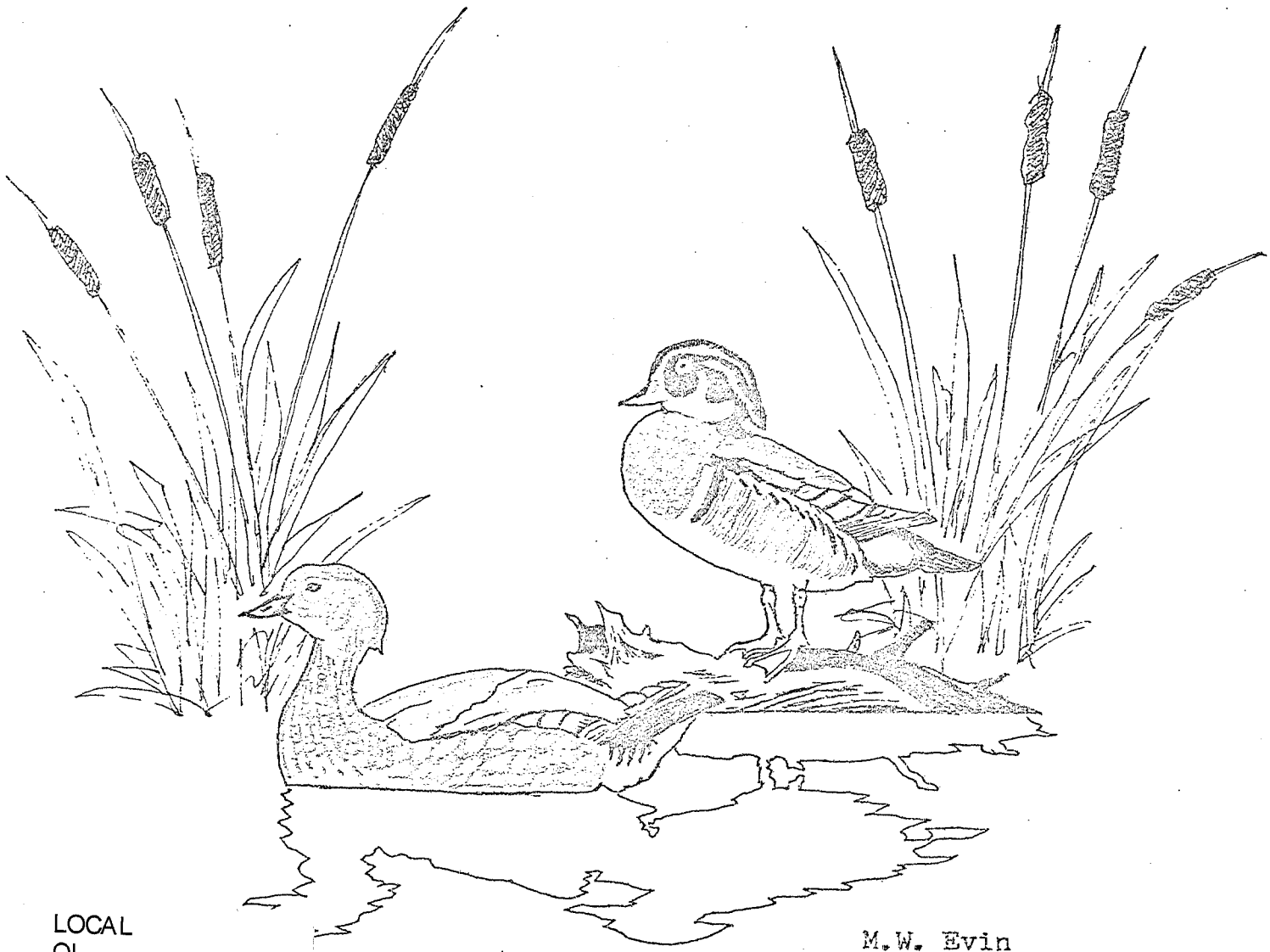
WATERFOWL MANAGEMENT GUIDELINES

FOR

PRIVATE LANDOWNERS



M.W. Evin

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FOR

PRIVATE LANDOWNERS

MONTY EVIN

WILDLAND RECREATION

SELKIRK COLLEGE

APRIL 15, 1977

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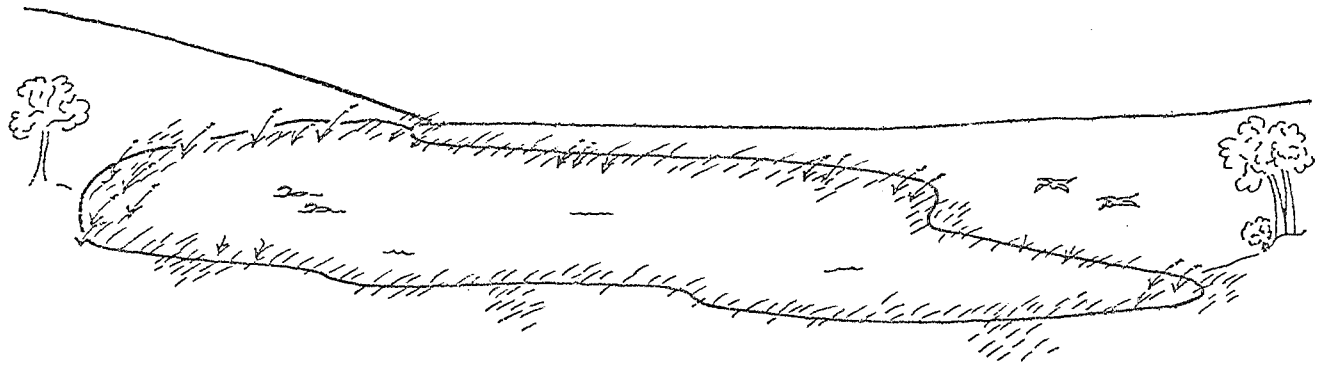
WATERFOWL MANAGEMENT GUIDELINES FOR PRIVATE LANDOWNERS

INTRODUCTION

Waterfowl management entails the management of habitats which waterfowl feed, nest and survive on. Throughout the years various agencies both Federal, Provincial and private have strived for the restoration, preservation and creation of prime waterfowl habitat in Canada. Private landowners especially interested and concerned with smaller site specific enhancement projects on their own lands can aid in conserving and creating improved waterfowl habitat. Personal appreciation and satisfaction can also be experienced through the viewing of waterfowl on these private lands.

The enhancement of one's land for the purpose of stabilizing or increasing waterfowl productivity on the land unit will be the main aspect which will be dealt with in this report. Persons interested in manipulating a land unit for the purpose of increasing its potential for waterfowl use will be able to refer to the guidelines set out to become familiar with various management practices and also when problems and questions arise in the planning and development process.

FOOD AND COVER REQUIREMENTS



WATERFOWL FOODS

The attraction of waterfowl to an area or land unit depends on the amount of breeding habitat and also the abundance of food. Pondweeds, Smartweeds, Sedges and Grasses make up the four main groups of natural waterfowl foods. Grains such as corn, wheat, barley and oats from adjacent farmlands are also favoured by waterfowl.

