ARTIFICIAL NEST STRUCTURES FOR OSPREYS

A CONSTRUCTION MANUAL

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GREAT LAKES CLEANUP FUND
LE FONDS D'ASSAINISSEMENT DES GRANDS LACS

Ontario

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INTRODUCTION

Ospreys *(Pandion haliaetus)* have been increasing rapidly in many parts of North America since the early to mid-1970s, when organochlorine pesticides were withdrawn from widespread use. In the Great Lakes region and elsewhere these increases have been facilitated greatly by people installing artificial nest structures, particularly in areas where preferred natural nest sites are now scarce (e.g. large, old trees with dead tops, especially in beaver swamps).

Ospreys are dramatic birds, with a two metre wingspan, and many people get a great thrill from seeing them flying near their summer cottage, or plunging into a lake for fish. In some areas there are now waiting lists for people wanting an artificial nest platform installed within sight of their cottage!

This manual brings together a number of different designs for constructing artificial Osprey nest platforms best suited to the habitats found in Canada. The focus relates mostly to the Great Lakes region, but designs and general considerations will be applicable to many other parts of North America. The final section deals with the alternatives for relocating Osprey nests which cause problems on live electricity transmission structures.

Different types of nest platforms are suited to different habitats and sites. If you are in doubt about which design to select, call your local wildlife office. The details provided in this manual will encourage and help people to install and maintain these nest structures for Ospreys in many parts of Canada.

SITE SELECTION CONSIDERATIONS

- The best opportunities for attracting breeding Ospreys into an area are when breeding populations already occur within about 20 km. If your site is more remote from existing breeding areas, you might have to wait a few years, since Ospreys colonise new areas fairly slowly.
- Ospreys prefer to nest close to water, so choose a site as close as possible to the water, usually within 50 m. Ospreys catch fish in shallow water less than 1-2 m deep, so there is little point putting up a nest platform in areas with little water of this depth. The shallow margins to lakes, often with emergent vegetation, are usually good sites, but sites on larger lakes in bays and among groups of small islands can also be good.
- Small, rocky islets are good sites, because they are often less accessible to predators such as raccoons, and the Ospreys have a clear flight-line close to the nest, uninterrupted by nearby trees.
- Ospreys have long wings and cannot manoeuver close to the nest, so avoid erecting platforms within about 10 m of large trees if possible. When a platform is installed on a tree in a forested area, select a large tree higher than the surrounding canopy.
- Bald Eagles are dominant over Ospreys, and steal fish from them, so do not install Osprey platforms in areas used heavily by breeding Bald Eagles.
- In areas where water levels drop dramatically in mid-summer, platforms installed over water might be left high and dry, and hence accessible to predators. In such cases it is crucial to have effective anti-predator guards on all supporting poles.
- Ospreys are reasonably tolerant of human disturbance, but it is better to install a platform at least 100 metres away from the nearest cottage or home. Avoid areas with very heavy boat traffic or other types of intense human disturbance.
- Platforms should usually be placed at least 200 metres apart, to avoid defence of two platforms by the same pair.
- You must contact the landowner before installing an artificial nest structure, and get their full permission. It is also advisable to contact neighbouring residents or cottagers at an early stage. Their support can help conserve the site later on, and generate a lot of community interest and involvement with monitoring events at the nest when birds breed.
- You should also contact your local government wildlife office at the early planning stage, to check that there are no other sensitive wildlife interests on the site (for example, nesting Common Terns or other colonial fish-eating birds, which could conflict with nesting Ospreys).

GENERAL NOTES ON CONSTRUCTION

There are basically two main types of artificial nest structures suitable for Ospreys in Canada -- a platform on a single pole (such as an old hydro or telephone pole) bolted to, or dug into, solid ground, or a platform on a quadrapod or tripod sunk into mud in shallow water.

Helpful Hints

- Winter and early spring are usually the best time to install Osprey platforms because one can readily access sites with vehicles such as snowmobiles, or ATVs with sleds. Travelling and working on ice can be very dangerous, especially in late spring, and extra care should be taken when hauling heavy equipment.
- Cedar is the best wood to use for the platform. Pressure-treated lumber is cheaper but the possibility of some leaching of the wood preservative into water courses might not be acceptable in some areas.
- Use galvanized nails, bolts and wire whenever possible. Pre-drill all holes to prevent wood from splitting.
- Male Ospreys often like to perch near to the nest. If no obvious tree perches are available within sight of the nest, a length of wood can be nailed to the platform so that it sticks out to one side by about 1 m, providing an excellent perch.
- A wire mesh base to the platform is often helpful, but not essential. Similarly, a few sticks lashed or woven onto the platform can encourage birds to get started with building a nest. Securing a short vertical stick at each corner of the platform can help prevent the nest from blowing off, as well as provide good perches for the birds.
- The anti-predator guard is very important, since raccoons are the main predator of Osprey eggs: a 1.5-2 m length of sheet metal (aluminum, tin or steel) wrapped firmly and completely around the pole(s) well above the water level is a good device. Make sure that the overlap is pointing downwards if you are using more than one sheet of metal. A more elaborate inverted cone (like an anti-squirrel guard on some bird feeders) has been used in some areas.
- Inspection of the sites on an annual basis is very important. Ice conditions can cause tripods/ quadrapods to move, or guy wires to break. Repairs are usually quite easy to make, and pay dividends later on when the birds arrive back. After a few years some nests become huge because Ospreys continually add new sticks to their nests. This weight may cause support structures to break, so it is often a good idea to remove some nest material every few years from particularly large and heavy nests. Most of these structures should last for 15-20 years, if constructed properly.
- In some areas Canada Geese will occupy Osprey nesting platforms before Ospreys return in April. To deter the Canada Geese secure a tarpaulin or convex lid from a garbage can over the entire Osprey nest during the winter, and leave in place until the first Ospreys are seen in the area in April. The smooth surface will prevent Canada Geese from nesting.
- Installation of these poles and platforms, and subsequent nest inspection and repair, can be dangerous. In all cases it is recommended strongly that experts in such types of construction and climbing techniques are consulted, and ideally be part of the crew on-site. The federal and provincial governments will accept no liability for any accidents arising from the construction, installation or maintenance of any of the structures described in this manual.

A. SINGLE POLES

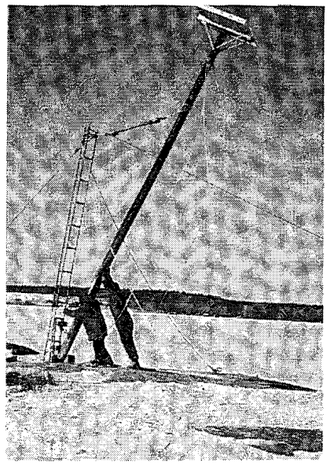
The pole should be 5-10 m above the ground at most. Sometimes old poles can be acquired from local telephone or hydro company offices, especially if these utilities are installing replacement poles in the community. Make sure that the pole you use is reasonably sound throughout and not rotten or riddled with woodworm. Be careful when using poles treated with wood preservatives such as creosote, especially if the pole is installed in water.

If the pole is being placed on a small rocky islet, rock mounts are usually necessary. These can be expensive to buy, but once again telephone or hydro offices may be willing to donate used ones. A rock drill is needed for securing the rock mount and the guy pins to the bedrock. Use guy wires where necessary, especially when rock mounts are used to bolt the base of the pole to solid rock, or when the pole is inserted to only a short depth in the soil or loose shale substrate, or in a stone crib. Three guy wires are usually adequate. Where the pole can be dug into a deep (2 m) hole in shale, bedrock or soil, guys may not be necessary. In very loose shale you may require an even deeper hole if supporting guy wires cannot be fitted. This kind of hole usually needs to be dug with specialized machinery on the rear of a tractor or snowmobile. Poles put into wet holes will lean later on if not secured well with guy wires.

An alternative mounting for the base of the pole is a rock-filled crib, at least 1-1.5 m deep. At sites where machinery cannot be brought, an effective way to erect the pole is to set up an old TV antenna adjacent to the pole site, using guys. A block and tackle is installed at the top of the antenna, then the Osprey pole and platform can be hauled slowly into an upright position, then secured to the rock mounts.

Georgian Bay Designs

Credit: L. Benner



Credit: Georgian Bay Osprey Society

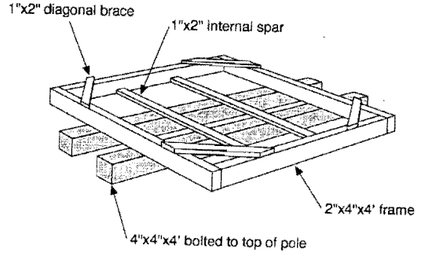
Georgian Bay Design

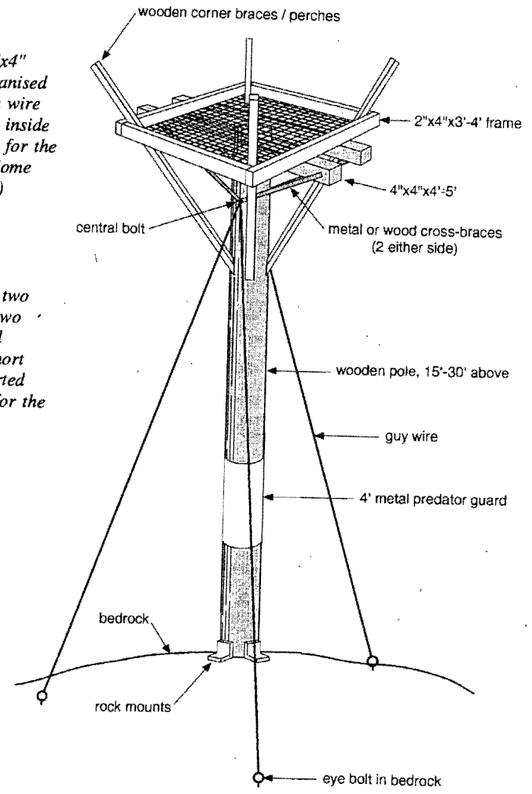
This type of pole/platform arrangement has been used successfully by the Georgian Bay Osprey Society, and in the Upper St. Lawrence River and eastern Lake Ontario. The 3-6 m pole is secured to the bedrock with a cast iron rock mount. Extra stability is provided by 3-4 guy wires tied to eyed bolts cemented into a hole in the bedrock, and attached to a bolt passed through the middle of the upper part of the pole. An anti-predator guard should be fitted to each completed pole. The cross-braces which secure the platform on top may be either of metal or wood, but it is best to fix these to the pole with a long bolt going right through the pole.

