Nesting boxes for mallard ducks

To improve your duck hunting prospects, there are several things you can do. Anything that increases duck productivity and/or survivorship is a good start. This article deals with one of those initiatives, nest boxes. Whichever style you chose, we suggest you read the whole article as tips are scattered throughout:

Natural habitat is usually best

Keep in mind that, in general the best "nest box" for a mallard is natural habitat. In many cases this natural vegetation around water bodies has been lost. Often it can be replaced just by removing cattle grazing from, or not mowing the pond margins allowing rank grass to establish and form excellent nesting habitat. So it can be as simple as locking the pond paddock gate. Planting low shrubs and other cover will give nesting mallards more options and serve as additional screening from aerial predators. Conversely, if there is only a thin strip of cover, predators can search this small area easily and the duck's chances are slim. When choosing where to plant, including at least some land above flood level is a good idea, for instance, a nearby hill-face or the like.

Rank grass, sedges etc. make very good nesting sites

Flood prone areas

Flood-prone areas especially benefit from having nest boxes mounted on poles above the flood-line or, if floods are higher still, you might consider mounting your nest box on a well-moored, home-made floating raft-island that can rise and fall with the flood levels. Polystyrene makes suitable, long-lasting floats; for instance, hardware stores sell slabs of it as underfloor insulation. The remaining structure can be made of treated wood, such as old fence posts, or even suitably shaped plastic crates. Alternatively you can purchase a floating wetland island from Robert Shearer (0800 495 777). These are highly recommended and used by Fish & Game (see photos below). If sedges and carex are planted on the raft, with their roots left dangling through into the water, the growing

cover ensures the nest box is screened. Also, seeds from these plants help feed the ducks. The more natural it all looks, the better. Keep in mind that ducks will sometimes take their brood back to the nest box for their first night after hatching if it is mounted at water level. So make sure that there is some sort of climbing aid, such as 25mm square wire mesh nailed to the island's edge, or weaker ducklings may simply fail to get back to the nest and perish.




Nesting Islands based on the NZ made floating wetlands available for purchase from Robert Shearer

Maimais as breeding structures

Mallards and even grey duck have responded well to nest boxes attached to maimai exterior walls or to maimai roofs in river sites that flood at ground level. Grey teal often nest in dark corners of maimais such as under low seats and we've seen mallard ducks nest against maimai walls in the shrubbery. Make sure that, if a breeding duck can somehow get inside a maimai to lay eggs, that her newly hatched ducklings can also walk out, (i.e. at floor level).

Mallard ducklings do not climb

Grey teal chicks can climb out of nest boxes that have some wire mesh inside and below the entrance to act as a ladder. However mallard ducklings are not as adept at climbing vertically and can die trapped inside. So unlike grey teal nest boxes, mallard nest boxes need to be horizontal. You can exclude mallards from grey teal boxes by having a 95mm diameter entrance, but a mallard box should always have an entrance at least 150mm diameter. An entrance that is too tight can break the egg inside the female ducks body when she comes to lay it.

If you can, it's also a good idea to set Fenn or DoC traps to control vermin in the general area through the spring nesting/breeding months. Pukeko can also kill young ducklings, one after the other, so it pays to thin them out hard if you want more mallards.

Nesting material

Ducks do not carry nesting material like many other birds. You must provide it for them fresh every year. Hay or rank grass is OK at a pinch but if it gets wet and mouldy, (which it probably will), it will create a problem called Aspergillosis, where fungi spores can kill young ducklings. Much better is wood-wool which can often be scrounged from places that use it as packing, for instance, for crockery and china. These long, thin wood shavings look like spaghetti and you may have seen them used in gift baskets. You can buy it wholesale in 5kg or 10kg boxes from NZ Woodtex, Herschel Street, Ngaruawahia – the only place in the North Island that makes it. In the South Island, contact Woodwool Specialists Ltd in Kaiapoi. Beware that some retailers can mark this product up very substantially. We have tried many alternatives; pine needles, sawdust, barley straw and short wood shavings, but they all have disadvantages. Once you use wood-wool, you'll never want to use anything else as the ducks love it!

Old nest material has to be removed and replaced with new after each breeding season, for instance, around March/April. This removes any insect nest parasites, old rotten eggs, rotting nest material, etc.