Preferred Species

Pondweeds

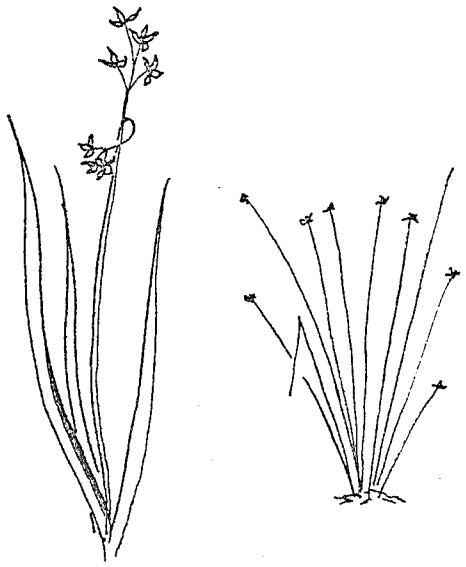
- Sago Pondweed (Potamogeton pectinatus)

Smartweeds

- Nodding Smartweed (Polygonum lapathifolium)

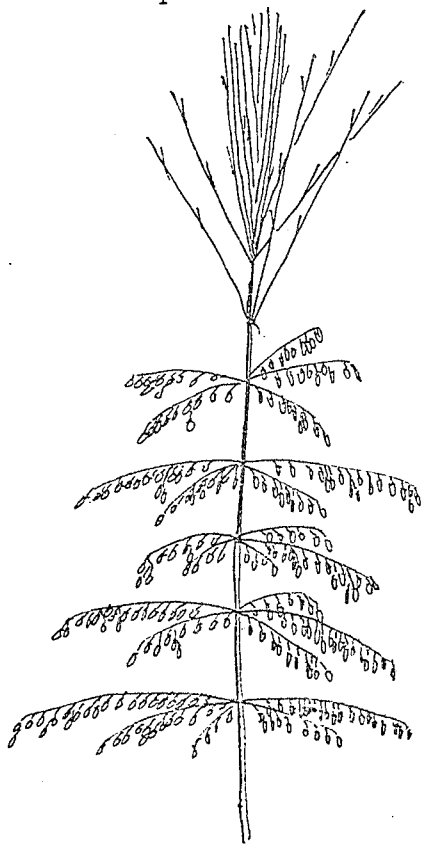
Sedges

- Hardstem Bulrush (Scirpus acutus)



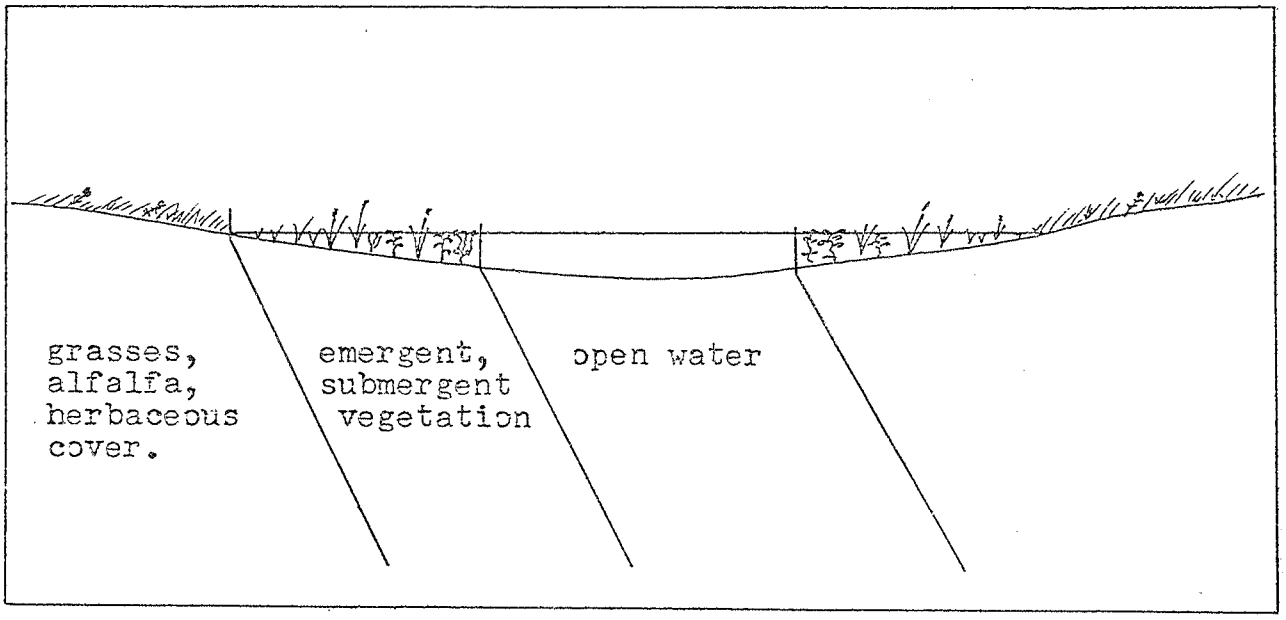
Grasses

- Wildrice (Zizania aquatica)



COVER REQUIREMENTS AND PREFERENCES

Open windy waters can prove detrimental to broods of young waterfowl. Mated pairs prefer areas where there is a balance between open water and protective marsh edge. Marsh edge and shoreline should contain a high proportion of low grasses as well as herbaceous cover. Grassy sections should also extend back from the marsh edge as to enhance nesting opportunities for mated pairs of waterfowl.



Desired cover relationships for ponds and marshes

Irregularily shaped ponds and marsh edges containing numerous bays and indentations are also desired as nesting areas. These bays and indentations provide protection as well as accomodate greater density and variety of breeding birds.

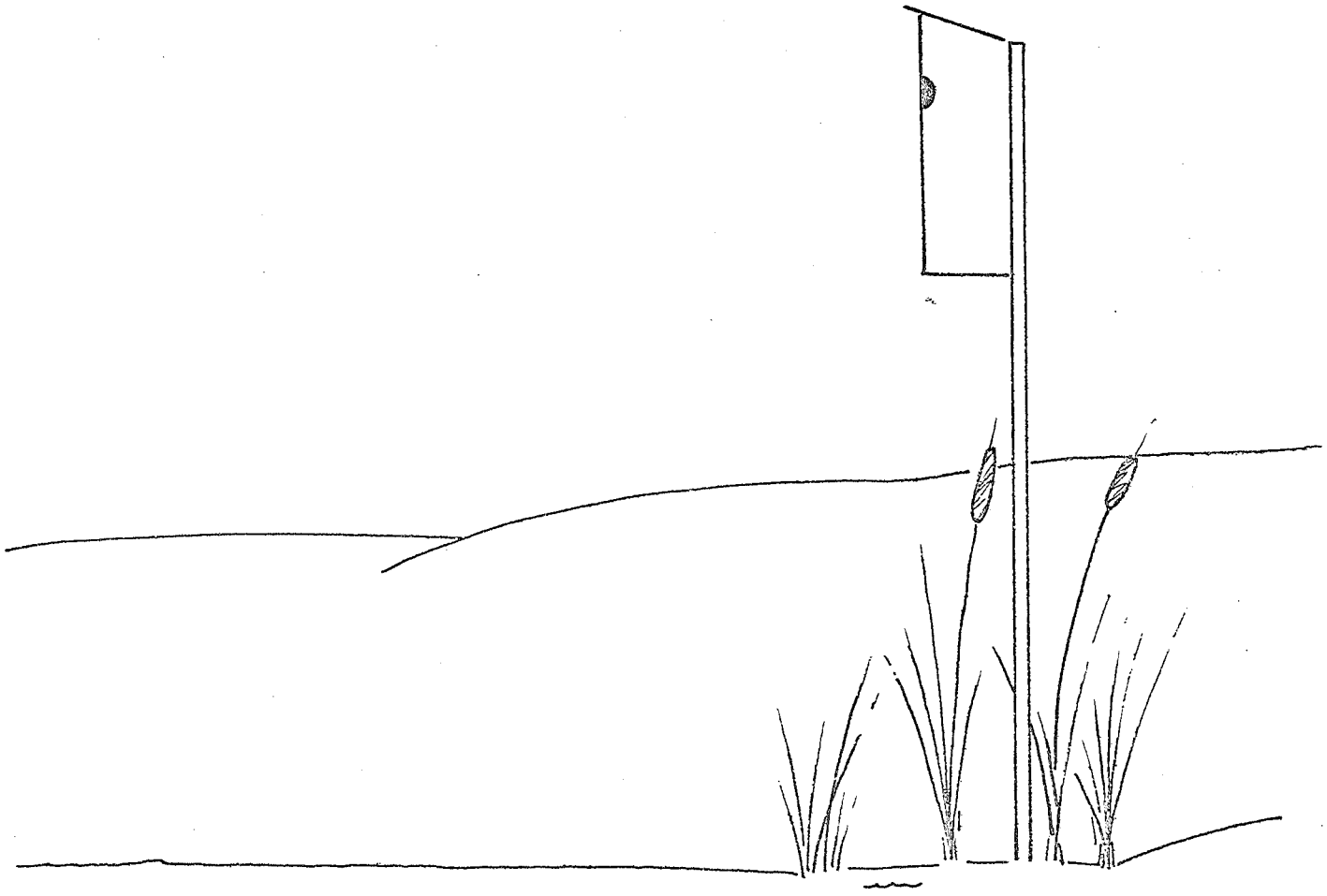
Width of the herbaceous strip back from the marsh or water's edge should be 50 to 100 yards but may vary with terrainal features. The prescribed width may not always be practical due to costs or other considerations, but if possible the strip should run right to the water's edge, eliminating the presence of willow, alder and cottonwood which usually thrive on shorline areas.

