NATURAL SHORELINES FOREVER

LESSONS LEARNED PORTAGE LAKE, PINCKNEY, MI

SHORELINE RESTORATION / PROTECTION / HABITAT IMPROVEMENT UTILIZING WOODY STRUCTURE

Green logs are best, heaviest, longest lasting and will sink in place and move less.

Holes can be made 2' in from each end of the log by using a 4" x 4" "plunge cut" hole done with a chain saw. This allows the use of up to a 3" diameter or square hardwood post to drive through and anchor the log to the shore and at the non-shore end. This configuration greatly simplifies anchoring, will essentially last for hundreds of years underwater and eliminates the need to retrieve foreign anchoring objects like steel posts, anchors or straps from the environment. The handy person can even make these hardwood posts from the treetop branches from the log harvesting, or small saplings from a congested area thus reducing costs and optimizing all natural materials so as not to waste anything.

Log diameter specification for shoreline erosion mitigation related to watercraft wake must take into account that regardless of the securing configuration the log will rock back and forth and displace bottom gravels and soils and wear a "trough" below it. If the log diameter is specified so part of the log is exposed above the surface film to break wave energy or provide habitat for turtles, etc. the depth of the worn "trough" will be a key determining factor. On our site the trough depth was 6" after just two months of lake bottom contact. Lake bottom consisted of fine silt and sand with some fine gravels.

If log installations are for the purpose of mitigating wave action and / or to provide a resting / sunning place for turtles, frogs, ducks, herons, etc., a large sample of water depth measurements, during normal water levels need to be taken at the shore and at the depth where the lake end of the log is to rest. The range and average of these measurements should be calculated and the correct log diameter should be determined from those calculations – then take into account the above paragraph. You don't want to go through the selecting, cutting, transporting and installing 3,000 lb. logs only to find out it they are under water and the incorrect diameter to accomplish your goals.

The treetops from logs which are not used for fish sticks should be cut up and the fist size diameter and smaller brush put in piles throughout the woods to provide habitat for rabbits and other wildlife that usually suffer from a lack of habitat from "clean floor" woods management. Other uses would be to stage this material for future use for "brush bundles". Should this be the case make sure to store on top of other material to prevent contact with the forest floor which will otherwise begin to break down the material rapidly.

Fist size and thicker branches not used for fish sticks should be either used for staking down fish sticks or logs or cut up and used for firewood. When using live trees it is important to plan ahead and optimize the resource.

Stumps should have been excavated from sand using an excavation process with the purpose of preserving a wider root system. This will take longer and cost more. Those excavated for land clearing normally have the roots cut off close to the trunk to save time.

Store stumps on their side. Storing them flat will rot the roots and freeze to the ground making them impossible to move in the winter. Side storage will also allow the rain to wash the dirt off them making them lighter for transport. Removing dirt from roots can be accelerated by using a heavy-duty pressure washer and shovels / picks but plan on an hour per root system. However, the weight reduction by removing soil will be worth it to enable transporting and shore placement.

Choosing the right trees for fish sticks takes knowledge and careful observation. Shape, size, branch count, branch length and tree species are all considerations. Intact live trees for fish sticks are best and can be harvested with minimal impact on the forest according to forest management practices such as published by the University of Wisconsin. The branches of these 50' trees are flexible and workable. Cutting large trees with the intent of using the treetops is not as good as the weight of the tree crushes the treetop when it hits the ground. However, even though the treetops may have some broken or missing branches it is good to mix thick and thin branch trees and treetops so that the fish stick configuration has a combination of small branches and much thicker branches.

SPECIAL NOTE: If there are beavers within 1 mile of your fishstick installation you need to choose your material very carefully. Beavers will chew off and remove most of your installed material. Softwood (except pine which beavers don't prefer) and red oak on our installations were significantly reduced by them. Interestingly, the beavers near our installation did less damage to white oak and LEFT ALL HICKORY TREES AND BRANCHES ALONE.

A farm wagon frame called "running gear" with high load capacity (ours is 18,000 lbs) and giant 22" diameter tires is the most versatile way to transport logs, stumps, and treetops over road and the irregularities and snow cover on shorelines and ice. Building a wagon bed from 6" logs which extend past each end is best. 6" cross beams which are higher than the tires and extend over the tires are the best for sliding the logs off the SIDE of the wagon with a 6' pinch bar once on site and close to the placement location. And NO, you can't "just throw the logs on the ice and drag them." That's a terrible idea ignorant of physics and all the types of terrain and towing traction variation you will travel.

The farm wagon bed should be attached by weaving 3,000 lb ratchet straps around the frame and logs, and around the cross beams. Any fasteners like screws or bolts would be very time consuming and may compromise the integrity of the wagon frame. The straps also provide some slight give and take for these giant loads where rigid fasteners can fail.

The ice travel route should be carefully mapped out and flagged and retested as appropriate. Our travels were always over 14" of hard, clear ice. Consultation with long time lake residents is essential to identify historical springs, currents, and areas of the lake which have opened up during the winter for no apparent reason – this does happen. Most of the ice travel, if not all, and even if it's a longer route, should take place over ice very close to shore, ideally where the ice is so thick it's actually laying on the bottom of the lake. There is no substitute for mapping out, marking, checking and rechecking a safe ice travel route.

