Afognak Island Bridge Replacement

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Briefly:
Forest roads support active export timber harvest operations

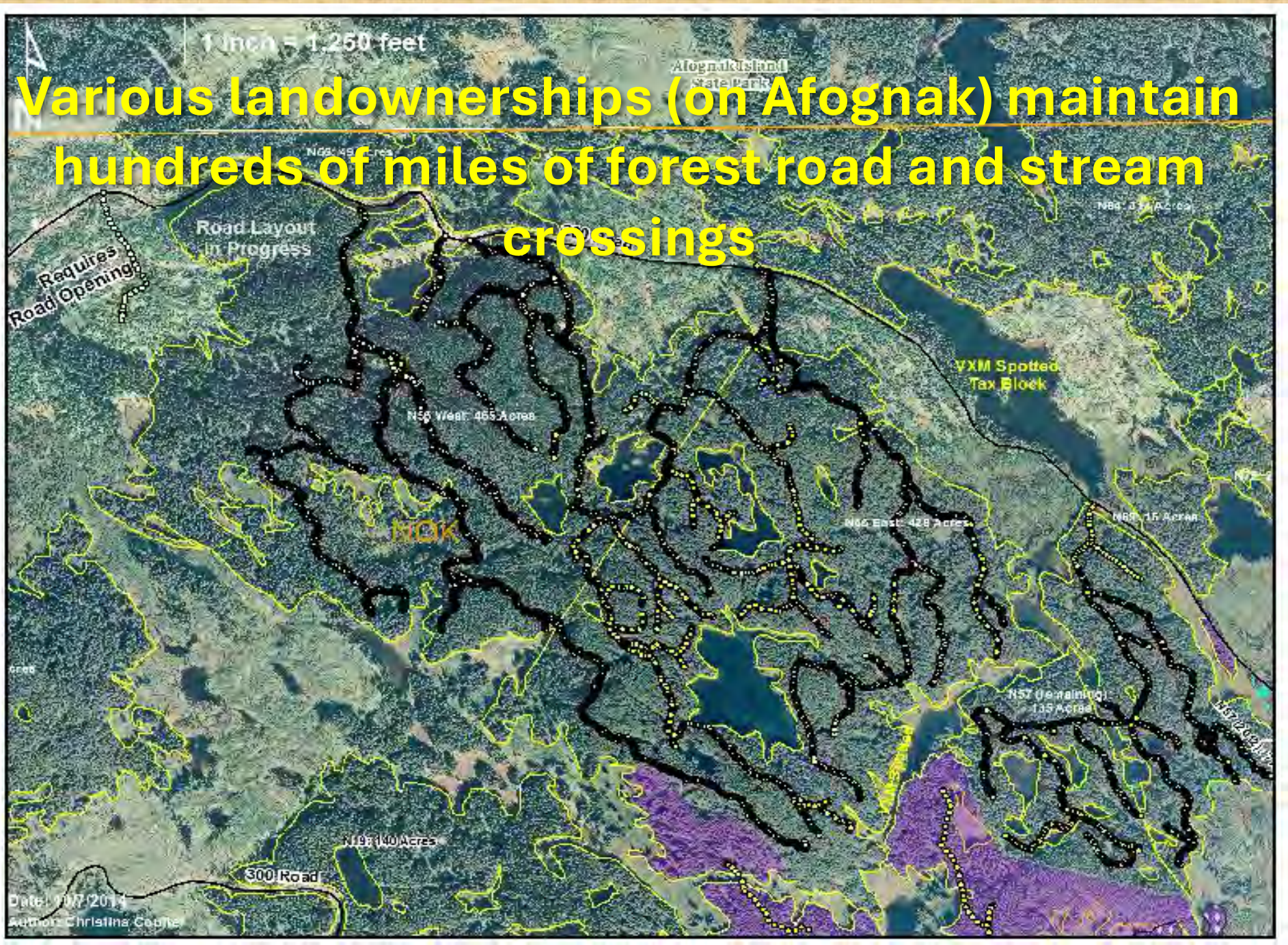
Consider this…..