If practical, these areas should be sewn with clover, alfalfa, timothy or a mixture. If not feasible, the general run of meadow grass is good. Mowing of these areas should be conducted at intervals which will keep taller species of goldenrod, cattail, coarse herbs and woody species under control. Any mowing that is planned should be delayed until the first of July or later to avoid the possibility of nest destruction or brood molesting.

For aesthetically pleasing effects and also for nesting of some species such as Wood Duck, occasional patches of trees and shrubs may be left on rock outcrops and steeper sloped sections which are not feasible for mowing.

Grassy, herbaceous strips can be very important for nesting and feeding by local and migratory waterfowl preciding on your land unit. To increase productivity of the grassy, herbaceous strip it is desirable to plant patches of corn or grains. If geese are to be encouraged on the site, the presence of corn and grains will aid considerably in attracting single or flocks of geese.

SITE DEVELOPMENT



MAINTAINING CONSTANT WATER LEVELS

During the spring and early summer, it is very crucial that a constant water level be maintained in the pond or marsh for the purpose of supplying food and protection for adults and young broods in the area. Various factors can effect the outcome of the pond or marsh area.

Late summer to winter rainfall is very important in determining water levels in the following spring. If potholes go into winter with saturated soils, then spring run-off can be used to fill up the pond or marsh rather than saturate the soils. If soils are not saturated before spring, then the soils will have to absorb spring run-off and rains to become saturated. A lack of fall rains will cause low water levels in the spring and summer and could cause problems for breeding pairs such as greater chance of predation and lack of food.

To ensure a constant water level of the wetland in your land unit, some form of water retention may be necessary. This retention could come in the form of a marsh or marshes created by damming small streams on the land unit or in the form of dug out potholes on wet areas which are known to hold water.

Once water levels are retained at a constant level year round then productivity of the land unit will be increased for waterfowl use. Greater numbers and variety of waterfowl utilizing the land unit can be achieved through the increase in productivity.

POTHOLE CONSTRUCTION AND PLACEMENT

A pothole may be defined as a small, shallow, open water retention area or basin with surface area usually under four acres in size. Potholes may be classified under two types, Diked Areas and Dug Out Units.

Diked Areas are shallow water retention areas developed by the construction of an earthen dike or cut off wall across a drainage with the overflow of excess water through an existing natural spillway, a cut spillway or over the cut off wall.

Dug Out Units are developed by simply excavating shallow basins. The Diked area has the advantage of flooding undisturbed vegetation and is then immediately attractive to waterfowl once the area is flooded.

When constructing potholes it must be first decided how large the pothole is to be and where it is to be located. It has been found that potholes one to two acres in size hold the highest number of waterfowl per acre. The average brood size is also largest on potholes one to two acres in size.

Potholes smaller then one acre in size may contain insufficient surface area for brood security, but if your land unit is located in an area where breeding is low due to climate or other factors it may not be necessary to concern yourself with potholes catering to breeding and brood rearing. Although smaller potholes may not be as useful for breeding areas, they are still very good sources of food for adults and can be beneficial for increasing waterfowl use on your land unit.

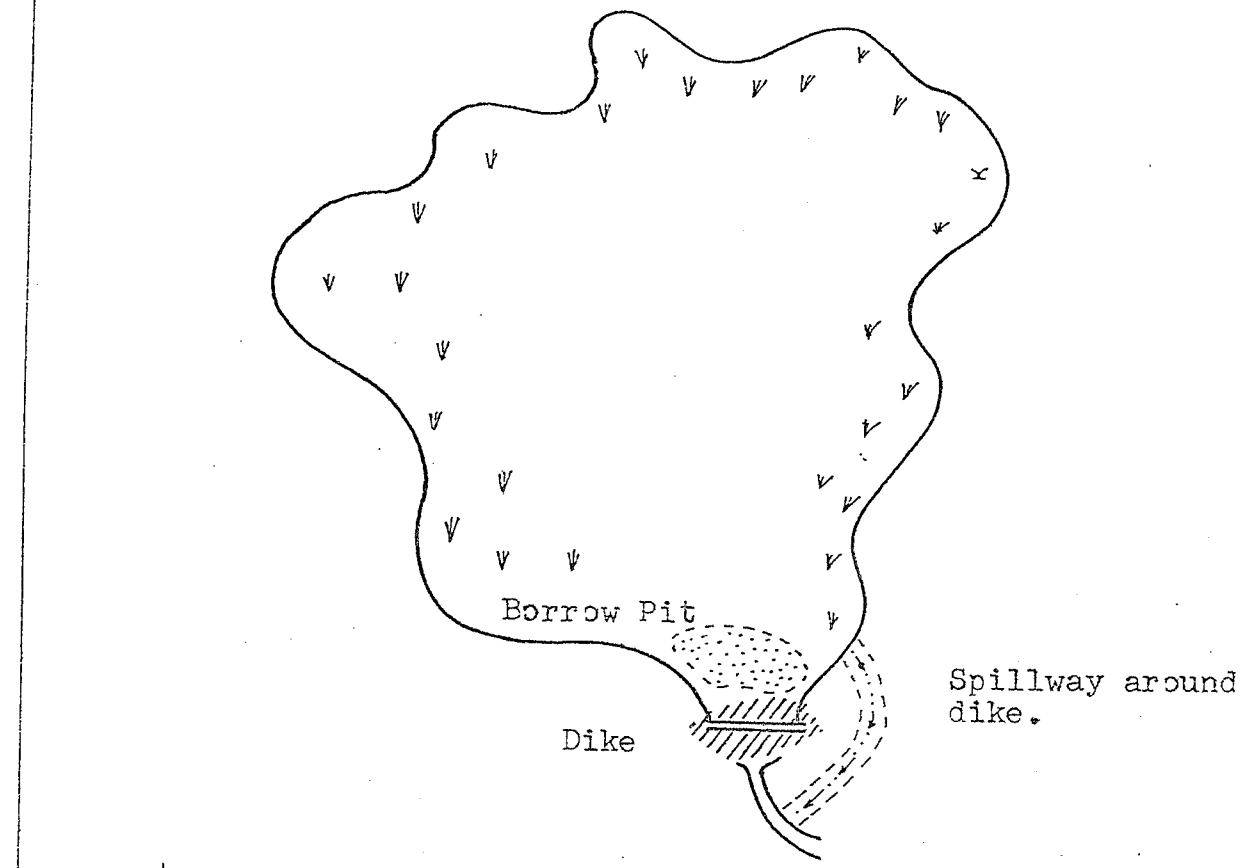
When deciding where to locate potholes, factors such as soil type, topography and water quality should be looked at. Only soils with good water holding potential should be considered. Medium to fine textured soils with a high clay or silt content are usually good but if in doubt of the soil characteristics in your land unit a person with a knowledge of soils should be requested.