Various designs have been used for the wooden platform. Both types are nailed firmly (4" - 6" nails) onto 4' x 4" x 4" timbers set horizontally at either side of the top of the pole, to form a firm flat base there. The two most practical and successful designs are shown in the figures:

Figure 1. *This type is a 3'-4' square frame of 2"x4" timbers, secured together by 4" exterior-use galvanised nails (spiral thread, for extra grip). A 2"x2" mesh wire base is used. Additional 2"x4" braces which pass inside the corner of the platform provide added stability for the nest, as well as a perch for the off-duty Osprey. Some sticks may be woven into the mesh base. (on right)*

Figure 2. *This type has a similar frame, but with two additional 2"x4" cross-pieces set internally, and two optional 1"x2" internal spars, with short diagonal strengtheners across each corner of the frame. Short (18"-24") sticks or lengths of lumber may be inserted into these corners, to provide additional support for the nest later on. (below)*





International Osprey Foundation Design

This design is similar to Figure 1, but is slightly simpler to construct, and uses chain-link fencing as the nest-base. See Figure 3 for construction details. For further details on this design, or on the Sanibel Tripod (see Figures 10 and 11), contact: International Osprey Foundation, P.O. Box 250, Sanibel, Florida 33957-0250, U.S.A.

Step #1
Nail the four frame boards together

Step #2
Staple the chain link fence to the top of the platform frame.

Step #3
Nail the base board across the middle of the platform frame.

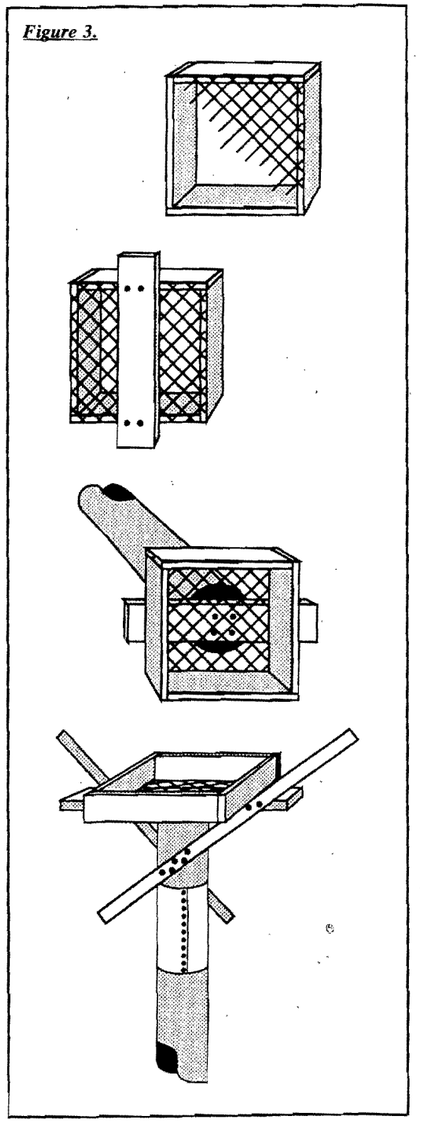
Step #4
Turn entire platform over so that the base board is on the bottom. Mount the platform on the top of the pole using the 6 inch nails, before the pole is placed upright.

Step #5
Mount the brace boards on opposite sides of the platform, with one end attached to the pole and the other end attached to the base board, extending a few feet above the platform.

Step #6
Wrap the sheet of aluminum around the pole so that it will be at least 10 feet above ground level after the pole is planted. (This acts as a guard against raccoons climbing the pole into the nest.)

Step #7
Plant the pole at the chosen location. To help attract Ospreys to the platform, place a few sticks (no larger than 3/4 inches in diameter and 18 inches long) within it.

Figure 3.



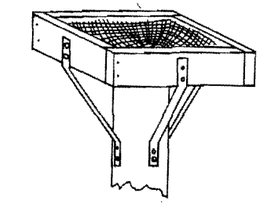
List of Materials

4-2" x 4" x 3' P.T. boards (Frame)
2-2" x 4" x 6' P.T. boards (Braces)
1-2" x 6"x 4' P.T. board (Base board)
1-3' square chain link fence
1-3' square of aluminum sheet
4-6" galvanized lag bolts or nails
Assorted galvanized nails & staples as needed

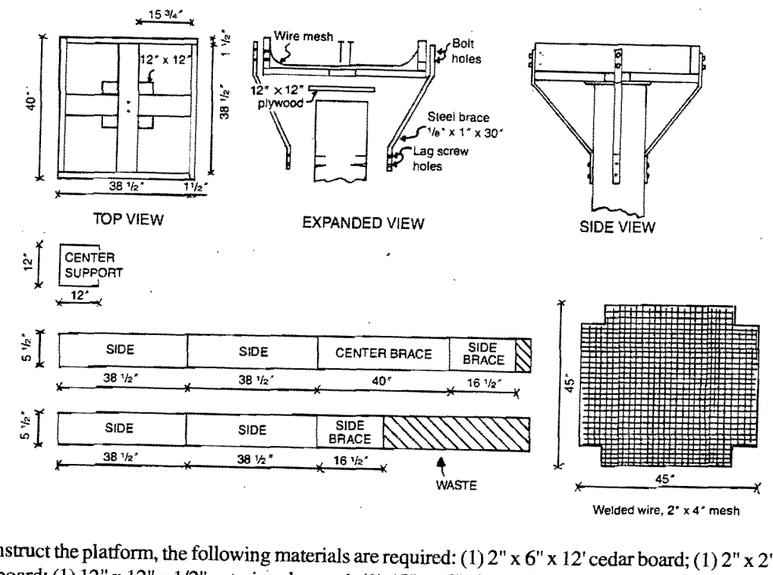
Minnesota Design

This platform is similar to the International Osprey Foundation's design, but has more sophisticated supporting braces. The design is recommended by the U.S. National Wildlife Federation (Millsap et al. 1987), and further details are provided in Woodworking for Wildlife (Henderson 1984). See Figure 4.

Figure 4. *Construction plans for Minnesota Osprey platform.*



LUMBER: One 12" x 12" x ½" exterior plywood
One 2" x 6" x 12' cedar board
One 20' or 30' cedar support post
One 2" x 6" x 8' cedar board



To construct the platform, the following materials are required: (1) 2" x 6" x 12' cedar board; (1) 2" x 2" x 8' cedar board; (1) 12" x 12" x 1/2" exterior plywood; (1) 45" x 45" piece of heavy duty wire mesh; (20) galvanized 40D nails; (4) 1/8" x 1" x 30" steel strapping; (8) 2 1/2" x 1/2" bolts with washers and nuts; (8) 4" x 1/2" lag screws; (1) 6' or 8" diameter cedar post, 20' to 30' long; and wood preservative and stain. To prevent splitting, predrill all nails and bolt holes. Treat the entire structure with wood preservative and stain brown. To encourage use by Ospreys, wire several sticks into the nest. (Platform drawing by C.L.Henderson, J. Voigt-Englund, and M. Miller. This diagram and information appears in Woodworking for Wildlife, Henderson [1984]. Please see this publication for additional information on platform construction and placement.)

U.S. Bureau of Reclamation Design

This is also a 3 ft square wooden frame mounted centrally on a wooden pole. A little more carpentry is required, but the final product is very solid. The final height of the platform is around 20 ft above ground. However, if the pole cannot be dug-in to a depth of 6 ft, guy wires and a rock mount or stone crib must be used. The design follows the one used by the U.S. Bureau of Reclamation (Bob Adair, Boise, Idaho, 1983). Lumber used for the platform should be durable softwood such as redwood, cedar, or cypress. If platforms are located in marine or extremely humid environments, weathered, pressure-treated lumber should be used.

The outer frame of the platform consists of three 2- x 4-in. x 3-ft boards and one 2- x 4-in. x 6-ft board joined to form a 3-ft-square frame with one 3-ft extension; the extension is designed to serve as a perch. The centre supports are comprised of four 2- x 6-in. x 3-ft boards that are notched (mortised) and joined to form four cross-lap joints; the inside edges of the notches should be spaced 5 in. apart. The bottom of each center support should be cut at an angle (beveled) approximately 6 in. from the end to match up with the 2- x 4-in. outside support. All joints should be glued and nailed. To provide additional support, galvanized metal straps are nailed across the cross-lap joints. After the framework has been constructed, a 3- x 3-ft piece of 1- x 2-in.- mesh galvanized welded wire fabric is stapled across the top of the platform. To help secure nest materials to the platform, twelve 5/8- x 7-in. hardwood dowels are set 2 in. deep and 10 in. apart into the upper edge of the 2- x 4-in. supports.

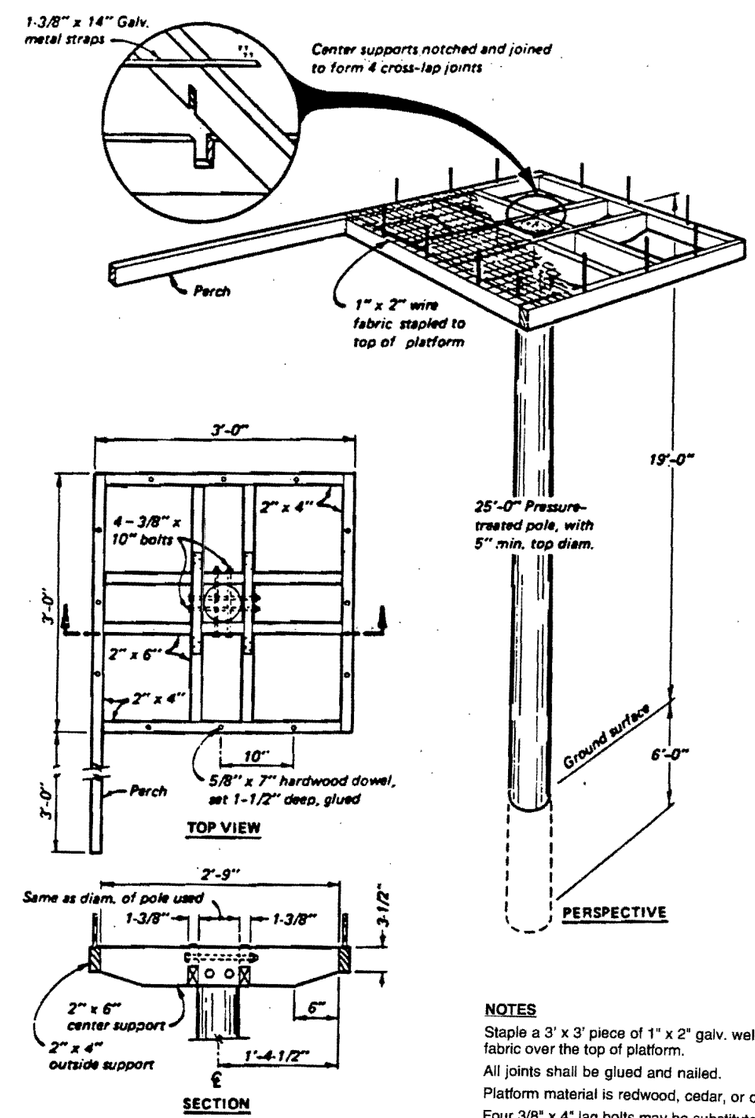
Frame platforms are usually mounted on a single pole support. If the frame is to be placed atop a snag or live topped tree, dimensions of the center supports will probably need altering prior to construction. To mount the frame on a pole, the sides around the top of the pole must be trimmed so that the center supports fit flush against the pole. Bolt positions should be marked on both the pole and frame, and the pole should be pre-augered if lag bolts are used. The assembly is completed by bolting the platform onto the pole.

