State of Alaska
Department of Fish and Game
Sportfish Division

Nomination Form
Anadromous Waters Catalog

Region: Arctic

USGS Quad(s): NOME D-1, D-2

Anadromous Waters Catalog Number of Water Body: 332-00-10270-2031

Name of Water Body: *Osborn Creek ☐ USGS Name ☑ Local Name

☑ Addition ☐ Deletion ☐ Correction ☐ Backup Information

For Office Use

Nomination #: 25-667

Revision Year: 2026

Revision to: ☑ Atlas ☑ Catalog

Revision Code: A-2

Fisheries Scientist	9/24/2025
Habitat Operations Manager	9/24/25
AWC Project Biologist	11 Sept 2025
GIS Analyst	9/25/2025

OBSERVATION INFORMATION

Species	Date(s) Observed	Spawning	Rearing	Present	Anadromous
Dolly Varden	07/30/2021		✓		✓

~ADD new AWC Stream #332-00-10270-2031 "*Osborn Creek" with DOLLY Varden REARING and PRESENT.

Process Nom #25-664 first*

Comments:

Captured 19 juvenile Dolly Varden during electrofishing survey of Osborn Creek. Additional YOY were observed that escaped through dipnet mesh.
Coordinates (Lat,Long): (64.992587,-165.48977)

Name of Observer (please print): Molly Payne

Signature: 10.231.39.10 (Web Nomination) Date: 09/02/2025

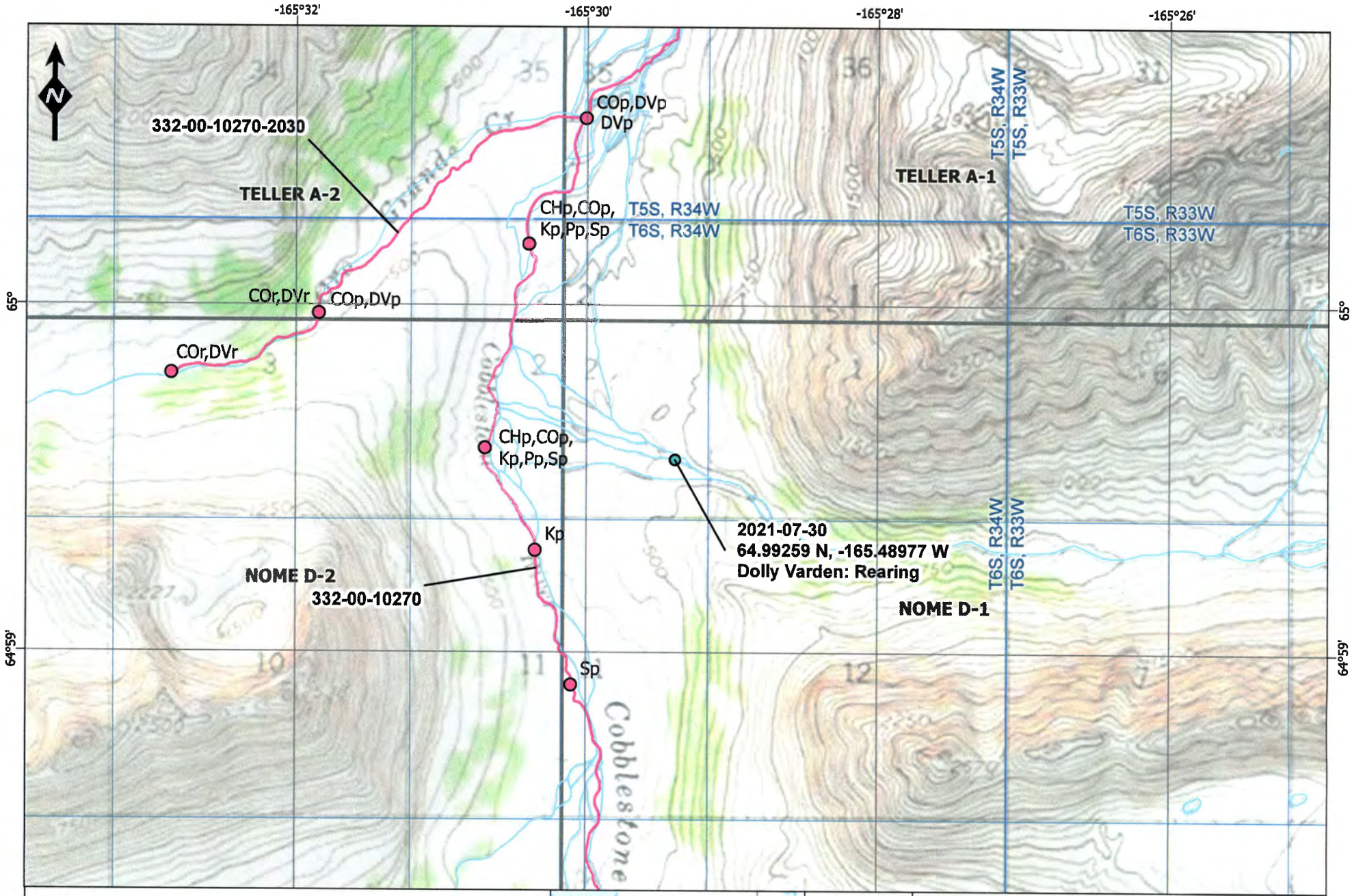
Agency:

Address: 4060 B Street Suite 200
Anchorage, AK 99503

This certifies that in my best professional judgment and belief the above information is evidence that this waterbody should be included in or deleted from the Anadromous Waters Catalog.

Signature of Area Biologist: _____ Date: _____ Revision 3/16

Name of Area Biologist (please print):


-165°32'
-165°30'
-165°28'
-165°26'
65°
64°59'
N
332-00-10270-2030
TELLER A-2
COp,DVp
DVp
CHp,COp,
Kp,Pp,Sp
T5S, R34W
T6S, R34W
T5S, R33W
T6S, R33W
TELLER A-1
COr,DVr
COp,DVp
COr,DVr
CHp,COp,
Kp,Pp,Sp
Kp
NOME D-2
332-00-10270
2021-07-30
64.99259 N, -165.48977 W
Dolly Varden: Rearing
NOME D-1
Sp
Cobblestone
Observation
Current AWC Extent
ADF&G Anadromous Stream
Township and Range
Section
USGS Quad Boundary
MERIDIAN: Kateel River
USGS 1:63,360 Nome D-1
ALASKA
Anchorage
MAP LOCATION
Gulf of Alaska
OWL RIDGE
NATURAL RESOURCE CONSULTANTS
AWC NOMINATION
COBBLESTONE RIVER
TRIBUTARY
SCALE:
0 1 2 Miles
0 1 2 3 Kilometers
FIGURE:
1
GRA098.aprx 9/2/2025 6:14 AM, R00

2021 G1 Stream Crossing Suveys

Method: Elec Fo | Time Start: 10:40 AM | Time End: 11:00 AM

Location: Osborn Creek | Start WPT: - | End WPT: -

Date: 7/30/21 | Lat./Long.: 64.99307 -165.48069 | Lat./Long.: 64.99248 -165.48489

Water Quality

Temp. (c): 4.3 | Turb. (NTU): 0.71

D.O. (%/mg/L): 96.6/10.69 | pH: 8.01

Con. (con/spec): 109.1/181.0

Notes: Saw YOY that were too small for mesh - Saw trout there

Species	FL (mm)	Notes
DV	108	
DV	119	
DV	225	
DV	71	
DV	69	
SLSC	93	
DV	115	
DV	69	
DV	63	
DV	69	
DV	111	
DV	105	
	76	
	58	
	97	
	63	
	59	
	82	
	97	
DV	65	