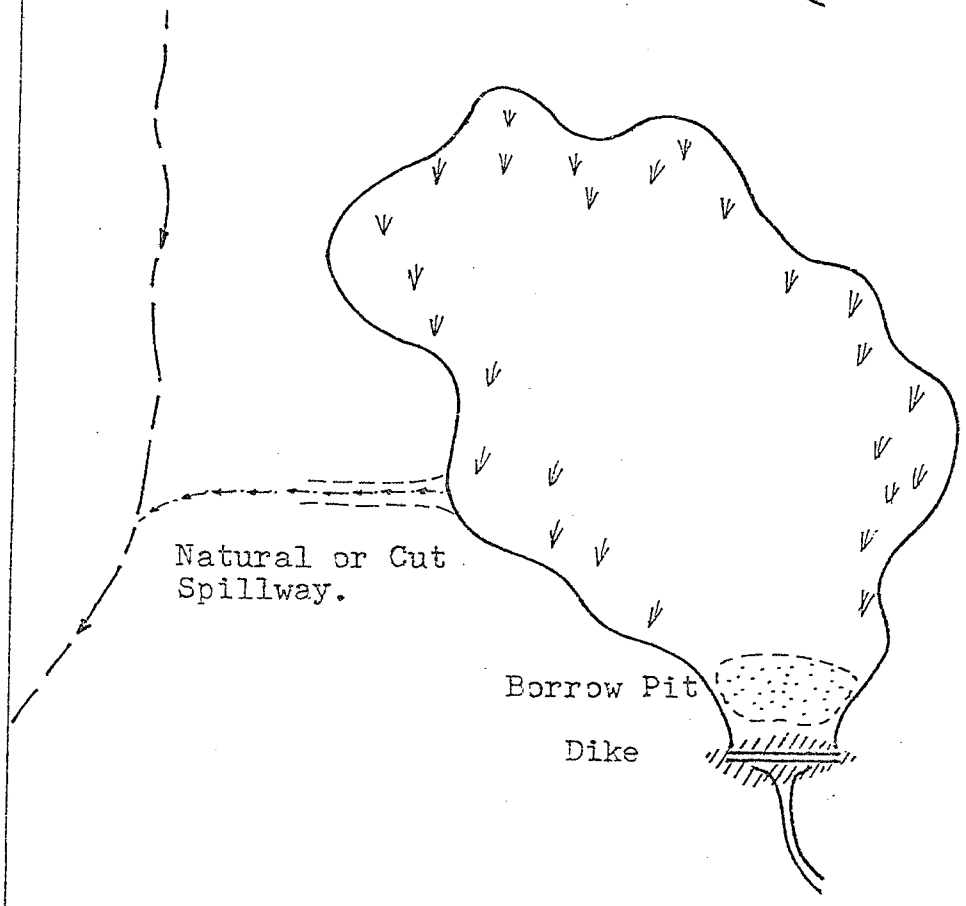
Gently rolling land offers the best possibilities for diked units. Basins in generally flat terrain are usually preferred to sites in hilly situations because deep depressions are apt to have abrupt slopes leading from the basin floor. When this occurs there will be less shallow water possible when the area is flooded.

Water should be clean and clear and when the pothole is constructed the depth should not exceed $3\frac{1}{2}$ feet but should remain at a constant $2\frac{1}{2}$ feet throughout the year for preferred conditions. Water depth should be deepest in the center of the pothole and taper off towards the edges.

Potholes should take irregular rather then just an oval shape. Numerous bays and indentations should be utilized as to accomodate greater density and variety of waterfowl. Potholes should be located in a manor which limits the interferance from humans, livestock and predators. Although waterfowl do tolerate some human interferance, detrimental effects can occur when activity is excessive or when actual molesting occurs.

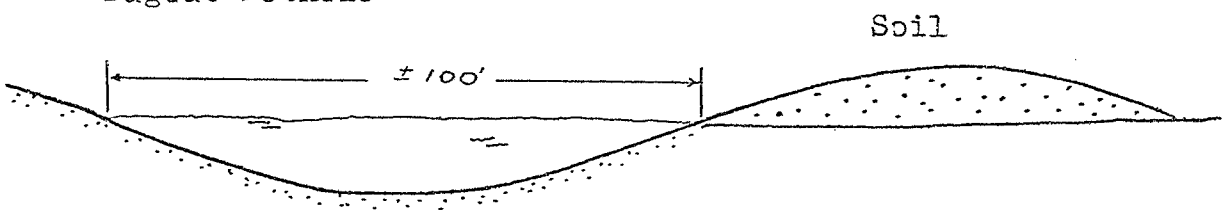
TYPICAL POTHOLE DEVELOPMENT





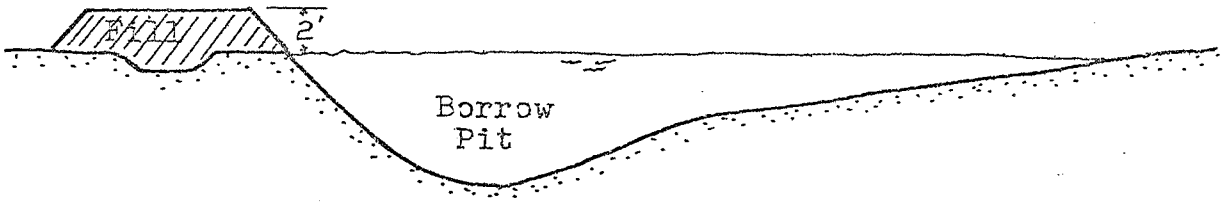
TYPICAL CROSS SECTIONS THROUGH CENTERLINES OF POTHOLE UNITS

- Dugout Pothole

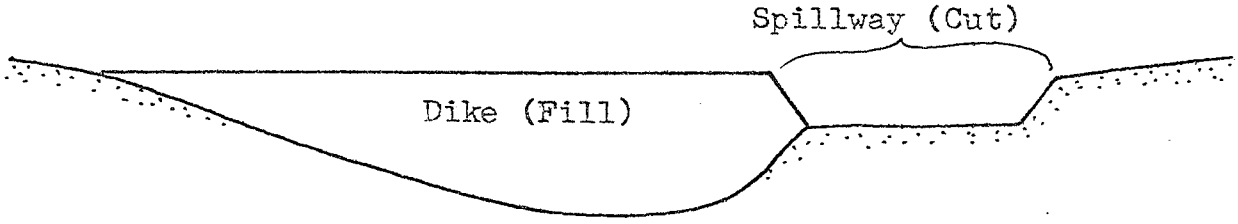


- Dugout with nesting island

- Diked Pothole



- Typical cross section through axis of dam of diked pothole



POTHOLE CONSTRUCTION METHODS

Dugout potholes can be constructed through the use of Caterpillar, Backhoe and/or explosives. Although the use of Cats or Backhoe may be the most expensive alternative, the final product may be the best since depth and contouring can be controlled better.

The use of explosives is usually a faster and less expensive method of removing soil to form the dugout, but you are not always guaranteed the desired effect. Before actual removal of the soil occurs, the shape, size and location of the pothole should be staked out so development can be made easier. If using explosives, a trained blaster should be chosen or consulted before construction begins. A general guideline for amounts of explosives to use per size of pothole is given below.

No. of Charges	Poundage	Pothole Size
3	120 lb.	22 x 52 x 5
triple 12 row	480 lb.	40 x 100 x 5
triple 25 row	970 lb.	30 x 170 x 5

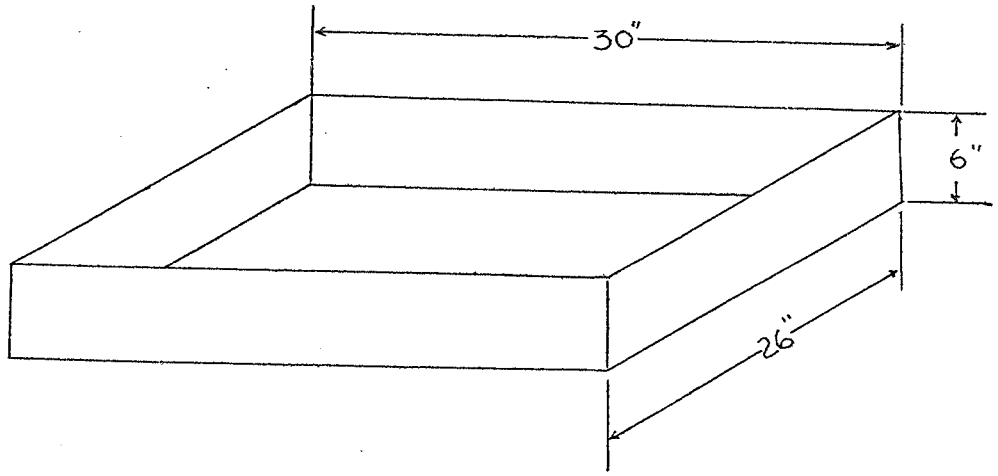
ARTIFICIAL NESTING

Man made nesting structures have been proven very useful for the purpose of increasing nesting capability around the marsh area. Various designs and sizes of nesting structures can be constructed for various species of waterfowl. These nesting facilities can be constructed from new materials or can be devised from various objects and structures found around the farm or home.

