



Invasive Species Assessment of the Randolph Yost, Kachemak Bay, April 21, 2016 for Furie Operating Alaska, LLC.

Introduction

On April 18, 2016 Kachemak Bay Research Reserve (KBRR) was contacted by Bruce Webb, Senior VP for Furie Operating Alaska LLC, to conduct a survey to investigate the potential for non-indigenous marine invertebrates or algal species to have been carried on the legs of the jack-up drill rig *Randolph Yost* and the possibility of these species being introduced into the marine water of Kachemak Bay and Cook Inlet. We agreed to conduct a visual survey of surfaces in representative areas of the legs to look for encrusted or attached marine biota. Crevices and cavities would also be looked at for potential to harbor more mobile species.

Background

The Randolph Yost jack-up rig last worked for years (unknown how many) in Balikpapan, Kalimantan, Indonesia before going to Singapore. (B. Webb, Furie Operating Alaska).

From the Shipping Agent's Letter documenting the movements of the Randolph Yost in Singapore; the Rig arrived in Singapore on April 10, 2015 where it was stored in the water (like at Homer Dock). It was then raised onto the land. It was in dry dock at Singapore from October 4, 2015 to February 8th, 2016 (4 months). (Bruce Webb/Document from 3J Shipping Agency PTE LTD, Singapore.)

In Sept, 2015 Bruce Webb from Furie Operating Alaska contacted Tammy Davis, Coordinator Invasive Species Program Alaska Department of Fish, to speak about the organisms that were on the legs of the Randolph Yost rig in Singapore. He proactively wanted to know what he should do in regards to invasive species for Alaskan waters. There are no regulations or protocol to follow besides the fact that it is illegal to introduce invasive species to Alaska. (State statute, Appendix D). Ms. Davis suggested he find out what kind of organisms were on the legs. Mr. Webb mentioned he could get samples and send them to Ms. Davis to be looked at. Samples were scraped off the legs of the rig September 12, 2015 while it was still in the water at Singapore and were Fed Ex'd to Bruce Webb in Anchorage arriving Sept.17, 2016. They appeared to still be alive, packed in a little dry ice and some sea water. They were shipped to Tammy Davis / ADF&G in Juneau on September 30, 2015.

This is really commendable behavior. In the absence of any regulations from the State of Alaska for jack-up rigs to be inspected before or upon arrival, this company took it on themselves to seek out the proper authorities in the hopes of avoiding trouble once they got here, and ultimately trying to prevent the introduction of an invasive species.

Ms. Davis received the specimen on Oct. 4, 2015 in Juneau and reported:

“All of the specimens I received appeared to be dead, with shells and other structures mainly vacated. On November 4, 2015 I sent photos to James Carlton, who is the preeminent marine invasive species taxonomist in the U.S. He’s a professor at College of William and Mary. (<https://mystic.williams.edu/about/faculty/dr-james-t-carlton/>) Jim replied on the same date listing these tropical groups from the photos I sent of the samples I received.”

- *Megabalanus* (possibly *M. coccopoma*)
- Tropical bryozoans (*Biflustra*-like)
- Tropical calms (chamids)
- Spirorbid polychaete works

James Carlton told Ms. Davis it was not probable that these tropical species would survive in Alaskan waters or a 30 day+ more dry dock period.

The city of Homer Port and Harbor received a berth request from John Stuart with Furie Operating Alaska VP of operations February 3rd, 2016. The Homer Harbor does not require any inspection or documentation when accepting vessels. The Coast Guard has no vetting on environmental issues that the Harbor has to comply with. The Harbor Masters are aware that a drying out period on land is a good “best practice” and they were told the rig had been in dry dock for several months. (Conversation with Brian Hawkins and Matt Clarke, City of Homer Port and Harbor.)

Back in Singapore, the Randolph Yost was put into a wet slot and loaded onto the Chinese heavy-lift vessel “**Tai An Kou**” on February 8, 2016 and began its 31 day journey to Kachemak Bay, Alaska. (Document from 3J Shipping Agency PTE LTD, Singapore). This transport method keeps the rig up out of the water but it could receive spray on the lower parts. The rig arrived in Kachemak Bay on March 10, 2016 and was floated off the Tan An Kou on March 12, 2016 and it put its legs down in 45 feet of water just off the Homer Deep Water Dock on the East side of the Homer Spit.

Here in Homer the rig has been undergoing repairs to the fresh water pipes (that froze in sub-zero temperatures off the coast of Japan), and upgrading the water discharge system before going out to the gas fields of Cook Inlet (conversation with Bruce Webb).