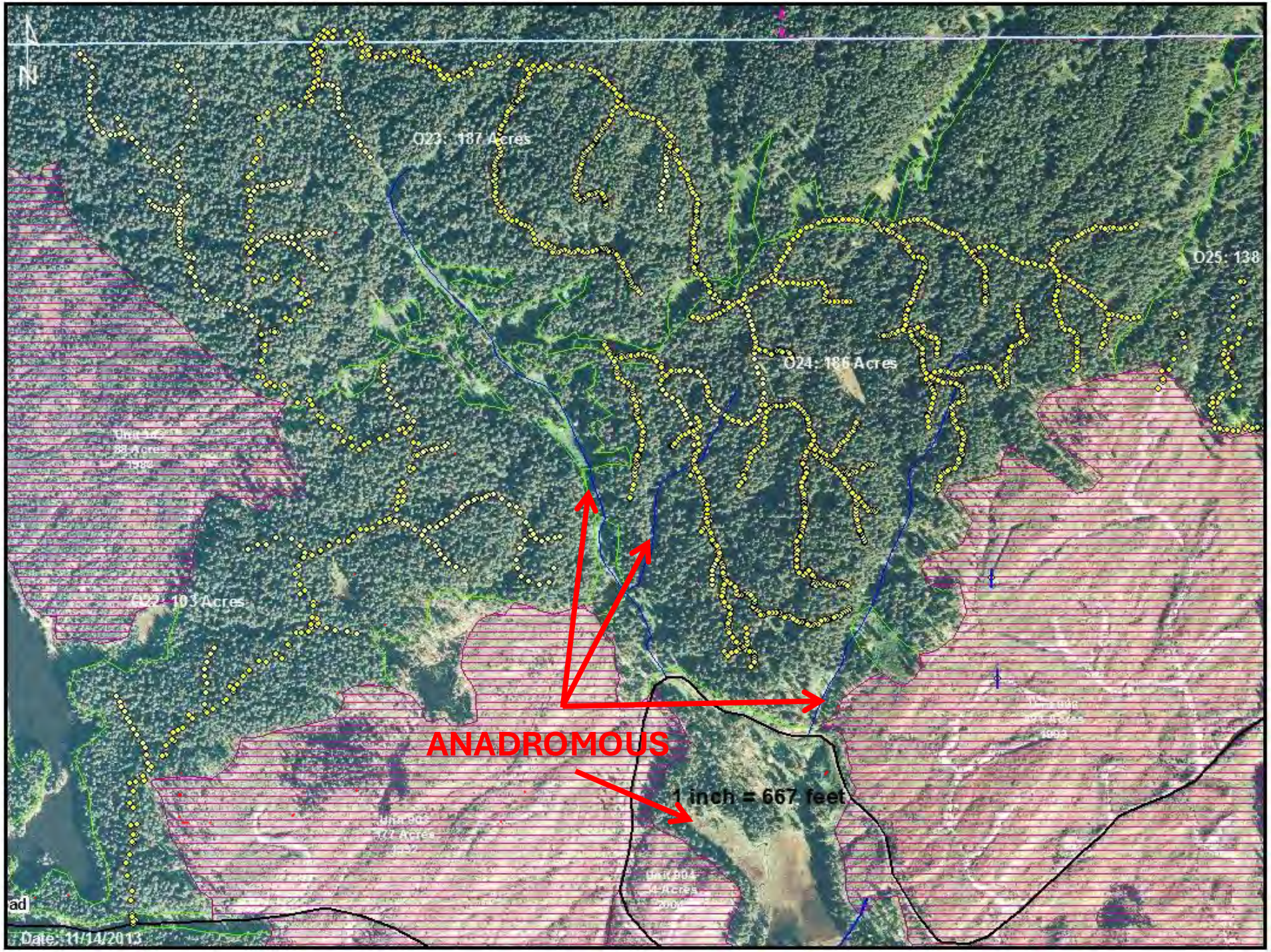
- As Alaska's timber industry continues to decline, who will be left to do this type of work?