NESTING STRUCTURES FOR CANADA GEESE

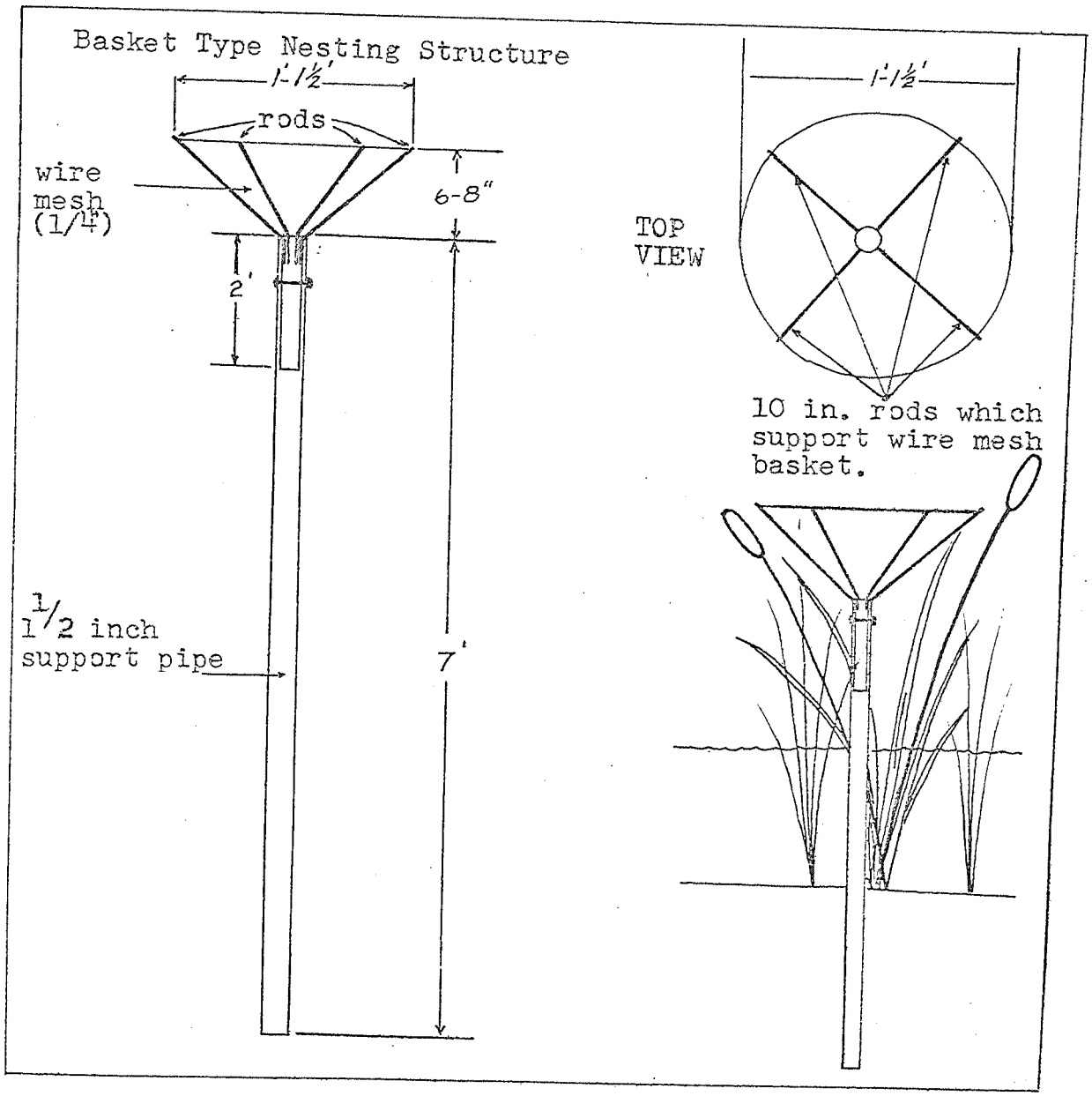
Canada geese prefer structures placed in aerial sites. These structures may be in the form of bathtubs, beer kegs and oil drums cut in half or constructed from wood. As a rule, nesting structures for geese should be placed 20 to 50 feet above the ground in trees which are located in isolated spots along marsh areas, rivers or on small islands. Soil and duff should be placed in the structure and be cleaned and replaced yearly.

Construction Dimensions for Wooden Nesting Structures

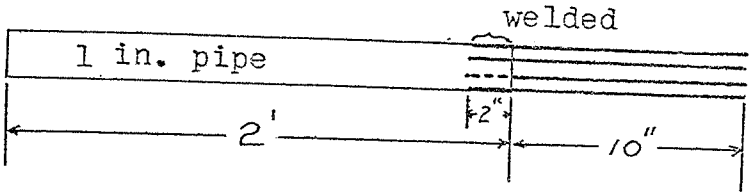


NESTING STRUCTURES FOR MALLARD AND BLACK DUCK

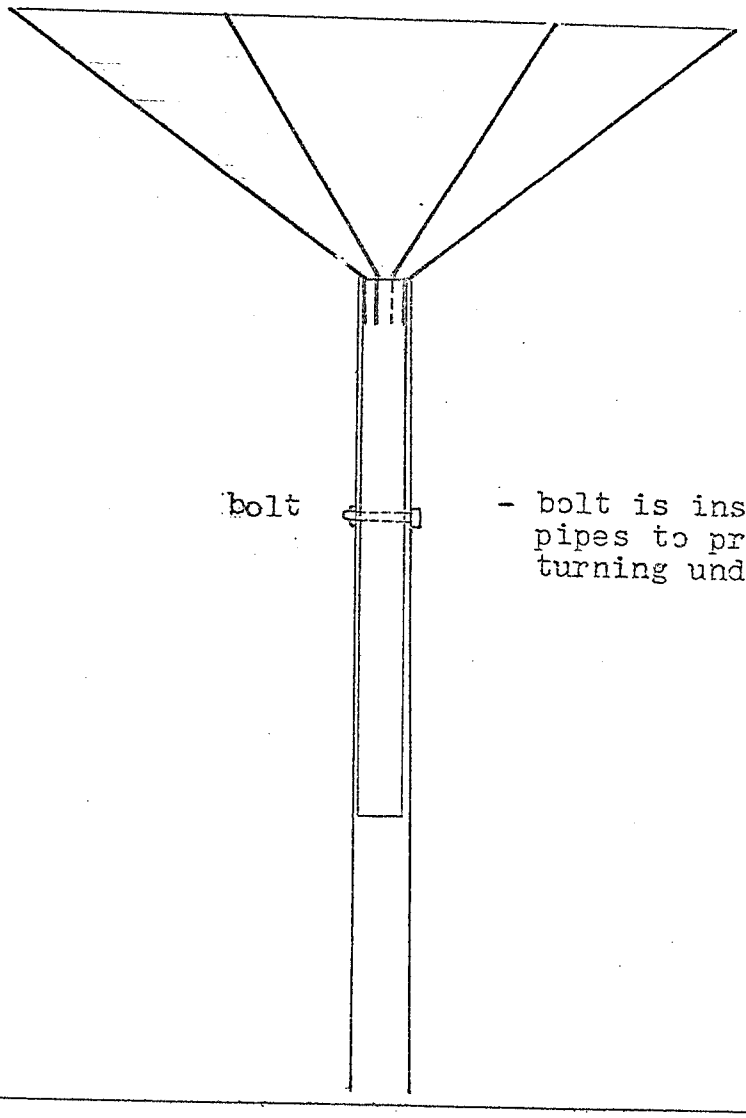
Mallard and Black Duck are ground nesters that usually nest in reeds and grasses along the marsh edge or on small islands. Nesting structures are of two types, Basket and Tube. Both structures should be placed out from the shores edge in the marsh area so that the nest is two to three feet above the water surface. A site should be chosen where reeds and various species of emergent vegetation are abundant for the purpose of achieving a protective camouflage effect.



