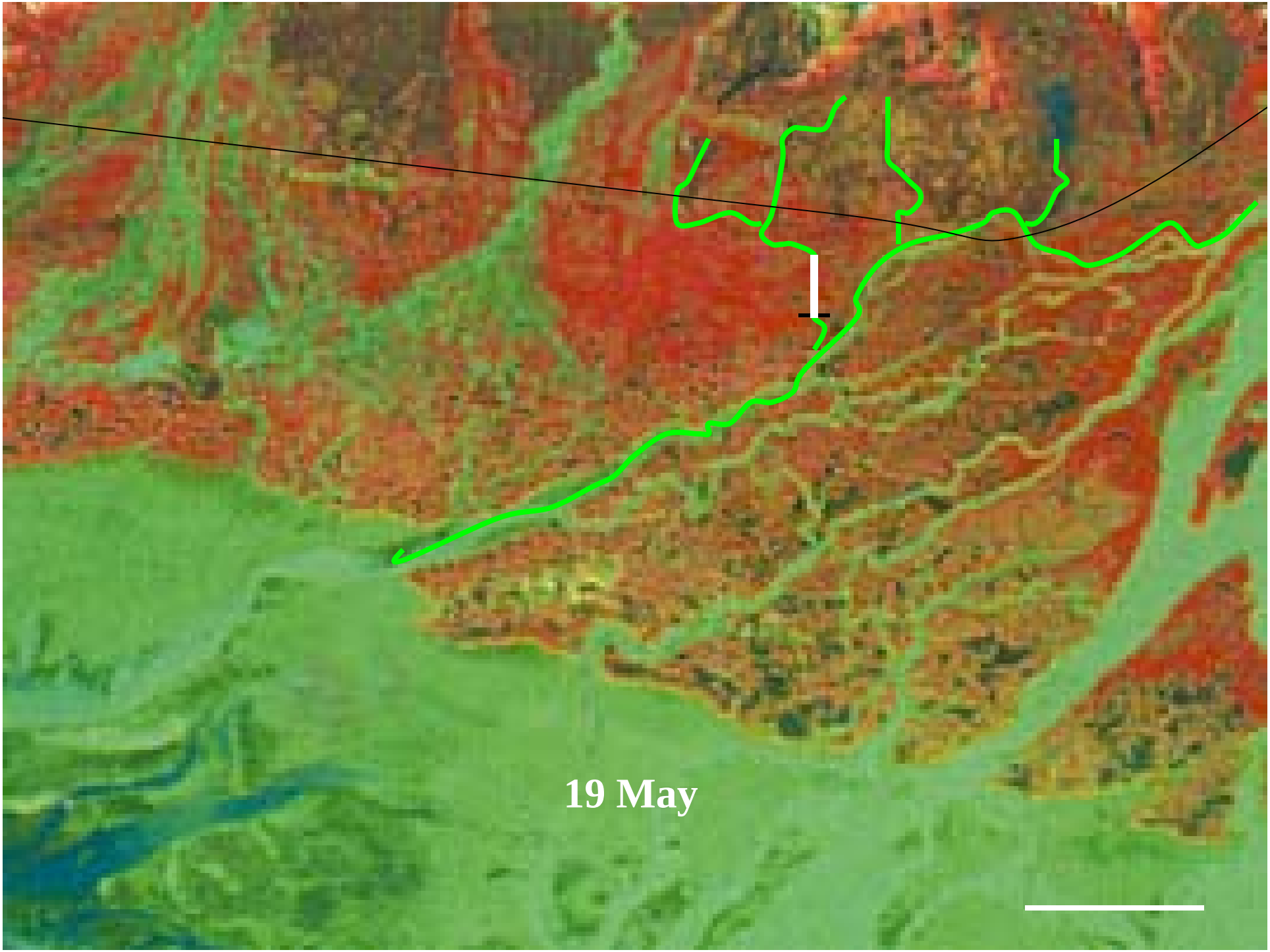


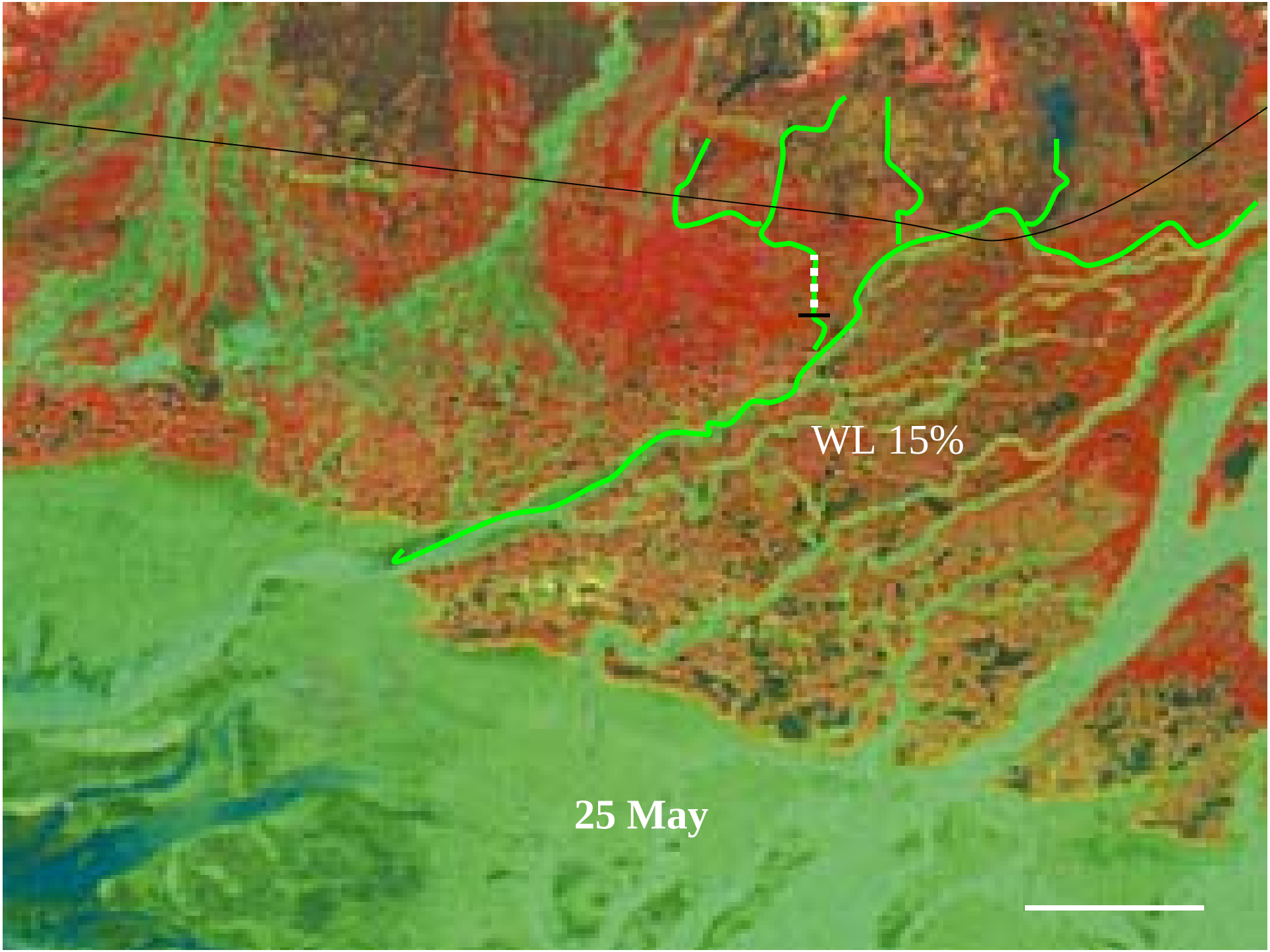
Down to salt 489 rf

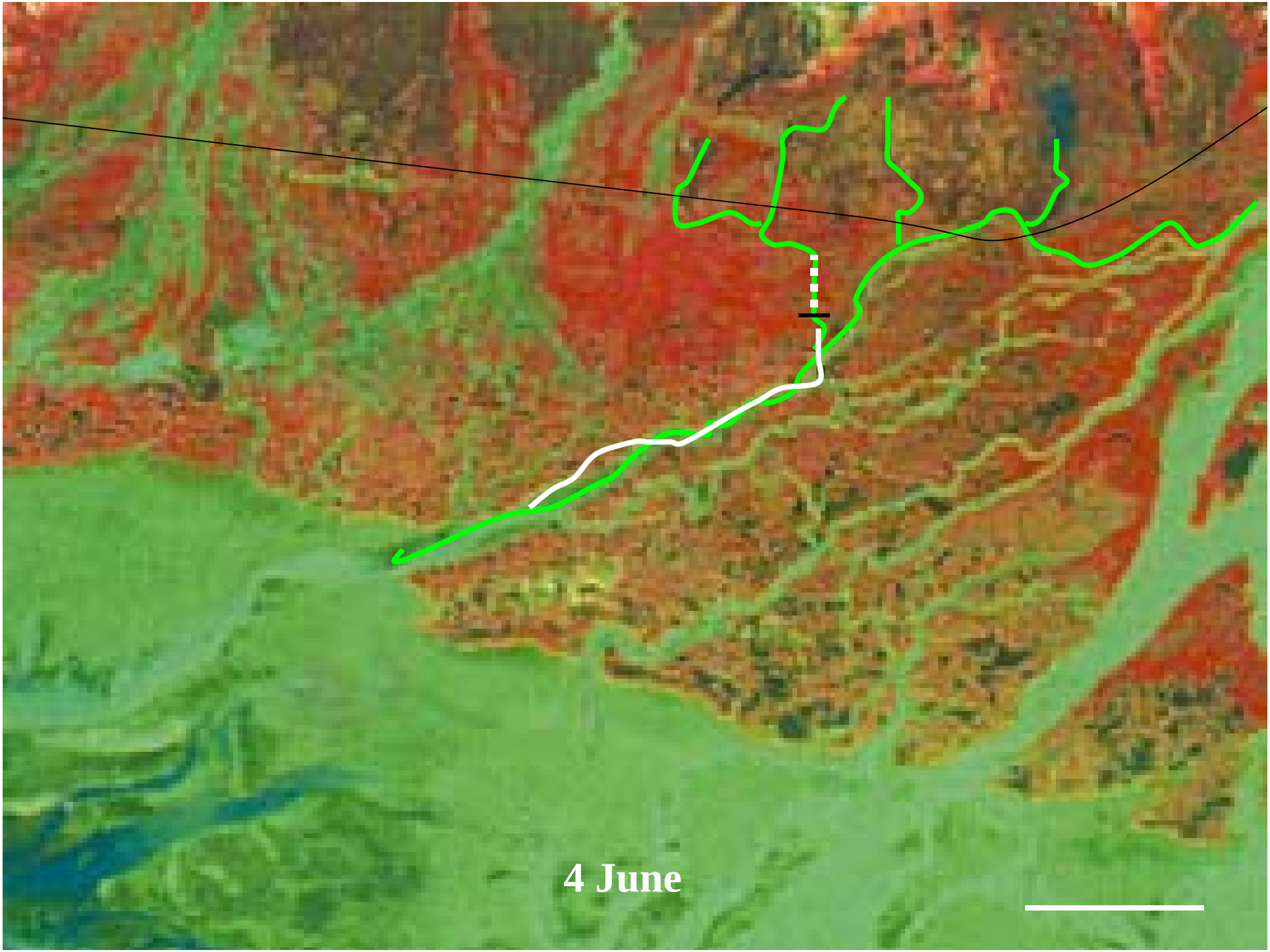


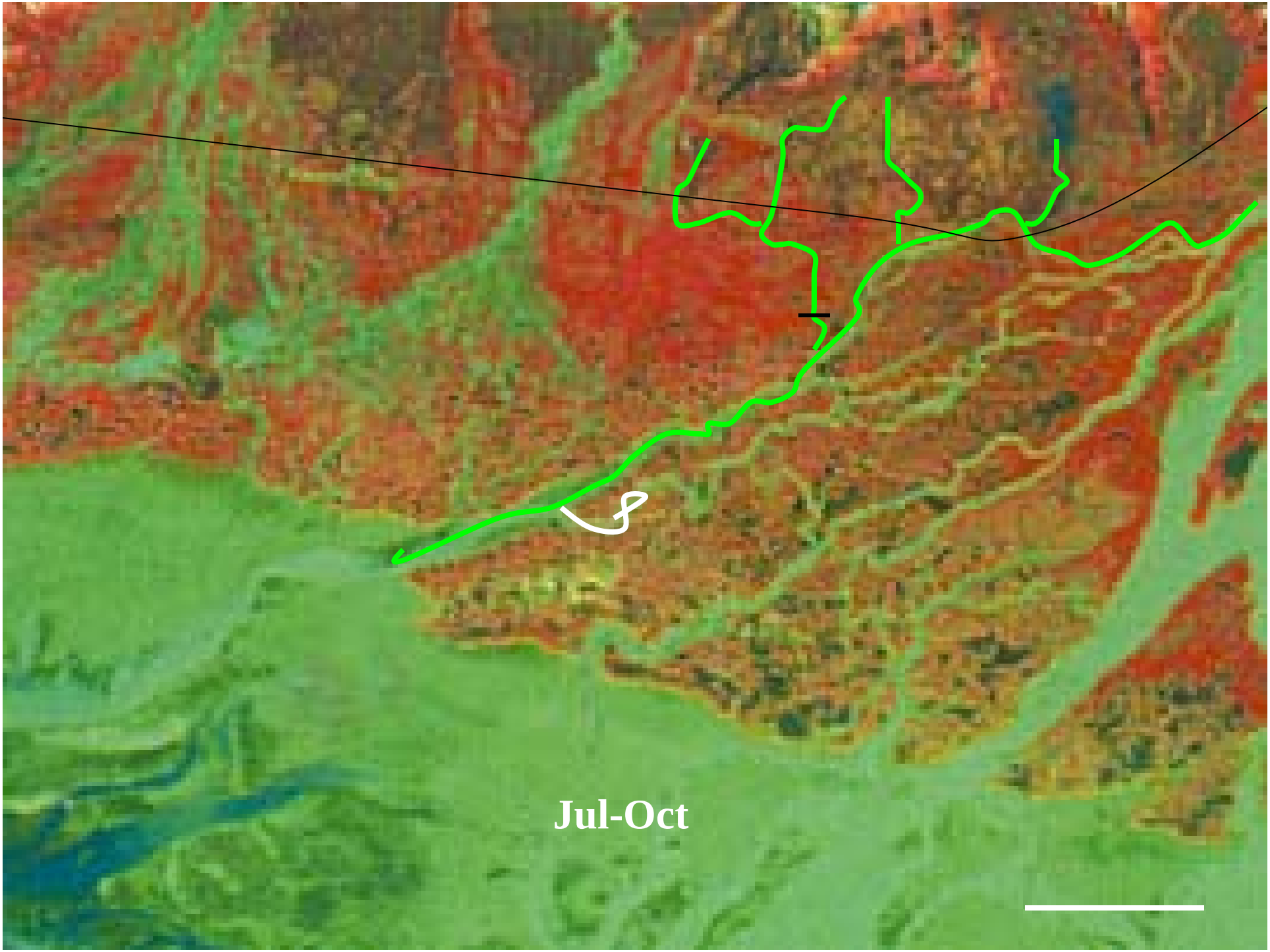


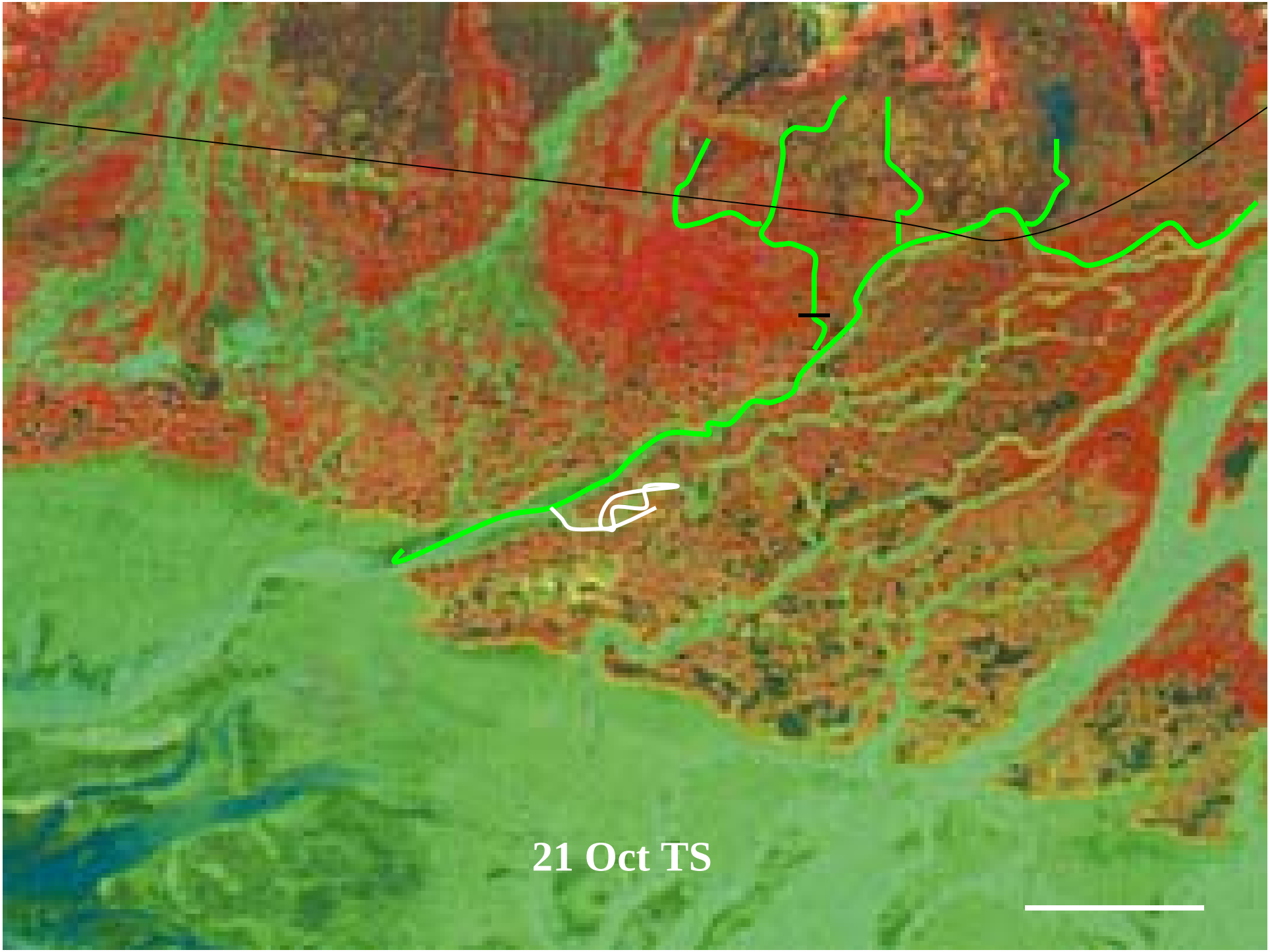

489RF
tagged
17 May


19 May

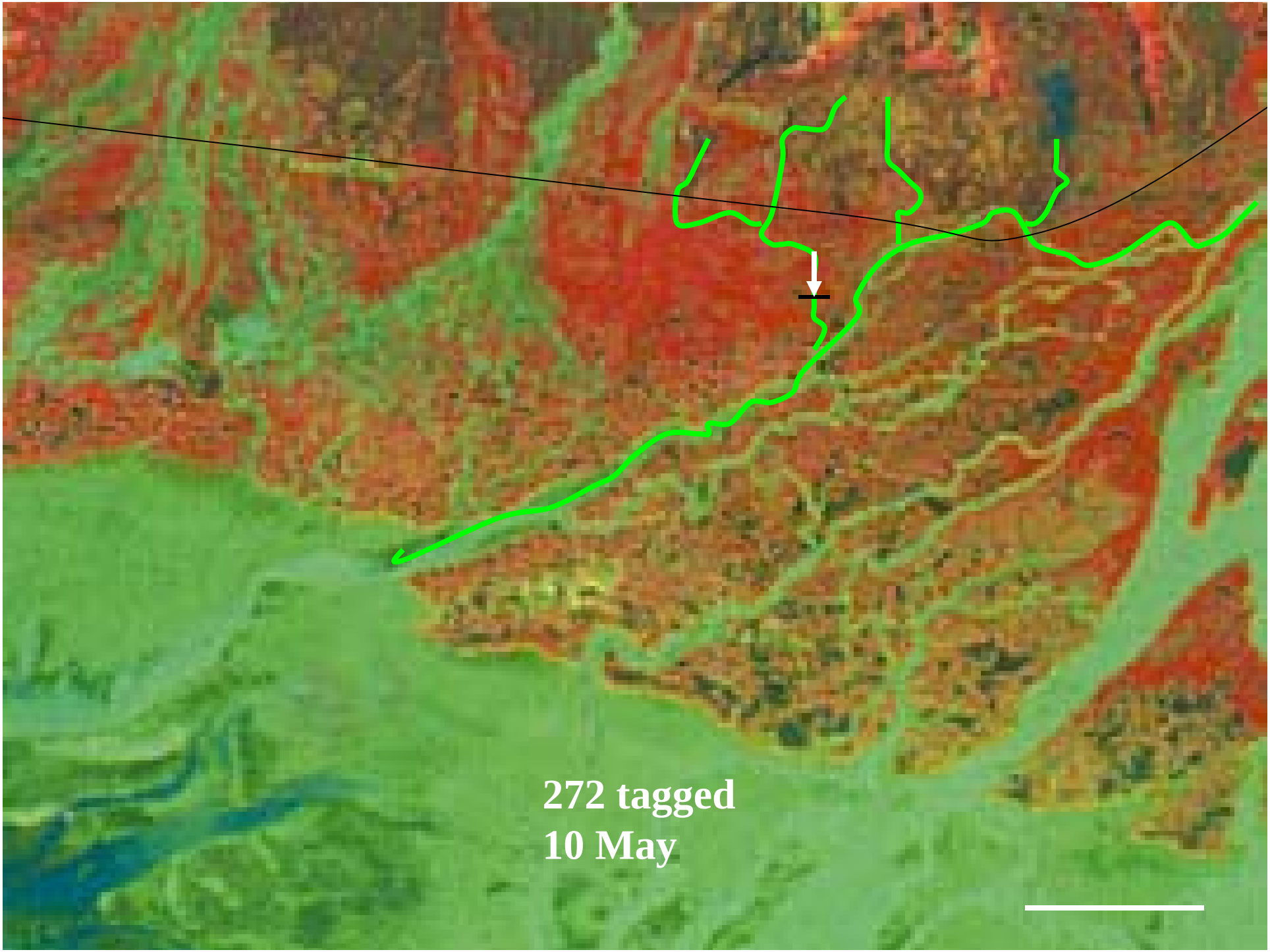

WL 15%