Species	FL (mm)	Notes

From: Cathcart, Charles N (DFG)
To: Giefer, Joe (DFG); Green, Duncan G (DFG)
Subject: Fw: Dolly justification for AWC
Date: Thursday, October 30, 2025 9:23:50 AM
Attachments: DV_managers_nightmare.pdf
Jaecks et al. 2016 .pdf
Bond et al. 2015.pdf
Gallagher et al. 2019.pdf
DV_distribution_forms.png

From: Joe Spencer <jrspencer2@alaska.edu>
Sent: Monday, February 13, 2023 7:08 PM
To: Cathcart, Charles N (DFG) <nate.cathcart@alaska.gov>
Subject: Re: Dolly justification for AWC

Hey Nate,

I had never read Nordeng's work. I'll see if Scanlon or Gryska have any of those old char symposia in their offices. I believe Fred DeCicco had many of those once-upon-a-time, and Scanlon/Gryska inherited most of his literature when he retired. I will let you know. I am, admittedly, not as familiar with the Arctic Char literature as I perhaps ought to be. The literature pool is pretty vast and they share a lot in common with DV, as far as life history.

There has been no such work that I am aware of in Alaska. I do have some information that gets to your question though, as well as a lot of my own thoughts on the subject. (get ready for too much damn information)

Christie Gleason of ADF&G Commfish here in Fairbanks did some work for Joe Buckwalter and crew (I believe?) back in the late 2000's or early 2010's, investigating the use of otolith microchemistry in the cores of otoliths from juvenile Dolly Varden captured by AFFI/AWC research to see if they could find marine maternal signatures, therefore showing anadromy in the population. I believe these fish were largely from the Seward Peninsula. Nothing was published, and I think it was a bust. Most (>75%) of my DV from the Noatak, which are almost all anadromous, have *no* marine maternal signature; this method is not well-suited to DV because of their propensity to "skip" migration during the year of spawning, hence an anadromous mother will not pass on a marine maternal signature to her offspring (or perhaps only a very weak one).

Colin Gallagher and crew with DFO have done quite a bit of research in northern Canadian DV populations. They have found that virtually all adult female DV in those populations are anadromous, but there are a lot of residual males in these populations. Resident females are only found above barriers, for the most part. Therefore virtually all DV in these populations are the progeny of at least one anadromous parent. These fish have life histories that are likely analogous to the DV of our North Slope DV; I think a key point when we consider these DV populations is that they typically *do not have access to salmon subsidies*; this is in contrast with the DV researched in Tom Quinn's lab (detailed below), which all come from Bristol Bay or AK Penn and have ample access to salmon.

Troy Jaecks, who did his Master's through UW with Tom Quinn, found that presumably anadromous Dolly Varden in the Iliamna River were *not likely* anadromous, based on his radio-telemetry. They were large-bodied and their otoliths appeared to have microchemical signatures consistent with anadromy; however, his radio-tagged adult DV evidently never made ocean migrations. They were likely able to consume enough food via salmon subsidies that they did not undergo ocean migration, and additionally, the consumption of salmon eggs and flesh was so intense that it artificially inflated their otolith Strontium levels. I have attached this paper. There is also unpublished evidence of this phenomenon in the Klutina River drainage, and I suspect Kenai River DV are this way as well.

Morgan Bond, a PhD student of Tom Quinn's, looked at anadromy in Chignik Dolly Varden quite a bit. He found that Chignik Dollies were mostly anadromous; he also found that many fish displayed a "retiree" life history, wherein a single ocean migration was made before retiring to freshwater to live the rest of their lives in a presumably semi-sedentary life waiting for sockeye spawn. Some of my fish in the Noatak appear to have done this as well. Paper attached.

