

Underwater Ordnance Survey
Fisherman's Bay (on Hog Island)
and the
Waugoshance Lighthouse



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Prepared by:

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Foreword

This report describes the underwater surveys of Fisherman's Bay on Hog Island and the Waugoshance Lighthouse. Both sites were known to have been used for target practice during World War Two. Suspicious objects were reported to have been sighted in Fisherman's Bay, and a 500-pound bomb was reported to have been spotted in the vicinity of the Waugoshance Light House.

Though Fisherman's Bay is in a remote location, the shallow depth of waters in which the suspect items were reported to have been seen raised concerns by those approaching the shore.

The Waugoshance Lighthouse was constructed in 1851, deactivated in 1910, and abandoned in 1912. Originally outfitted with a Fifth Order Fresnel lens (removed) it is accessible only by boat and not open to the public. Evidence of the public visiting the site was noted by the presence of an aluminum ladder leaning against the structure at the time of the survey.

This survey was conducted under contract to the Michigan Department of Environmental Quality by Underwater Ordnance Recovery, Inc.

Special thanks to the members of US Coast Guard Station Charlevoix who supported this mission and to Northwest Scuba, East Jordan, MI, for supplying dive gear.

Executive Summary

Fisherman's Bay

Since no ordnance items were detected in Fisherman's Bay, no action needs to be taken.

Waugoshance Lighthouse

Three ordnance items were located near the lighthouse:

- Two bombs having dimensions consistent with the US M117 750 LB General Purpose Bomb.
- One Torpedo warhead, which is separated from the propulsion unit (not found).

Are these items "armed and dangerous?"

- It must be assumed these items are explosive-filled, armed, and dangerous, since it is difficult to positively determine otherwise. The torpedo warhead and one of the bombs have sustained sufficient damage to have exposed the explosive filler material to lake waters, thereby greatly reducing the potential for a high order detonation.

What can be done to eliminate them?

- Since armed ordnance cannot be moved manually, the most common procedure is to detonate the items in place.

Will this damage the lighthouse?

- It is very unlikely the lighthouse will sustain damage as a result of the high order detonation of these items. The shock wave from the blasts will have little or no effect on the lighthouse footings and foundation. Most of the blast and fragmentation resulting from detonations in shallow water are directed straight up.

Could fragmentation damage the "birdcage" at the top of the lighthouse?

- My estimation is there is less than 6% chance for damage to the birdcage caused by fragmentation resulting from the high order detonations of these items.

Are there any other options?

- Underwater Ordnance Recovery Inc. (uwuxo.com) has the technology to remotely remove and transport these items to a distant disposal site.
- However, the system could not be employed at this site before the spring thaw and would require substantial funding to proceed.

What do you recommend be done?

- Request that the US Navy Explosive Ordnance Disposal Team respond and detonate the items in place, using "low order" detonation procedures. Though not always successful in preventing "high order detonation," these procedures are intended to explosively break apart ordnance and reduce the chance for a high order detonation. The remains can then be safely collected and disposed of at a more suitable location.

The State of Michigan Department of Environmental Quality Participants

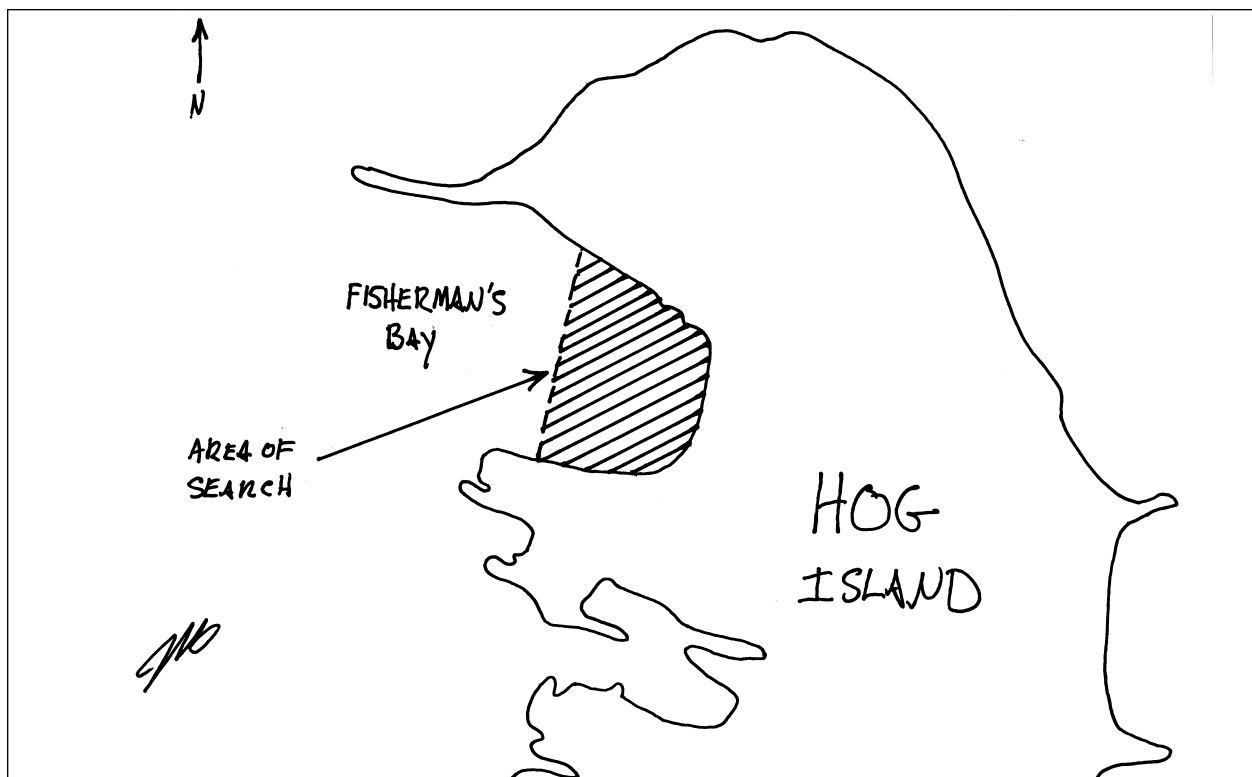
Team Leader: Bill Harmon, Formerly Used Defense Sites Coordinator
Bob Delaney, Defense State Memorandum of Agreement Coordinator
Nick Ekel, Georeference Specialist