25 May

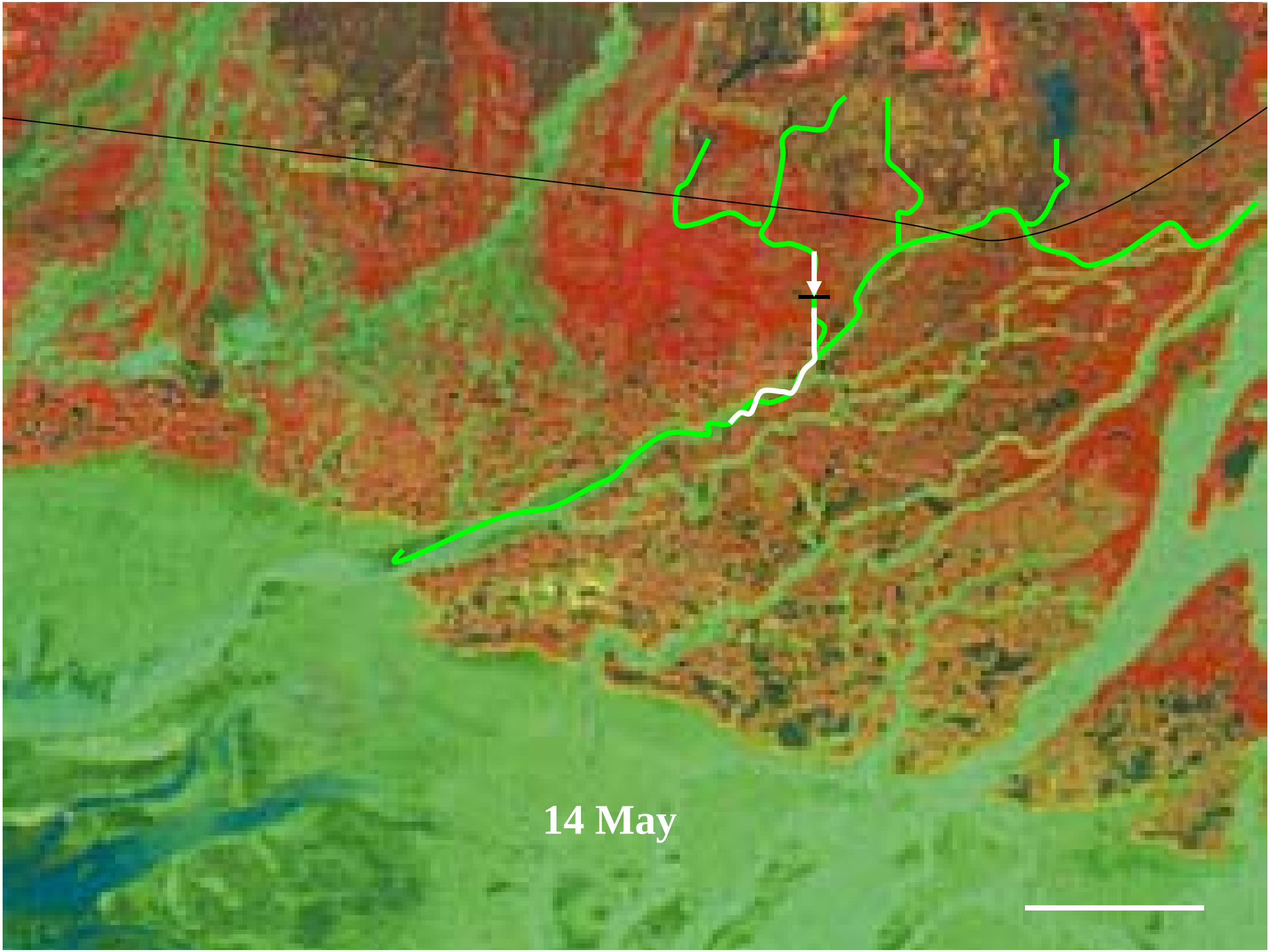

4 June

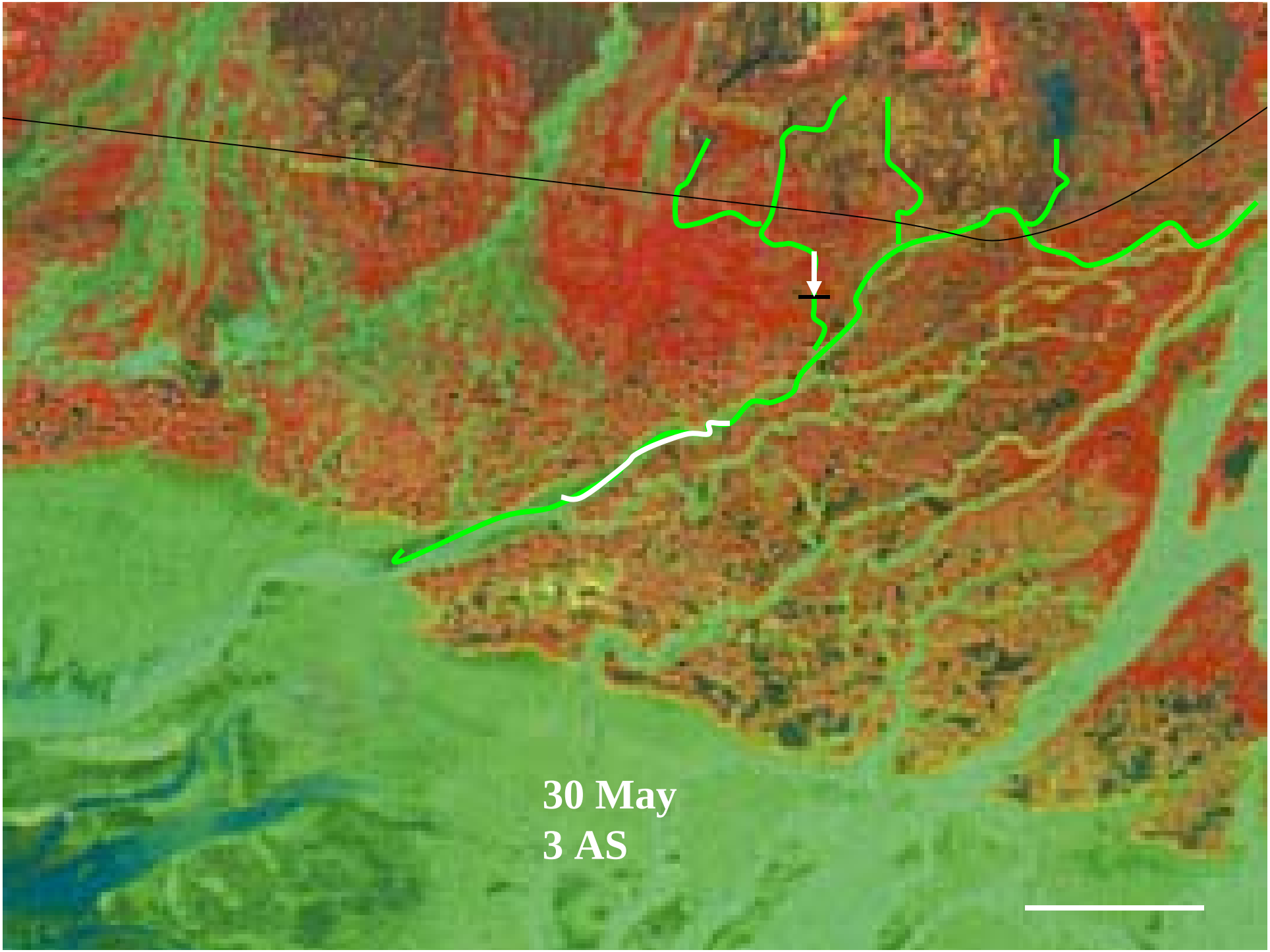

Jul-Oct

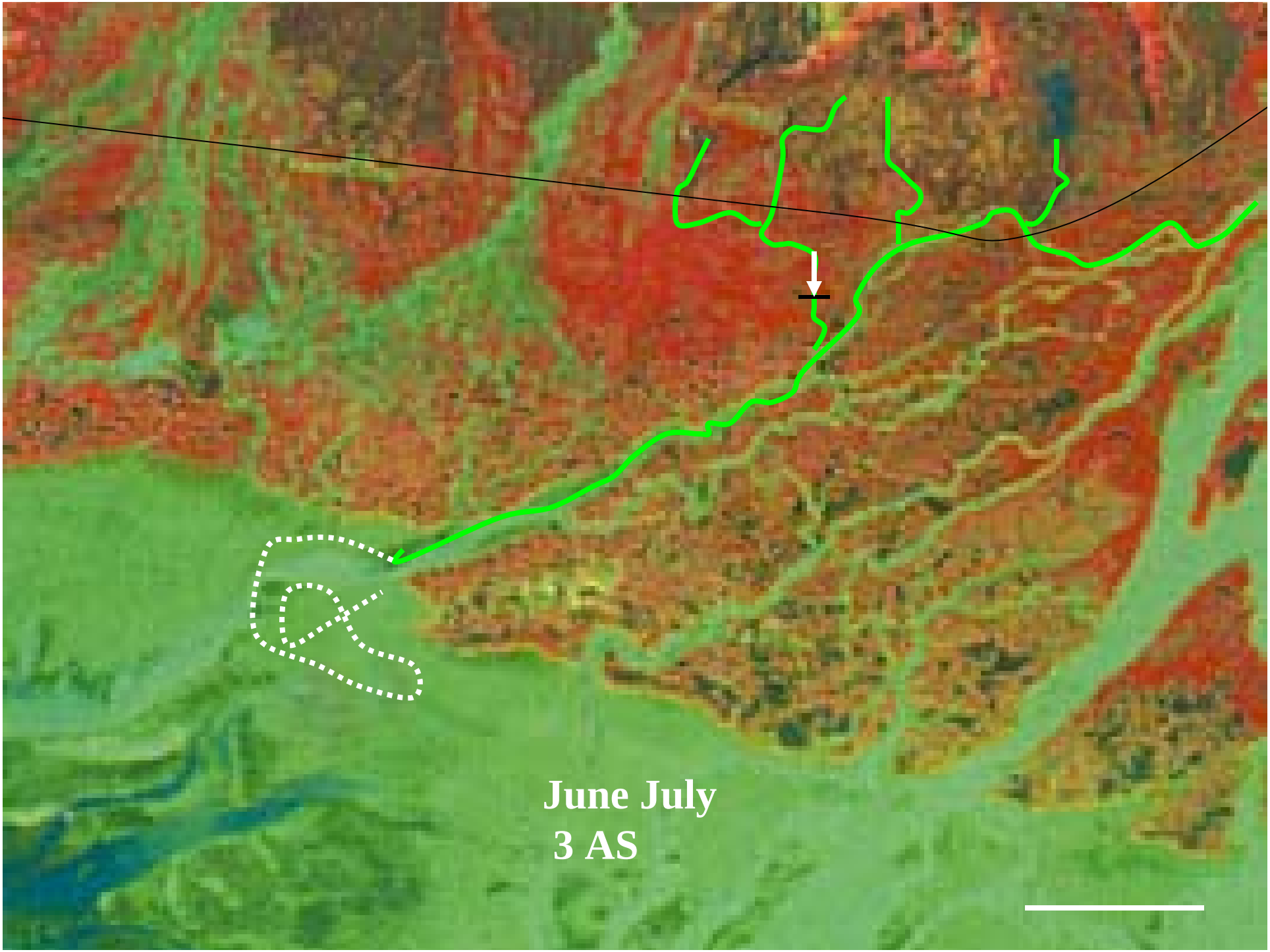

21 Oct TS

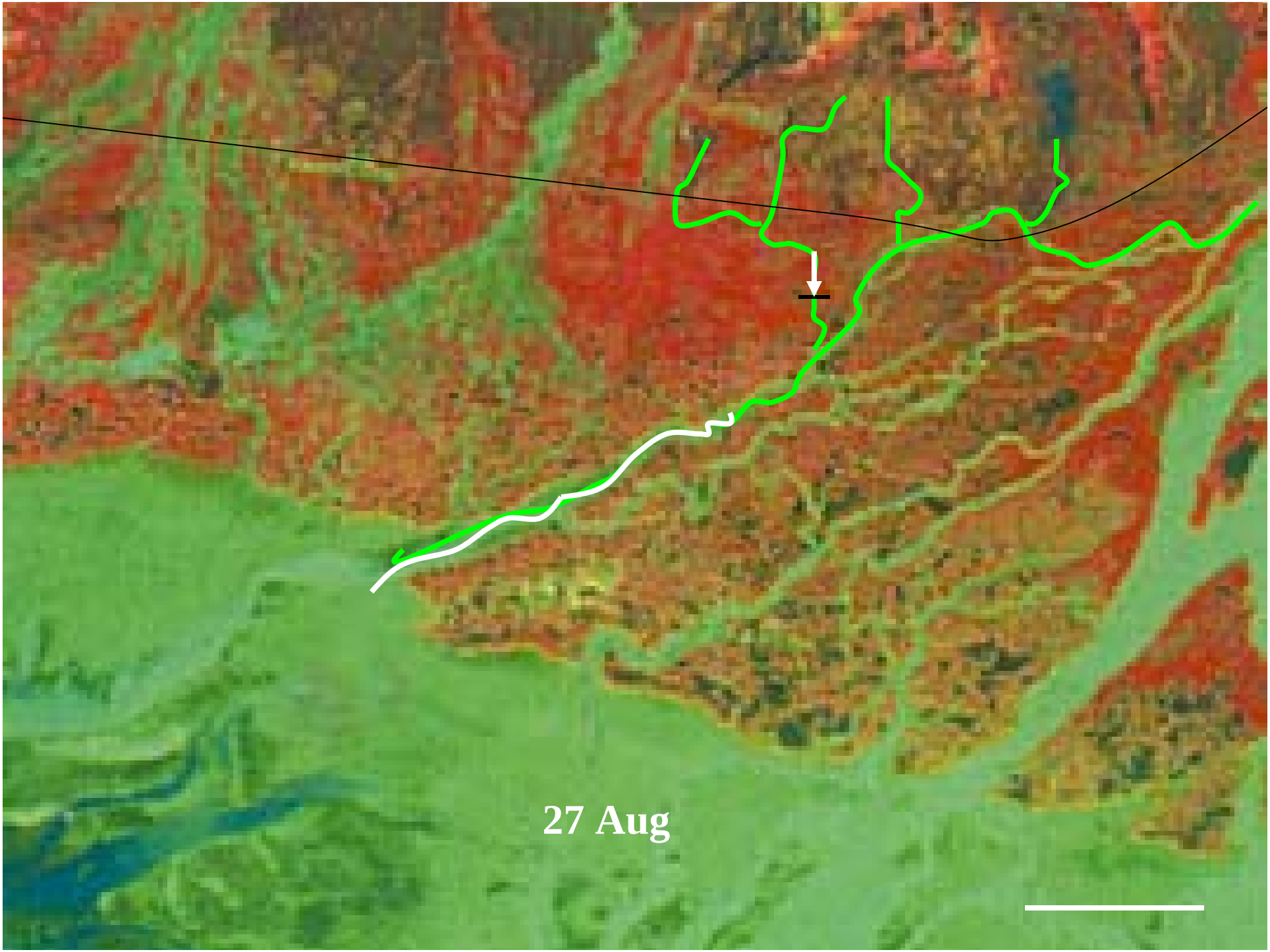
272 Down to salt


272 tagged
10 May

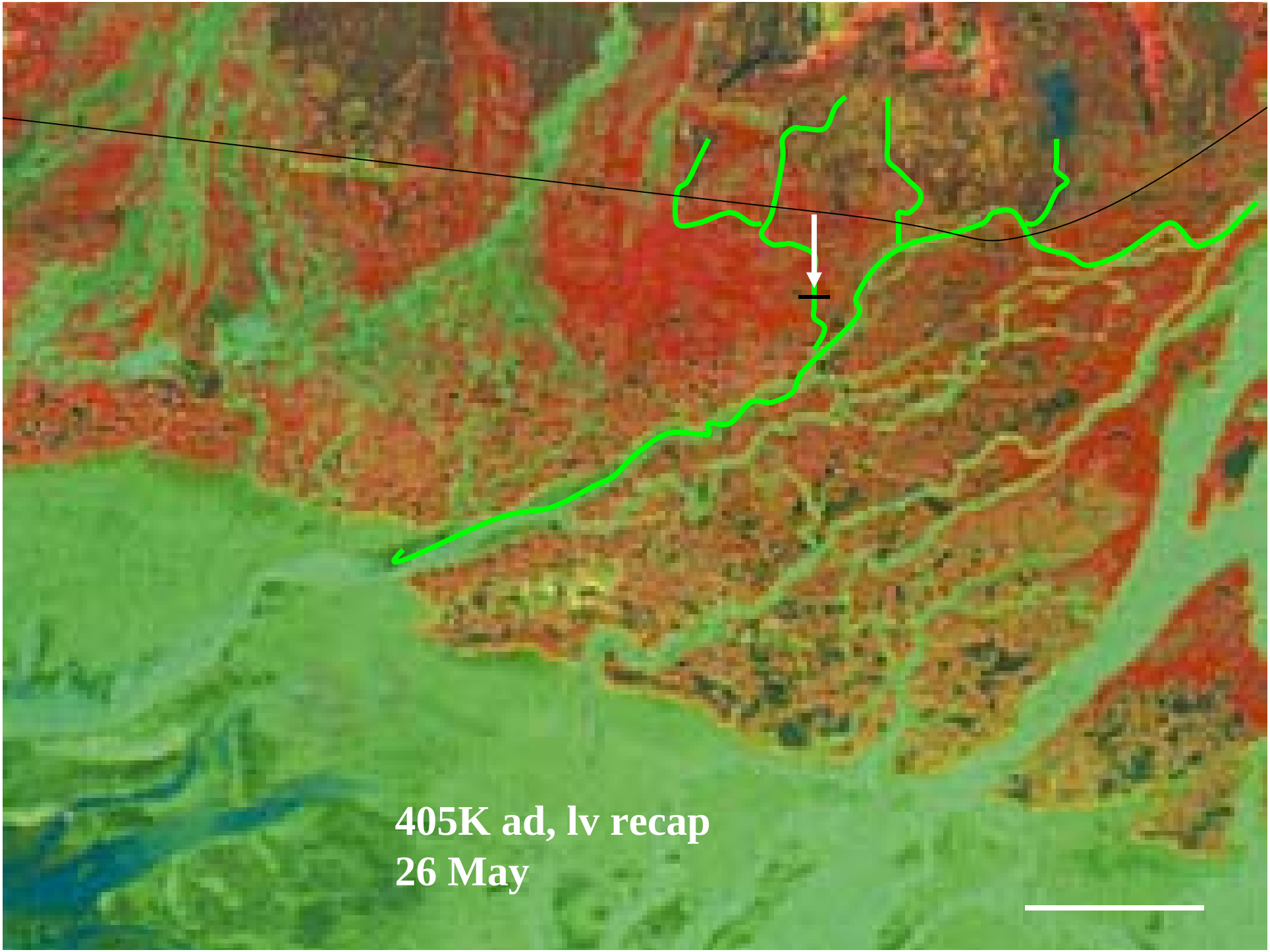

14 May