Fred Decicco of ADFG and Jim Reist of DFO thought that the traditional distinction between subtypes of DV, that being "Southern form" ranging from Washington State up to the southern AK Penn, and Northern form from the north side of Alaska Peninsula up to the Canadian Arctic, inadequately described North American Dolly Varden taxonomy. Their proposed change split Northern DV into an "Arctic" DV lineage, ranging from the Imuruk Basin on the Seward Peninsula north to Arctic Canada, and a "Bering Sea" lineage encompassing southern half of Seward Peninsula, Unalakleet area, lower Yukon/Kusko, Bristol Bay, and AK Penn. (see attached distribution map) Their idea was that Arctic DV evolved in the absence of salmon, and therefore developed into populations of large-bodied adults that fed far offshore and fed little or not at all in freshwater, whereas Bering Sea DV evolved in the presence of salmon and therefore maintained a life history more analogous to that of southern-form DV (maturing at smaller <500mm size, yearly diet heavily composed of salmon subsidies). Their thesis, which I think holds water, is that DV migratory history is intricately tied to the abundance of salmon across their range. In many coastal areas of SE, SC, SW Alaska, this manifests as DV using anadromy as a "conduit" to access more coastal salmon spawning streams.

All of this boiled down: MOST large DV in Alaska are anadromous. There are possibly some exceptions in Bristol Bay or other exceptional salmon systems. I think it is highly probable that virtually *all* Alaskan DV populations with ready access to the ocean display some degree of anadromy.

I think that the resident/nonresident ratio of DV in Alaska likely *do not* adhere to the Arctic

Char observations of Nordeng, and this is why: Arctic Char live in association with lakes. They spawn and rear in lakes, almost exclusively. Lakes, even at extremely high latitudes, are productive enough to grow resident fishes fairly large. The same cannot be said for mountainous rivers and creeks, which is where Alaskan DV live for the most part. Mountainous Arctic/subarctic rivers and streams are pretty sterile and cannot produce large resident fishes, for the most part (and DV aren't really piscivores, like burbot). The exception to this is when there are vast numbers of salmon present. This is backed up by the observations of the Canadians, who have seen very very few resident adult females in their extensive sampling of DV spawning/overwintering areas in the Canadian Arctic. I think that virtually all females in Alaska display some degree of anadromy at some point in their lives, yearly, retiree, or otherwise, outside perhaps some places in Bristol Bay with exceptional availability of salmon. Some unknown proportion of males will remain precocious; I'm guessing a lot of them do. But I do not see widespread evidence of female DV living entirely in FW, if they have access to the ocean. It should also be said that this question has also not been studied extensively!

My own microchemistry thus far has shown almost all adult Noatak DV are anadromous. I have a few from the Nimiuktuk River that are not, including one male @ 613mm! So while it is possible, only 3/143 spawners I have looked at were residents. I am confident that virtually all large adults can be confidently assigned as anadromous.

Now, to your question about the little DV's: I think that it is highly likely that little 1 or 2yo DV in small streams of NW Alaska, where there is plausible access to the ocean, are the progeny of anadromous adult females (and perhaps males). As I say, I do not see widespread evidence of lifetime-resident adult female DV in Alaska. It is true that DV are theoretically able to display a wide variety of life history patterns, but I think the evidence points to most Alaska populations having *functionally obligate anadromy in female DV* (you can quote me on that!). I think the most concrete supporting evidence of this would be the Gallagher et al. paper I have attached here, documenting the rarity of adult female resident DV in northern Canada. I think it is similarly rare in AK.

How do you *prove* little DV is the progeny of anadromous mother? I don't think you can. The little ones all look the same, as indicated in Al's memo and McCart's work on the Slope in the 70's. Regardless I think that population-level anadromy is highly likely in this area of Alaska, and in most areas of Alaska.I would argue that in any coastal or near-coastal stream in northern Alaska, if there are no apparent barriers to fish migration, DV populations (if present) can be assumed to be composed of anadromous individuals.

Another interesting "debate" is anadromous DV + CT in SC and SEAK, which seemingly do not get included in the AWC when found by Habitat division in their AWC work. I think we have good reason to believe those fish are anadromous too, but that's a topic for another time!

If you start finding 170-250mm females with developing eggs, THEN you might want to re-evaluate your assumptions about anadromy.