The completed platform assembly can be trucked to the installation site and set into a hole with a backhoe. Holes for artificial supports can be excavated with a power auger and should be a minimum of 6 ft. deep. The pole must be set into a dry hole because one set into a wet hole may eventually lean, thus creating a safety hazard and possibly eliminating an accepted nest site. Poles must not be set in concrete because pole shrinkage with subsequent accumulation of water may result in wood deterioration. After installing the pole, the soil should be tamped very tightly in layers up to the surface of the ground, and the pole should be plumbed as tamping proceeds to ensure that it will stand in a vertical position. Adding a base of sticks to the platform after installation may attract Ospreys to the structure and facilitate nest construction.

Materials needed to construct this frame platform

Item	Quantity
Frame Platform Lumber	
2 x 4 in. x 3 ft	3
2 x 4 in. x 6 ft	1
2 x 6 in. x 3 ft	4
Hardware	
Nails, common 16d galvanized	1/2lb
Nails, common 6d galvanized	1/4 lb
Galvanized metal strap, 3/8 x 14 in.	2
Bolts, 3/8 x 10 in.	4
Galvanized welded wire fabric	
1-x 2-in. mesh	3 sq ft.
Heavy-duty wire staples, 7/8 in	1/4lb
Miscellaneous	
Hardwood dowels, 5/8 x 7 in.	12
Wood glue	1 container (16 oz)
Support Pole	
Pressure-treated pole, 25-ft minimum height, with 5-in. top diameter	1

Figure 5. *Wooden frame nesting platform with perch, after guidelines originally provided by Bob Adair, U.S. Bureau of Reclamation (Martin et al. 1986).*



NOTES

Staple a 3' x 3' piece of 1" x 2" galv. welded wire fabric over the top of platform.

All joints shall be glued and nailed.

Platform material is redwood, cedar, or cypress.

Four 3/8" x 4" lag bolts may be substituted for the four 3/8" x 10" bolts.

Circular Platforms

In some cases an old wagon wheel attached to the top of a single pole has provided a firm nest support for many years. Wooden or metal wagon wheels could be used. Old satellite TV reception dishes can also be used, provided plenty large holes are drilled in the base to prevent rain water from accumulating and flooding the nest contents. A wooden pallet secured by wire within the satellite dish provides a firm base for the nest. Circular platforms are usually mounted centrally on the pole.

Another simple type of circular platform was introduced in Lunenburg County, Nova Scotia, in the late 1970s, when Osprey nests on live hydro poles were interfering with electricity supplies. After the end of the breeding season, nests were removed from eight live hydro poles, and a 12.2 m pole erected close by. The circular end was cut off a 1.1 m diameter wooden cable spool, and the hole in the middle was enlarged to 27-29 cm. to fit over the top of the pole. Two 2" x 4" timbers were bolted to the top of the pole as supports, then the wooden spool end was bolted to the 2x4s. Nails were driven part-way into the top of the spool as anchorage for the nest sticks which were transferred from the nearby nest. All wood was treated with preservative to retard rot. Six of the eight substitute poles were occupied the first season after installation (Austin-Smith & Rhodenizer 1983). Holes should be drilled in the wooden spool end to allow water to drain away.

Circular Platform Designs

Credit: L. Benner

Credit: L. Benner

Offset Solid-Base Platform

These designs differ from the preceeding single pole designs in that the platform is made from a 3 ft square of 3/4 in. exterior plywood, which is then cut into an octagonal shape and mounted to one side of the top of the pole providing easier access to the nest by ladder, or pole climber. Both designs shown (support A and support B) could be used readily on top of a sawn-off live tree, or a pole installed specifically for this purpose, or even on an old hydro or telephone pole. To prevent water accumulation, drill large drain holes in the base. See Figure 6.

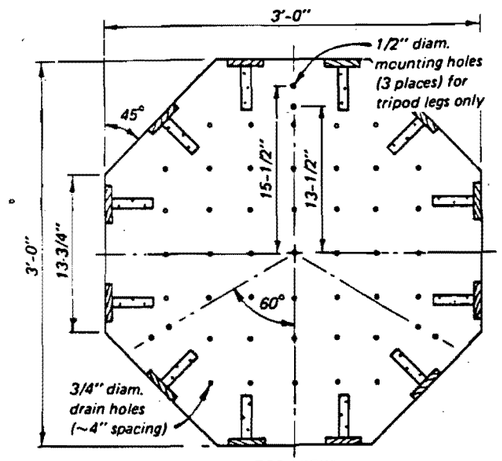
Platform design: The solid base platform described here is essentially a 3-ft square cut from 3/4-in. AC exterior plywood. The corners are sawed off to make an octagon in the recommended design after guidelines provided by Thomas U. Fraser, Sr., (Conservation for Survival, Grosse Point Shores, Michigan, 1984). After cutting the base, a series of 3/4-in. holes are drilled through the base to allow for water drainage. Twelve nest material retainers are installed around the edge of the base. Each is constructed of a 1- x 4- x 8-in. block set on end and attached to the platform with a 4-in. corner brace and wood screws; two 2-in. wood screws are driven into the retainer from the bottom of the platform, and six 3/4-in. wood screws are used to attach the predrilled brace to the platform and retainer. Solid base platforms may be mounted on either a single support or a tripod. If a tripod is used, three pairs of mounting holes should be drilled in the platform at points an equal distance from each other to connect the legs; the holes should be 13-1/2 in. and 15-1/2 in. from the center of the platform. Flat steel reinforcements may be attached to the bottom of a tripod platform for added strength.

Pole supports: Two designs are suggested for attaching the solid base platform to a pole or tree. In the first method (support A), two opposite sides of the pole are notched at the top so that two 2- x 4-in. x 3-ft horizontal supports can be nailed to the flattened surfaces. Two struts made from 1/2- or 3/4-in. conduit with the ends hammered flat and predrilled are screwed, nailed, or lag-bolted to the platform support and the pole or tree. The platform is nailed to the horizontal supports using 8d or 10d nails. An alternative method for attachment is to use three struts for support and nail the platform directly to the top of a pole (support B). Mounting the platform off-center facilitates access by the investigator.

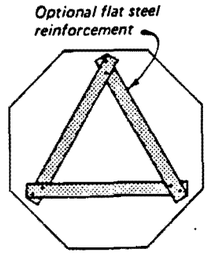
Materials needed to construct a solid base platform and supports

Item	Quantity
Platform	
3/4-in. AC exterior grade plywood, 3 x 3 ft	1
Blocks, 1x 4 x 8 in. (nest material retainers)	12
Metal corner braces, 4-in.	12
Wood screws, 2-in. (for attaching retainer to platform)	24
Wood screws, 3/4-in. (for attaching metal corner braces to platform and retainer)	72
Steel strapping, 1/4 x 3/4 x 27 in. (optional reinforcements for bottom of platform--for use with tripod support only)	3
Support A	
Lumber, 2 x 4 in. x 3 ft (horizontal platform supports)	2
Conduit, 1/2- or 3/4-in. diam, 3 to 4 ft long (struts)	2
Nails, 16d (for nailing platform supports to pole	4
Nails, 8d to 10d (for nailing platform to supports)	12
Lag bolt or wood screw, 2-in. (for attaching strut to pole)	4
Lag bolt or wood screw, 3/4-in. (for attaching strut to support)	4
Support B	
Conduit, 1/2- or 3/4-in. diam, 3 to 4 ft long (struts)	3
Lag bolt or wood screw, 2-in. (for attaching struts to pole)	6
Lag bolt or wood screw, 3/4-in. (for attaching struts to platform)	6
Nails, 20d (for attaching platform to top of pole)	2-3

Figure 6. Solid-base octagonal platform and two support options [original design supplied by Thomas U. Fraser, Sr., of Conservation For Survival, (Martin et al. 1986).]



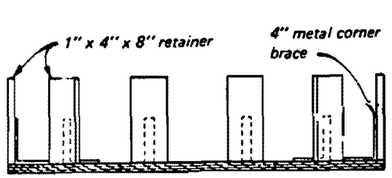
TOP VIEW



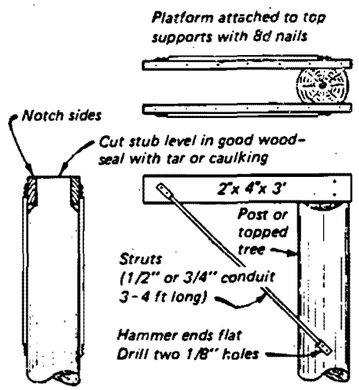
BOTTOM VIEW

NOTES

The base shall be 3/4" AC exterior plywood.
3/4" holes are drilled through the base for drainage.
Mounting holes and steel strapping are for use with tripod support only.

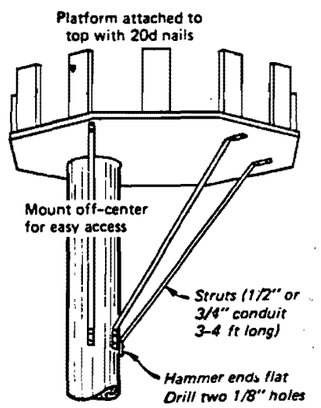


SIDE VIEW



Mount off-center for easy access.

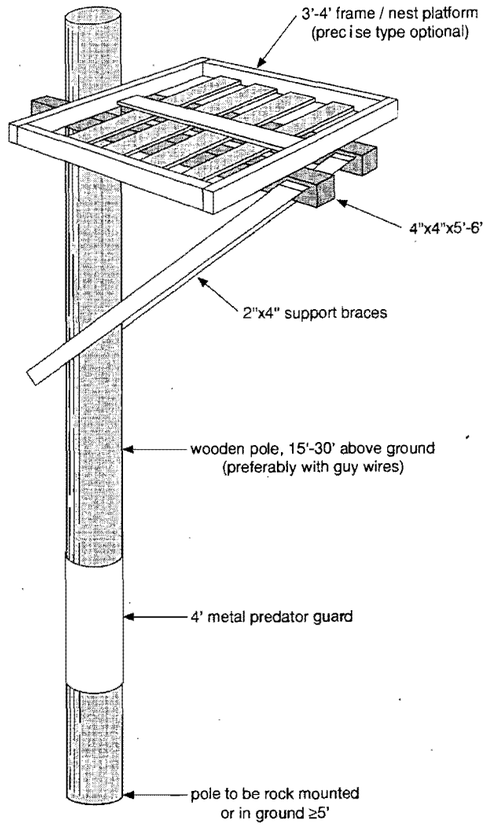
SUPPORT A



SUPPORT B

Offset Pallet Platform

This design has been developed recently in Ontario by B&J Pole Line Construction Ltd., Napanee, in conjunction with the Ontario Ministry of Natural Resources and Environment Canada. The platform is made from a hardwood industrial pallet (such as maple or oak, not a softwood). Remove the top half of the pallet (to reduce the overall weight), then nail on hardwood perimeter boards 2" x 8" or 2" x 10" in dimensions. One or two central cross spars (2" x 4") can be added to strengthen the platform. (See Figure 7). This platform is then nailed firmly onto the two horizontal mounts (4" x 4" x 6'), which are bolted or nailed close to the top of the single pole, and supported by two 2" x4" braces. (See Figure 8). This modified industrial pallet can also be used on support structures other than single poles, such as quadrapods, or in trees. (See Figure 15).