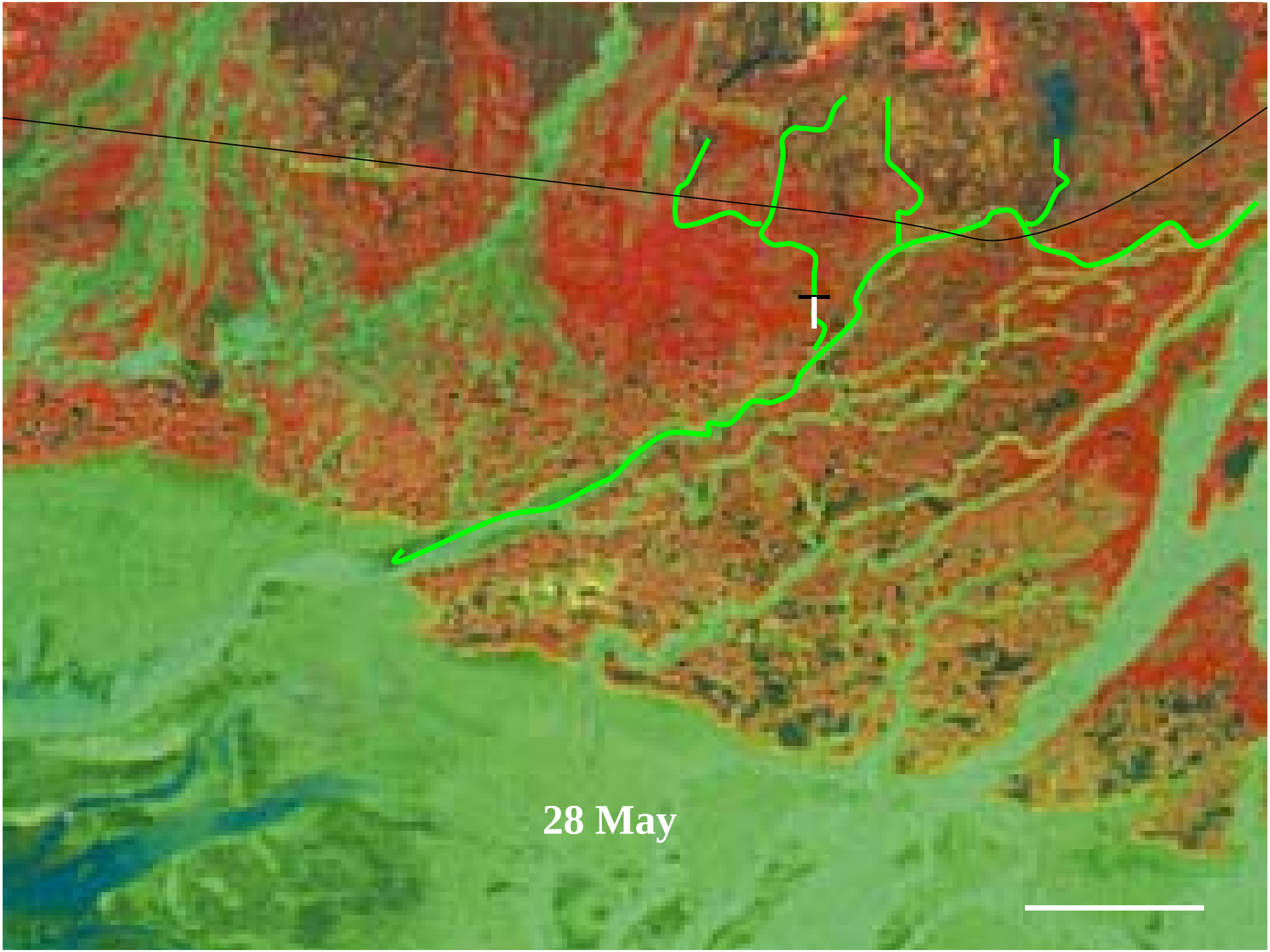

30 May
3 AS

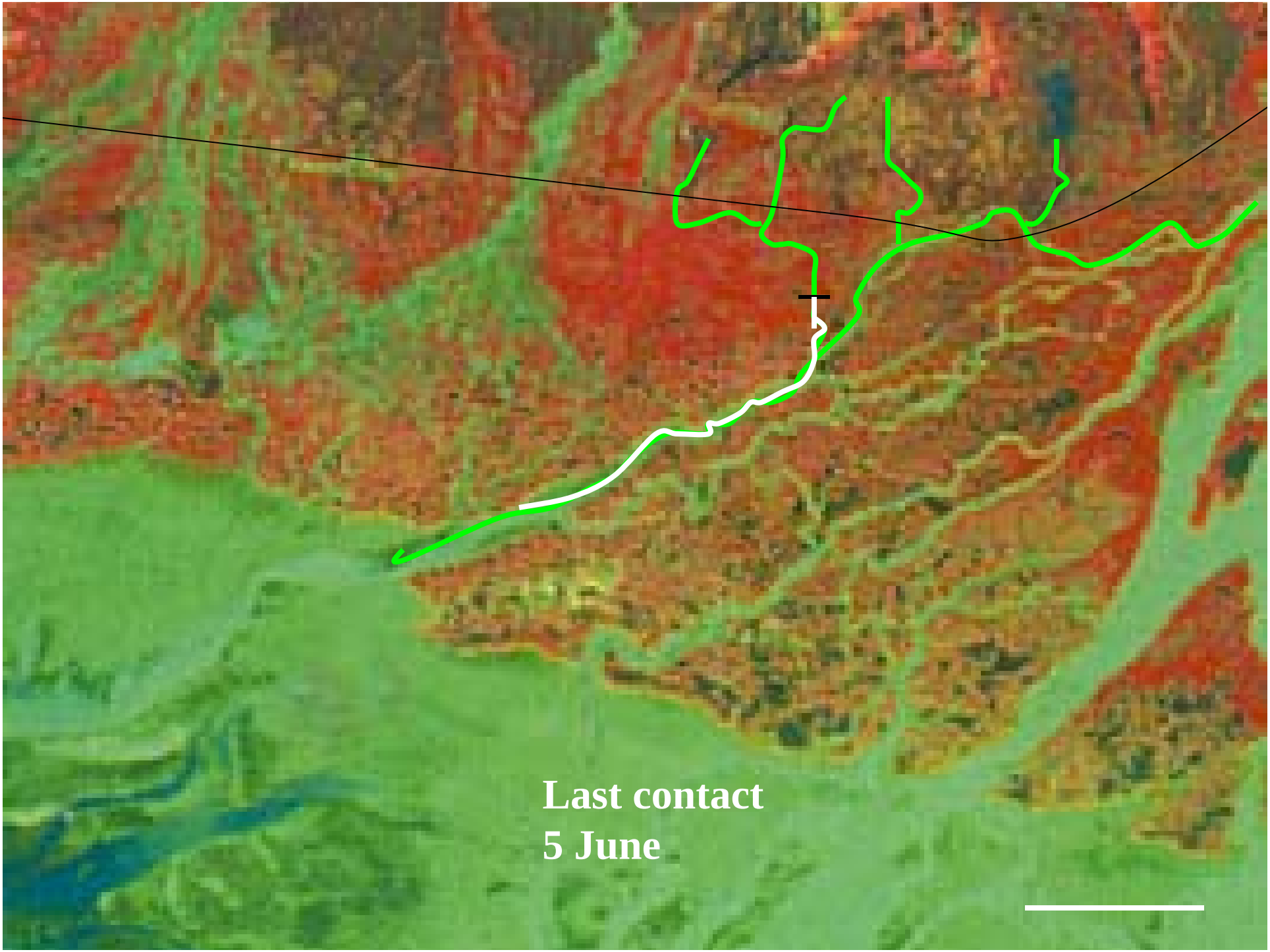

June July
3 AS


27 Aug

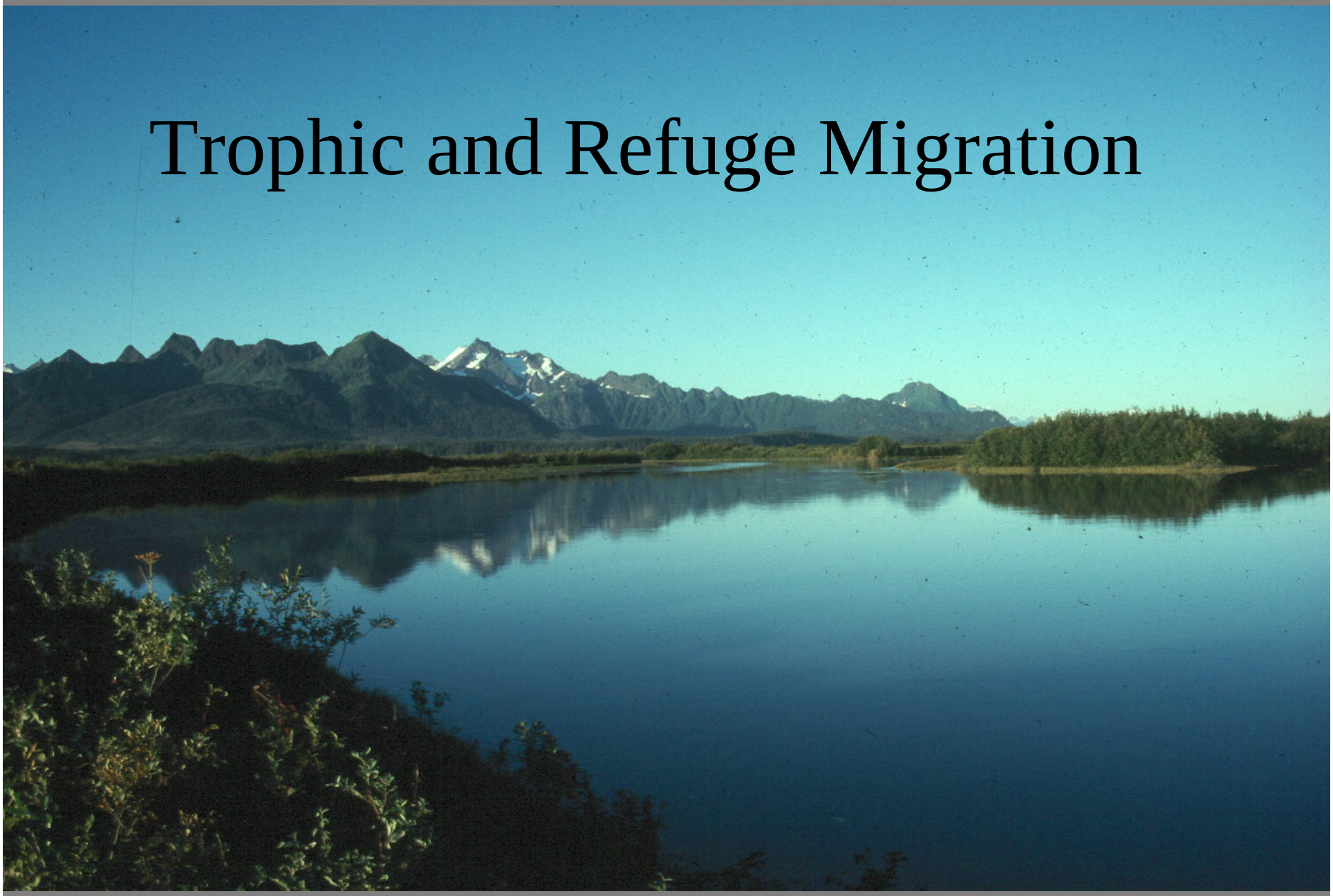
405 kelt moving downstream thru weir


405K ad, lv recap
26 May

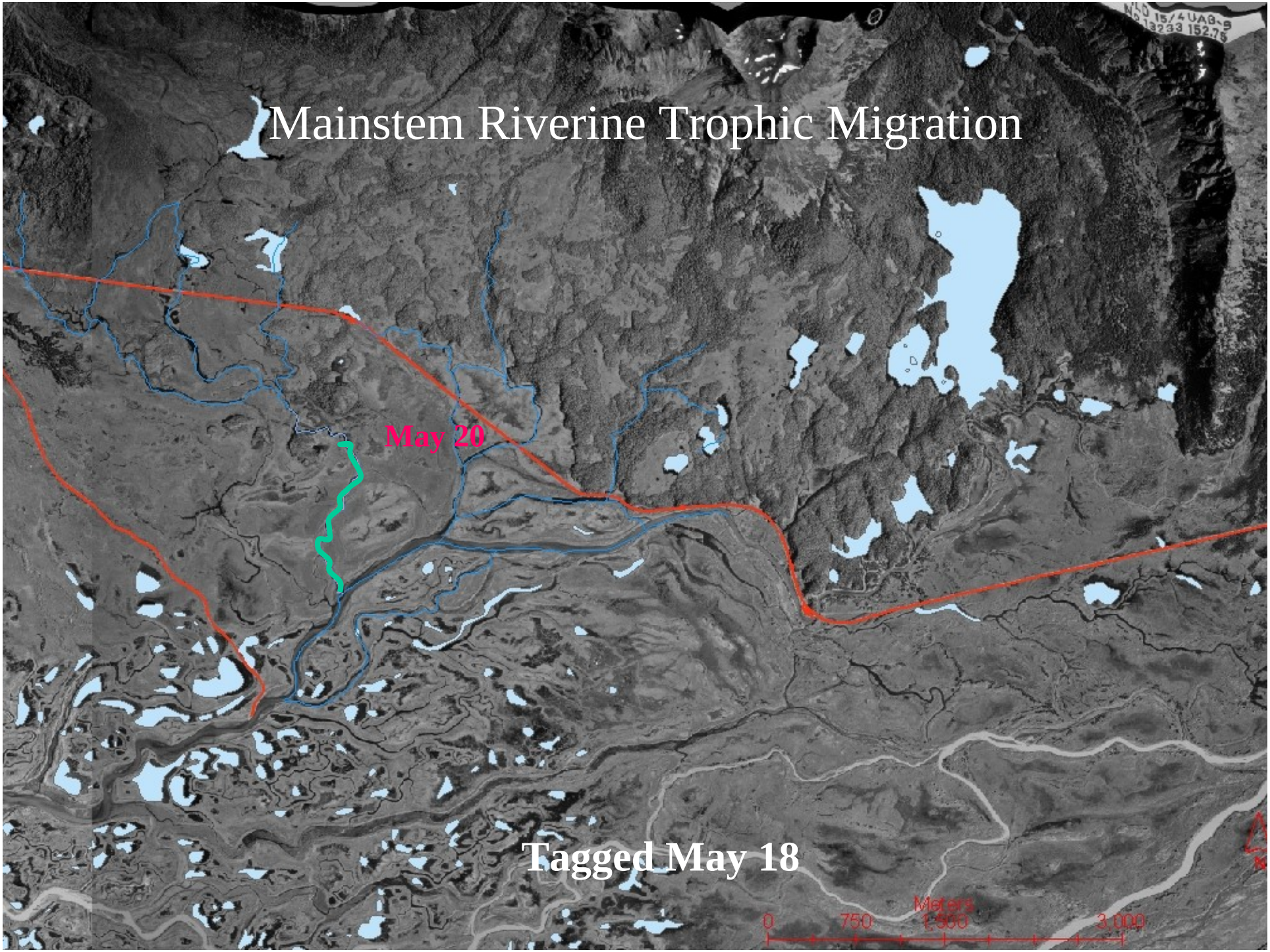

28 May

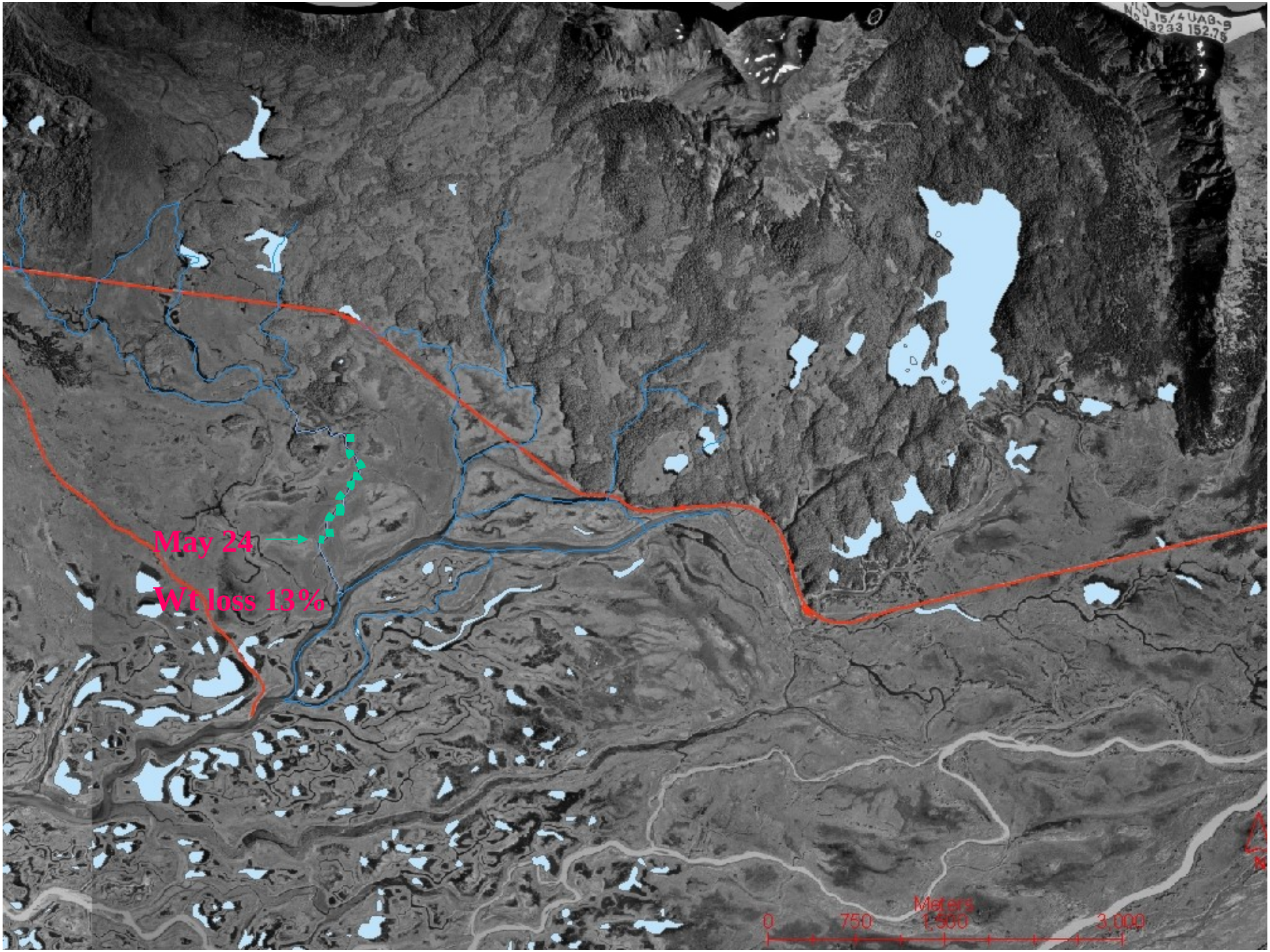

Last contact