A powerful 4WD ATV can pull a farm wagon across the ice with a 1,000 lb. modified farm wagon and a 3,000 lb log or stump load several miles over irregular surfaces, snow encrusted ice, pressure ridges, etc.

If snow occurs on ice, it can insulate the ice and create a water layer between the snow cover and the ice. This will all but eliminate any traction and transportation over the ice will be impossible. If this happens, you must create a suitable roadbed. Wait until frigid temps are in the forecast and repeatedly drive over the transportation path and along the project shoreline. This will pack the snow down into the water creating a slush, then the slush will freeze solid providing you with a rough textured ice surface perfect for transporting materials by ATV and farm wagon.

Trees for fish sticks can be transported with the wagon by placing the heavy end of the tree hanging over the front of the wagon, bound down tightly at the front and the branch end hanging over the back end. The tree branches touching the ice do not create much drag friction. IMPORTANT: Use ratchet straps to bind together the width of the fish stick material at the midpoint and further toward the tips of branches. The width of the fish stick material can be bound together to reduce the width as much as 50% greatly enhancing transport and placement logistics.

Logs can be rotated on the ice for final placement using a logger's "Cant Hook". A Pinch Bar can be driven into the ice on the end you don't want to move and the other end can be rotated to create that log end movement to achieve desired angle to shore.

Once the material is moved to the general location for final placement, reference the permit and PLACE IT and FASTEN IT! Put together a plan for transport and placement as one effort and have suitable resources on hand to get the materials PLACED AND FASTENED immediately. No exceptions to this.

The risks of not placing the material once transported to site are great. Weather change can make placement later very difficult and time consuming due to snow / rain / water on ice. Once the ice is gone, even non-fastened 3,000 lb logs will move off shore and shallow waters into deep water if a storm hits. It's almost impossible to retrieve 3,000 lb logs that have migrated to deep water due to unpredicted storm waves and currents. Temporarily or permanently fasten everything immediately upon placement!

Pulling materials to shore for final placement can be accomplished by selecting a tree inland or driving temporary stakes and using a capstan winch such as the Portable Winch Company's PCW4000 and 300' of the recommended double braid polyester rope. This $1,700 expense and associated equipment is worth every penny for efficiency and preventing serious injury. Don't think you're going to save money by just getting enough bodies to pick this stuff up and move it. That's foolish and someone is going to get gravely hurt with these big loads - spend the money on the capstan winch for the efficiency and safety.

Placing some material on 3/16" X 4' X 8' High Density Polyethylene sheets reduces the friction on the wagon and on the ice and they can be slid easier. Though expensive we found these very useful for many situations where an extremely durable friction reducer was needed.

Though anchoring of material to shore should be immediate, Anchoring material by post, stake, duckbill, or Danforth anchor will have to wait until spring for final driving into the soil. Winter soils are frozen solid. In these cases a simple ½"diameter rope will do through chainsaw slots or 4x4 plunge cut holes and then tied back to trees.

For cabling fish sticks together, you can chain saw plunge cut several side-by-side slots in the stump end of the material until you get the desired width for the cable to go through.

¼" cable is as thick as you should use, it has 7,000 lbs of tensile strength, and the larger cables are far stiffer and very difficult to cut, bend to put through multiple tree slots and to install cable clamps.

For cabling fish stick trees together, allow an extra 8' for the weaving of cable through each of the individual tree chainsaw slots and for clamping the cable together.

For cabling, cables should be pre-cut, but ends wrapped with tape before and after cutting. Lengths and locations should be labeled - on both taped ends of the cable – one will wear off or get lost onsite just prior to installation, count on it.

When anchoring large logs or trees, using the 4" X 4" chainsaw plunge cut holes on each end, your stake length should follow the general rule of 4X the log thickness. Example: 18" log requires an approximate 6' stake. Drive through log, into the lake bottom and leave about 6 " above the log exposed, resulting in about 4' + of lake bottom engagement. Obviously, this is a very general rule, EGLE / DNR may have specifications on this that supersede those found here and this configuration choice is very site specific. This can be adjusted for lake bottom composition, but the general rule is still a good one. Stake width in this application should be at least 3" diameter and hardwood such as oak or hickory.

After logs are staked or fish sticks are anchored to shore, check the final installation often and check every time after a storm for the first few months. If any movement, use longer stakes or re-position/reconfigure any other anchoring method and resume checking. There should be no perceptible movement of any shoreline fastening system or the material will eventually break free.

On large projects, **there is no substitute for having the permit generating Scientist, EGLE official or other officials on site with the permit diagram in hand to help physically stake out where the materials should be placed and in what orientation ahead of time.** During this several hour process, very often adjustments need to be made from the theoretical placement of materials to accommodate or optimize the practical or physical realities and processes of actually transporting and placing the materials. These officials must be there to see for themselves and if needed, amend the permit accordingly. Once these officials have helped you stake out the materials, locations, etc. and initiated the appropriate amendments, the permit holder is in a much more efficient position to get the project done efficiently and in compliance with the approved permit with newly approved amendments.

It's best to consider these projects as one continuous experiment and with a full intent to continue to improve as observation occurs. These projects should never have a goal of being "done", but rather dynamic, educational, and being continuously improved to achieve more conservation benefits with a view towards sharing knowledge with the conservation community.

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