Nest cylinders, "Hen Houses"

These have been used with success overseas but in New Zealand our mallards seem to mostly ignore them. Grey teal will readily use them, but there are better alternatives for this species. These nesting cylinders are made from rolled up wire mesh with reeds, straw, etc., rolled inside the cylinder walls. Every year or two they need to be unwound and repacked, so use some long-lasting vegetative material such as teatree or flax and then add wood-wool for the nest itself. The cylinder, which is open both ends, needs to be mounted on a base attached to a pole of some kind that is driven into the wetland. In our experience, most people don't persist with this design due to poor results. However, we'd love to hear from anyone who has found otherwise.

Wooden and plywood NZ Wildlife Service design mallard nest boxes

This is the easiest of the proven designs for the home handyman to make. What we would suggest though is; if it's worth doing, it's worth doing right. Sometimes F&G staff see half-hearted attempts at making some sort of nest structure and the lack of results are usually proportionate. Well-built next boxes will last for years, so taking a small amount of extra time to get it right will have long-lasting benefits.

Rough-sawn, H4 treated wood not only looks more natural, it's also cheaper than dressed timber. The NZ Wildlife Service long ago concluded the ideal wooden mallard nest box with sloping roof should be:

Box dimensions:

Height of side wall at front 300mm

Height of side wall at back 260-280mm

Box depth 460mm

Box width 300mm

Roof 560x350mm

Front opening 150mm round or square.

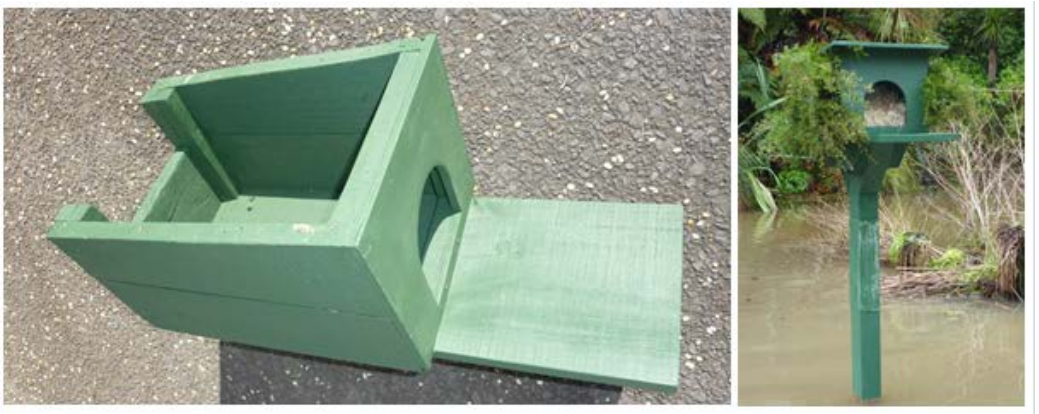
Rear escape opening, 130-150mm high.

Landing platform 250mm+ long x 300 wide.

A slight gap between upper and lower side-boards allows the nesting duck to see approaching danger. It should only be 1-2mm at most. 20mm treated, rough sawn timber is ideal. The roof should be plywood. The whole box can be made in treated plywood, if you prefer.

This box should be attached to a wooden bracket screwed to an H4 treated - 100x75mm support pole over water, (see photos) - or use two slightly smaller poles just like a letterbox - or fix it to a floating raft. An effort should be made to exclude rats, who'll also adopt this as their home if allowed. You can poison them from nearby and/or use some form of predator guard that helps prevent rats climbing the mounting pole/s. A sheet of metal that skirts right around the pole is ideal. It should be non-rusting and not too shiny, (i.e. painted matt green). The best material for the job found to date is the thin, flexible aluminium plates used by some smaller commercial printers to make posters. These are sometimes known as "goss plates" and sometimes not! But if you ask for these, you'll probably be on the right track to getting what you need. Wrap them around tight and nail them on with small, flat-headed galvanized nails. Also trim well back any overhanging willow branches that might allow possums or rats to gain entry down to the nest box. Remember that, supporting a predators' weight, these branches will bend lower.