- In absence of active timber harvest (revenue), how can these projects be paid for?

- Active regional logging/milling infrastructure maintains the economic underpinning of many localities in Alaska (or it used to….)

- What *could* we be doing with Alask's timber economy versus what we *are* doing?


Various landownerships (on Afognak) maintain hundreds of miles of forest road and stream crossings
1 inch = 1,250 feet
Afognak Island State Park
Road Layout in Progress
Requires Road Opening
N56 West 465 Acres
NOK
VXM Spotted Tax Block
N66 East 428 Acres
N57 (remaining) 135 Acres
N58 140 Acres
300 Road
Author: Christina Coppe

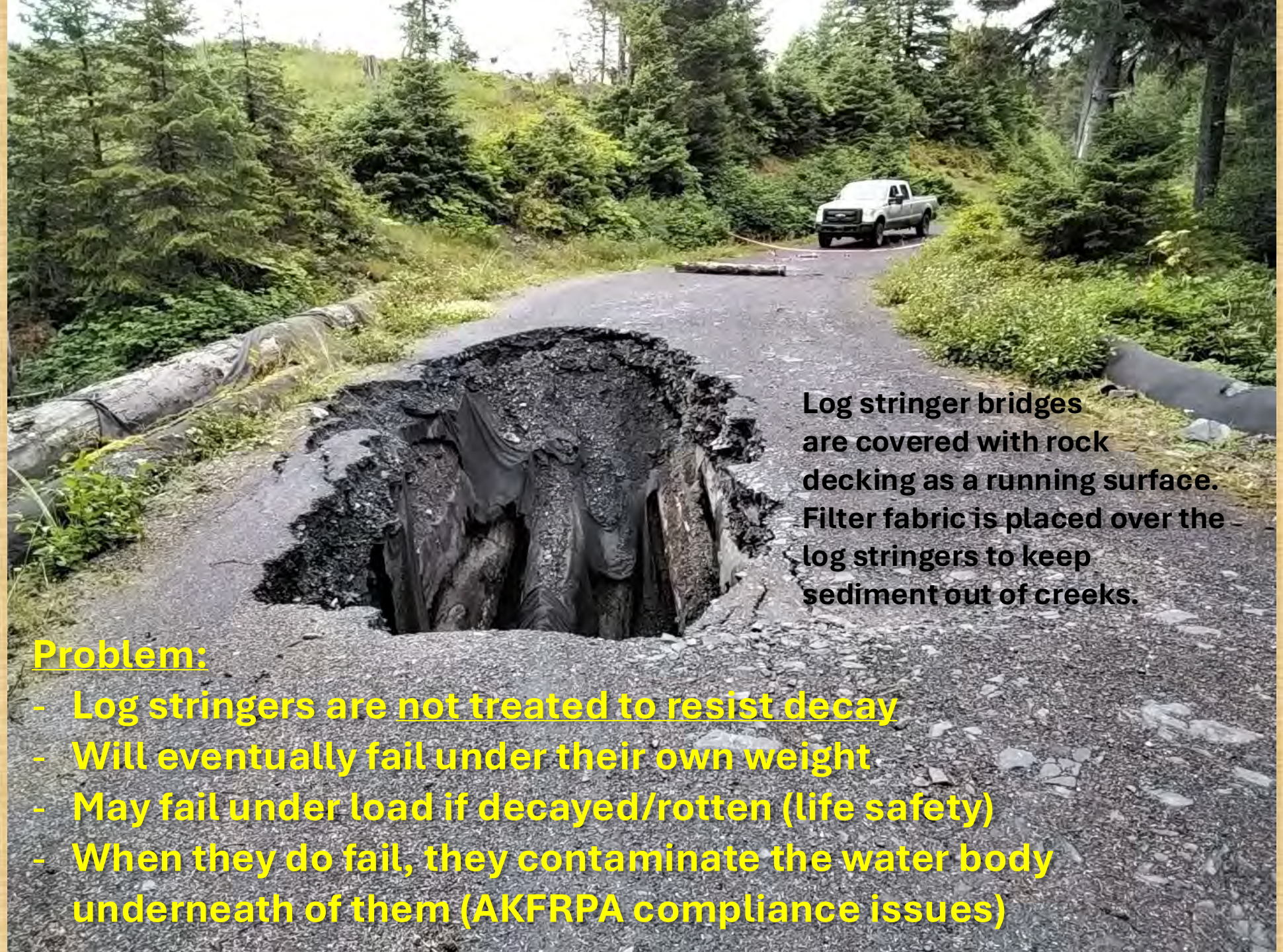

N
O23: 187 Acres
O25: 138
O24: 186 Acres
O22: 103 Acres
ANADROMOUS
1 inch = 667 feet
Date: 11/14/2013


Log stringer bridges have been the crossing structure of choice since timber operations began on Afognak Island

Why:

- **Low cost**
- **Reasonable to install**
- **Durable, can tolerate large payloads and high duty cycles (given their life span)**

A longer span log stringer bridge, note the stiffener logs placed mid span for more strength....



Log stringer bridges are covered with rock decking as a running surface. Filter fabric is placed over the log stringers to keep sediment out of creeks.

Problem:

- Log stringers are not treated to resist decay
- Will eventually fail under their own weight
- May fail under load if decayed/rotten (life safety)