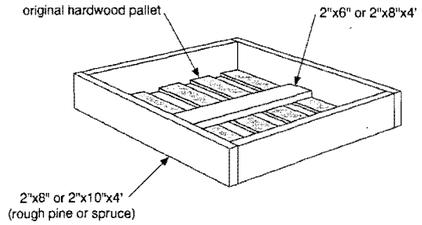


Figure 7. Industrial pallet modified as Osprey nest platform.

Figure 8. Pallet platform mounted offset on a single pole.

B. OTHER STRUCTURES

Wooden Quadrapods and Tripods

This type of artificial nest structure has been most successful in more sheltered, shallow water situations, especially around the edge of cattail swamps and margins to smaller inland lakes. The design given here is the culmination of years of experience in the Kawartha Lakes, Ontario, and was provided by Mike Barker and Herman Milke. It is advisable to check this type of support structure each winter/early spring to make any repairs just before Ospreys return in mid-April. Often this involves installing an additional support leg, since ice movement causes some leaning of the platform over the years. Wooden tripods have been used in a few areas, but they are not as stable as quadrapods.

Materials required

Item	Quantity
Cedar poles 18- 20-feet long, 4-6" thick	4
Block of hardwood (about 5" x 5" x 2')	1
8" spikes/nails	2
4" spiral spikes/nails	12
6" spiral spikes/nails	12
Black fencing wire	20 ft
4' wide sheet metal for predator guards	4
2" roofing nails	30
4' x 4' pallet	1
pliers, claw hammer, sledge hammer, saw, ice pick, 8" ice-auger	
4' length of chain, 5 m ladder or step ladder	

Wooden Quadrapod Design

Credit: P. J. Ewins

Procedures for constructing wooden quadrapods and tripods

Usually the optimum time and ice conditions for building quadrapods occurs in late January and February. Equipment such as snowmobiles and/or 4 wheel all-terrain vehicles can make the job of transporting material and people to the site easier. If walking to the site, a sleigh or toboggan can be utilized for moving equipment. Plan to have at least 3-4 people to assist with building the structure. (See Figure 9).

Step #1

Once the site is established, 4 holes are drilled into the ice with the ice-auger at a 45 degree angle. Holes should be drilled in a square pattern, 5 to 6 feet (2m) apart.

Step #2

The sharpened Cedar poles are then rammed into the holes and can be driven deep into the ground by using a sledge hammer on a block of hardwood which is attached to the side of each pole by a chain. To hold the chain in position on the pole a small V - notch is made into the pole with a saw. The poles should be driven into the ground at least 3' (1m).

Step #3

The wooden skid/pallet(platform) can then be placed into a level position between the tops of the poles. Try to have the platform at least 8' (2.4m) above the ice. Nail (6"spikes) and wire the platform to the poles. A 15' (5m) aluminum ladder or tall stepladder is useful to reach, position and nail the platform into a level position. Cut the pallet to 3' x 3' (1m x 1m) if needed.

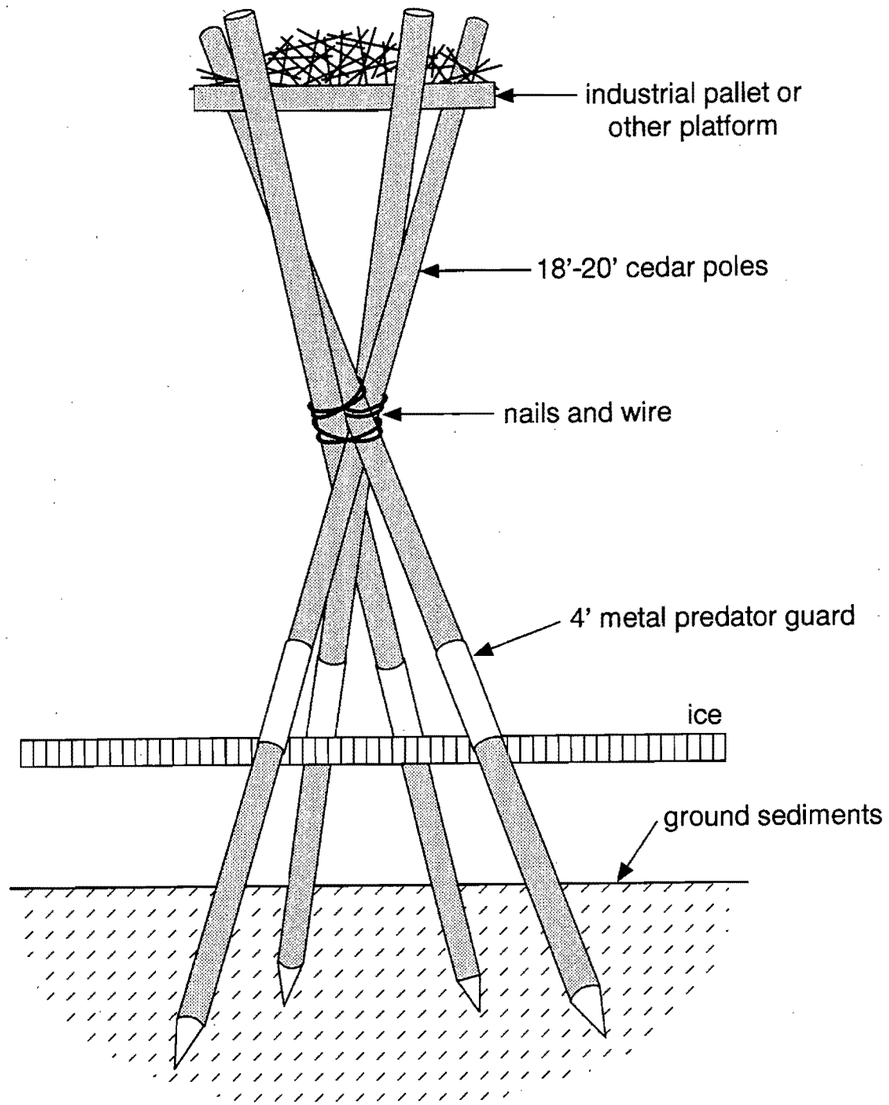
Step #4

The poles can then be nailed together using the 8" spikes and wrapped with wire. The predator guards (sheet metal, aluminum siding or plastic crazy carpet) at least 3' (1m) in length are then wrapped and nailed (2" roofing nails) to the base of the poles, from ice level upwards. Make sure nail heads are flush and that there are no gaps or projections for predators to get toeholds.

Step #5

If available, a nest can be fixed to the platform, if not weave some twigs into the top of the platform. An Osprey perch can be attached to the platform or an extra cedar pole can be driven into the ground at a 45 degree angle about 15' (5m) from the quadrapod. The perch is often used by the male Osprey for feeding and also helps to keep the adults close to the nest during fledging.

Figure 9. Wooden quadrapod support for nest-platform, installed over ice.



Sanibel Tripod (International Osprey Foundation)

This relatively lightweight tripod was designed to be portable, for use in remote areas and in locations with very soft substrates such as marshes and swamps. It was designed on Sanibel Island, Florida, by the IOF in conjunction with the Sanibel-Captiva Conservation Foundation, and has worked well there. It is quite sophisticated, and more complicated to construct than most other nest-structures, but can be useful in some situations. See Figures 10 and 11 for construction details. For further information, contact: The International Osprey Foundation, P.O. Box 250, Sanibel, Florida 33957-0250, U.S.A.

Each leg of the tripod is 24 ft long and consists of 4 connected pieces of 2" x 4" lumber (three 12-ft lengths and one 8-ft length). Two of the 12-ft pieces are fitted together and are attached to an 8-ft/12-ft piece so that there is a 4-ft long, 2" x 4-" extension at the top of the leg. The legs are assembled by fastening the 2- x 4" sections together with 12d nails and latex glue. Joints where the 2x4s butt together are staggered and strengthened with splice plates made of strips of waterproof plywood that are glued and nailed across each joint. Five holes are then drilled in the top of each leg; the first 4 holes are 1/8" diameter, to receive wire; the fifth hole is 9/16" diameter, and is drilled through two 2" x 4" boards to receive a metal rod (part of the spider hinge).

Removable steps can be installed on one leg to facilitate nest monitoring and banding later on. To do this, attach 7 "step lugs" (1" x 2" x 3" wood blocks which support the removable steps) to the underside of the leg at 2-ft intervals. The bottom 6 steps are 5 3/4" wide to support one foot at a time, and the top step is 9" wide to support both feet while the investigator is at the nest level. Step construction details are shown in Figure 13.

The legs are hinged together at the site with a "spider hinge". This is made of a 4" length of 2"-diameter O.D./ ABS/PVC pipe which is drilled and tapped to receive three 1/2" O.D. x 4 1/2" threaded metal rods. A 1/2" hex-head nut is tightened onto the end of each rod inside the 2" pipe. The rods are then inserted into the 9/16" hole in each leg, and a 1/2" lockwasher and nut are secured to the outside. Each leg thus pivots about a rod in a plane at 90° to the axis of the rod. After the tripod is erected, a 2-ft x 2-ft piece of chain link fence (ideally plastic-coated) is placed on top and wired to the legs through smaller holes above the spider hinge, thus forming a firm base for nesting materials. To secure the tripod firmly to the substrate, 2" x 4" x 4-ft stakes are driven into the soil at a 30° angle toward the tripod centre and nailed to each leg. In addition, a screw anchor is twisted into the ground and bolted to each leg with a 4" lag bolt. Aluminium or sheet metal predator guards can then be attached to each leg.