5 June

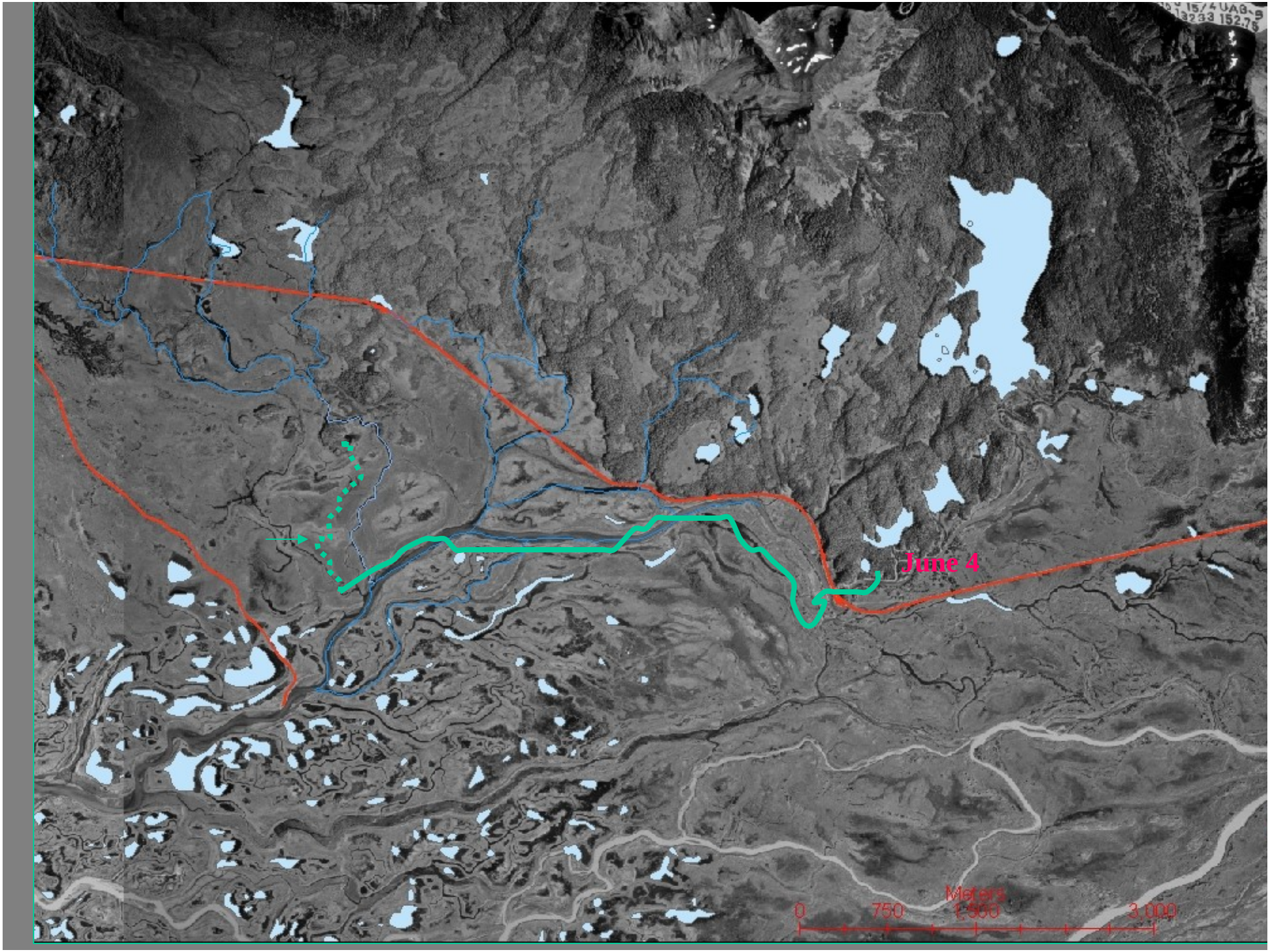
Trophic and Refuge Migration

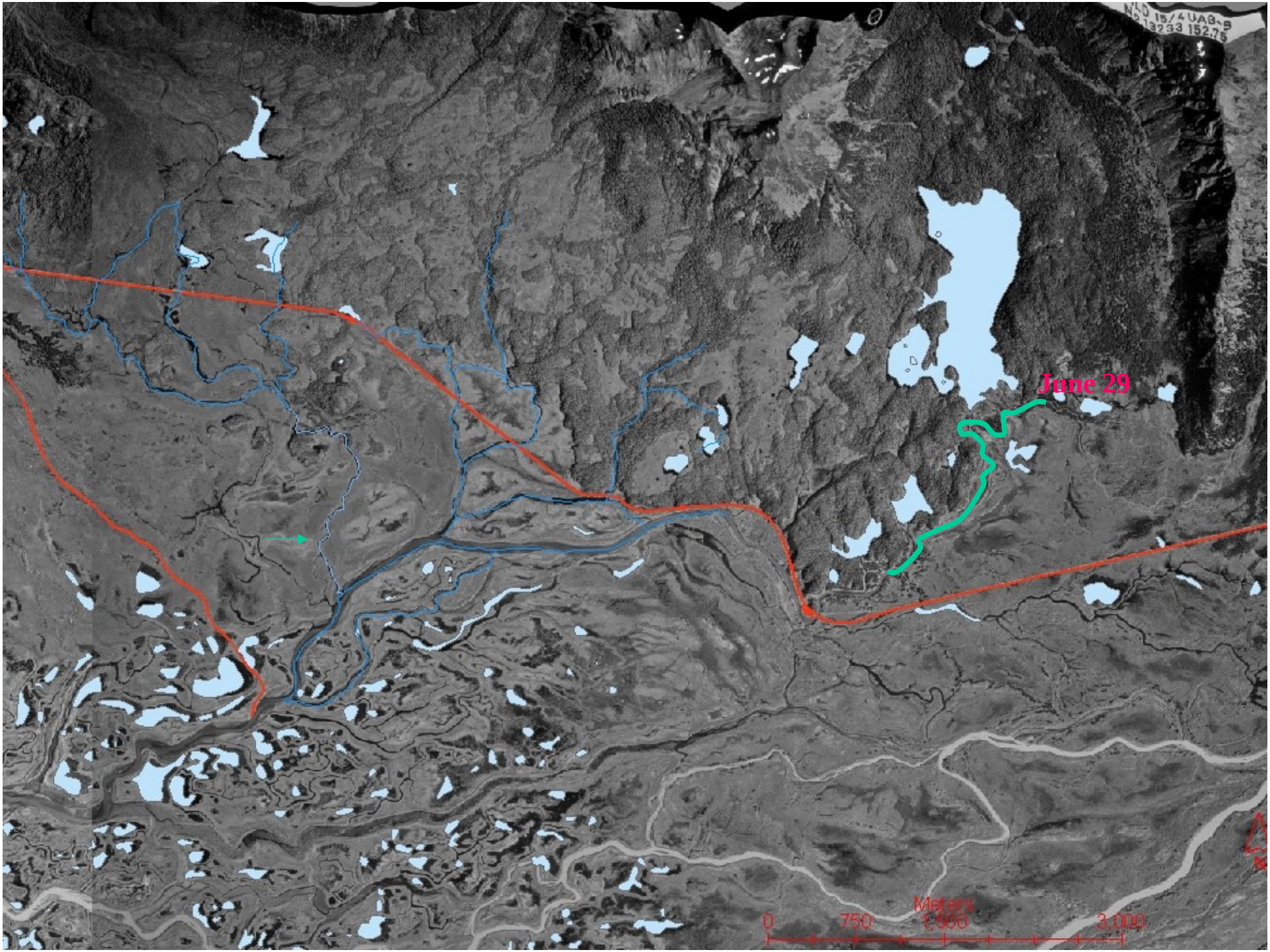


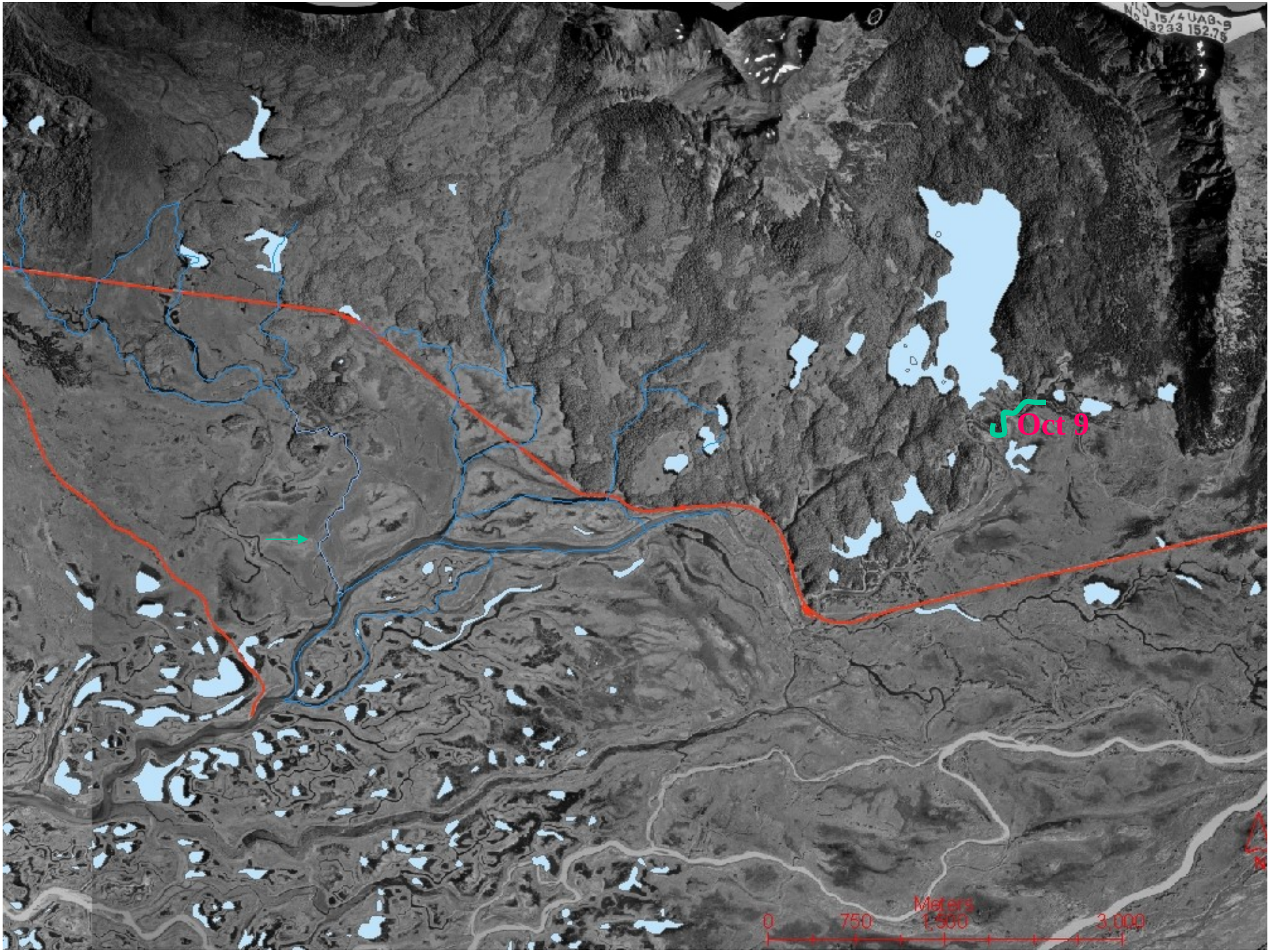
Mainstem Riverine Trophic Migration

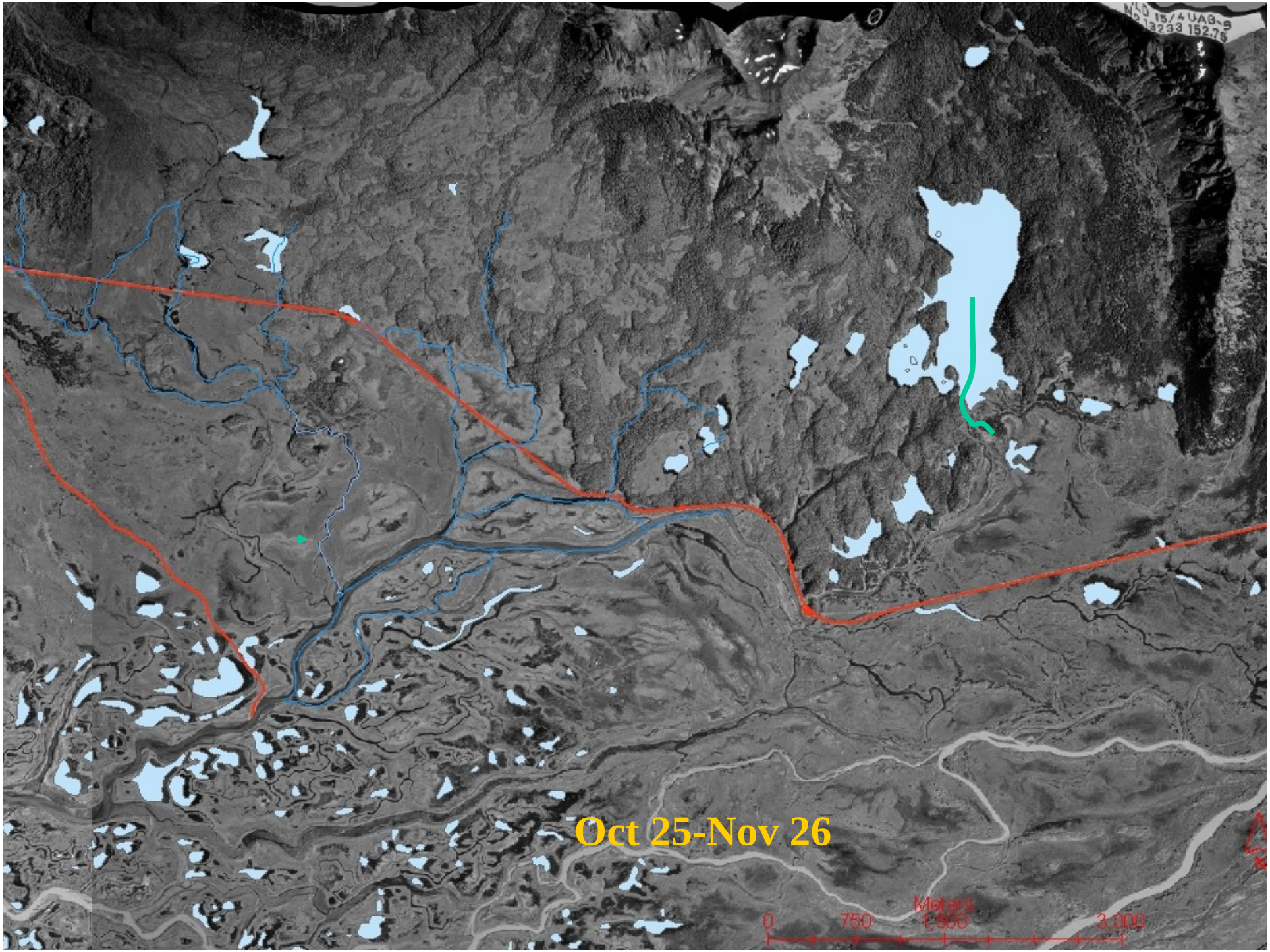



May 24
Wt loss 13%
Meters
0
750
1,500
3,000

