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Milham Pond Saltmarsh and Shorebird Habitat Restoration Project

2009 Report (Appendix D)

Introduction

Milham Pond is located on Ash Island and forms part of the Ramsar-listed Hunter Estuary Wetlands. This area consists primarily of coastal saltmarsh and provides an important feeding site for shorebirds.

Ongoing surveys in this area by the Hunter Bird Observers Club (HBOC) have shown the encroachment of mangroves into the saltmarsh. The prime cause most likely is due to increased tidal influence as a result of continuing and additional deepening of the Hunter Estuary for shipping. Mangrove seeds carried by the rising tide are deposited higher into the saltmarsh areas where they grow and create a closed canopy. The result is a mangrove forest replacing a saltmarsh.

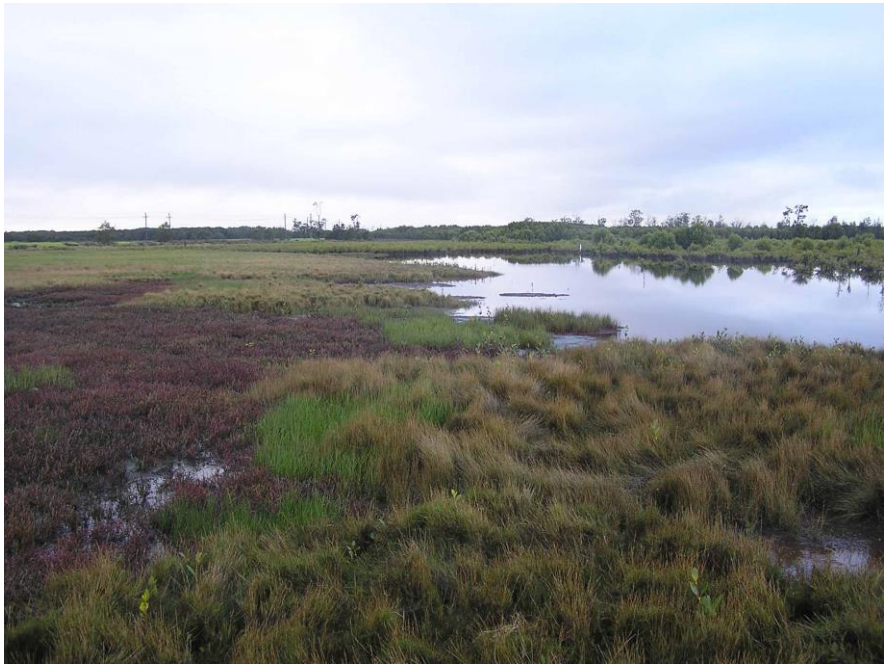
This project aims to rehabilitate the saltmarsh area of Milham Pond through the removal and treatment of the encroaching mangroves and installation of an appropriate Mangrove Propagule Exclusion Device (MPED) to prevent the introduction of additional seeds. It has been demonstrated previously on Swan Pond, Wader Pond and part of Milham Pond (all on Ash Island), that saltmarsh and shorebirds will return once mangroves are removed.

It was agreed that funding be sought to pay for contractors to carry out the bulk of primary treatment of mature mangroves at Milham Pond and to assist with some secondary work to give the volunteer effort a much needed boost. It was estimated that approximately $28,500 would be required to achieve the removal of mangroves from Milham Pond and to install a MPED. In 2008, HBOC approached Birds Australia Southern NSW and Act (BASNA) for partial funding of this project. Half the funds ($10,000) raised during Twitchathon 2008 were granted to the Project. In addition, HBOC was successful in obtaining a Caring for our Country Coastcare grant for $18,200 bringing the total funds to $28,200.

The project is run as a partnership between HBOC and Kooragang Wetland Rehabilitation Project (KWRP) with KWRP responsible for most of the administration, a community education component and liaison with other government agencies while HBOC takes responsibility for project design, site supervision of contractors and the continuing volunteer effort.

Previous Restoration Works at Milham Pond

Previous mangrove removal has been carried out on Milham Pond with limited success. A contractor was engaged in 2005 to remove mature mangroves from Swan, Wader and Milham Ponds with funding from Envirofund. Works at Swan and Wader Ponds were mostly completed but the Milham Pond component was only half done. Follow-up weeding by volunteers over the winter months of 2006, 2007 and 2008 combined with the introduction of Mangrove Propagule Exclusion Devices (MPED) successfully maintained the Swan and Wader Ponds. The volunteer effort at Milham Pond however failed to completely maintain the area previously cleared by the contractor. This was unfortunate as initially this area realised great success in providing shorebird habitat.



In the foreground is saltmarsh with scattered mangrove seedlings waiting for volunteers. The low green line in the middle is 2ha of mature saplings re-established since the previous contract work. In the background is the forest of mature trees yet to be felled. This is the challenge for 2010.

For Milham Pond two factors remained after the initial primary treatment of 2005; an underestimated volunteer effort and lack of exclusion to further invading mangrove seeds. This situation resulted in the re-establishment of mature mangroves over about half of the initially cleared area. The aim of this renewed project is to address these issues as well as to clear the remainder of the mature trees left by the previous effort.

Permission to carry out work.

Mangroves provide important habitat for fish nurseries and are protected by State legislation. To remove mangroves it is necessary to gain permission from NSW Department of Primary Industries (Fisheries) and a permit issued under the Fisheries Management Act 1994 is required.