Materials needed to construct a Sanibel Tripod nesting platform

Item	Quantity
Lumber, pressure-treated	
2 x 4 in. x 12 ft	9
2 x 4 in. x 8 ft	3
2 x 4 in. x 4 ft (for stakes)	3
Marine plywood, 5/8 x 2-3/4 x 16 in. (for splice plates)	6
Hardware	
Screw anchors (mobile home), 4-in. diam x 30 in.	3
Lag bolts, 1/2 x 4 in.	3
Pipe, galvanized, 2 x 4 in.	1
Threaded steel rod, 1/2 x 4-1/2 in.	3
Hexnuts, 1/2 in.	6
Washer, 1/2 in.	3
Chain-link fencing, 2 x 2 ft	1
Wire, galvanized, 12- to 14-ga	20 ft
Nails, common galvanized, 6d	1/2 lb
Nails, common galvanized, 12 d	1/2 lb
Sheet aluminum, 4-ft length	1
Miscellaneous	
Latex glue	2 tubes
Step lugs, 1- x 2- x 3-in. wood blocks	7
Steps	7

Figure 10. *Sanibel Tripod nest-platform design.*

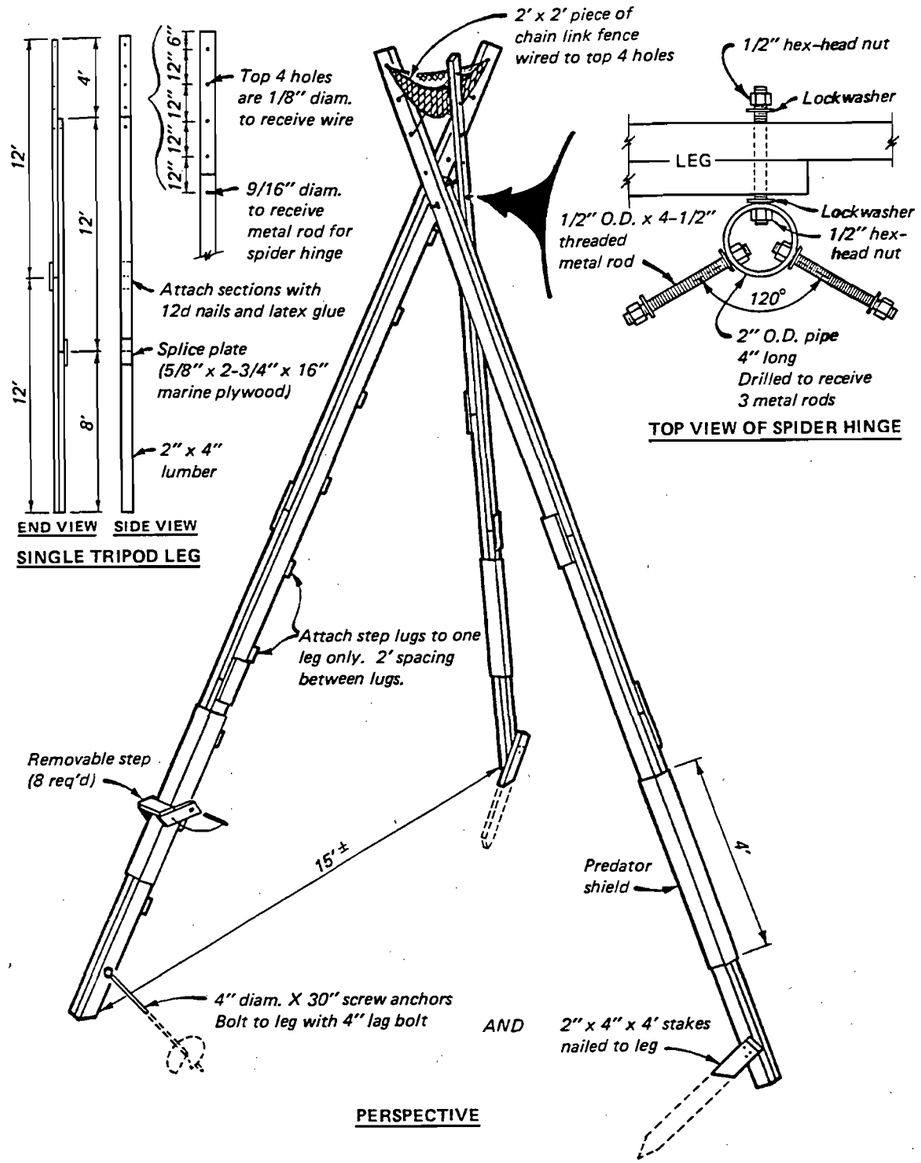
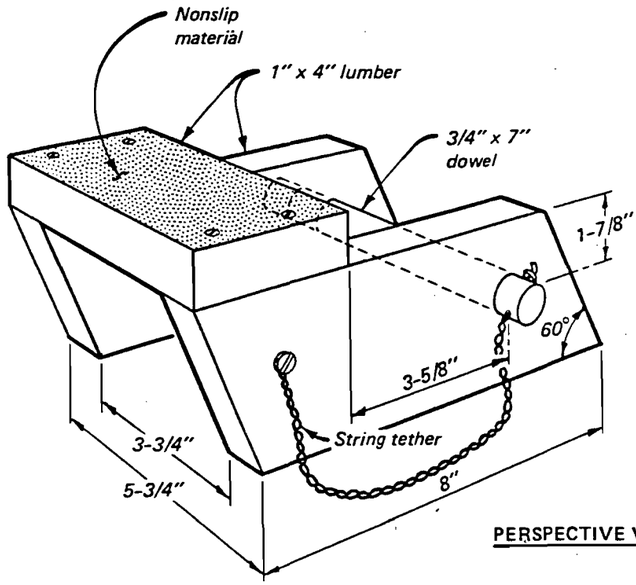


Figure 11. *Optional inspection step for Sanibel Tripod.*



NOTES

Materials are 1 x 4" stock.

Parts are glued and fastened with wood screws.

String tether keeps dowel with step.

Step lugs are attached to one leg of tripod to keep steps in place.

Top step is 9" wide to support both feet of investigator.

Nonslip material should be glued to steps.

Metal Tripods

On many floodings in central Michigan, metal tripods have been used successfully, with circular, and more recently octagonal, 1/2" marine plywood platforms attached on top, constructed along the same lines as the Offset Solid-Base platforms (see Figures 6, 12 and 13). Two important additional measures have guaranteed continuing success of these metal tripods — inverted cone anti-predator guards, and metal garbage can lids tied over the nest cup in the fall/winter, and removed only when the first Ospreys have returned in the spring (usually mid-April). This last measure is essential now to prevent Canada Geese (*Branta canadensis)* from nesting in the Osprey nests. In recent years numbers of Canada Geese have increased dramatically in many parts of North America. Since the geese are incubating by the time Ospreys return in the spring, they usually prevent Ospreys from breeding at the site.

The solid base platform can also be mounted on tripod legs made of 1-1/2-in. I.D. galvanized steel pipe (Figure 12). A 21-ft length of pipe is first cut in half to form an upper and lower section of each leg, and the upper section is threaded at both ends to receive couplings. The lower section is threaded at the top end, and the bottom end is hammered flat and welded shut. Top-end fittings, each made from a pipe coupling that has been cut off at a 15 degree angle to the perpendicular, are threaded onto the upper section of each leg. A 3- x 3- x 1/4-in. steel plate with a 1/2-in.-diameter center hole is welded to the cut end of the coupling, and a 2-1/2- x 1/2-in. hex-head bolt is placed through the hole and welded to the plate.

The tripod platform is assembled at the installation site. A boat will be required to reach an overwater site and to hold a ladder from which personnel can work. The tripod legs are first positioned to form an equilateral triangle, with the lower section of each leg approximately 9 ft from the others. The sections are driven into the substrate (a wooden block should be used to protect the threads when hammering) until the top of the lower leg is at the surface of the water. The upper section is then attached to the lower section with a 1-1/2-in. pipe coupling.

The platform base is mounted on top of the legs by inserting the bolts through the predrilled 1/2-in.-diameter holes at each point of attachment; two bolt holes at each point will allow flexibility in leveling the platform. A 3- x 3- x 1/4-in. steel plate with a 1/2-in.-diameter hole through the center, a flat washer, lockwasher, and hexnut are placed over each hex-head bolt to hold the platform base securely in place. The platform may be reinforced by attaching three 27-in. lengths of 1/4- x 3/4-in. steel strapping to the bottom; a hole is drilled at the ends of each strap (distance between holes should be approximately 25 in.), and these are fitted over the hex-head bolts on top of the tripod legs before the platform is mounted. Cone-shaped sheet metal predator guards may be attached to each leg either before or after installation. These should be spaced 2-1/2 ft from the base of the platform.

Figure 12. *Design specifications for metal tripod support (original design supplied by Thomas U. Fraser, Sr., of Conservation For Survival, Martin et al. 1986).*

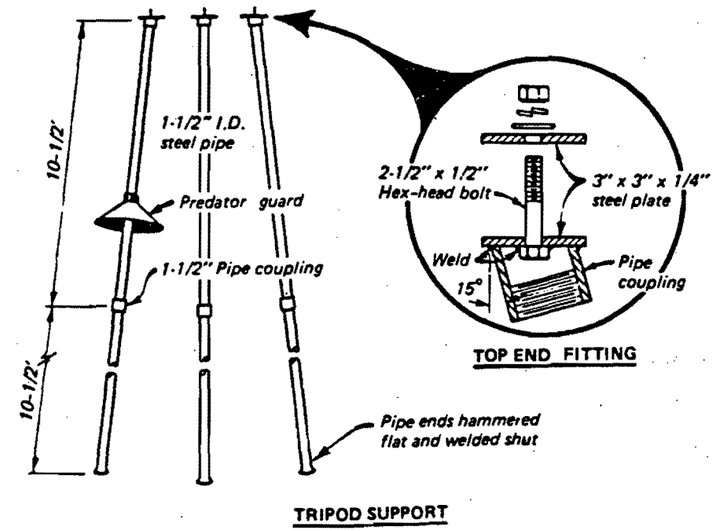
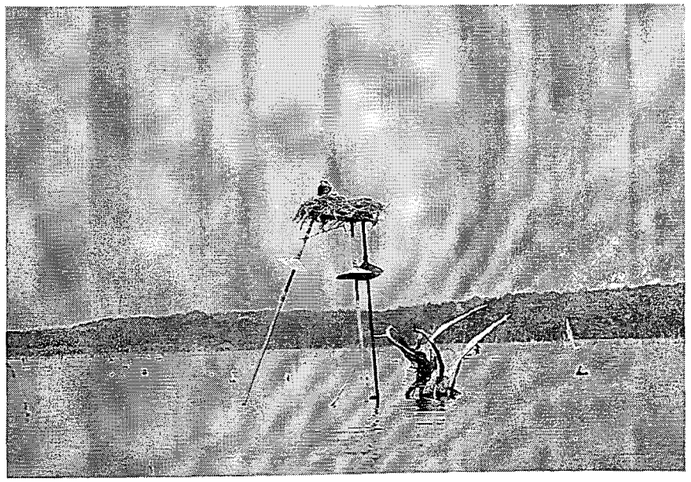


Figure 13. *Metal tripod and occupied wooden platform in Central Michigan.*



Credit: S. Postupalsky

Platform on a Large Tree

Dead trees are usually unsafe to climb, but a live, large tree (usually a conifer) which sticks up above the surrounding canopy can provide a suitable site for an artificial platform, particularly if it is close to water. This type of platform has been used very successfully in Scandinavia, and increasingly in the western U.S. and Scotland.