- When they do fail, they contaminate the water body underneath of them (AKFRPA compliance issues)

Bridge failure and subsequent exposure of creek to sediment

Bridge Inspection – Indicators of a log stringer bridge near collapse

BEAVERS!!!

Pre - AKFRPA

- Culverts on Afognak (installed decades ago) were generally too small for adequate fish passage and would not meet ADFG permit compliance
- Generally, any creek wider than 3’ would require a bridge crossing to meet ADFG Title 16 crossing compliance
- Culverts are continuously plugged by beaver resulting in road washouts
- Culverts would work in many applications; however, they would have to be much larger and would be expensive to install (cost to get them to the island, what size, etc.)
- This is an excellent example of maintenance issues associated with roads in any use classification (new or temporary or some combination of restricted use)

Consider this….

- Ongoing discussion about road classifications. How does this fit in?
- AK FRPA Compliant?
- Active road? Inactive?
- Open but not very active?
- Should it have been closed?
- Ignore maintenance?
- This is when liability becomes an issue.

***3 to 5 years post harvest….

***Don’t forget about the taxes….

Keep the roads open?

Active or inactive…forest roads require monitoring, maintenance and upkeep and that equals **COST**…..

How to fund maintenance as timber harvest declines or ends?

This generally means road closure (being put to bed) at least on Afognak.