All nest boxes should have 4 good sized drain holes in the floor so that, in the event of driving rain entering the entrance, the water will not pool inside the box and spoil the eggs. Also be very careful to avoid anything that projects from the box floor like screw or nail heads as these can damage eggs when the sitting duck turns them over and rearranges them ever day they're incubated. Treated wood is the best material for boxes, but if you should instead use creosote or Metal-X, make sure it's well dried out so any smell has worn off. A flat green, water-based paint such as Taubmans Timberproof mid-Bristol-green is the ideal colour to make it look like part of the wetland and help improve uptake besides. A few small poultry staples, one in each corner, will allow you to attach lock-wire to hang teatree against the sides – again to make it look more natural and hopefully improve use rates.



Wooden NZ Wildlife Service design nest box, (roof removed)

Wicker nest baskets

In Holland, these have been used for centuries with hundreds being put on individual lakes by sportsman's groups to encourage ducks to nest. They are very successful with 2,000 ducklings coming out of them on one lake alone, (averaging 5 fledged per basket). The baskets chief advantage is that the sitting hen-bird can see danger approaching through the woven design. These baskets are made from basket or osier willows and have to be taken down each year, dried out and coated with preservative* ready for the following spring. Used correctly, they're mounted on 3 stakes, (using lock-wire, for instance), above the flood line. European Ebay is the place to shop for them if you don't mind the cost – about NZ$60 plus freight to NZ. Look up either Entenbrutkorb (German) or Eenden Broedkorf (Dutch). It'll certainly help ensure delivery if you have friends or family in Europe who can buy them for you and forward them on. They can also be found for sale sometimes in England as gamekeeping supplies. They're pricey obviously, but they make a great talking point on a feature lake. Designs vary, but the important thing is that the neck of the basket should be about 150mm in size. Bean-poles pushed into the wetland make good stakes and use lock-wire to make sure they stay put. Remember that ducks also need nesting material provided in the form of wood wool.

*The best preservative for any sort of cane-type product is 1 part gum turpentine, (do not use mineral turps), to 1 part boiled or artist's linseed oil, then add another 10% by volume of tung oil. Shake well, paint or spray on until well soaked and then thoroughly dry in the sun. Diluted green Metal-X has also been used on cane baskets but it takes quite some time for the smell to abate.

Dutch nest basket, the first to be made in NZ.

European Louvered nest boxes

Inspired by the wicker basket design, this wooden version uses wooden slats around the box – again to allow the nesting bird to see danger approaching. You may find it has greater acceptance in early years with some teatree lashed to it as you would a maimai. Lock-wire (1.25mm dia. or smaller),

that is sold by hardware stores is ideal for tying it on. Have a look at how commercial "Brushstix" is bound by 2 thin wires that run either side, front and rear of some brush material, which are then crossed over to take the next piece of brush and so on. Do this both ends of the small branches and tie the wire to the box by having a small poultry staple nailed in each corner.

Once a generation or two of ducks have used nest boxes, the young birds will have imprinted on them and will seek them out when it's their turn to breed. So a little bit of effort, (i.e. the teatree), can be needed to get the nest-box habit started. Be careful about shooting a pond too hard or you may burn out all the imprinted ducks. A simple way to avoid this is to shoot drakes only. It's the hen-mallard that selects the breeding site, the male just goes where he's told, (sound familiar guys?)

The 20mm square slats around the sides are not normally sold treated. Dipping them in green Metal-X or similar wood preservative will ensure they don't rot prematurely. A mitre-saw will help cut the ends evenly so everything mates up neatly. Pre-drill and screw home the slats. Don't forget 4 good sized drainage holes in the base.

To install these boxes, it's suggested you use a 100x75mm H4 treated pole driven into the pond base using a wooden mallet or a 'pole donger' steel cylinder. The pole needs to be in far enough and the attaching mounting bracket made sturdy enough that the nest box is steady when birds land on it. Hex-head screws are easier to secure everything with onsite than nails. The photos supplied show a successful bracket design.

European Louvered nest boxes

Willow tee-pees

When a willow trunk is chopped off square a couple of meters from the ground, (called pollarding), and new branches then sprout out of it, these can be folded over and tied together to make a sort of tee-pee. Bung some wood-wool in the middle, add some form of predator guard on the bole of the tree and you have a fairly natural and cheap nest structure.