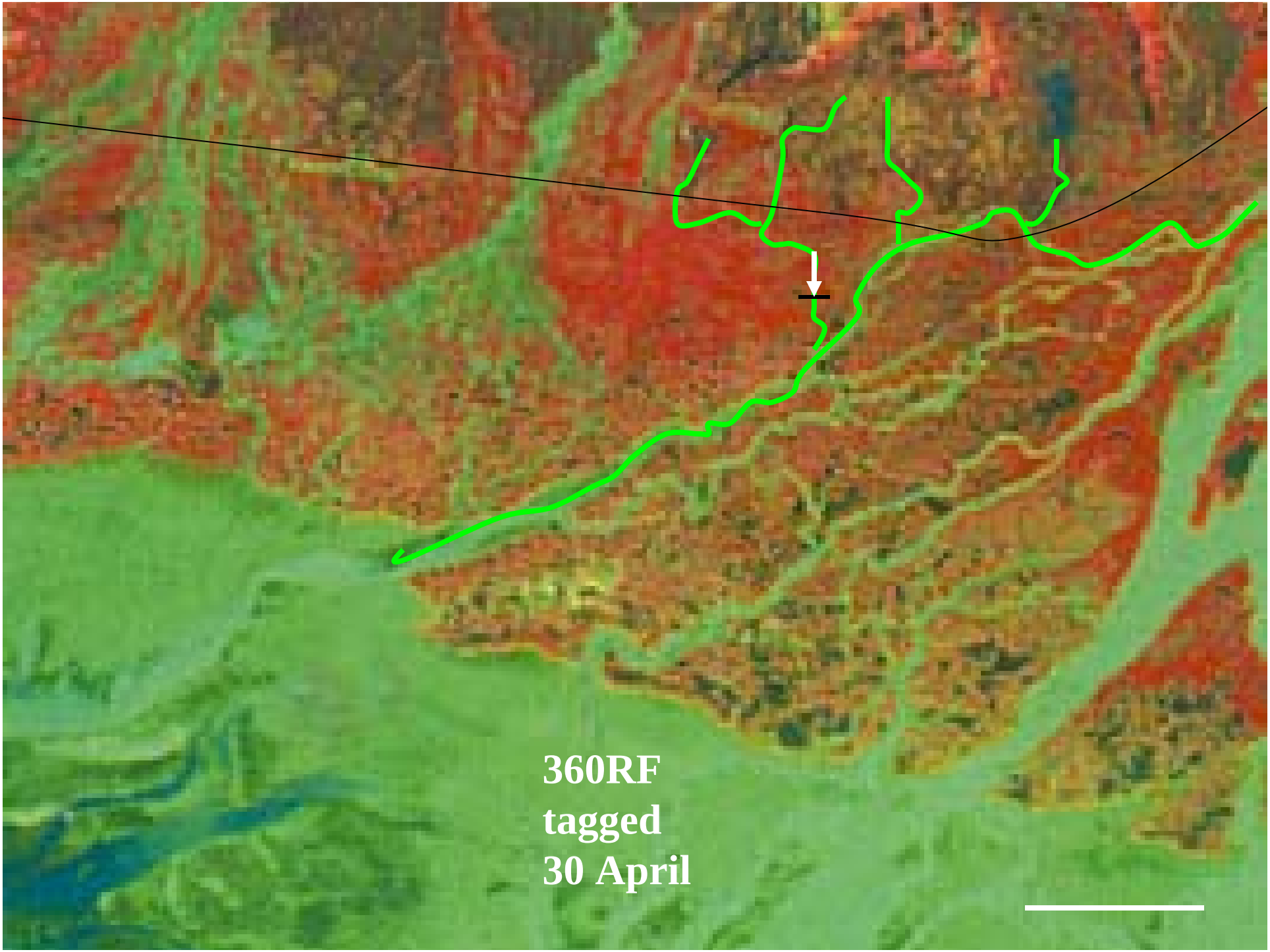

June 4
Meters
0
750
1,500
3,000

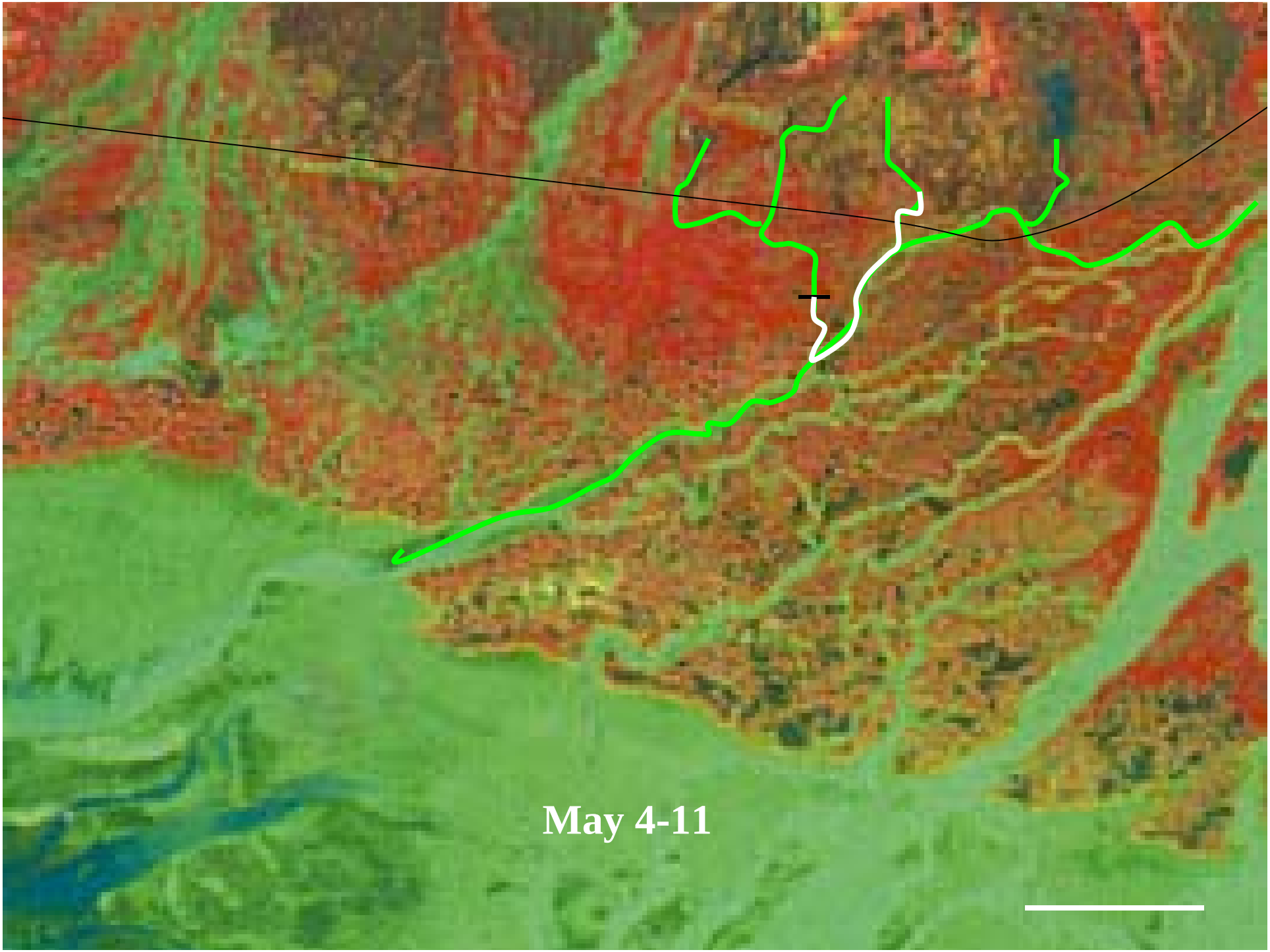

June 29
Meters
0
750
1,500
3,000

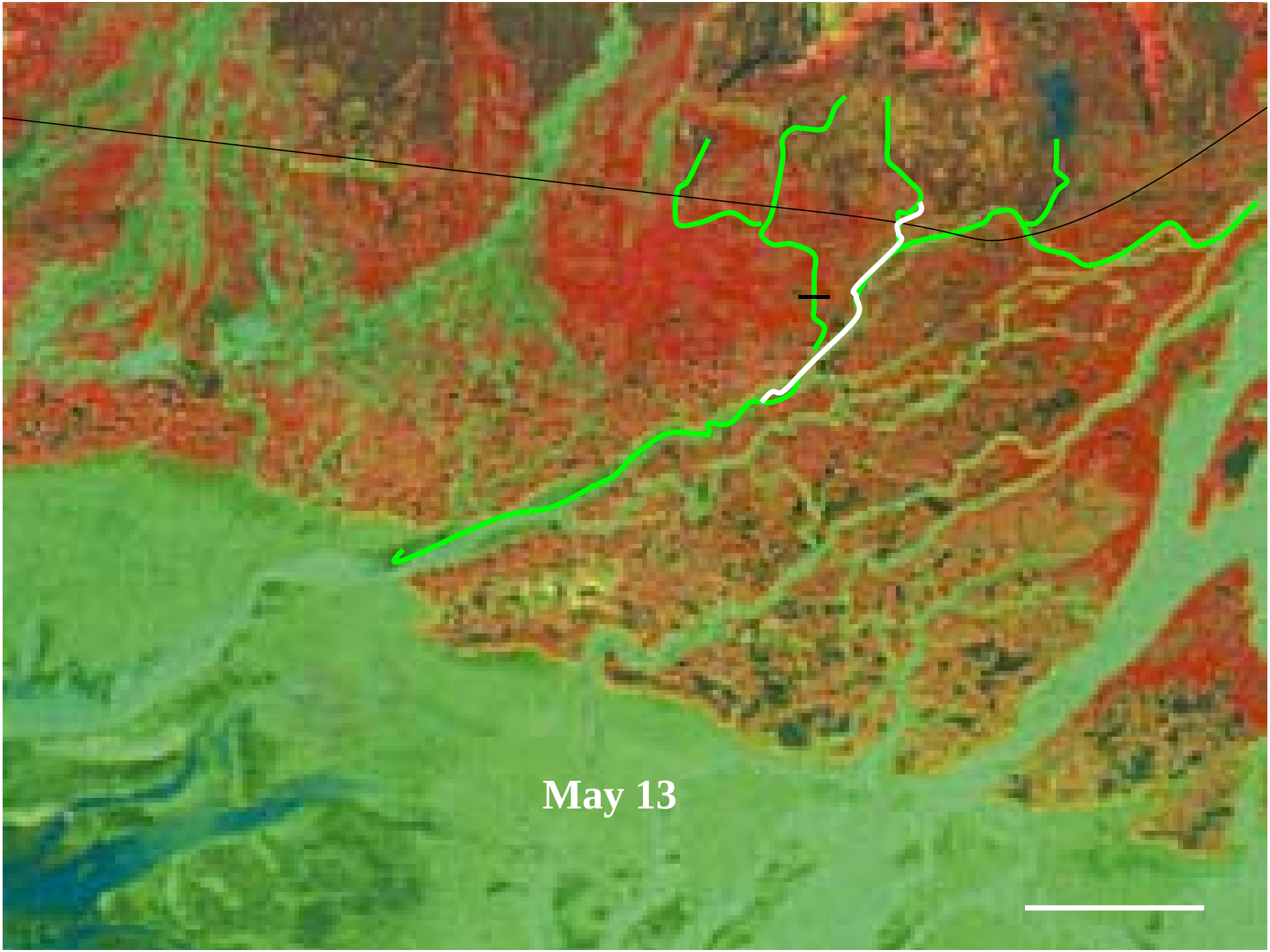

Oct 9
Meters
0
750
1,500
3,000

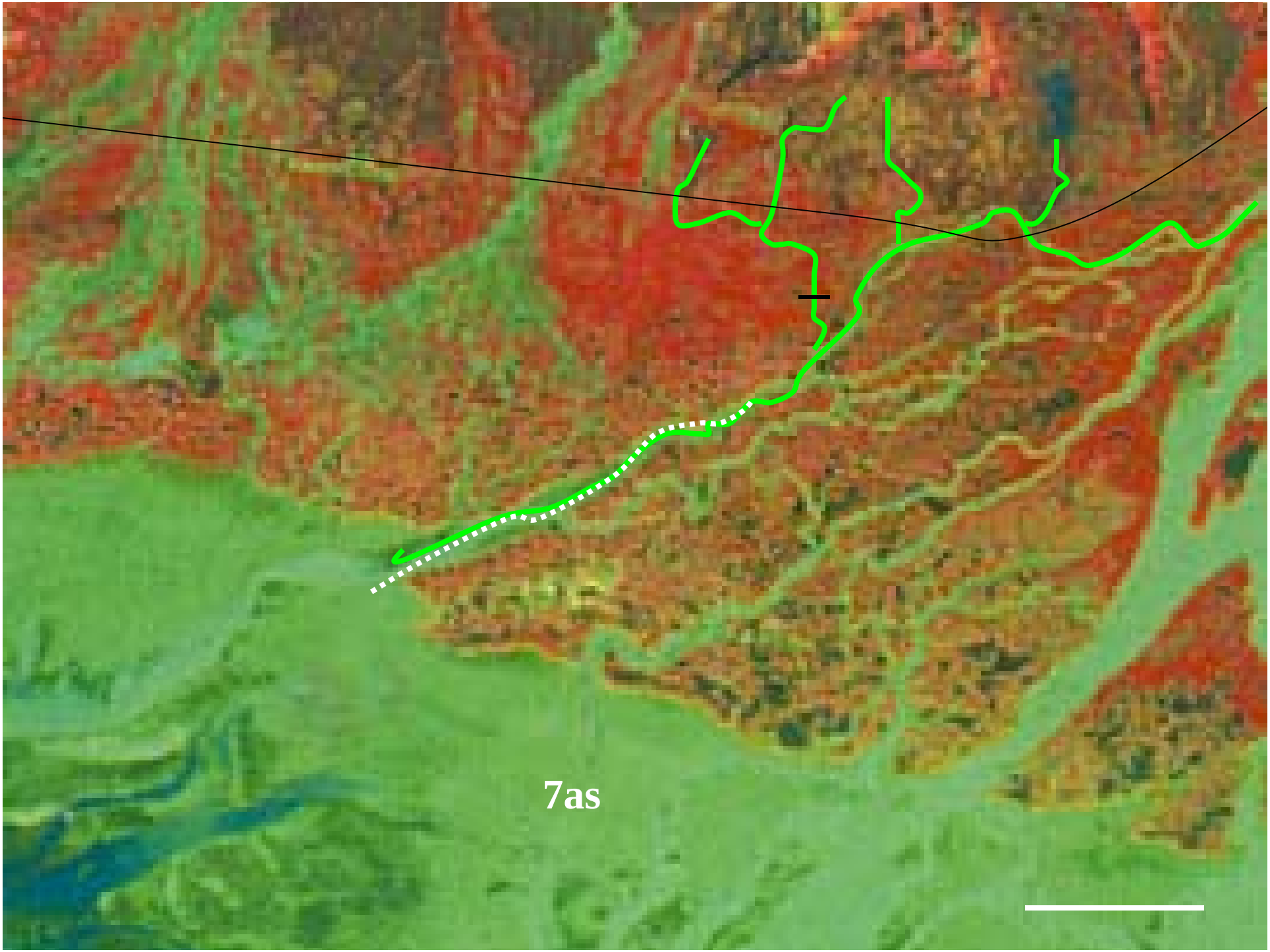

Oct 25-Nov 26
Meters
0
750
1,500
3,000

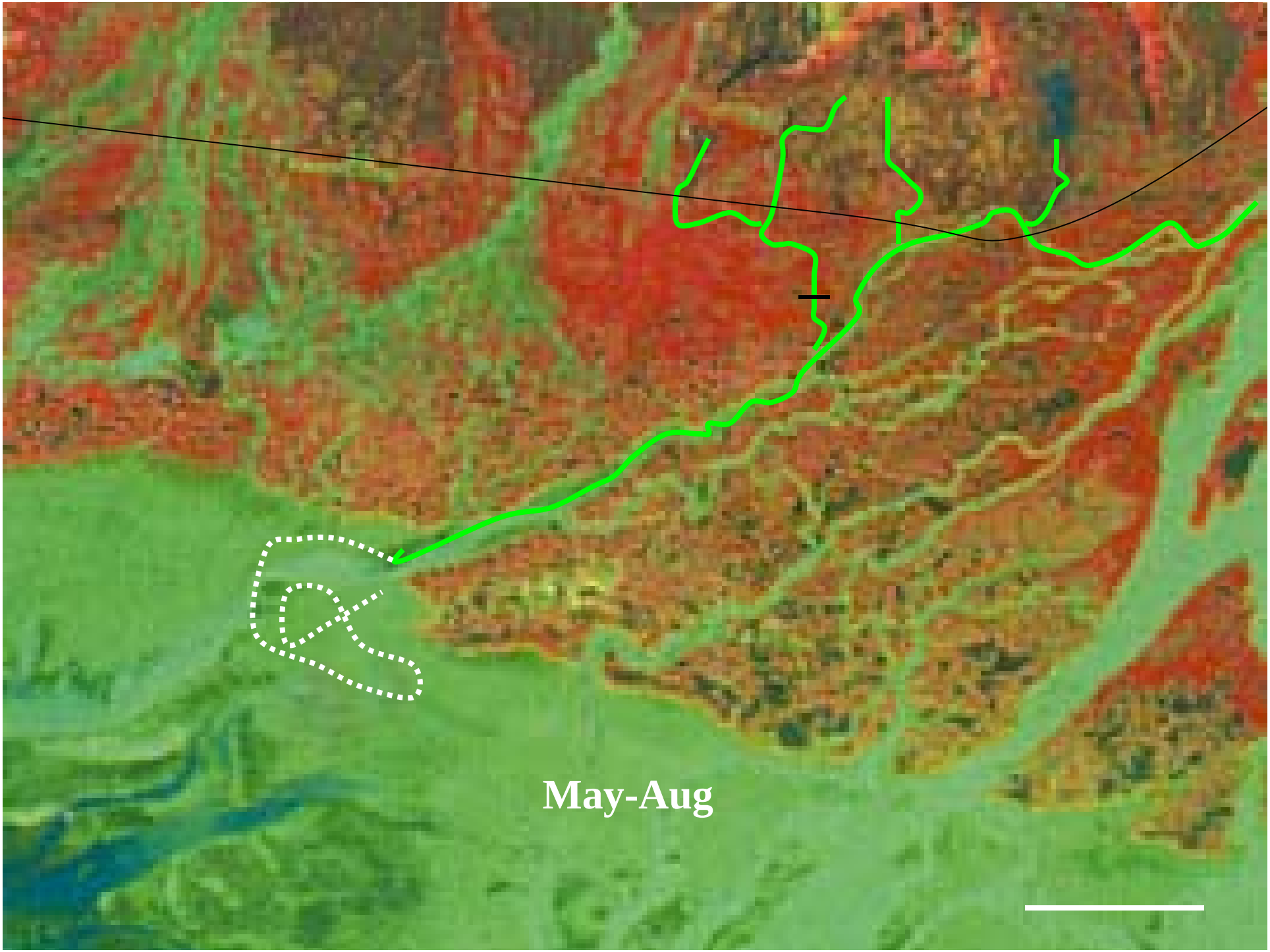