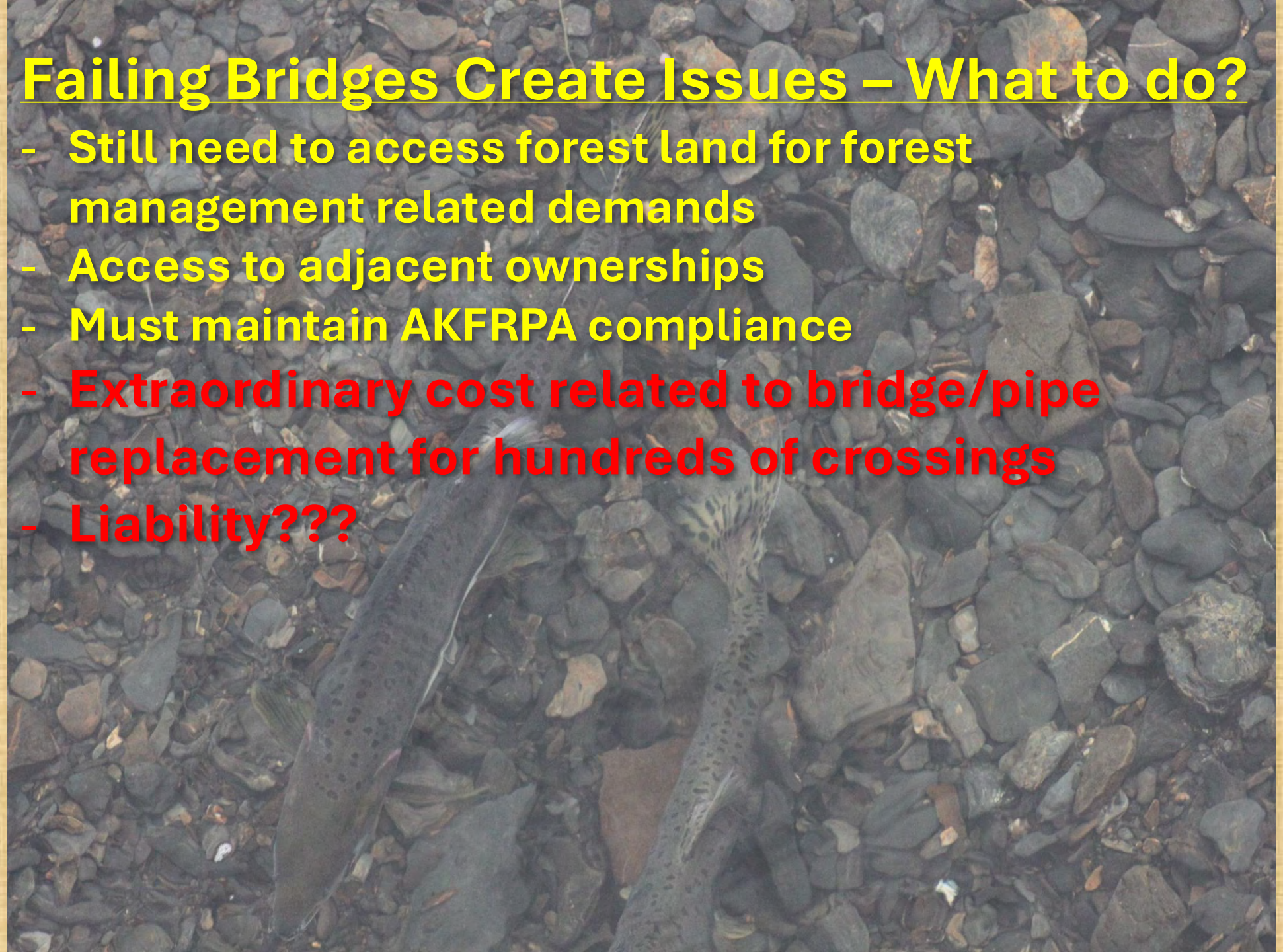
Operational Challenges

Roads/Bridges:

Roads/Bridges must be constructed for "ALL WEATHER" (per logging contract) hauling purposes and meet/exceed AK Forest Practices Act (AK FRPA) requirements.

Bridges must meet payload & duty cycle demands:

GVW of many lowboy/equipment combinations approaches/may exceed 200,000 lbs.



Failing Bridges Create Issues – What to do?

- Still need to access forest land for forest management related demands
- Access to adjacent ownerships
- Must maintain AKFRPA compliance
- Extraordinary cost related to bridge/pipe replacement for hundreds of crossings
- Liability???