Clear as mud?

Dollies do lots of cool stuff.

I say, nominate them!

Joe

On Mon, Feb 13, 2023 at 3:24 PM Cathcart, Charles N (DFG) <nate.cathcart@alaska.gov> wrote:

> Hi Joe,
>
> Figured you'd get a kick out of this…check out the attachment. It outlines the rationale behind calling Dollies on the Seward Peninsula area anadromous.
>
> Joe Giefer came across this document in the AWC files.
>
> You ever read about Hans Nordeng's work? Al Ott seems to have misspelled the name in the memo. I'd like to track down the proceedings of that symposium to see how he did that study to get the ratios. Has anybody performed any analyses of wild populations in Alaska to determine ratios of resident to anadromous individuals?
>
> How would you feel about this applying to other western Alaskan Dollies? I think it should given the size-classes we see in summer are predominately age 1-2 individuals in systems that have documented pre-spawn adults such as the Kobuk. But it would be sweet to better define Dolly spawning habitat in western Alaska. Hoping that October 2023 flights for Coho in the Kobuk will also find Dolly spawning grounds since it seemed their spawn timing coincided on the Seward Peninsula. Just differed in habitat types (Dollies spawning in the much smaller tribs compared to coho in the larger systems).
>
> Thanks,
>
> Nate

Nate Cathcart

Habitat Biologist II

Alaska Freshwater Fish Inventory

Alaska Department of Fish & Game

Division of Sport Fish – Research & Technical Services

Cell: 612-616-4663

Office: 907-267-2238

--

Joe Spencer
M.S. Student, Fisheries
University of Alaska Fairbanks
Cell: 907-723-6886

Figure 1.1 – Map showing the distribution of Dolly Varden (*Salvelinus malma*) in North America. Green shading represents southern form Dolly Varden (*S.m.lordi*) while black and red represents northern form Dolly Varden (*S.m.malma*). The red is a proposed intermediate subspecies that is currently identified as northern form (Source: COSEWIC 2010).

Citations:

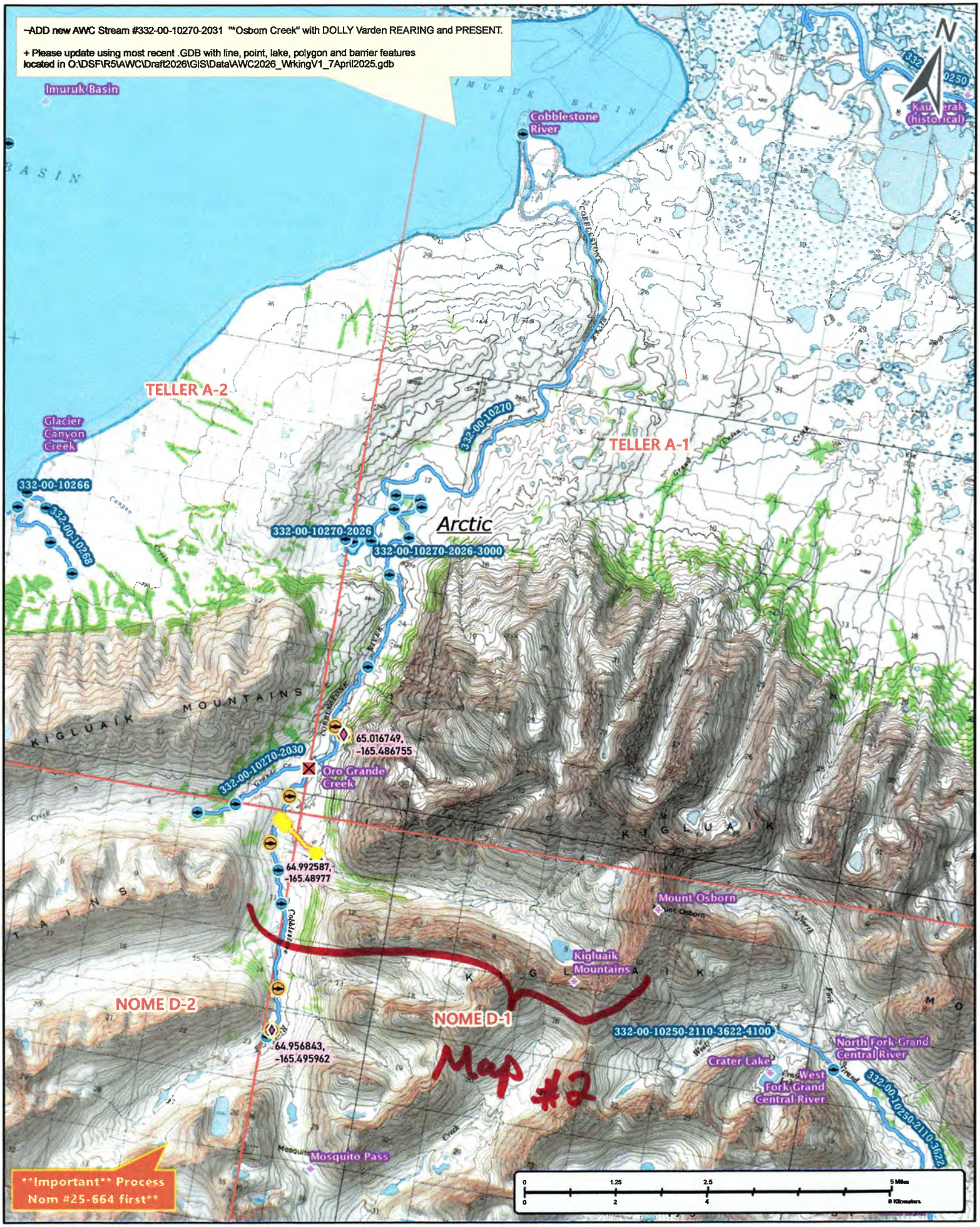
- Johnson, L., & Burns, B. (Eds.). (1984). *Biology of the Arctic Charr: Proceedings of the International Symposium on Arctic Charr. Winnipeg, Manitoba: University of Manitoba Press.*
  - Armstrong, Roberth H. Migration of Anadromous Dolly Varden Charr in South-eastern Alaska – A Manager's Nightmare. *Pages 559 – 571*