360 RF saltwater trophic migration

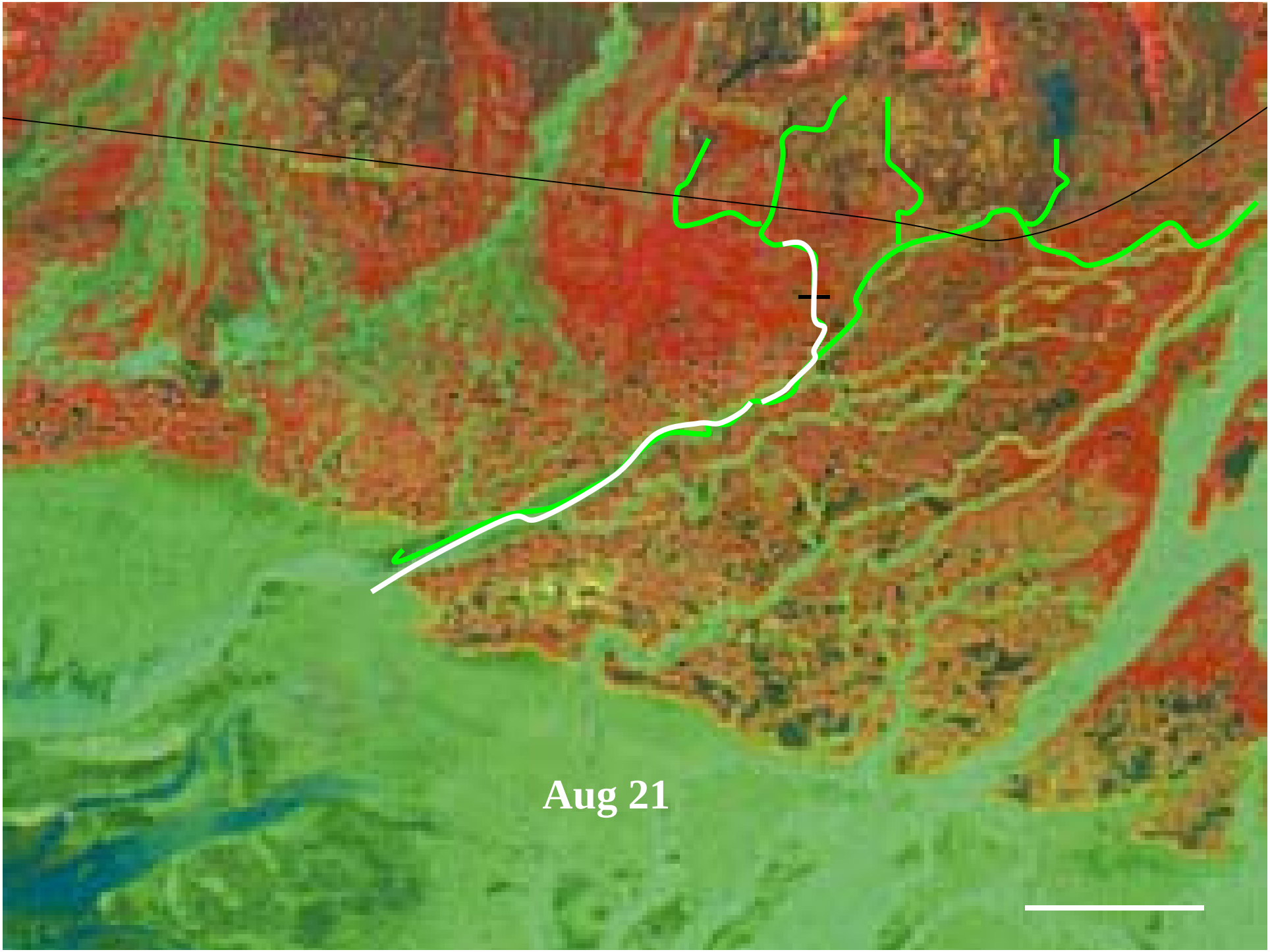

360RF
tagged
30 April

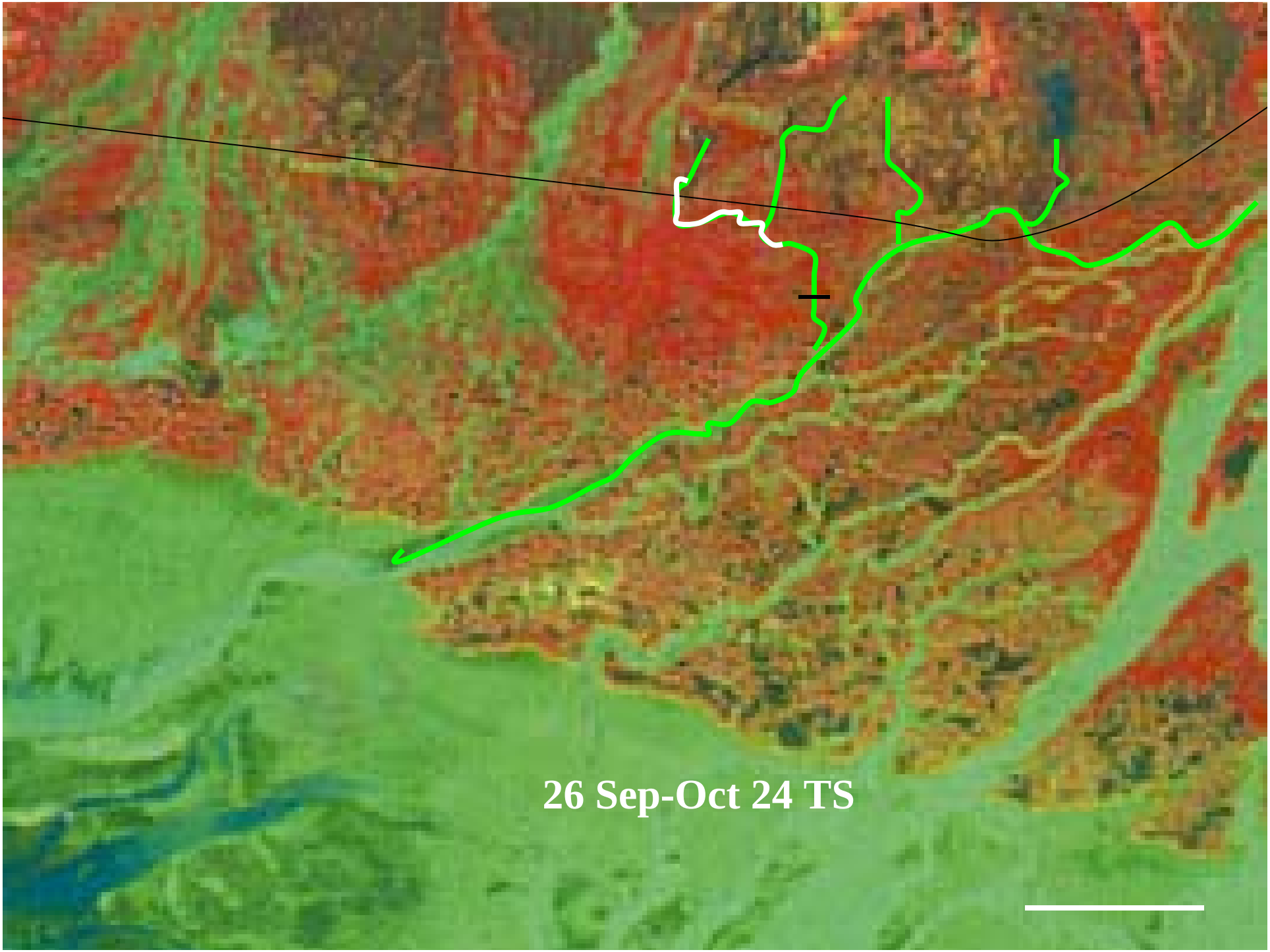

May 4-11


May 13

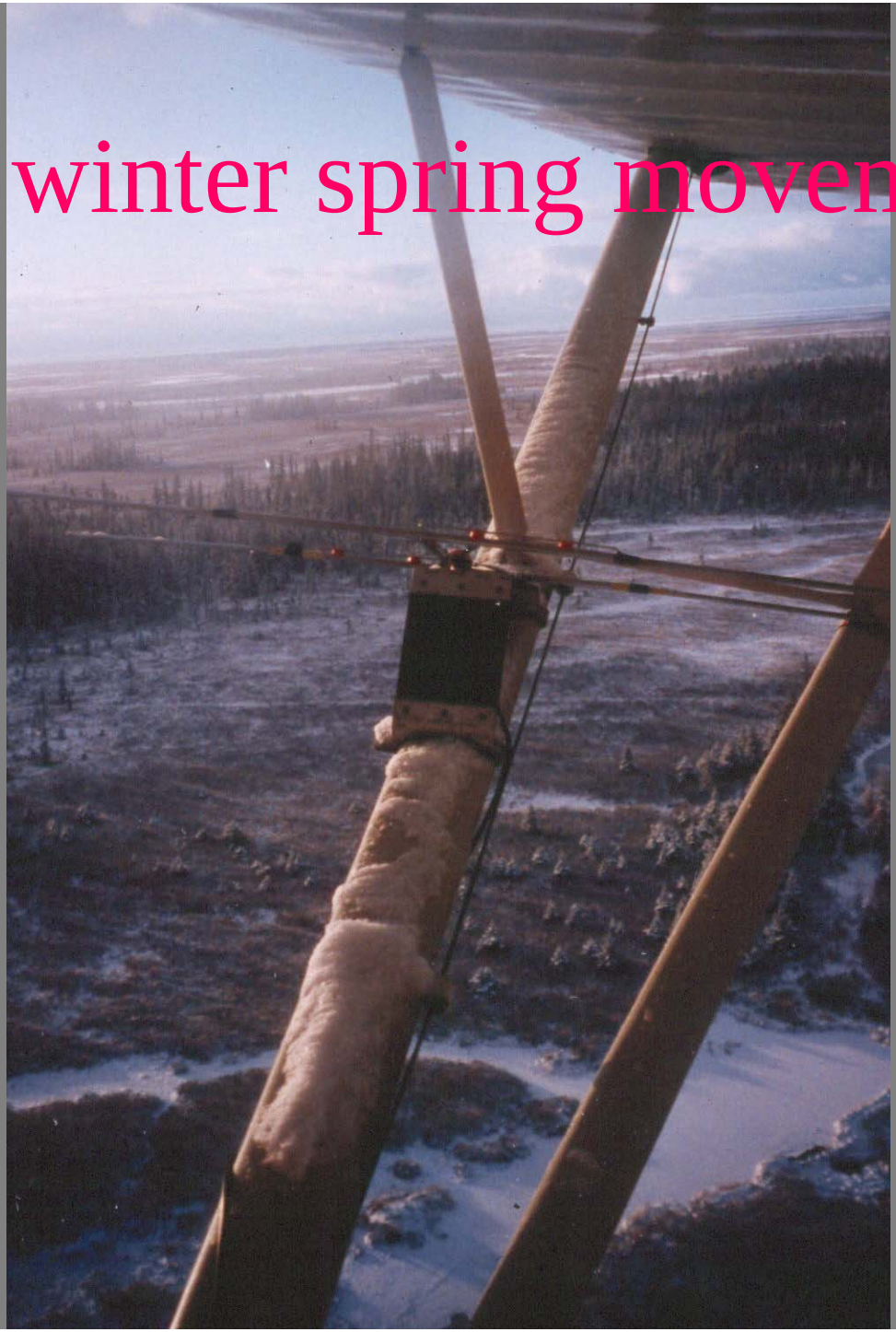

7as

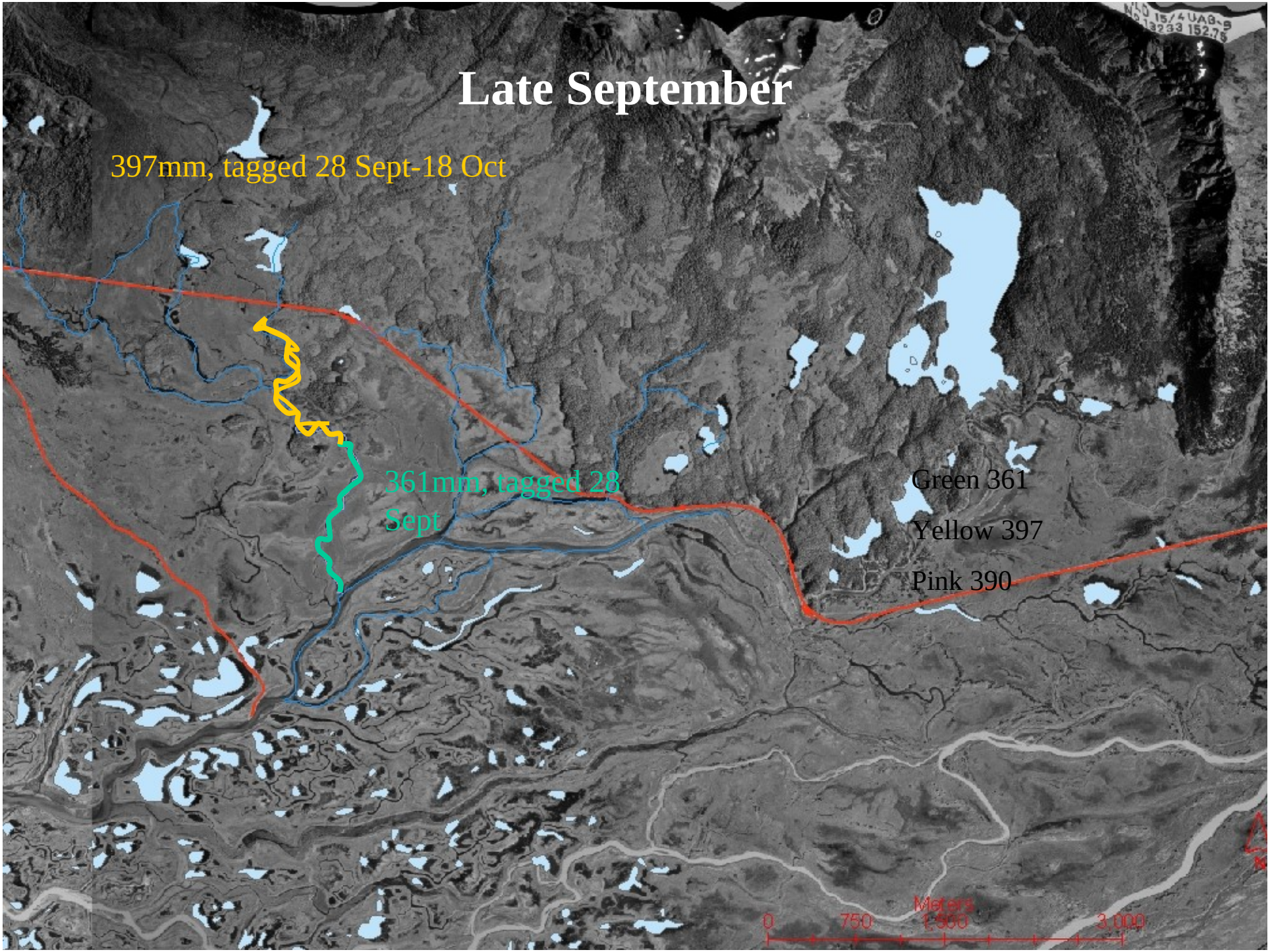

May-Aug

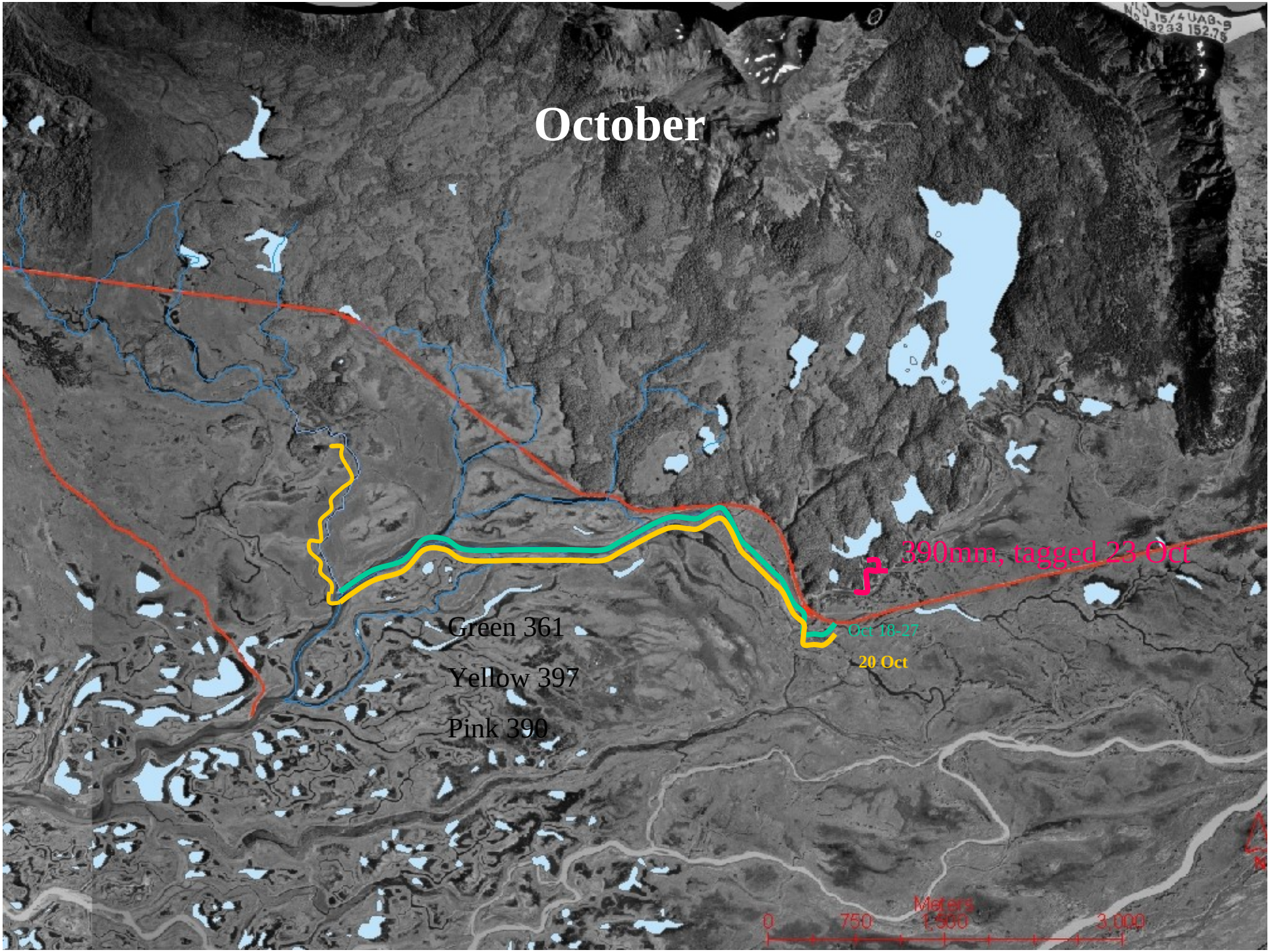