On April 18th, 2016 Bruce Webb contacted Ms. Bursch at Kachemak Bay Research Reserve about conducting a survey to satisfy questions and concerns he had heard about the potential for invasive species coming from the rig.

Survey Schedule

The visual survey was conducted by KBRR under and on the Randolph Yost on April 20, 2016 while it was east of the Homer Deep Water Dock. The survey was conducted by Catie Bursch, Harmful Species Coordinator for the Kachemak Bay Research Reserve and Rose Robinson, Research Technician. Ms. Bursch has worked in the Marine Invasive Species field for over 6 years in the state of Alaska. Ms. Robinson and Ms. Bursch were accompanied by Bruce Webb from Furie the entire time. A safety officer and a crane operator from the rig crew accompanied us when we were on the rig itself. The rig crew is hired by Advance Drilling Solutions.

Methods

Mr. Webb hired a water taxi to take us from the boat harbor to the rig legs to examine the metal structures that descend down into the water and into the substrate of Kachemak Bay at the Homer Deep Water Dock. We departed the harbor at 8:00am and within minutes were underneath the rig. We chose a low tide so that more of the legs would be visible. The water was not rough so we were able to idle and inspect each leg and nose up to them and take samples. Remains of calcareous (white shell material made of calcium carbonate) organisms covered 50% of the surface area of the legs under the rig. We were at ~ 45 foot level at that time from the bottom of the legs. Multiple samples and photos were taken from each of the three legs. We did not examine the spud cans at the bottom of the legs as they were under water. Appendix A

From 9:00-11:00am we went onto the rig itself to take representative samples, do a visual inspection and take photographs. The legs and jacking guides were the areas that organisms had grown on. The 3 legs of the Randolph Yost are each 400 feet long. At the Homer Deep Water Dock 45 feet were under the water leaving 355 feet sticking up in the air. The encrusting calcareous material went up to the 285 foot level. (So roughly $\frac{3}{4}$ of the legs) There were 3 levels on the rig that we could get close and inspect the legs. The deck and two "walk-arounds" that allowed us to examine the legs at 140 foot level, 160 feet and 180 feet. So at the highest level the legs rose up an additional 220 feet above our heads and were impossible to examine. The calcareous remains on the metal legs went from the bottom to 285 feet up the 400 foot legs. (Reflecting the water depth of the last deployment where the organisms attached in Indonesia.) We also looked at the deep water well where hoses uptake saltwater, but could not see in the large metal tube that the hoses come up out of. Appendix B

Samples were labeled and taken back to the lab to be photographed and sent to a taxonomist for species identification. Appendix C

Results

The calcareous remains covered between 50-100% of the metal surface on the legs on 285 of the 400 foot lengths. In some places the shell material was 3" thick. All shell material we saw was empty of any tissue and was bleached with no sign of life. The shell community consisted of the same 4-5 organisms in the spots we surveyed. All the calcareous shell material was on the rig legs and in the leg guides. No other surfaces had any old shells attached.

We feel comfortable that although we were able to survey only a small fraction of the rig, what we saw was a representation of the rest of the legs. The dry dock in Singapore and transfer time across the Pacific seemed to be sufficient in killing the organisms.

Discussion

Kachemak Bay is very fortunate that the dry dock schedule of the Randolph Yost inadvertently avoided the transport of non-indigenous species that could have possibly become established as invasive species in our area.

All the nooks and crannies and surface area of the hundreds of square yards of 3" thick shell material has a tremendous potential to harbor species if kept in a marine or even a damp marine environment. Removing the organisms or sufficient dry docking can diminish or extinguish this risk. There is a lot of potential for transport of marine organisms on Jack-up rigs as there is no financial incentive for rig companies to clean the legs. It is not like the hull of a ship where a smooth clean hull saves fuel costs. When rigs are to be moved shorter distances it is even more important to clean and inspect as they are towed by tugs and not lifted out of the water as on a heavy-lift ship. It could be riskier to tow a rig from an area that has an already introduced invader in one location in Alaska to another, than these cross Pacific journeys. Rigs are also moved seasonally and stored with legs down in sheltering bays for the winter. Spreading invasive species from one area of Alaska to the other should be investigated before these scheduled moves as well. Four years ago the jack-up rig Endeavor came to Homer and had much the same backstory as the Randolph Yost and in that instance as well we were fortunate that the rig had an extended period of time in dry dock before coming to Homer. Hopefully regulations or a protocol can be put into place before a rig comes without sufficient drying time and brings with it live organisms.