Basket Type Nesting Structure

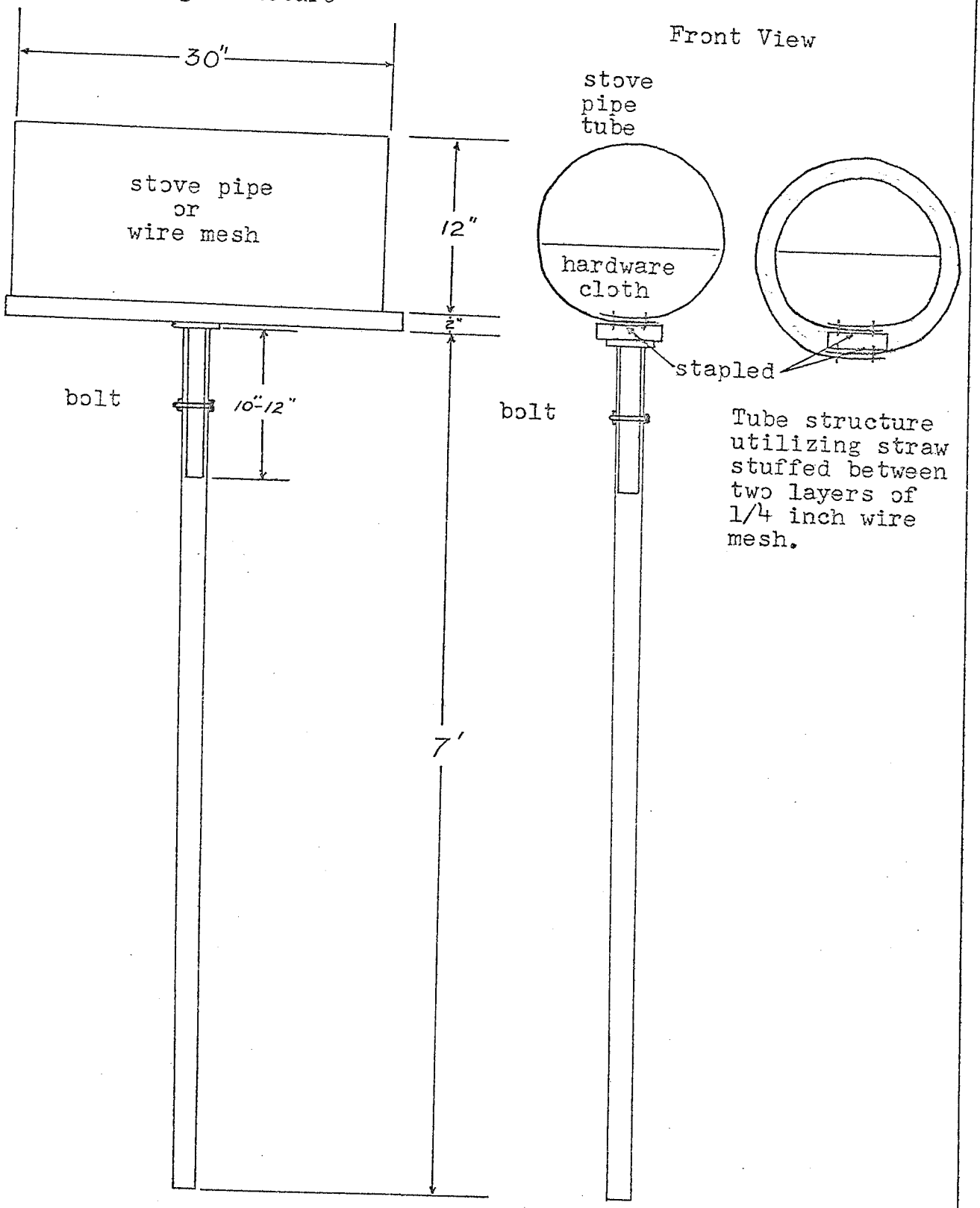


- 12 in. steel rods should be welded to 24 in. pipe (1 in)
- rods should then be bent and inserted through wire basket (pre-made) to hold basket in place.
- basket, insertion section is then placed into 7 foot support pipe which has been pounded into selected site in marsh.



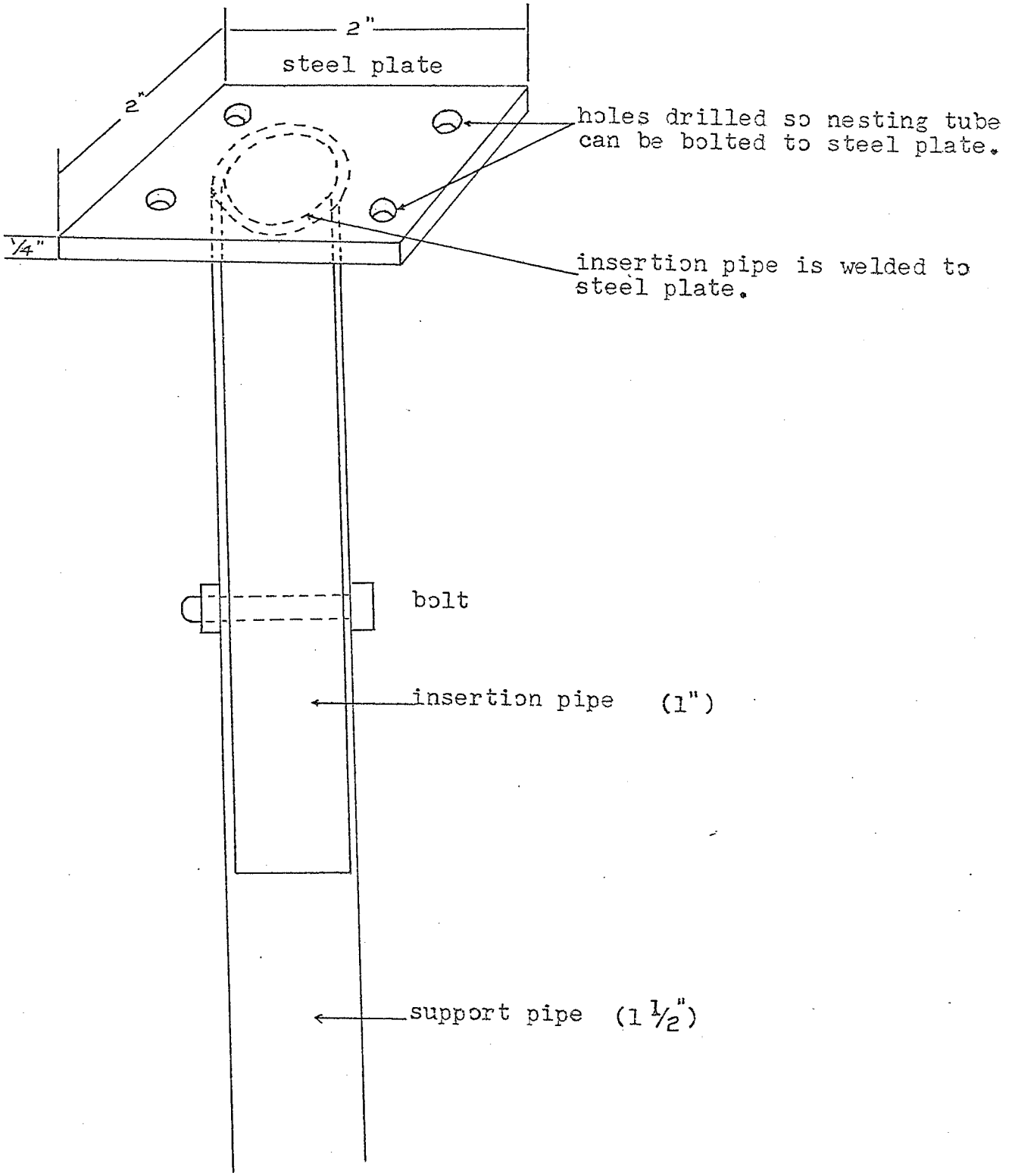
- bolt is inserted through both pipes to prevent basket from turning under windy conditions.

Tube Type Nesting Structure



- 6 inches of hardware cloth should be soldered inside furnace pipe tube and/or wire mesh tube at distances of 5 inches from either end for purpose of retaining nesting material and for protection from invaders (predators).