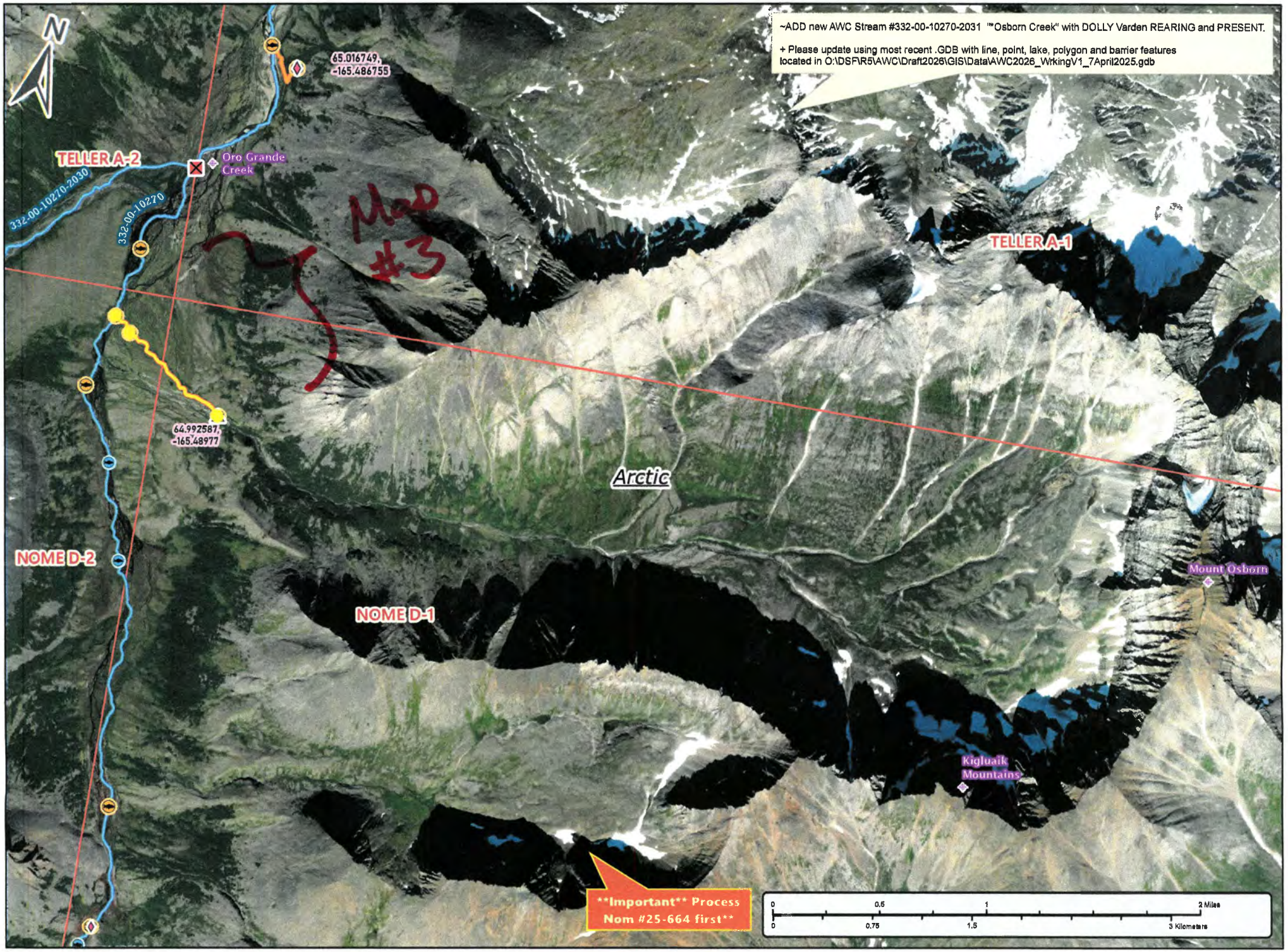
- Jaecks et al. 2016. Can dietary reliance on Pacific salmon eggs create otolith Sr/Ca signatures that mimic anadromy in resident salmonids? *Environmental Biology of Fish, Vol. 99*

- Bond et al. 2015. Beyond dichotomous life histories in partially migrating populations: cessation of anadromy in a long-lived fish. *Ecology, Vol 96, No. 7*

- Gallagher et al. 2019. Growth & reproductive characteristics of rarely observed resident female Dolly Varden (Salvelinus malma malma) in North America. *Hydrobiologia, Vol 840.*