DAY ONE (Fisherman's Bay)

On Monday morning October 26, we loaded mission gear and the 16 FT inflatable boat onto the 41 FT Coast Guard boat then headed out on Lake Michigan for what was to be a two hour plus transit to Fisherman's Bay on Hog Island. The skies were overcast and the wind and waves were up this day, but the trip was otherwise uneventful.

The approach to Fisherman's Bay is too shallow for the draft of the 41 FT boat, so we launched the inflatable some distance from the mouth of the bay. After arriving at the location of the previous sightings of suspicious objects, the diver donned snorkel gear and investigated each item in question and found them to be not ordnance-related.

A wide area search was then begun by towing the diver behind the inflatable boat in a north/south track within the bay. Shallow depths and 10-foot visibility permitted a reasonably swift pace. Several anomalies were investigated, though none proved to be ordnance-related. Later that afternoon we headed back out to the 41 FT Coast Guard boat to transfer gear and re-stow the inflatable boat. We then returned to Coast Guard Station Charlevoix.



Area of search within Fisherman's Bay.



We experienced inclement weather on Day One.



DEQ Team Leader Bill Harmon (right) passes out life vests before departure.



DEQ Team Members Bob Delaney (left) and Nick Ekel are hopeful we can get underway despite the weather



US Coast Guard Station Charlevoix personnel assist in stowing the gear below decks.



John Stevens of SCUBA NORTHWEST in East Jordan provided dive gear support.



The gear is stowed and the 16-foot inflatable is secured on the stern of the 41-foot boat.

DAY TWO (Waugoshance Lighthouse)

On Tuesday morning October 27, we departed Charlevoix for the Waugoshance Lighthouse. Skies were clear and winds were light, yet the seas were still up. After an uneventful transit we arrived and anchored the 41 FT boat approximately 300 yards off the west side of the lighthouse. Upon launching the inflatable boat and approaching the light for a closer look, we decided to launch the diver off the east side of the light where the seas appeared slightly calmer.

The diver employed a long-range underwater scooter and was tracked via attached “witness float,” though the boat crew had no trouble maintaining visual contact with the diver due to exceptionally clear water.

The first ordnance item found was located just off the east side of the light at a depth of 10-feet. An “old style” bomb with the nose pointing south embedded in the lake floor to almost half its diameter. An M117 750 LB bomb has a 16-inch diameter and a length of 46-inches. The dimensions of this item are 18-inches wide and 54-inches long. The dimensions recorded are a bit skewed due to the fact that the bomb was deformed on impact, having a flattened area along the top (creating a wider than normal diameter), a flattened tail (adding a few inches to its length), and a dent along the nose. The nose fuze well is hollowed out, and the base plate appears to be missing. No lifting lugs were visible. My conclusion is that this bomb is probably a M117 750 LB General Purpose Bomb.

A close look at the armor plating on the east side of the light reveals damage consistent with the size and shape of this piece of ordnance.