One Solution:

- USDA Temporary Bridge Program
- https://www.fs.usda.gov/science-technology/energy-forest-products/wood-innovation

- Railcar bridges were chosen for their cost, durability, ease of installment, service life and capacity....

Alternative Bridge Structure:

Wood???

- Life span?
- Decay Resistance?
- Duty cycle/capacity?
- Cost over alternate design?

<u>Railcar bridges are commonly used throughout the US as stream crossing structures:</u>

- **Reasonable purchase cost compared to alternative designs (single spans up to 89')**
- **Extreme duty cycle, durable, large payloads (designed for 200,000 lb payloads traveling at 60 MPH)**
- **Service life of 50+ years**

Through the USDA Temporary Bridge Program:

- **19 railcar bridges were purchased, shipped and installed on Afognak Island for two separate Native Corporations in 2025**

- **~20 Railcar bridges are being built and readied for shipment to Afognak in 2026**

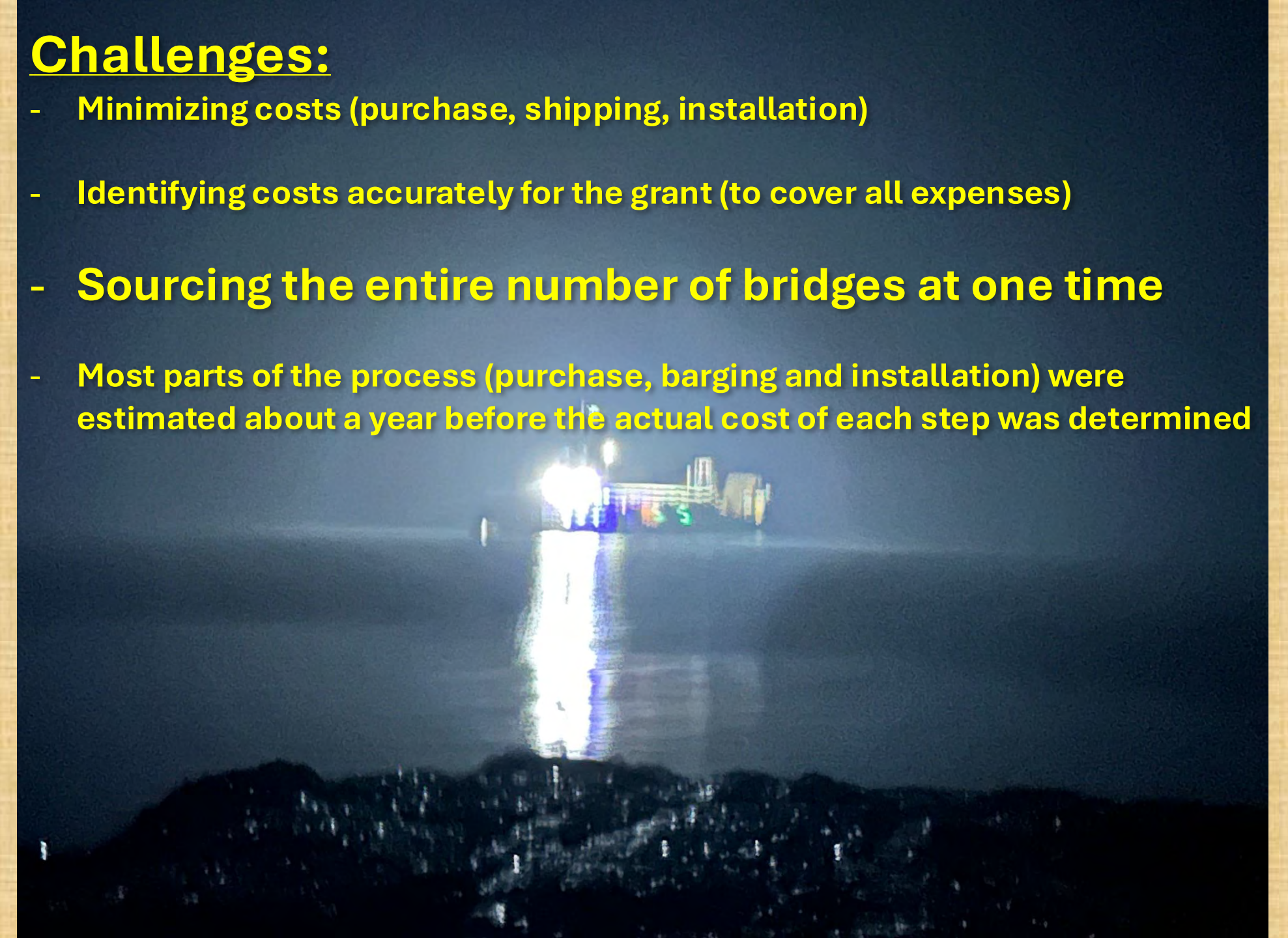
Challenges:

- Minimizing costs (purchase, shipping, installation)

- Identifying costs accurately for the grant (to cover all expenses)

- **Sourcing the entire number of bridges at one time**

- Most parts of the process (purchase, barging and installation) were estimated about a year before the actual cost of each step was determined

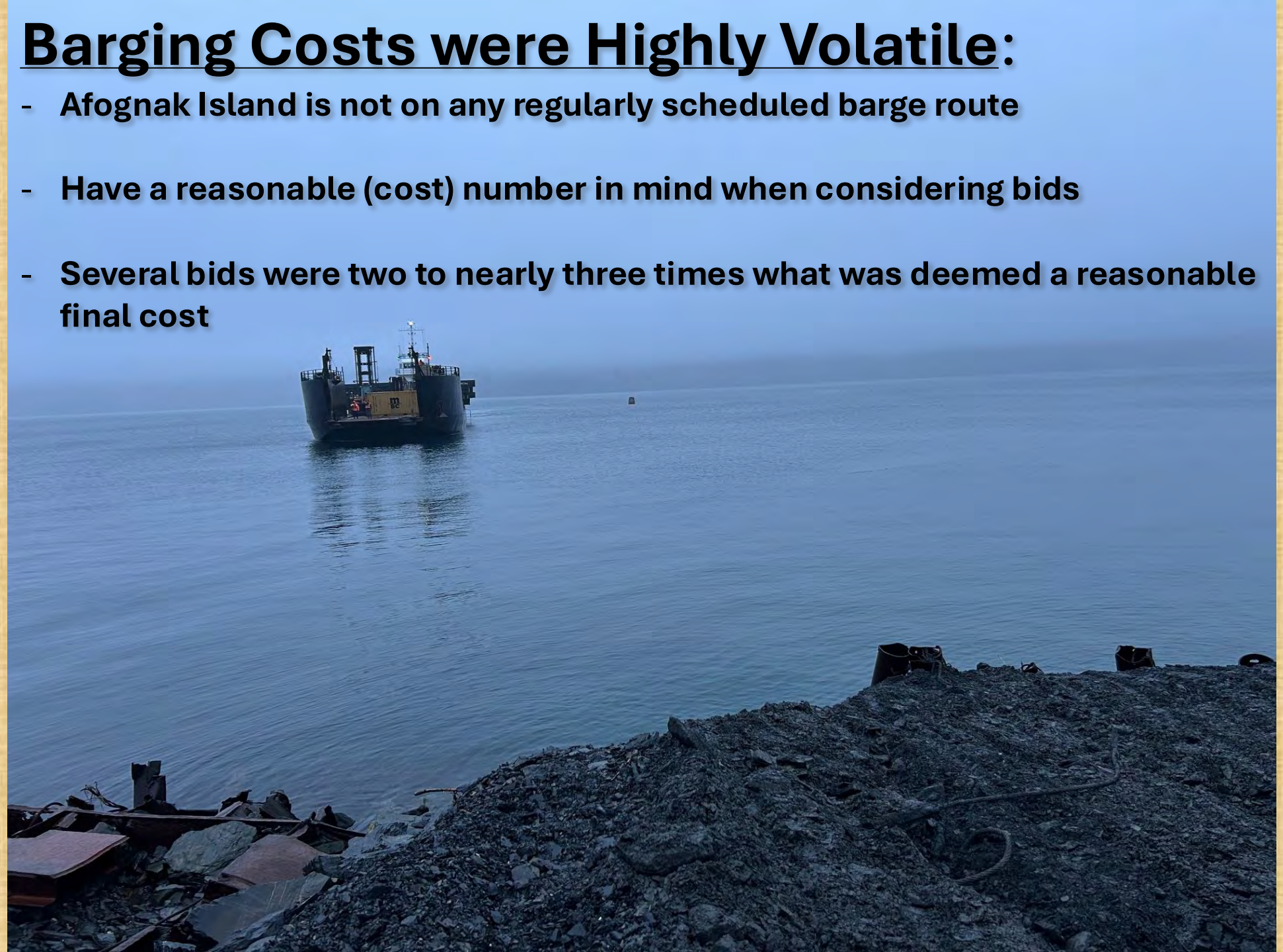


Barging Costs were Highly Volatile:

- Afognak Island is not on any regularly scheduled barge route

- Have a reasonable (cost) number in mind when considering bids

- Several bids were two to nearly three times what was deemed a reasonable final cost



Installation Costs:

- On-island logging contractor or outsource to bids/off island logging contractor???
- **This is huge**....regional logging contractors that are already in these remote places allow for these types of projects to be completed far under the costs of outsourcing to off island contractors....by 50% OR MORE....

Determine Contractor Cost for installation: (How?)

- Cat Handbook method
- Dealer Equipment Rental Cost
- Past Experience
- Various depreciation methods
- Ask a contractor???

In summary.....

- Railcar bridges are a superior alternative for stream crossings on forest roads

- Watch costs closely

- Am not sure how the same project would have gone without local contractors to do the same work vs. outsourcing (to who???)

Railcar Bridge Project Management Considerations:

- Ensure availability of the required number of railcars
- Cost
- Type of rail cars (flat cars vs?) and design
- Installation cost and who can/will do it?
- Shipping logistics?

For more information Contact:

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Alaska Crossing Solutions