Once full permission has been obtained, cut off the top of the tree, ideally at a trunk diameter of at least 6". Treat the horizontal cut with tar, pitch, or caulking. Cut off most protruding side branches near the top of the tree, to allow ready access to the nest by Ospreys. Nail two 3'-4' lengths of 2" x 4" lumber parallel on to the horizontal cut, and attach the remaining 4 lengths of 2" x 4" with nails or bolts, (Figure 14). Secure the platform with stiff wire attached to large eyed hooks screwed into the trunk about 6' below the top. Do not forget to attach a 1.5-2 m metal anti-predator guard towards the base of the tree.

An alternative means of securing the platform to the tree has been used successfully in Nova Scotia, when relocating Osprey nests from live hydro poles (Toner and Bancroft 1986). This design uses a pair of 2" x 4" brace timbers to support a pair of 4-6ft long 2" x 4" boards which in turn support the nest platform. Bolts placed through drilled holes in the tree trunk provide the necessary firm support for the overall structure. A small platform to stand on when inspecting or repairing the main nest platform is also installed several feet below the nest-platform, and this is braced with 2' x 3" boards, again bolted to the main tree trunk (Figure 15).

Figure 15. *Offset wooden platform and inspection platform (modified from Toner & Bancroft 1986).*

Figure 14. *Wooden platform secured to sawn-off top of tree trunk.*

Ring Platform

This sophisticated metal platform was designed in Chattanooga, Tennessee (Martin et al. 1986). It can be fitted on a derelict metal tower / antenna, or on an active communication or navigation tower (often useful when Ospreys have been trying to build their nest among electrical equipment on the tower). (See Figure 16). Utility companies are often willing to pay for such structures, but sometimes need advice on designs and remedial options.

Materials needed to construct a ring platform for Ospreys

Item	Quantity
Steel pipe, ungalvanized, 1-in. O.D. x 10 ft	1
Steel rod, 3/8-in. diam, 36- to 38-in. sections	4
Steel rod, 3/8-in. diam, 15-in. lengths	6
Steel rod, 1/2-in. diam, 5 ft	1
U-bolts, 2-in., with hex-head nuts, washers, and lockwashers	4
Steel plate, 3/8 x 4 x 16 in.	1
Backing plate (for use with U-bolt on lower support)	1
Hex-head lag bolt, 1/2-in. diam x 6 in.	4

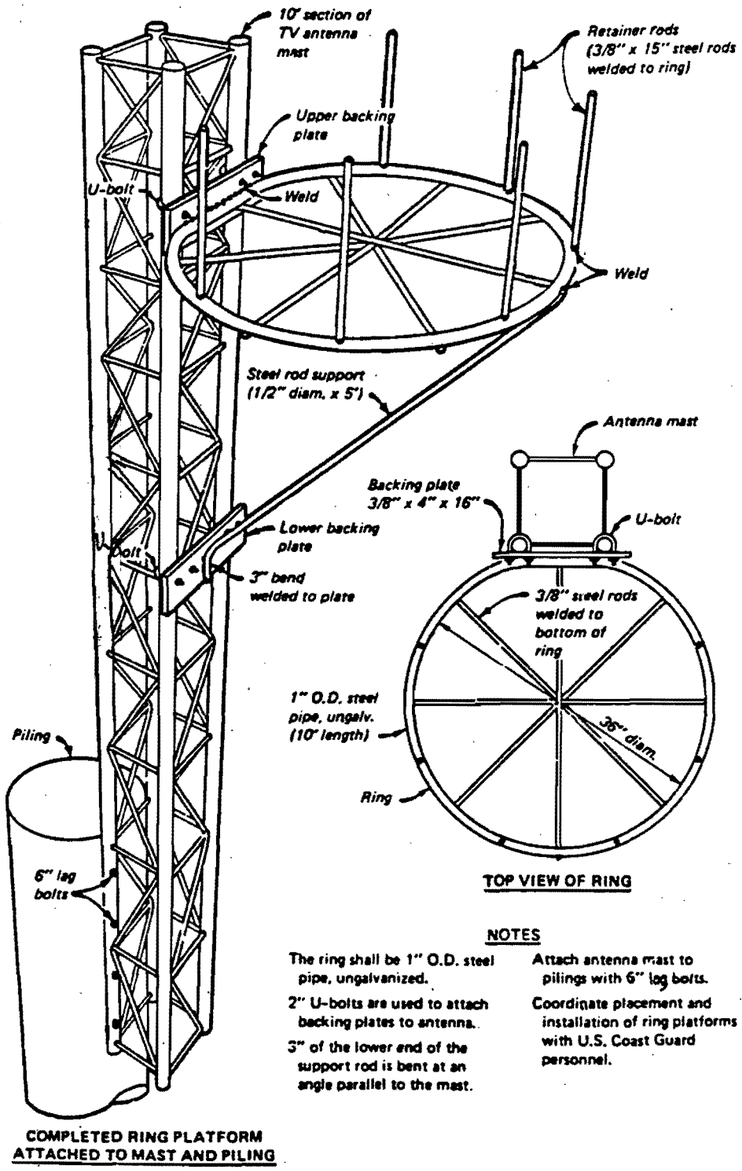
In coastal areas and many inland waterways, marine navigation aids provide potential nest sites in suitable habitat. For example, over two-thirds of the Osprey nests in Chesapeake Bay are located on navigation aids and duck blinds. Though many markers, especially lighted aids, have adequate structures to support a nest, the nest often obstructs the light or hinders maintenance. Consequently, nests have traditionally been removed by U.S. Coast Guard (USCG) maintenance personnel.

The ring platform described here was designed to allow Ospreys to nest on navigation aids without causing hazards or interfering with maintenance. USCG personnel from the Chattanooga, Tennessee, station cooperated in the design and placement of these platforms. The platform is essentially a steel ring with supports mounted to an antenna mast.

To construct the ring, a 1-in.-diameter steel pipe is first bent into a 36-in.-diameter circle on a conduit bender, and the butt ends are welded together. Four 36- to 38-in. lengths of 3/8-in.-diameter steel rod are then cut and welded in a spoke-like pattern to the bottom of the ring; the first rod attached should be 36 in. long, and each subsequent rod welded will be slightly longer than the previous one to overlap properly and make complete connection with opposite points on the ring. Vertical retainers for holding nesting material consist of six 15-in. lengths of 3/8-in. steel rod spaced at approximately 19-in. intervals along the top edge of the ring; holes are drilled in the top of the ring, and rods are inserted and welded into place. A 5-ft length of 1/2in.-diameter steel rod is welded at a 45 degree angle from the ring plane to form a lower support; a 3-in. section of the lower end of the rod is bent at an angle to be parallel with the antenna mast support structure.

U-bolts with backing plates are used to attach the platform to an antenna mast. A 3/8- x 4- x 16-in. steel plate is first welded to the ring, and four 1/2-in. holes are drilled in the plate to receive 2 U-bolts; the 3-in. bend in the support rod is also welded to a backing plate to the antenna. The mast is then fastened to a navigation aid piling using four 6-in. lag bolts spaced at 2-ft intervals on the lower end of the mast.

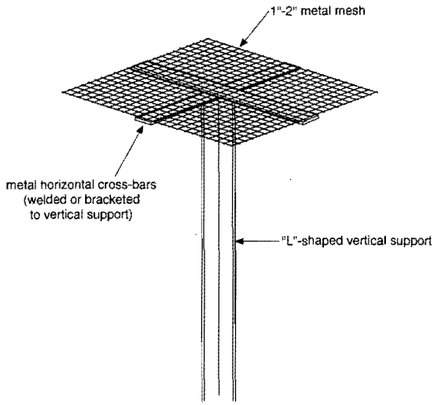
Figure 16. *Specifications for construction and attachment of a metal ring platform. (drawings from Martin et al. 1986).*

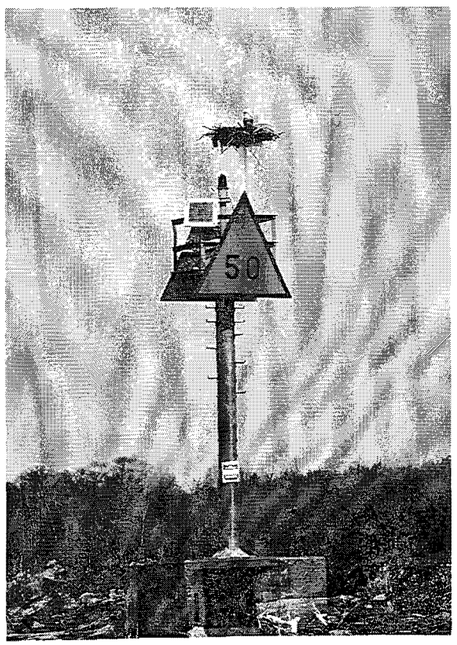


Metal Grid Platform

Various types of metal grid platforms have been used successfully in Lake Huron on navigation aids where Ospreys have tried to build nests on top of lights, batteries, solar panels etc. The U.S. Coast Guard has been particularly successful in the St. Marys River in encouraging Ospreys to nest on these simple platforms, which are installed above the navigation light equipment. The design is simply a vertical metal support bar, to which a 3' square metal grid is attached, usually by means of two horizontal supporting cross-bars (which are either welded in place or bracketed to the vertical bar with bolts). The grid must be solid mesh, not floppy wire. Some short vertical supports around the perimeter of the grid can help to stabilize the nest later on. A 1" to 2" mesh is best, so that the sticks can catch well in the holes. With a finer mesh, the nest can sometimes blow off the platform.

Figure 17. *Metal grid platform design used by U.S. Coast Guard in Lake Huron.*





U.S. Coast Guard Platform in Lake Huron
Credit: L. Benner

Duck Blinds

Ospreys sometimes nest on wooden duck blinds. A few extra supports can be provided to the roof of the blind (i.e. 4-8' x 2" x 4") to prevent the nest from falling through when it becomes too large and heavy. In most areas the nest does not seem to be a problem for the duck hunters who use the blinds later in the year. In fact, additional coverage and shelter are usually provided for the hunter.

Credit: M.J.R. Miller

C. POWER LINE STRUCTURES

In many parts of North America, Ospreys now breed regularly on live high tension electricity transmission towers, as well as wooden utility poles -- usually ones with double cross-arms at the top to support the bulky nest (Olendorff et al. 1981; Toner & Bancroft 1986; Ewins 1995). Common locations for Osprey nests on power line structures are shown in Figure 18. Poles close to water are preferred by Ospreys, but occasionally utility poles located a few kilometres from water are used. This presents problems for electric utilities because the nest sticks, and even the Ospreys themselves, can cause electrical short circuits between the live wires, or they can create safety hazards for maintenance workers.

If you see a nest causing problems like this, contact your local utility office. DO NOT attempt to climb to the nest !! If the nest is in a location that compromises system reliability or safety, the utility can usually provide an alternative safer structure for the Osprey. They will often install a single pole and platform nearby (usually within 50 m, see Figure 19), which the Ospreys usually accept readily. The old nest is moved to the replacement platform, and modifications are made to the utility pole to deter the Ospreys from nesting there in the future. Alternatively, the utility crew may lower the wires slightly and install a wooden nest-platform on top of the utility pole, well clear of the live wires (Figure 23). A useful decision chart for hydro company engineers and managers has been produced in Nova Scotia by Toner & Bancroft (1986) (Figure 20).