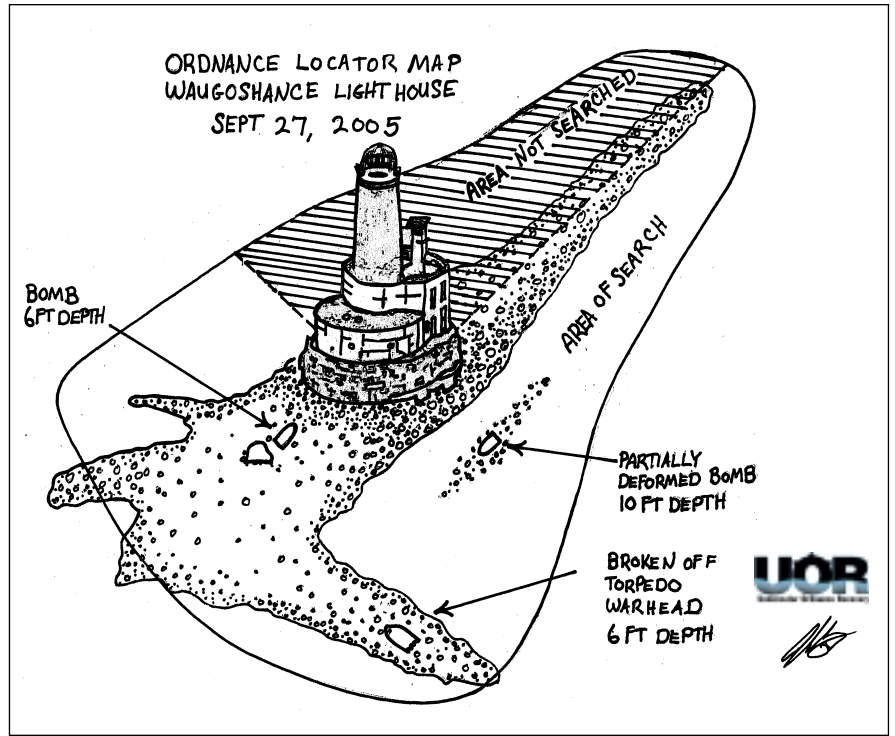
The second ordnance item was located SE of the light, in about 6-feet of water. It is a torpedo warhead, minus the propulsion unit. The body of the warhead is 22-inches in diameter and has a length of approximately 36-inches (with about a third of the diameter having settled into the bottom). The warhead faces west, is constructed of ferrous metal and appears undamaged near the nose. Where the propulsion unit would have been attached, there is evidence of a violent separation, possibly resulting from an aerial deployment having glanced off a shallow rock or the lighthouse itself. No exploder or arming well is visible.

The third ordnance item found was located almost due south of the light in about 6-feet of water. Relatively close to the light and near an unusually large boulder, it points north. Another old style bomb, it has dimensions similar to the first bomb located. Exact measurements could not be taken due to the surge created by high waves breaking over the area. This bomb appears intact and undamaged and has no cavities in either fuze well. No lifting lugs were visible, and the bomb case appears to have settled in to the bottom to almost half its diameter.

Efforts to complete the search of the immediate vicinity of the light were discontinued due to declining weather conditions.



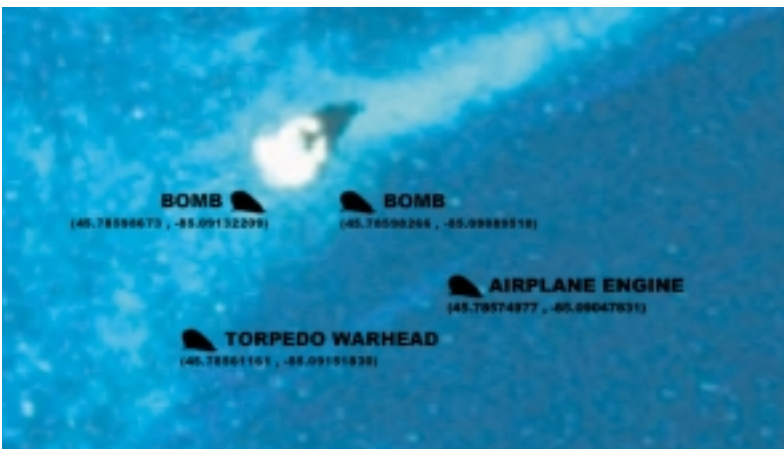
A view of Waugoshance Lighthouse as seen from the south east.



Inspection of the armor plating reveals an indentation about the same size as the partially deformed bomb in the water nearby.



The damage from this bomb appears to have come from direct contact with the lighthouse.



This satellite image plots the GPS location of each item as follows:

- Deformed Bomb 45.78598266, 85.09089510
- Torpedo Warhead 45.78561161, 85.09151830
- Intact Bomb 45.78598673, 85.09132209
- Airplane Engine 45.78574977, 85.09047831



The nose of this torpedo appears undamaged.



The rear area of the warhead shows how it was violently separated from the propulsion unit.



This bomb appears intact and without damage.



Underwater Ordnance Recovery Inc. non-destructive Bomb Recovery System undergoes a function test prior to being lowered into the water.



Found resting nearby is this early aircraft engine; note that it once had a two blade wood propeller.

On Sunday October 9, members of the US Navy Explosive Ordnance Disposal Team stationed in Crane, Indiana, under the direction of CW03 Kenneth Robinson, located and detonated three pieces of ordnance with no complications.

All items were verified as inert after detonation.



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