Natural nest sites

Crotches in tree branches and even holes in larger willow trunks can be popular nest sites for mallards, so don't be too quick to cut older willows down without doing an inspection first. The native flax-like plants, (epiphytes), that grow in trees like puriri and on stumps also provide nesting cavities in their roots. Possums compete for these natural nest sites so be sure to keep them under control so the site is vacant for ducks in spring.

Plastic drum nest boxes

Not as picturesque as the Dutch nest baskets, but the black interior seems to make them popular with ducks. Avoid drums that have held anything toxic. In fact, if ducks smell anything strong or unusual when they first inspect it, they'll probably reject it. The best for the job are 20-litre detergent drums used by trucking firms to wash down their vehicles and by famers for washing down cowshed-yards. Drill a 150mm hole about 100mm from the base. Fill the drum with plenty of damp sand for added weight to stop it blowing away. Add some wood-wool and put it somewhere above flood levels – a maimai roof is ideal. If it's on a sloping roof, make sure the entrance is on the high side, so the bird nests at the back away from the preying eyes of predators. Make sure it has drainage holes so it doesn't fill up with rain water. Sand will fall out of these drainage holes so improvise something porous to keep the sand in and let the water out – perhaps a bit of sacking.

Plastic heats up in the sun and black plastic worst of all. Temperatures exceeding 41.5 degrees Celsius are lethal for duck eggs and above 47 degrees Celsius for the incubating duck. So you'll need to provide plenty of shading for the drum in the form of branches, such as macrocarpa, teatree, Brushstix, etc. The good news is this screening cover increases usage. Grey ducks seem to use these drums as well as mallards.

Plastic drum nest boxes

Mounting poles

As mentioned, an H4 treated pole, 100x75mm will service most nest structures, if a sturdy platform is screwed to it to support the box itself. A 2.6-3.0m long post will cover most scenarios where someone in waders is driving the post in. Scaffolding pipe also makes a good pole. For grey teal nest boxes a fence batten was turned down round on one end in a lathe to be a tight fit and driven into the end of the pipe. The box was then screwed (using a hex-head screw at the top and lock-

wire at the base), to the batten. To attach mallard boxes to these same battens, F&G use coach-bolts and bolt these to one side by pre-drilling the batten to accept the 2 bolts. Use large galvanized washers to protect the pole wood from the tightened nut. Poles can then also optionally be smeared in lithium grease to deter rats. Fence-posts can also be used as poles but they may need to have a flat face cut to ensure the box attached doesn't wobble. What is not recommended is nailing nest boxes to trees. This only encourages possums, rats, etc.

How will they get down?

Ducklings can jump quite incredible distances so don't worry about how they're going to get down. They will. Why not set up a game camera and find out how? Make sure their path to the ground is unobstructed though. The nest box should be on a pole over water and not over reeds, weeds or land.

Did they use my nest box?

It's a good idea to keep well clear of active nests. If a bird is disturbed, especially at the early nesting stage, she might well desert – especially so if your Labrador finds her first and gives her a fright. Keep him on a lead. Toward the end of their incubating period, ducks do become a lot calmer but we still recommend you do any inspections from a distance with field glasses. Good binoculars will see inside the shadows and you may see the duck's head showing inside the nest structure, confirming she's in residence. They'll lay one egg a day, perhaps 10-12 of them and then incubate them, (heat them up with her own body heat), for about 25 days from the time of the last egg laid. When the eggs hatch after this, she'll keep them a little while longer under her to dry them off and for late hatching ducklings to catch up so the brood is complete.

When you come to replace the wood-wool the following year, (we suggest around March / April, when all nesting should be finished), we hope you'll see last years old wood-wool woven into a nest shape with small duck feathers/down interlaced. This means that one or more birds have incubated eggs in that box. When you remove/renew the wood-wool, dozens of fine egg chips falling through it also mean a clutch has hatched. There may be one or two unhatched eggs left behind. That's not unusual and they need to be thrown out to prevent these from going rotten. If they do, and another hen in future lays her new clutch with them, they can explode when she starts to incubate these eggs with her own. These old 'bangers' can cause her to desert or contaminate her eggs if she stays.