Aug 21


26 Sep-Oct 24 TS

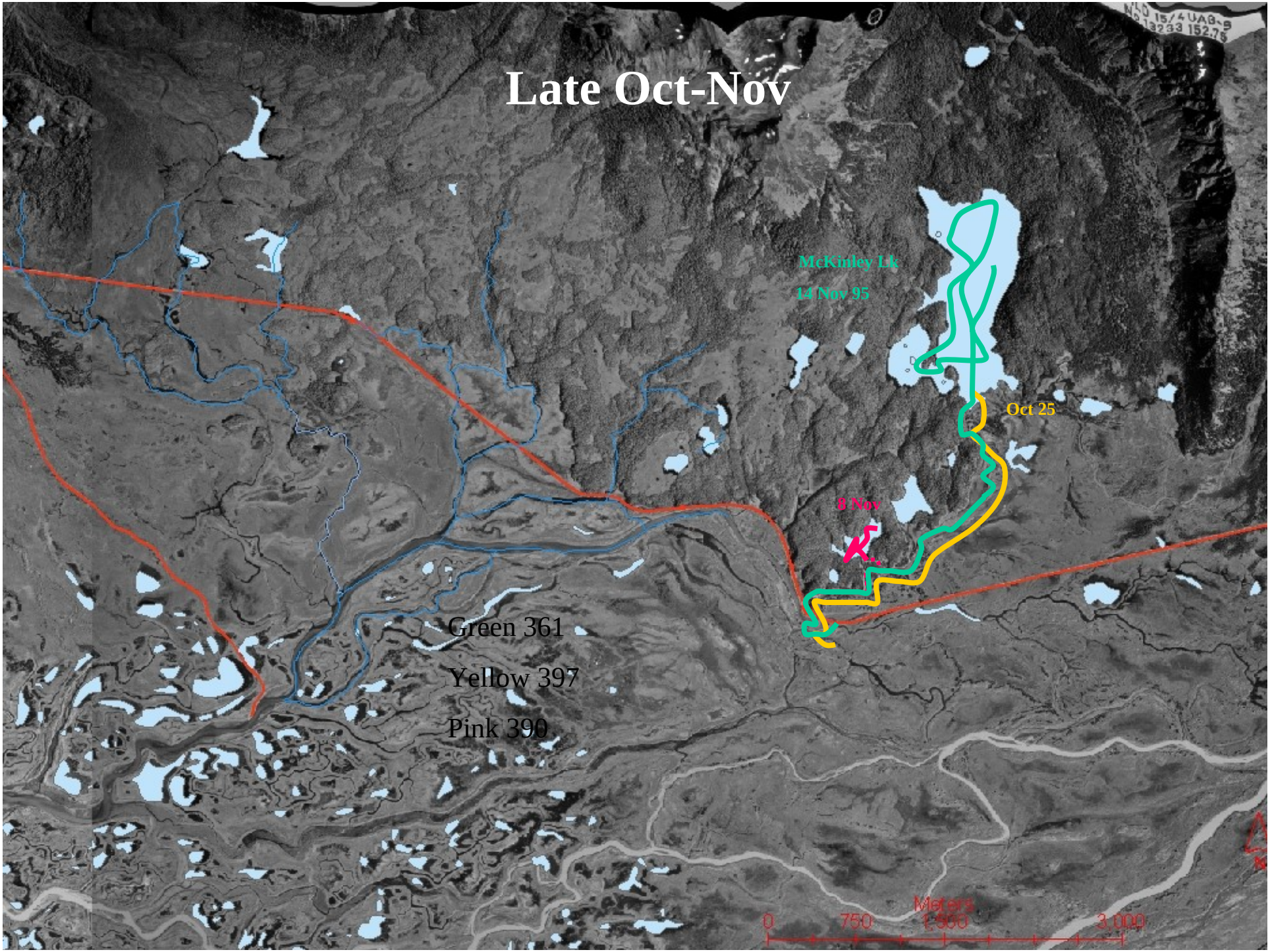
Fall winter spring movements

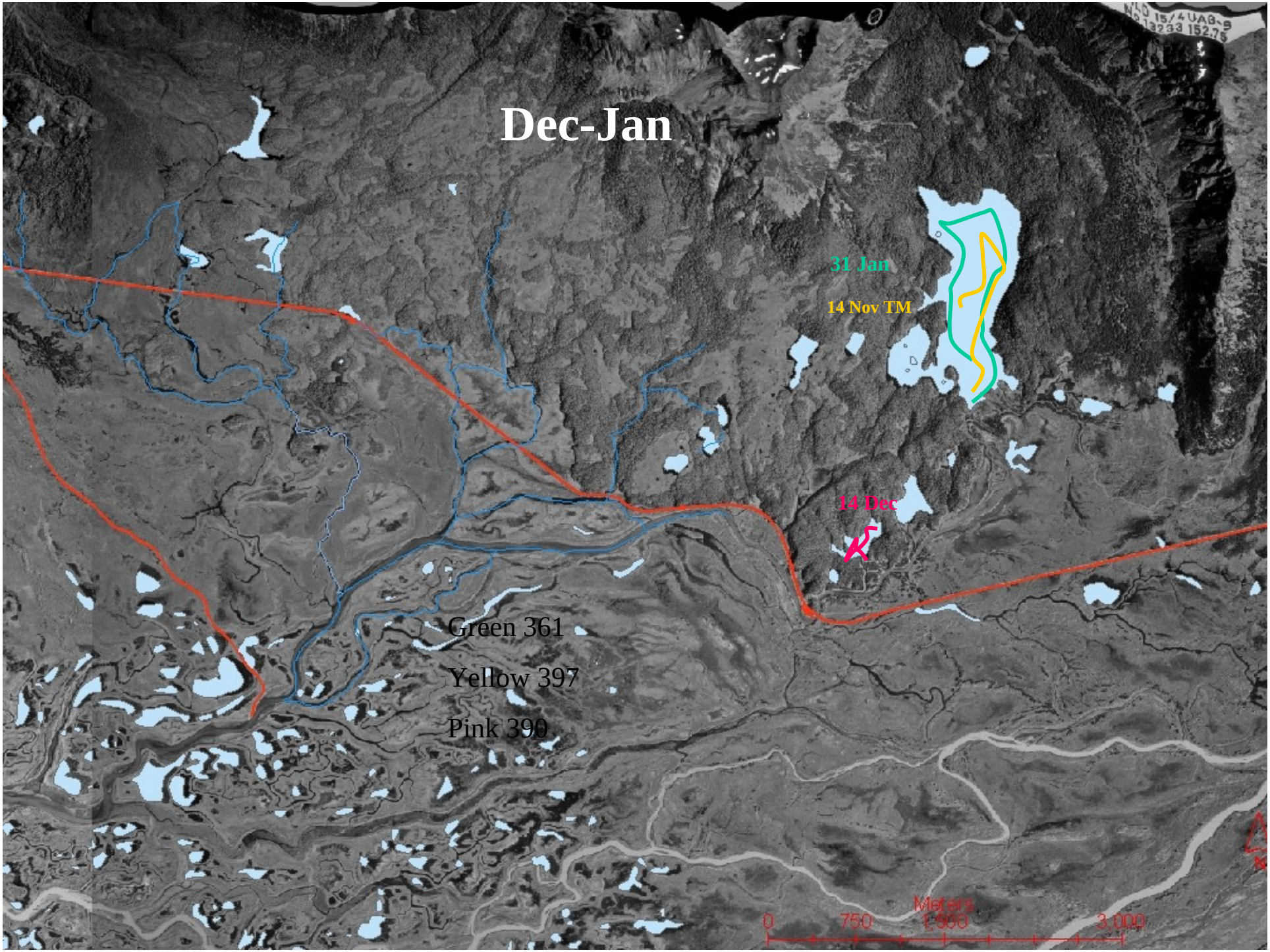


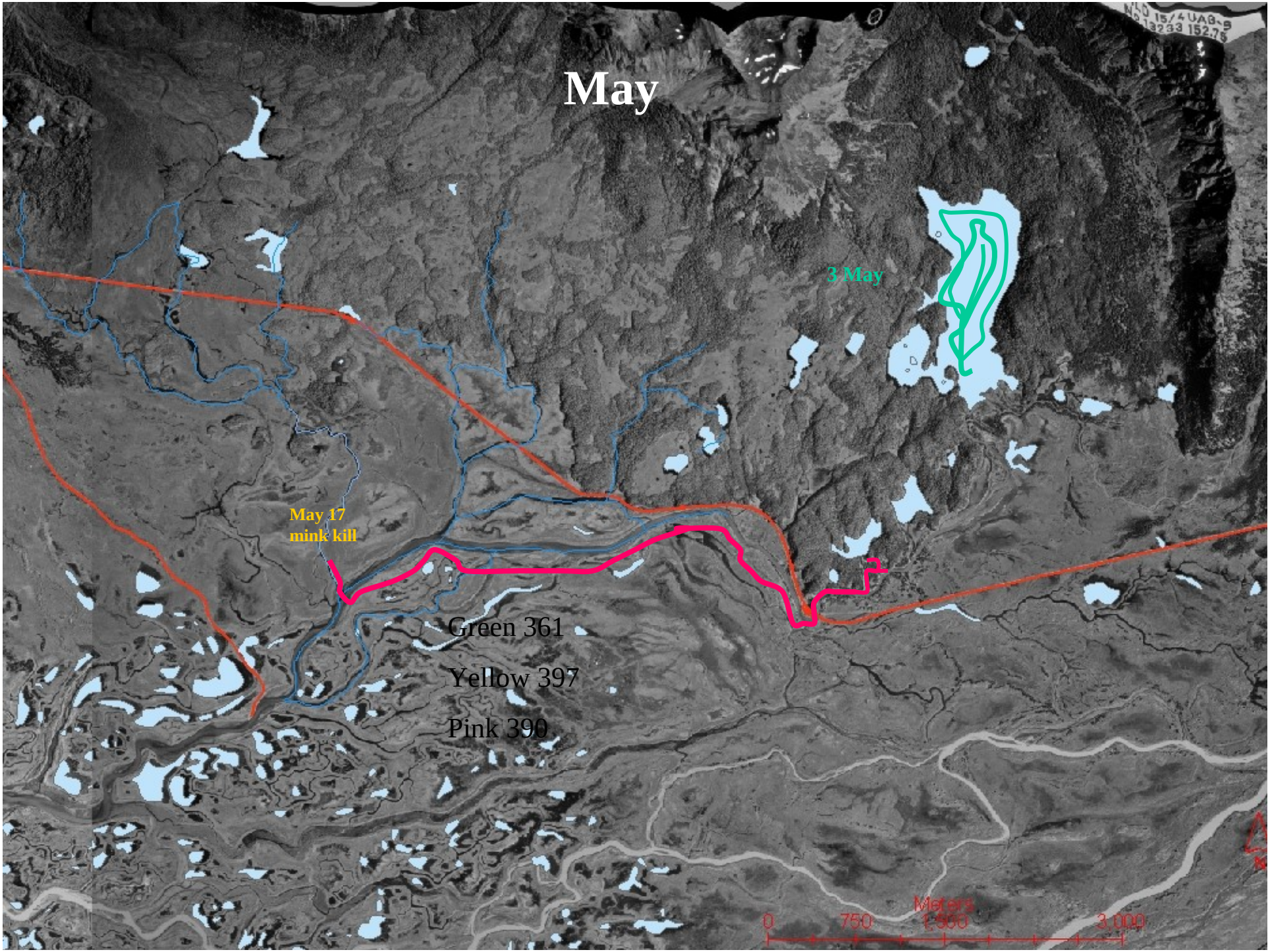

Late September
397mm, tagged 28 Sept-18 Oct
361mm, tagged 28 Sept
Green 361
Yellow 397
Pink 390
Meters
0
750
1,500
3,000