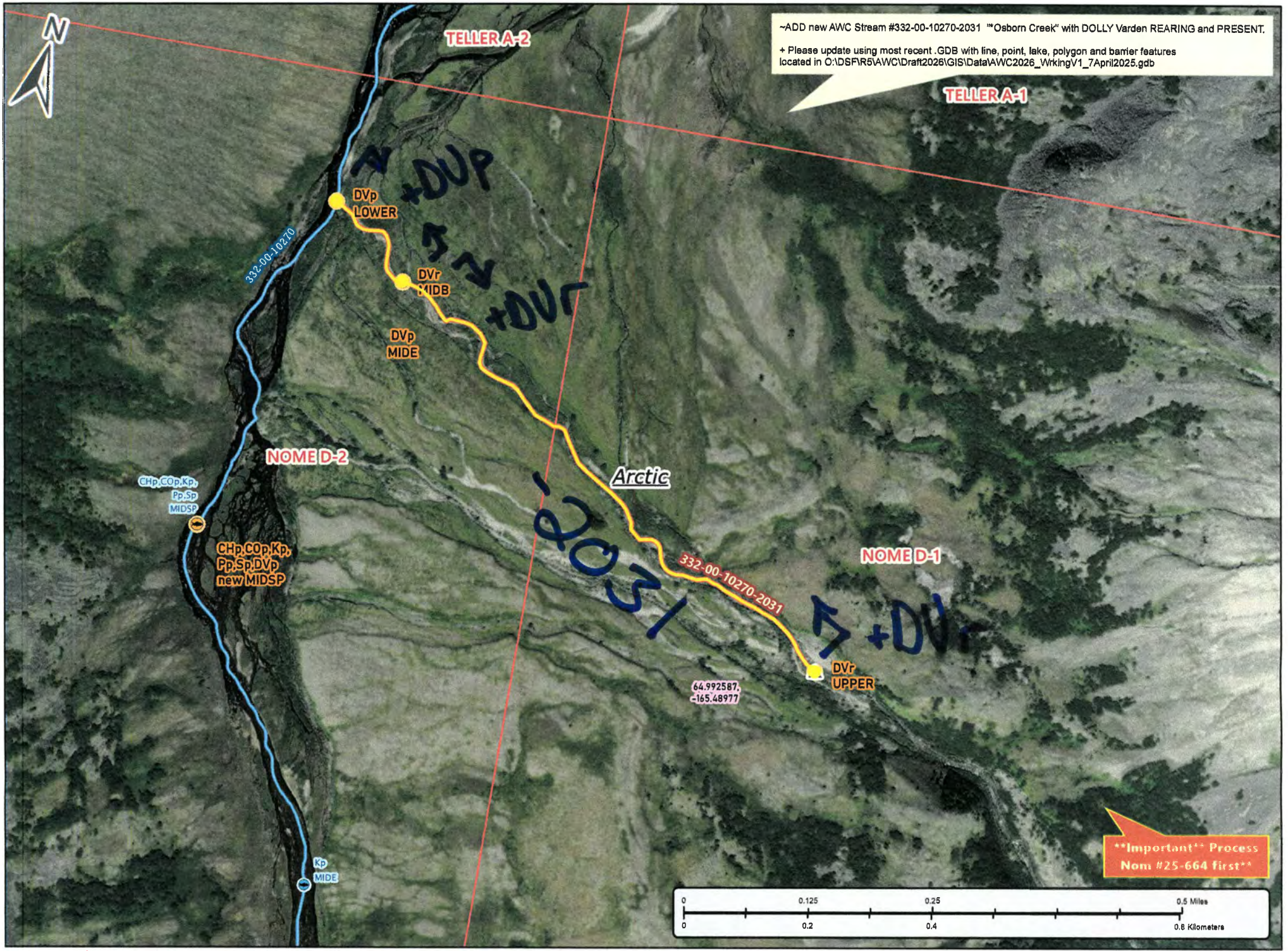
*Citations available on request.


~ADD new AWC Stream #332-00-10270-2031 "Osborn Creek" with DOLLY Varden REARING and PRESENT.
+ Please update using most recent .GDB with line, point, lake, polygon and barrier features located in O:\DSF\R5\AWC\Draft2026\GIS\Data\AWC2026_WrkingV1_7April2025.gdb
Imuruk Basin
Cobblestone River
TELLER A-2
TELLER A-1
Glacier Canyon Creek
332-00-10266
332-00-10268
332-00-10270
332-00-10270-2026
332-00-10270-2026-3000
Arctic
65.016749, -165.486755
332-00-10270-2030
Oro Grande Creek
64.992587, -165.48977
64.956843, -165.495962
Mount Osborn
Kigluaik Mountains
NOME D-2
NOME D-1
332-00-10250-2110-3622-4100
Crater Lake
North Fork Grand Central River
West Fork Grand Central River
Mosquito Pass
Important Process Nom #25-664 first**
Map #2
Nom #25-667
Map #1



Nom #25-667

Map #2



Nom #25-667

Map #3