If there are old eggs or just squashed shells pushed well down into the nest and another nest made on top, there may have been 2 clutches by 2 birds. If there's a full clutch of whole eggs in the nest, and it's March/April, she may have deserted for some reason, such as disturbance by a predator. If you put one of the eggs to your eyelid, this is the gamekeeper's trick to test for; is it warm? (eyelids are very temperature sensitive). If it is, it's still being incubated. Put it back and leave them in peace to hatch. Good eggs sink and old eggs float or nearly so, but this test should only be done with tepid, (just warm), water – bring along a thermos of it and a small but deep-ish container to float them in. If the egg is leaving tiny ripples, for goodness sake, put it back before it hatches! An egg with a few small chips or even just a small creak at one end may be in the process of hatching. Don't put this in water as the (hopefully still warm and alive), duckling is pecking its way out with its special "egg-tooth". If this creaked/chipped egg is quite cold and abandoned, it may not have succeeded.

If you think the clutch is obviously cold, try smelling it. If the eggs smell quite bad, they're unlikely to hatch. Try the floating test and if they stand fully upright or float, get rid of them. A good egg will smell fresh for months but one that died at any stage in incubation, for instance, if they were abandoned, will soon smell off. Off eggs start to rot so be careful handling any potential bangers as they're brittle and can easily explode if you're rough with them. You'll soon know which way the wind is blowing it they do!

If the eggs you find are just shells and broken open, it may either mean they've hatched or been predated. If the thin white membrane inside the eggshell has come away from the inner part of the shell, the ducklings have hatched. However if the membrane is firmly attached and there's perhaps some blood and/or yellow egg contents, those eggs were probably eaten.

If rats are living in the box the nest will smell "ratty" and will be puffed up with a noticeable entrance in one corner. Remove contents with care! Rats will dive as soon as they hit the water and will only surface near the edge. Have a shotgun or even a terrier waiting for them there. Boxes can also have starling or myna bird rubbish in them. Clear it all out and start with fresh wood-wool.

With all this detective work, you should by now have a shrewd idea of what happened.

Can I take eggs out of a box and hatch them?

You certainly could, but you must have a DoC permit first. In general, it's best to leave the duck with her own eggs to hatch as the ducklings will get the full value of having a wild mother to teach them how to survive in the wild. An incubation lamp just can't teach them those skills. Broody bantams can hatch and raise ducklings in a pen, but the best surrogate if there's a pond available is a broody female Muscovy duck.

Concluding remarks

Mallard ducks don't always take to nesting boxes, especially if there's lots of natural nesting cover. But once they do, their usage rate can quickly improve – if you continue to service the boxes with new nesting material each year. It's certainly rewarding to see that your efforts have resulted in a successful nest. If success initially seems elusive, have a look at duck/duckling eye-level at your pond. Are there gently sloping margins leading to cleared areas where ducklings can get out to rest, (adult ducks rest up to 6 hours a day)? You could also stake bigger branches at water level that they can climb out onto safety to roost. Is there plenty of overhead cover from hawks, such as flax plants whose drooping leaves overhang the margins? On larger ponds, (100m long+), a weeping willow or two can provide excellent hawk screening cover for ducklings, but please don't plant other willow species as these can soon become a menace.

Sunlight is important for birds to dry off and warm up after heavy rain, for instance. This is particularly important in cold, wet weeks when ducklings are in their downy stages and can chill and die. To ensure that the shade from larger trees falls away from the water, consider cutting down at least some of those trees that would otherwise make the pond cold and dark. A pond that is completely overgrown at ground level will also benefit from some clearing around the edges. The extra sunlight let in will stimulate insect life which the ducklings depend on. Some people ask us what sorts of fish they can also release into their ponds. These compete directly with ducklings for food so we strongly advise people who want to encourage ducks not to do this. There are also serious legal implications surrounding unauthorized fish transfers.

Lastly, make sure that any overflow from the pond is not a duckling trap. If they fall down it, can they get back up again? On some designs a screen is sufficient to prevent this happening or a ramp of stones can be used that they can climb back on.

Feedback?

Auckland Waikato Fish & Game would be most interested to hear your nesting structure experiences, whether successful or not, so that our hunters' collective knowledge, experiments and experiences can be shared to improve the waterfowl resource. This is one field where there is still much to learn about our mallards local preferences. Your 'citizen's science' results may prove to be the cutting edge and an important part of that learning process.