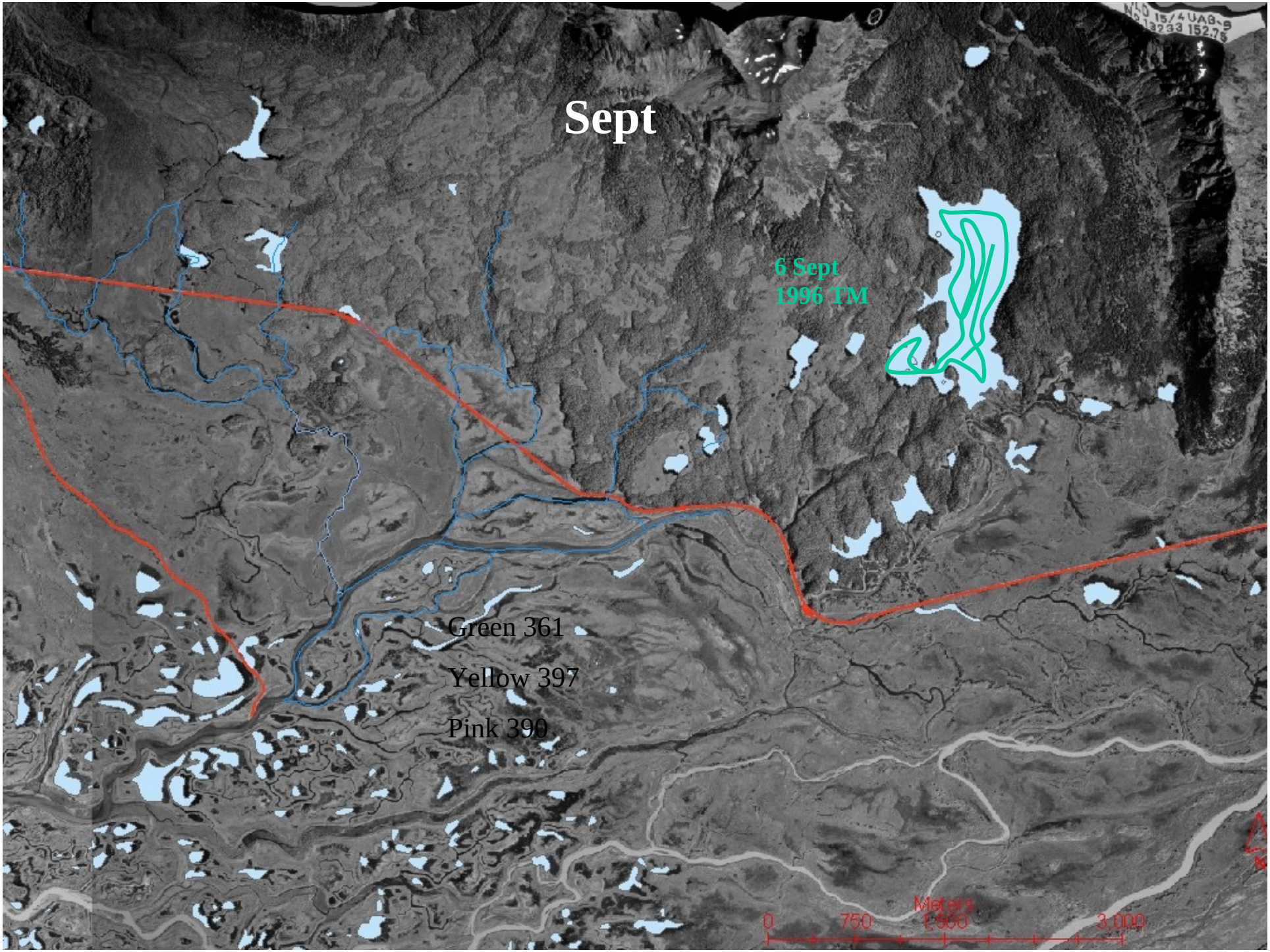

October
390mm, tagged 23 Oct
Green 361
Oct 18-27
Yellow 397
20 Oct
Pink 390
Meters
0
750
1,500
3,000

Late Oct-Nov


McKinley Lk
14 Nov 95
Oct 25
8 Nov
Green 361
Yellow 397
Pink 390
Meters
0
750
1,500
3,000

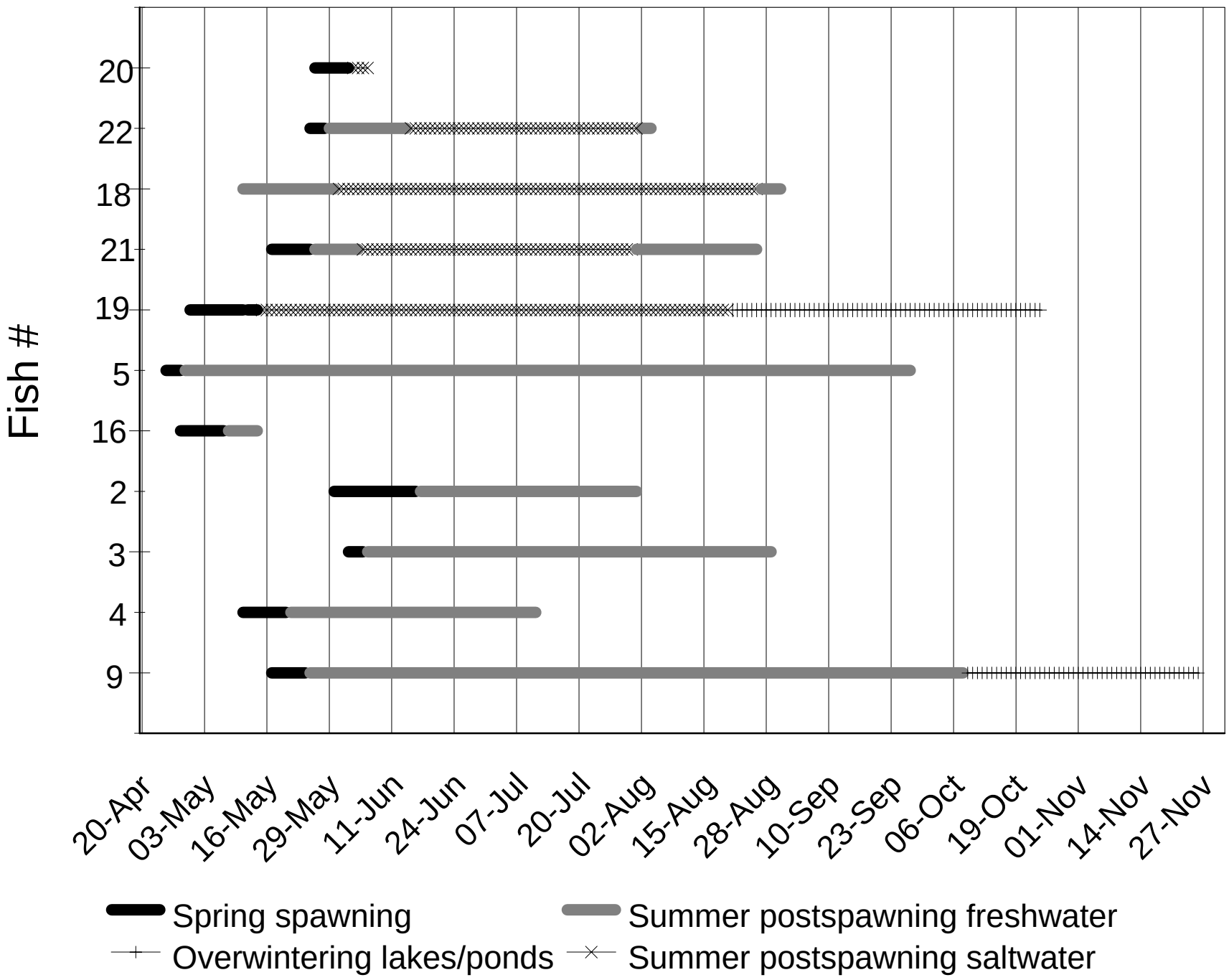

Dec-Jan
31 Jan
14 Nov TM
14 Dec
Green 361
Yellow 397
Pink 390
Meters
0
750
1,500
3,000

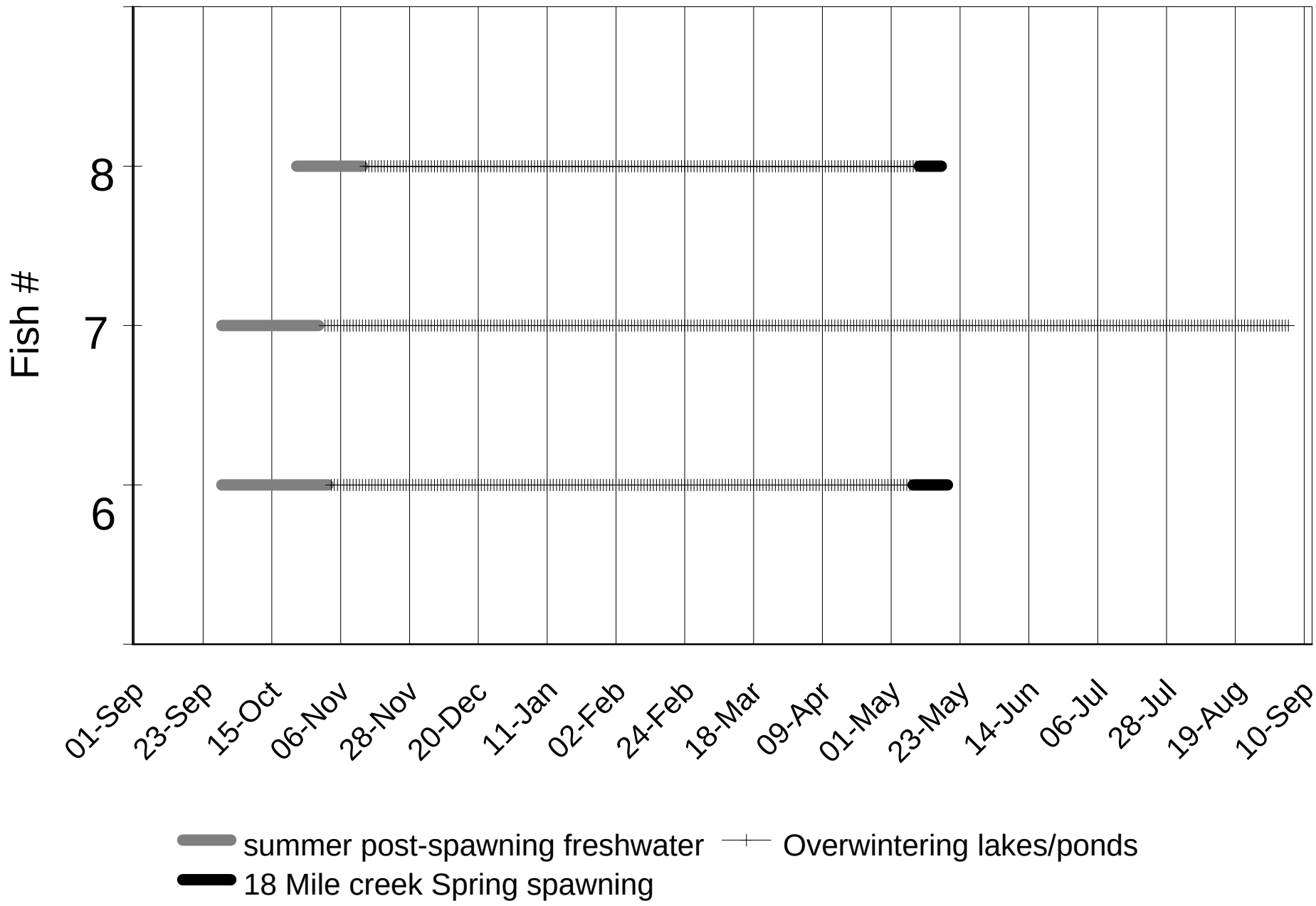

May
3 May
May 17
mink kill
Green 361
Yellow 397
Pink 390
Meters
0
750
1,500
3,000

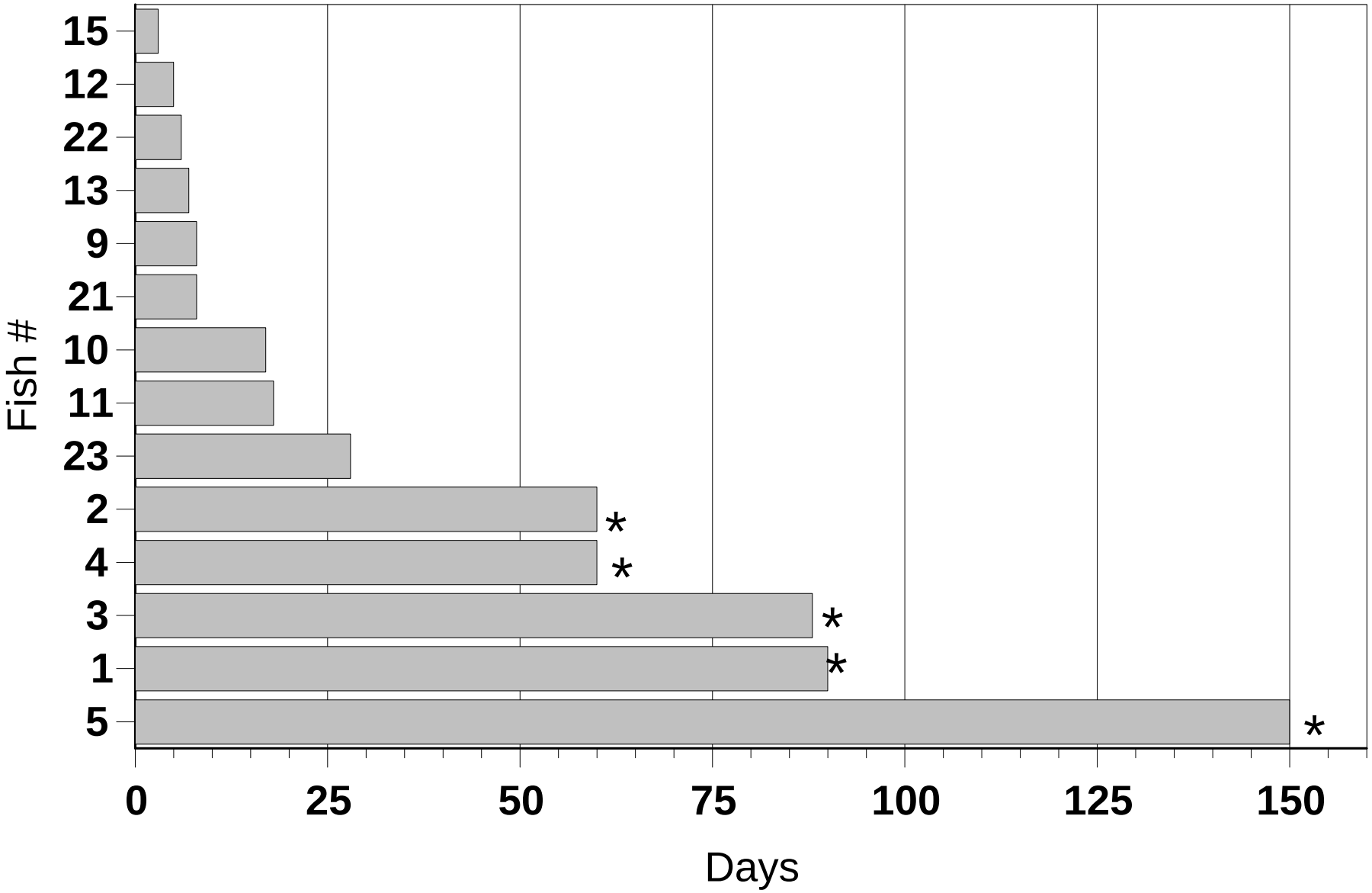

Sept
6 Sept
1996 TM
Green 361
Yellow 397
Pink 390
Meters
0
750
1,500
3,000

Headwater stream spawning interactions

Seasonal movements


Fish #
20
22
18
21
19
5
16
2
3
4
9
20-Apr
03-May
16-May
29-May
11-Jun
24-Jun
07-Jul
20-Jul
02-Aug
15-Aug
28-Aug
10-Sep
23-Sep
06-Oct
19-Oct
01-Nov
14-Nov
27-Nov
Spring spawning
Summer postspawning freshwater
Overwintering lakes/ponds
Summer postspawning saltwater


Fish #
8
7
6
01-Sep
23-Sep
15-Oct
06-Nov
28-Nov
20-Dec
11-Jan
02-Feb
24-Feb
18-Mar
09-Apr
01-May
23-May
14-Jun
06-Jul
28-Jul
19-Aug
10-Sep
summer post-spawning freshwater
Overwintering lakes/ponds
18 Mile creek Spring spawning


Fish #
15
12
22
13
9
21
10
11
23
2
4
3
1
5
*
*
*
*
*
0
25
50
75
100
125
150
Days

Conclusions

-CRD spawning streams have simultaneous in- and out-migrating runs

-Simultaneous resident, anadromous and potomodromous forms in close proximity to saltwater/migrations can occur entirely within freshwater

-Varied trophic habitat utilization (stream/river/salt/ponds/lakes)

-CRD habitats sustain multiple seasonal habitat needs for multiple behavioral forms

-Mainstem rivers are critical as migratory corridors. Road culverts that present migration barriers may affect multiple seasonal life history phases and multiple forms.

Acknowledgements: Cordova Ranger District Fisheries Dept: Samantha Greenwood, Ken Hodges, Merlyn Shelske, Dave Schmid