Tube Type Nesting Structure

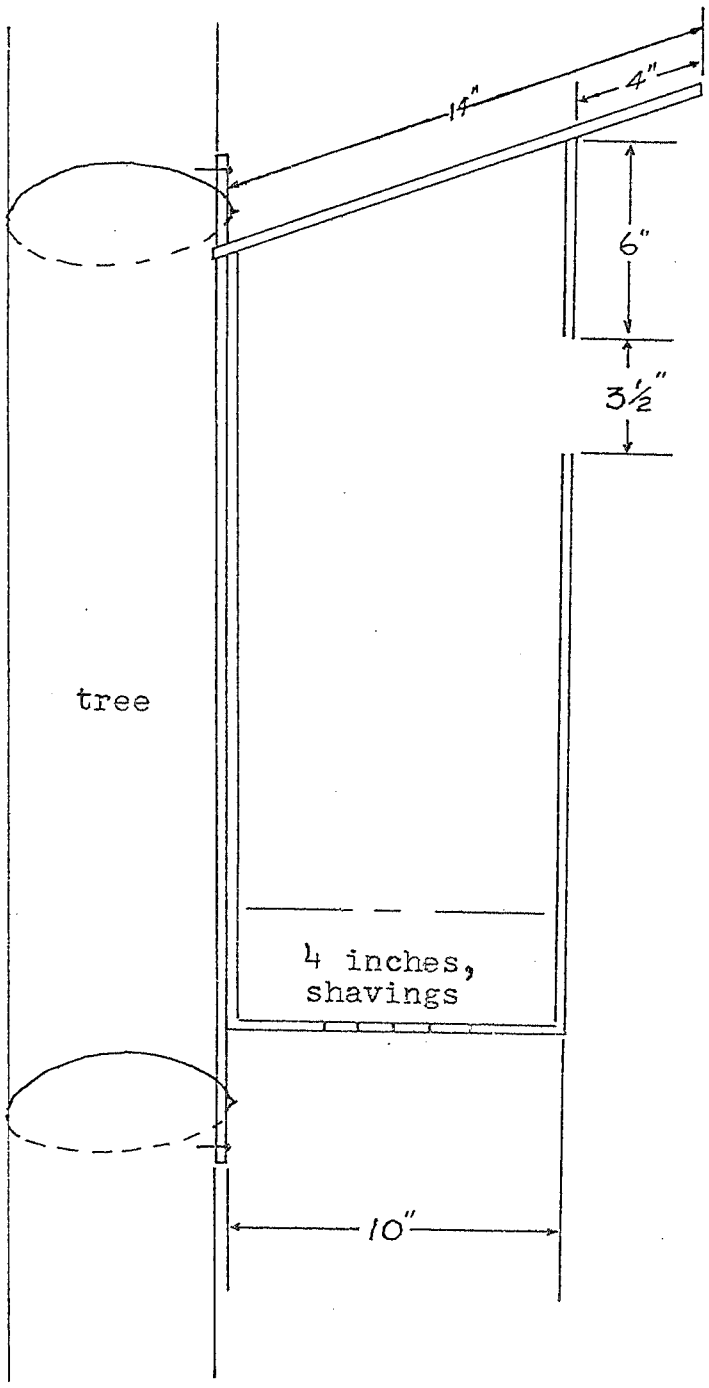


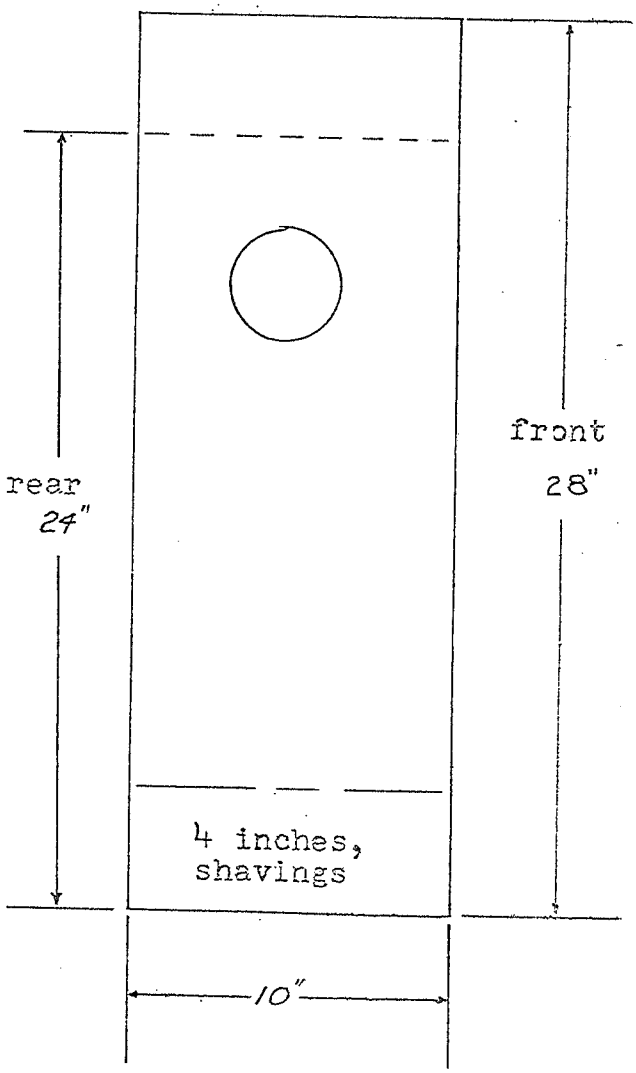
- after steel plate has been welded to insertion pipe, tube section can be bolted to steel plate and then tube/insertion pipe section can be slipped into support pipe which should be pounded into selected site in marsh before hand.

When placing both the Basket and Tube type nesting structures in the marsh, it should be noted that the support pipe should be at least 3 feet in the marsh bottom or at a distance in which the pipe will not wobble. If the nesting structure is not stable, it could be rejected by mated pairs of waterfowl which would probably inhabit the nesting structure if it were stable.

Predation of the nest in the Basket and Tube type nesting structures is not a major problem since predators cannot usually climb up the support pipe and water around the structure also aids in protection of the nest from invasion of predators such as Weasel, Mink and various species of squirrels.

Nesting Structure for Wood Duck





- wood used should preferably be rough cut lumber (1 in.).
- nest boxes should be nailed or tied using wire to trees, 10 to 20 feet above the ground and should be no more then half a mile from the pond, river or marsh area.

FEED PLANTING

The pond or marsh area should contain approximately 50 percent emergent/submergent vegetation of various species and 50 percent open water for preferred conditions. In newly constructed ponds or marshes it may take two to three years before any aquatic species of vegetation will make an appearance. If earlier establishment is desired by the landowner then seeds, tubers or rootstocks should be gathered from local areas and planted in the newly constructed pond or marsh. If aquatic vegetation is sparse or lacking in already established wetlands and large sections of open water lead directly to dry land then a planting program may be helpful or necessary. By introducing natural and domestic food species to the water body itself or to the areas adjacent to the pond or marsh area waterfowl capability of the land unit can be increased.

To decide which species is best adapted to the newly constructed wetland one must first determine the depth, clarity, constancy and pH of the water. The bottom of the pond or marsh should be checked for hardness or softness and fertility. Through visits to local marsh areas with the same characteristics as the newly constructed pond one can determine the type of vegetation which will probably survive best in the new pond or marsh.

PRESCRIBED SPECIES FOR VARIED CONDITIONS

PONDS

FRESH (Neutral, slightly acid to slightly alkaline)

- Sago pondweed
- Wildrice
- Bushy pondweed (Northern naiad)
- Claspingleaf pondweed
- Longleaf pondweed
- Small pondweeds (grass-leaved types)
- Small duckweed
- Floatingleaf pondweed
- Variableleaf pondweed
- Muskgrass

ACID

- Water smartweed
- Floatingleaf pondweed
- Small duckweed
- Watershield
- Waterlily

MODERATELY BRACKISH

- Sago pondweed
- Wigeongrass
- Clapingleaf pondweed
- Horned pondweed
- Muskgrass

STRONGLY BRACKISH (nearly seawater saltiness)

- Wigeongrass
- Eelgrass (tidal creeks and bays only)

For species identification it is advisable to contact your local library or Fish and Wildlife Branch Biologist for reference or information on the subject.

PRESCRIBED SPECIES FOR VARIED CONDITIONS

MARSHES

FRESH

- Water smartweed
- Marsh smartweed
- Swamp smartweed
- Nodding smartweed
- Wildrice
- Small duckweed
- Common threesquare
- Dwarf bulrush
- Waterpepper
- Duckpotato
- Burreed

BRACKISH

- Tidemarsh waterhemp
- Common three-square
- Saltmarsh bulrush
- Dotted smartweed

MARSHY FLATS AND MOIST MARGINS

- Wild millet
- Largeseed smartweed
- Nodding smartweed
- Dotted smartweed
- Waterpepper
- Ladysthumb
- Chufa
- Common threesquare

PLANTING USING SEEDS

If seeds are to be collected from local marshes, they can be gathered through hand removal using a boat or by first cutting plants containing seed and letting these plants hang and dry. Once the seeds are dry they can be removed. After windy conditions, seeds are often blown in large quantity to the marsh edge where they can be collected also.