(It is interesting to note how far behind saltwater invasive safeguards are compared to terrestrial invasive species regulations. The garbage from any foreign flagged vessel at its first port of call to the States must be treated very carefully. Both the US Coast Guard and US Dept. of Agriculture require all garbage to be handled by a certified contractor and transported to the nearest certified incineration point. This was done on the Randolph Yost with the rigs garbage being trucked by a special contractor to the Anchorage Airport to be incinerated.)

(Conversation with Matt Clarke Asst. Homer Harbor Master.)

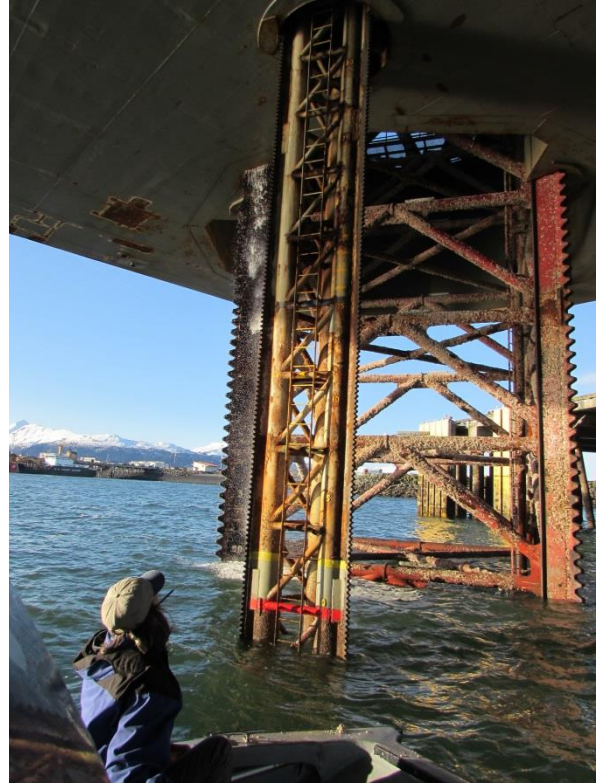
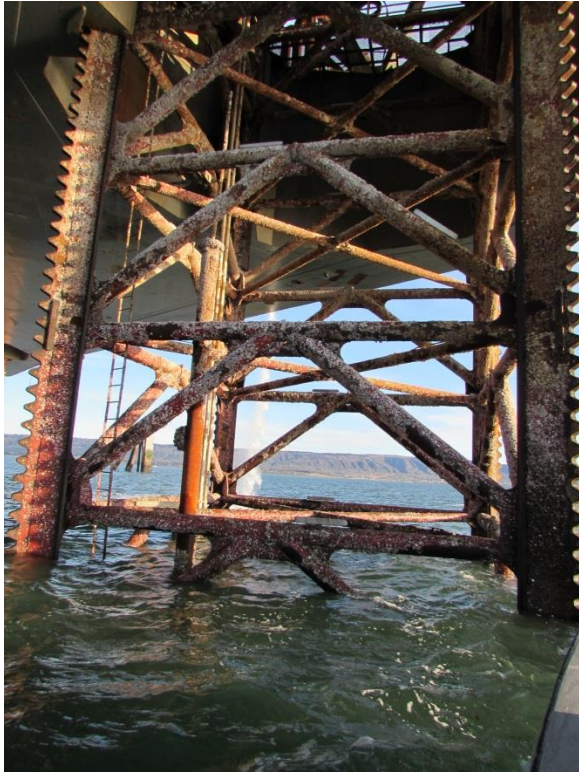
Recommendations:

- State of Alaska should create regulations to require jack-up rigs to document a complete dry dock period sufficient to kill all marine organisms attached to it, OR document the removal of organisms from the rig. It should also be required to have a survey conducted on the rig before it begins its journey to Alaskan waters, documenting it is clean of living organisms and ready for the journey. It would probably be a good idea to survey on arrival as well.
- If no state regulations are in place, which is the case now, cities or communities should protect themselves by requiring before giving berth:

- Organisms and shell structure be removed from all areas (legs, areas near the legs, spud cans, supporting structures and catwalks near legs, & jacking guides) before a rig comes into Alaska from another area OR to document a complete dry dock period sufficient to kill all marine organisms attached to the rig. It should also be required that the rig undergo a survey to document there are no living marine organisms attached to the rig before its journey to Alaska, and a survey upon arrival.
 - (During a discussion with Mr. Webb, he estimated that to sandblast and paint rig legs would cost \$1.5 million. Mr. Webb thought dry docking would be the least expensive option for the company.)
- Docking facilities or harbors are sometimes the first to know a jack up rig is coming to town. They should notify the invasive or harmful species agency in their area and Alaska Dept. of Fish and Game so that communication can be started about best practices, in the absence of regulations. Arrangements could be made for dry docking/removal of organisms and transit time can also be considered before it enters Alaskan waters.
- Jack up rigs are brought into protected waters for winter storage. Often they are towed some distance. Ideally they should be cleaned of organisms before they are towed to a new location/bay each season to minimize potential for transport of non-indigenous species from one area to another. Alaska does have invasive species and transporting marine structures is proven to be the most common way they are spread.
- It is recommended that the word “knowingly” is dropped from the Sec. 16.35.210. ➡ Nonindigenous ➡ fish state statute, as that word strips the statute of any teeth. See Appendix D

Appendix A: Survey underneath the rig from the boat.

Randolph Yost jack-up legs entering the water at the Homer Deep Water Dock.
Approximately 50% of the metal legs had calcareous shell covering. No live organisms seen.





Appendix B: Survey on the rig.



Randolph Yost jack-up legs are 400 ft. total. 50-100% of the metal legs had calcareous shell coverage. No live organisms seen. Shells end at 285 ft.





Bivalve shells, calcareous tube worm workings and barnacles were by far the most dominant organism remains seen.



This photo above shows one of many corners of the legs, which creates a depression that can hold stagnant water. We did not see any living organisms in these spots but it is a location of concern on the lower legs if spray accumulates during transit on heavy lift vessel.

(above)

More of the jack-up rig legs encrusted with shell remains.

(right)

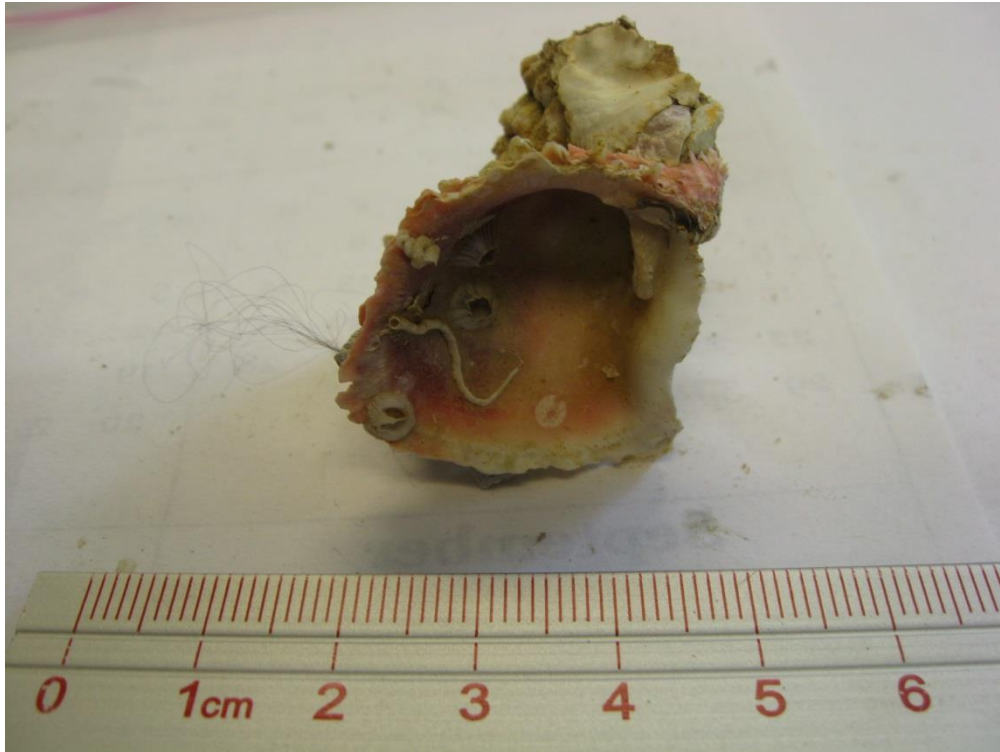
Appendix C: Samples taken; photos.

We will send these samples out for taxonomic review to find out as closely as we can what species they are. Contact Kachemak Bay Research Reserve for the results.