The following are a number of sensitive management steps and alternative solutions an electrical utility can use to manage the problems caused by Ospreys nesting on utility installations.

1. If the nest and birds are not interfering with the electricity supply, and no immediate safety hazard is involved, do not disturb until after the breeding season (by September most nests in Canada have been vacated). Some pruning of longer nest sticks can help prevent power outages, but only in the short-term.

2. During the fall or winter, install a new platform nearby, and/or modify the existing occupied pole. If a customized pole and platform are installed, most of the designs for single poles given in this manual will be suitable, provided siting criteria are met (especially important in relation to open access for the birds and height above the surrounding canopy). Completely remove the old nest from the live pole and place some or all of the material on the new platform.

3. Once an alternative pole and platform have been installed, the existing utility structure must be modified to prevent the Ospreys from re-nesting there. Effective deterrent modifications are shown in Figure 21 (vertical lumber and/or plastic pipe). A single horizontal wooden bar raised 20-36 cm above the pole's crossarms can also be used. Plastic cones have proved effective in Ontario, but not in Nova Scotia (Toner & Bancroft 1986).

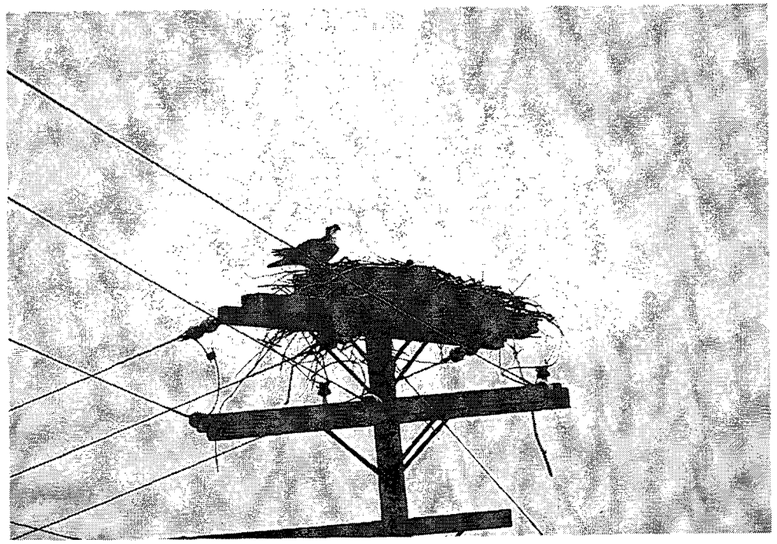
4. Modifications to the live hydro pole can often solve the problem without having to install an alternative nesting pole and platform nearby. The commonest method is to lower the wires and crossarms (Figures 22 and 23), or to add a pole-top extension (Figure 24). The objective in all cases is a minimum of 152 cm separation of the three-phase conductors. When adequate separation of conductors and potential conductors is not possible, insulation (commonly with PVC tubing) is recommended, extending a minimum of 1 m (and ideally 2 m) to either side of the insulators (Figure 25). The local utility can offer advice on suitable modifications which are compatible with existing structures.

5. In some cases (notably in Alberta and Ontario) the wires have been lowered (Figure 23) and the original double cross-arms retained so that a nesting platform can be installed to provide firm support for the nest (Figure 26; Ontario Hydro Technical Directive HO 1012).

6. In the Northwest Territories significant Osprey nest problems along Northern Canada Power Commission's H-frame transmission tower lines were solved by installing wooden platforms mounted on angle iron frames above the power lines (Figure 27; Poole 1985). Platforms were of 19 mm plywood, treated with creosote. Twelve 10 cm long dowels (1.2 cm diameter) were secured in the plywood as nest anchors. The 5 cm angle iron frame was fastened to the pole with two galvanized bolts, then the platform was bolted to the frame (including metal support braces). Platforms were a minimum of 70 cm above the horizontal crossarms.

Finally, as a reminder for those who might be conducting work at nests of Ospreys, and other large raptors such as eagles, large hawks, or Great Horned Owls, these birds are very territorial, and some individuals may be very aggressive in the defence of their eggs and young, occasionally dive-bombing and striking humans close to the nest. If you have to visit an Osprey nest during the breeding season (April-August, inclusive) always consult beforehand with the local Natural Resources office.

Osprey nest on live power line structure



Credit: L. Benner

Figure 18. *Common locations for Osprey nests on power line structures in North America.*

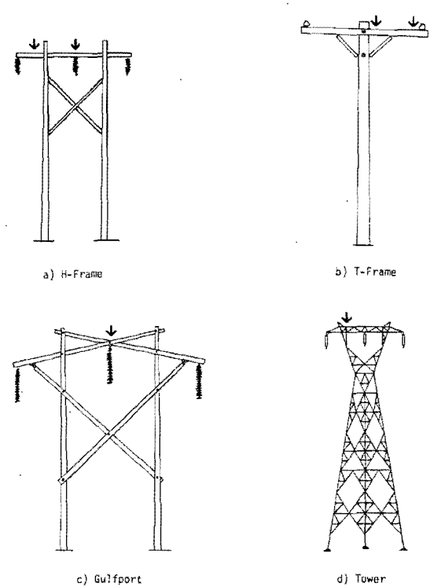


Figure 19. *Typical location of alternate nesting platform for Ospreys adjacent to nest on live transmission tower.*

Credit: M. Barker

Figure 20. Decision chart for solutions to Osprey nest problems on power line structures.

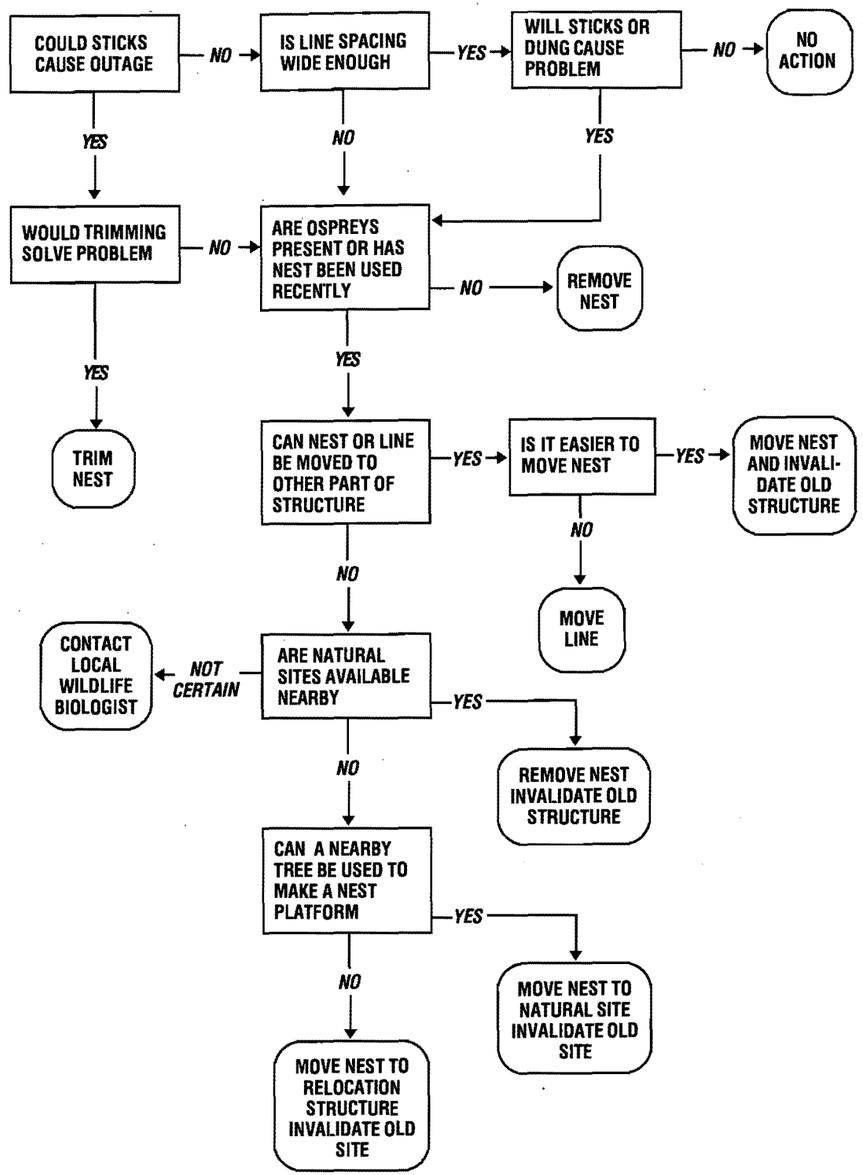


Figure 21. Techniques for deterring Osprey nests on live poles.

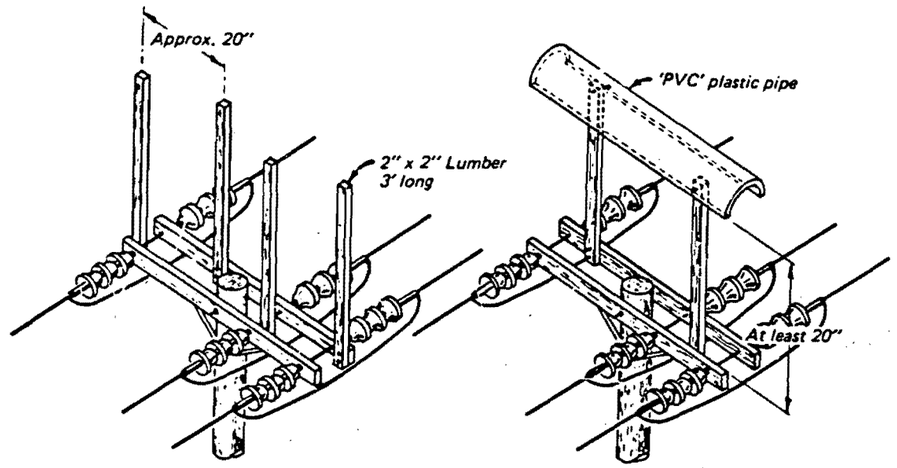


Figure 22. Lowering of crossarms to reduce risk of nest sticks interfering with supply.