Seed should preferably be planted in early fall, but if waterfowl are feeding in the area the seed may be eaten so planting should be delayed until spring or summer. Emergent species should be planted right along the shoreline in moist soils so they can spread into the shallow waters along the edge naturally. Submergent species such as the pondweeds should be planted in the shallow waters 10 to 30 feet out from the shoreline, depending on the size of the pond or marsh.

If storing the seeds over the winter, it is recommended to store them in water below 40 degrees Fahrenheit. Hard coated seeds of the pondweeds, burreeds and bulrushes can be stored dry but should be soaked in cold water for a few days before planting to allow the seeds to become saturated so they will sink to the bottom of the marsh easier and faster.

Some seeds such as those from Wildrice may be able to be bought from persons in the province. Contact with the local Fish and Wildlife Branch may aid in locating or obtaining addresses of persons selling Wildrice or other feeds.

PLANTING USING ROOTS & TUBERS

Roots and tubers should be harvested from the marsh bottom by hand or by use of a tool such as a potato hook or other device. They should be planted by hand in shallow water's along the edge of the pond or marsh. Fall planting is preferred since water levels are usually at their lowest and access is easy. Roots and tubers may be eaten by muskrat or waterfowl or can be removed by ice action and flood waters so periodical checks should be conducted whenever possible.

When storing roots and tubers, they should be kept in a cool place such as a pond or stream and held in a wire mesh cage if possible. If roots and tubers are touching while being stored, fermentation and rotting can become a problem. To solve this problem, roots and tubers should be packed loosely into the holding structure.

PLANTING USING WHOLE PLANTS

Whole plants from marsh areas should be removed by shovel or potato hook. Emergent species such as bulrush can be removed as single plants or preferably in sods. If stems are removed, they should be pushed into the marsh bottom at 6 to 8 inch intervals. Whole plants should be stored in the same method as roots and tubers and special care of fineleaved pondweeds is necessary since they are very susceptible to drying if exposed to warm, dry conditions. Whole plants should be planted as soon as possible after they are gathered.

DRAWDOWN

If your enhancement project consists of a water level control system such as a gate in the dike or dam, it may be possible to use this device to your advantage. Some species of aquatic vegetation such as the smartweeds thrive best when they first become rooted on drier soils. Through drawing down the pond or marsh areas water level in the spring and summer so these important foods can become rooted on drier soils, the possibility of increasing the yield of these food species becomes evident. Once the vegetation becomes established, re-flooding of the area should occur thus making these foods accessible to waterfowl preciding in your area.

If your enhancement project consists of potholes with no water level regulation system, then pumps may be used to lower the water levels. It should be noted that if waterfowl are already nesting around the pond or marsh, lowering of the water level should be delayed since predation, food and cover may prove to be a problem or limiting factor for the nesting adults and young broods.

COSTING

When planning to enhance your land unit for waterfowl use, one of the major considerations is expense. Construction costs can be reduced if site preparation is completed by ones self. If the use of a Caterpillar or other earth removal machine is available to yourself, a sustantial amount of the construction cost can be reduced. A general cost percentage outline is given below.

	% of total
1.) Site survey and preparation	15
2.) Earth removal	60
3.) Seed and fertilizer	10
4.) Artificial Nesting	7
5.) Corrugated metal pipe (if needed)	8
	100

It should be noted that if any objects around the home or farm could be used in the enhancement project they should be implemented to reduce added costs.

MAINTAINING PREFERRED

WATERFOWL HABITAT

MAINTAINING PREFERRED WATERFOWL HABITAT

Over time, a marsh or pond will gradually fill in with vegetation which grows and dies. With the encroachment of such species as willow and alder to the pond or marsh edge, the resulting effects on waterfowl habitat are that preferred nesting area will be reduced and eventually the actual size of the pond or marsh will be reduced also. Species such as cattail can also take over a pond or marsh and reduce the amount of open water available to waterfowl for feeding.

Through various management practices, succession can be reversed or turned back to a stage which is more favourable to waterfowl. The stage in succession which waterfowl actually prefer is when there is a 50/50 ratio between open water and protective cover. This ratio will provide the best conditions for feeding as well as for breeding and brood rearing.

Through managing the pond or marsh by turning back succession, the possibility of maintaining a preferred stage in succession becomes evident. The productivity of the land unit for waterfowl use can be controlled and stabilized which results in stabilizing or even increasing the waterfowl capacity of the land unit also.

OVERGROWN PONDS AND MARSHES

In cases where there is a dominant plant species such as cattail which out compete other species which could be a better alternative, then some means of eradication may be necessary. Unwanted species may be removed by mowing, grazing by cattle, spraying with chemicals and by encouraging the presence of muskrat which utilize cattail for food as well as material for their homes.

ERADICATION BY MEANS OF MOWING

If removing unwanted plant species from the pond or marsh area by means of mowing, then it should be noted that wet soil conditions can create problems for machinery working in the pond or marsh. By mowing when conditions are at their driest, the problem of bogging down in the marsh bottom by mowing machinery can be decreased or eliminated. Fall conditions in the marsh are usually at their driest for mowing, but by mowing in early July, eradication of unwanted plant species can be more successful due to cutting before seed is produced. For added success, another cut should be conducted when the new growth is about two feet high.

ERADICATION BY MEANS OF GRAZING

Through the act of grazing by cattle in ponds and marshes, openings in the emergent vegetation occurs which are used for travelways by ducks and geese. Although grazing can be advantageous to the pond itself, over grazing can leave the area barren of cover. Cattle should be removed should be removed when the unwanted species has been eradicated or when coverin the pond or marsh becomes depleated.

Fields adjacent to ponds and marshes are very useful as feeding areas for geese, since geese are grazers and feed on new succulent grasses and sprouts. By allowing cattle to graze in these adjacent fields, build up of dead grass does not occur so geese can feed on the shorter new grwth without having to fight through the accumulation of dead grass which would inevitably build up if grazing were not allowed or practiced.

Fertilization of meadows or fields by cattle dung increases benefits by increasing production of hay, providing more and better cover in uncut areas and by stimulating early growth in spring. As a management tool, grazing is a natural and effective method of eradicating unwanted species as well as thinning out dense growth.

ERADICATION BY MEANS OF CHEMICALS

Removal of unwanted plant species or growth by the use of chemicals should be one of the last alternatives of management. If it is found that chemical eradication is the best alternative then 2,4-D, 2,4,5-T, dalapon, amitrole and T.C.A. can be sprayed on the unwanted vegetation. For the correct chemical use it is recommended to contact a local dealer or Fish and Wildlife Branch Biologist.

ERADICATION THROUGH MUSKRAT ENCOURAGEMENT

By encouraging the presence of muskrat in the pond or marsh it is possible to open up dense vegetation or remove unwanted species such as cattail. Muskrat utilize cattail for food and for their home construction. By opening up a 15 foot diameter area then piling three bales of hay or straw in the center, muskrat will be encouraged to build their homes on top of the bales. Ducks and geese will also use muskrat homes for loafing sites.

ERADICATION BY MEANS OF FIRE

Through a burning program in early spring the pond or marsh can be revitalized through nutrient release into the soil. Burning causes better growth in plant species and pushes back succession or the filling in of the marsh by vegetation but it could also create better growth on unwanted species. By burning then flooding of the area, taller species such as cattail can be kept under control.

AGENCY CO-OPERATION

Through out the planning and construction of your land unit, various problems or questions may arise. For added information and advice, the following Agencies may prove helpful.

1.) Your local Fish and Wildlife Branch

Fish and Wildlife Branch
Dept. of Recreation and Conservation
Victoria B.C.

2.) Canadian Wildlife Service
Ottawa, Ontario

3.) Ducks Unlimited
2-345 Victoria St.
Kamloops B.C.

4.) Creston Valley Wildlife Management Area
Box 640
Creston B.C.
V0B 1G0

5.) British Columbia Wildlife Federation
17655 57th Ave.
Surrey B.C.

6.) British Columbia Waterfowl Society
5191 Robertson Rd.
Delta B.C.
V4K 3N2

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