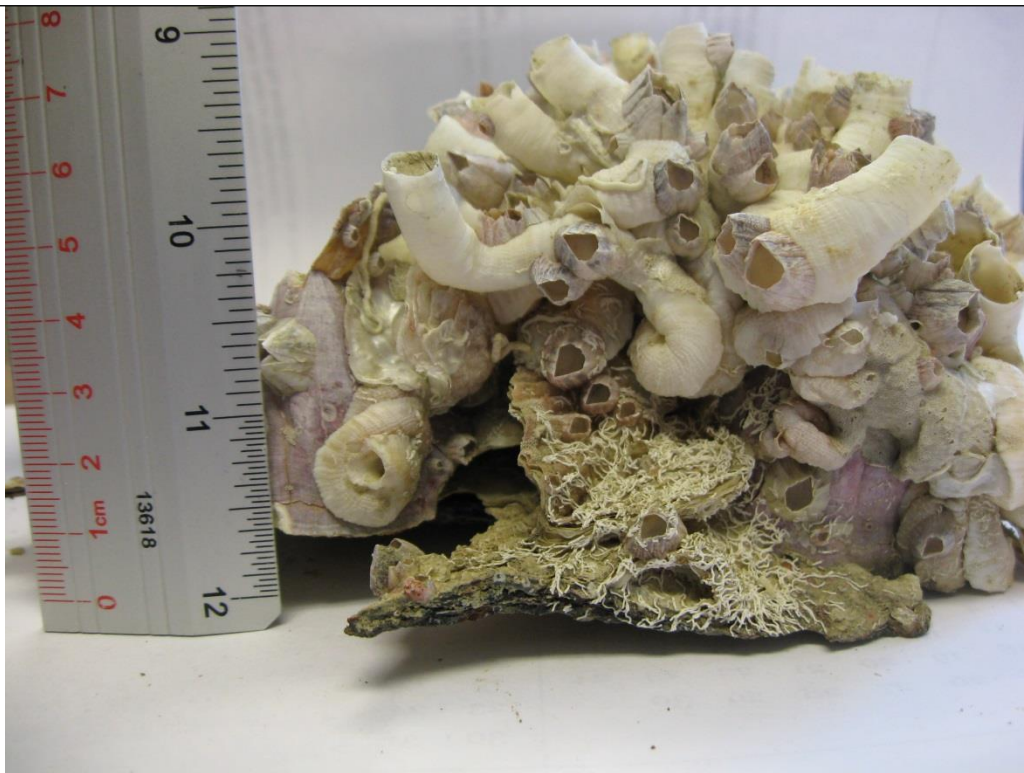


Possibly a spiny oyster. This is not a live organism. It was one of the only shells we saw with color that wasn't bleached out.





Small tube worm and barnacles shells inside bivalve shell.



Large and small tube worm casings and barnacle shells.



Large barnacles shells, large tube worm casings and oyster or bivalve shells. No living organisms.

Appendix D: state law on invasive fish (which includes invertebrates)

Sec. 16.35.210. ►►Nonindigenous◄◄ fish.

(a) A person may not knowingly release, or transport, possess, import, or export for the purpose of release, into the water of the state live ►►nonindigenous◄◄ fish or live fertilized eggs of ►►nonindigenous◄◄ fish, unless permitted by AS 16.05 - AS 16.40 or by a regulation adopted under AS 16.05 - AS 16.40.

This subsection does not apply to

(1) a fisherman who catches and releases a fish into the water from which the fish was taken; or

(2) generally accepted conduct in relation to permitted salt water commercial or sport fishing.

(b) A person may not knowingly rear live ornamental fish in, or release live ornamental fish into, the water of the state.

(c) A person who violates this section is guilty of a class A misdemeanor.

(d) In addition to the penalty imposed under (c) of this section, a person who is convicted of violating this section may be ordered by the court to pay restitution to the state to cover the costs of damages to fishery resources of the state and of removing the introduced fish species from the water of the state.

(e) In this section,

(1) "knowingly" has the meaning given in AS 11.81.900;

(2) "►►nonindigenous◄◄ fish" means a species of fish that is not native to the body of water in which the fish is released or is intended to be released;

(3) "ornamental fish" means an aquatic finfish, commonly referred to as tropical fish, aquarium fish, or goldfish, an aquatic invertebrate, or an amphibian that is imported, cultured, or sold in the state customarily for viewing in an aquarium or for raising in an artificial containment system and that is not customarily used for sport fishing in the state or used for human consumption;

(4) "water of the state" means any water of the state forming a river, stream, lake, pond, slough, creek, bay, sound, estuary, inlet, strait, passage, canal, sea, or ocean, or any other body of water or waterway within the territorial limits of the state.



Kachemak Bay National Estuarine Research Reserve
Alaska Center for Conservation Science
UNIVERSITY of ALASKA ANCHORAGE

Catie Bursch
Kachemak Bay Research Reserve
2181 Kachemak Drive
Homer, AK 99603
907-235-4797
cmbursch@uaa.alaska.edu