Alaska Crossing Solutions distributes flatcar bridges for industrial, municipal and public works, low-volume roads, access roads, forestry, agricultural, and pedestrian applications. Our bridges provide a practical, cost-effective alternative to conventional bridge construction, especially in remote or challenging access locations or projects with a very short schedule.

Alaska Crossing Solutions uses retired railroad flatcars to develop long-lasting, heavy-duty bridges.

Why Flatcar Bridges?

- Proven structural performance using repurposed railcar platforms.
- Cost-effective alternative to traditional bridge fabrication.
- Adaptable to remote, rural, and difficult site conditions.
- Well-suited for temporary or permanent installations.

Flatcar Bridge Details:

- Flatcars are available in lengths up to 89 feet long.
- Flatcars are generally 9-ft to 9.5-ft wide and can be steel or timber decked.
- Heavy duty industrial applications typically use steel decks, and side-by-side flatcar construction to provide an 18-ft wide bridge.
- Rural installations typically use a single flatcar with 13-ft long timber decking which provides a 12-ft travel lane with 6-inch guardrail timbers.

Alaska Crossing Solutions provides:

- Flatcar inventory options to help reduce project lead time
- Engineering coordination for load ratings and documentation, upon request.
- Barging, trucking, delivery, and logistics planning.
- Installation and site placement support

Typical Applications:

- Forestry and logging road access
- Private and rural property crossings
- Industrial and heavy-use sites
- Municipal and public works projects
- Parks, trails, and pedestrian crossings

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