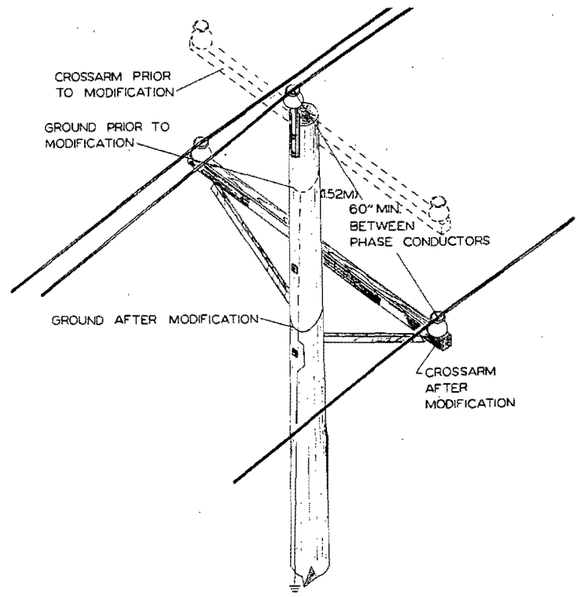


Figure 23. *Lowered hydro wires*

Credit: P. J. Ewins

Figure 24. *Pole-top extension to reduce risk of nest sticks interfering with supply.*

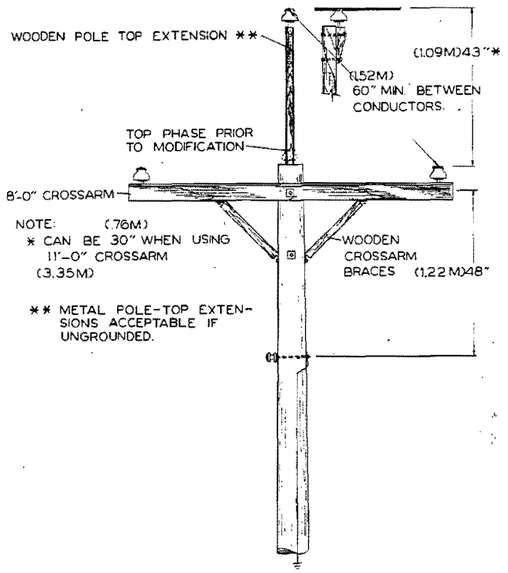


Figure 25. *Conductor insulation alternative, to reduce risk of nest sticks interfering with power supply.*

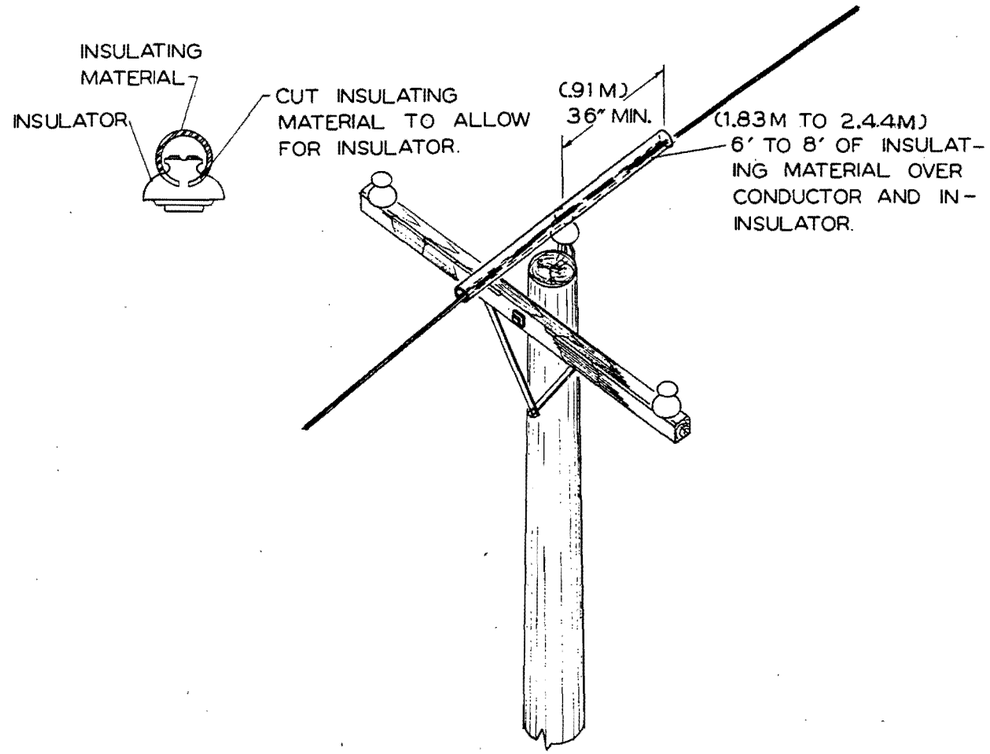


Figure 26. *Wooden nesting platform used on top of live power pole at which wires have been covered. (Reproduced from Ontario Hydro Technical Directive HO1012).*

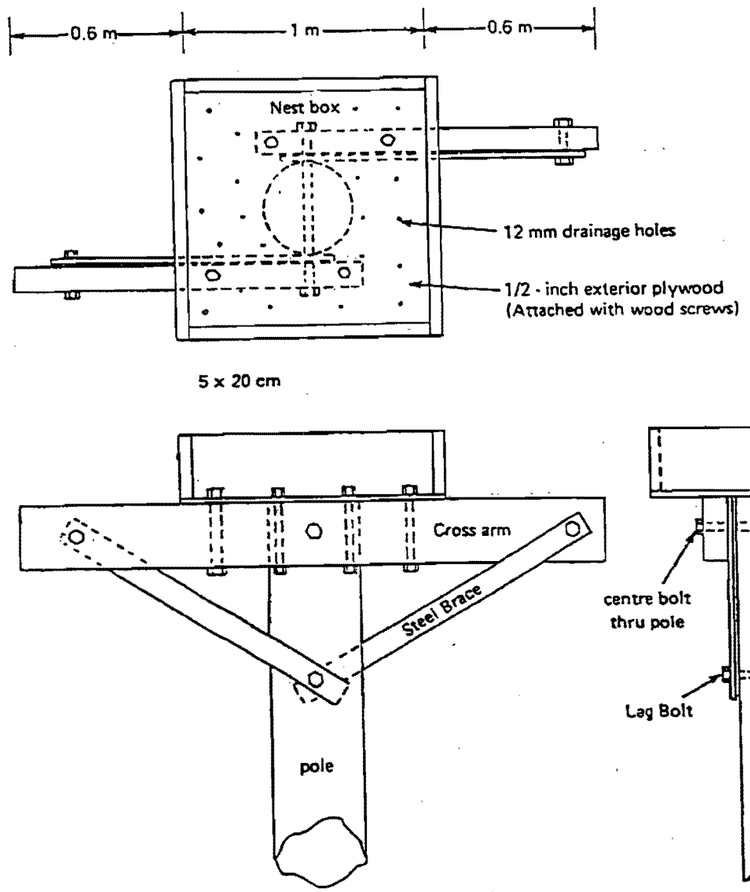
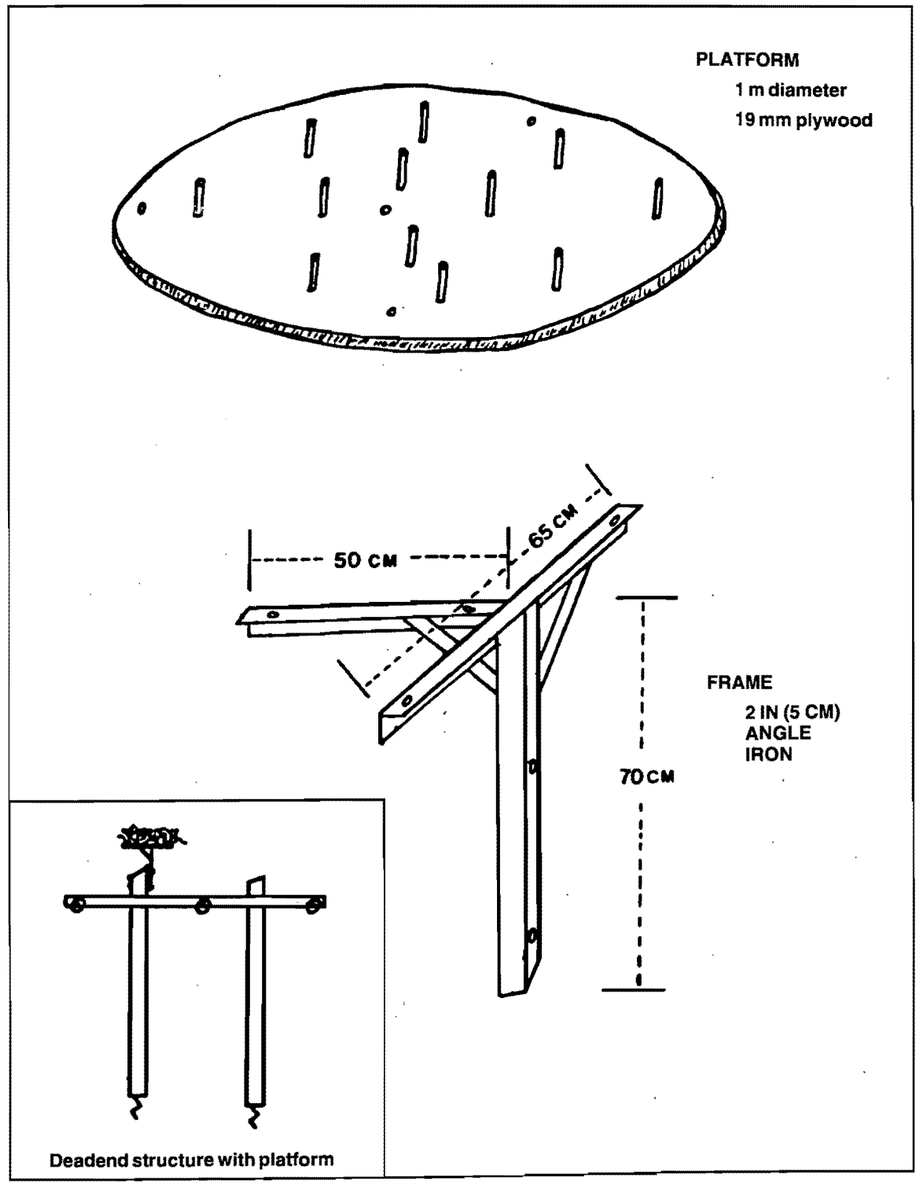


Figure 27. *Circular wooden nesting platform and angle in a frame design used on H-frame transmission tower in Northwest Territories. (Reproduced from Poole 1985).*



Installing a single pole platform on the banks of the St. Lawrence River

Credit: N. Mahony

Credit: N. Mahony

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A successful cooperative project

Credit: P. J. Ewins

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FURTHER INFORMATION

You could contact your local wildlife office for advice on platform construction and site suitability. In Ontario, contact the local Ontario Ministry of Natural Resources office. For more general information on Ospreys contact:

Environmental Conservation Branch - Ontario Region,
Environment Canada,
25 St. Clair Ave. East, 3rd. floor,
Toronto, Ontario,
M4T 1M2,
Canada.

Alternatively, you might like to join an organization specializing in Ospreys or raptors:

The Georgian Bay Osprey Society (GBOS),
c/o 35 Nanton Avenue,
Toronto, Ontario,
M4W 2Y8, Canada.

The International Osprey Foundation,
P.O. Box 250,
Sanibel, Florida 33957-0250,
U.S.A.

The Raptor Research Foundation,
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Hastings, Minnesota 55033,
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