Since the original permit had expired in March 2008 a renewal had to be secured and with support from both National Parks and Wildlife Service (NPWS) and Kooragang Wetland Rehabilitation Project (KWRP) a new permit was issued. This *"Permit for removal and exclusion of mangroves*

from Milhams Pond" is valid until 30 December 2014. Additional to the permit, a Works Notification is sent to Fisheries prior to contractor site works commencing. The notification was made on 3rd June 2009. All people (volunteers and contractors) involved in site works removing mangroves need to carry a copy of the Permit.

To carry out restoration work on Ash Island, permission is required from KWRP, the practical land managers. The morning "call in" prior to any works is an established protocol that works well and a visit to the Old School House for a chat with KWRP staff at end of a shift is appreciated.

Additional to that, permission to traverse a temporary construction area is also negotiated as required. Access by contractors to the most southern areas of Milham Pond is via a track that runs parallel to Ramsar Road. This area is currently secured by Hunter Water Corporation contractors as they upgrade a water main across Ash Island. Again, the established "call in" routine is acceptable by those people and they are aware of our presence nearby. This protocol will continue into 2010 despite the need to find access via this route has now become slightly redundant.

Tender Process

Bush regeneration contractors were asked to tender for the work and demonstrate that their team members were competent and experienced bush regenerators and held appropriate work cover tickets.

The Scope of Works offered was to remove invading Grey Mangroves *(Avicennia marina var. australasica)* at Milham Pond within the defined area. Mangroves were described as being at various growth stages from seedlings to young trees. There were no trees regarded as mature or old growth.

Treatment of mangroves was to include felling of trees and saplings with seedlings being dealt with by hand removal techniques. Felling required chainsaw operation while hand removal utilized the use of hand-saws, loppers, secateurs etc. Smaller seedlings or seedlings in soft ground could be pulled up by hand. All plants needed to be pulled or cut at the base as close to the substrate as possible and then placed in piles as directed. It was insisted that no herbicide treatment was necessary or desired.

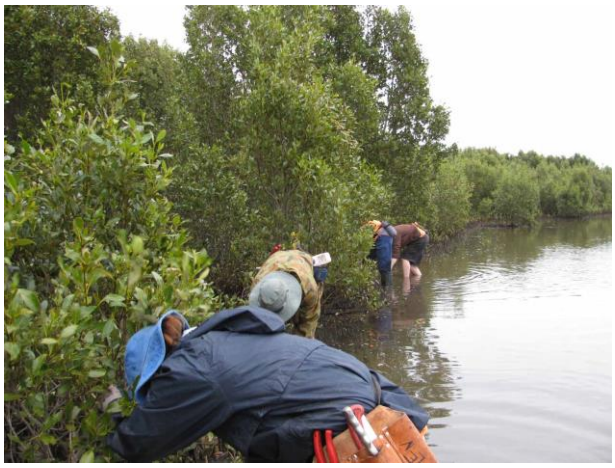
A site inspection was carried out 27th July 2009 where representatives from Hunter Land Management (HLM), Enviroculture Maintenance Services (EMS) and Trees In Newcastle (TIN) attended. The Scope of Works, methodology, planned schedule, site conditions, access, OH&S and matters of Contractor supply were discussed. Contractors were asked to provide a team of willing and dedicated workers, a Schedule of Rates and a commitment to start as soon as possible.

All Tender documents were received by 5th August and after a discussion on 10th August it was agreed that TIN be engaged for the work. After a couple of weeks of computer failures, KWRP finally were able to raise a Purchase Order on 21st August.

Mangrove Removal - Contractor Effort

Principally, the defined area for contractor works is that section of Milham Pond at its most downstream end and vegetated entirely by a forest of mature mangrove trees. The site is 1.4ha but it will be extended to over 2ha if the opportunity presents itself.

The TIN crew started site works on 31st August 2009 and after a "site induction" and familiarisation with the nature of the site commenced to under-scrub the mangrove forest. Three days work using hand tool techniques was incorporated as planned but the density of seedlings in some parts (most notably along the edges of the forest) made for slow going. It was also apparent that days planned for chainsaw operation needed to be scheduled for low tides. These were early learnings that helped to modify our approach.



Work finally gets underway and it is good to have the TIN crew getting up close to some mangroves.

And killing them!

Under-scrubbing by way of a brush-cutter was trialled on the next visit using a machine borrowed from KWRP. It was in reality a heavy duty 'whipper-snipper' and worked out reasonably well in cutting seedlings. Two limiting factors became apparent after a short time; one was the high frequency of cord replacement needed and the other was its tendency to destroy other saltmarsh plants when clearing near the upper margins. Nevertheless, the operator was easily able to keep in front of the chain saw operator's progress within the forest and seedlings standing within saltmarsh would still need to be hand removed.

A brush-cutter fitted with a circular saw blade was utilised for the next two visits and proved to be amazingly superior to the 'whipper-snipper' model. This machine not only cleared seedlings but all young saplings up to about 50mm in dia. thus reducing the number of trees requiring felling by chain saw. Under-scrubbing operations and clearing in general over muddy areas is now easily achieved and augers well for the 2010 effort as a large proportion of the remaining work area has little tree cover.

The chainsaw days proved the efficiency of these machines and after only three days 26% of the Contractor component had been cleared. Felled trees were cut into manageable lengths and placed in piles to break down over time.

The practice of not removing biomass from a vegetative community is a well regarded axiom with bush regeneration. Woody plants can be left to break down and feed the soil from where they grew.

Piles of plant material also serve as habitat immediately after treatment as well as during the decomposition. It was apparent that several bird species, including shorebirds, were using this new habitat even as the work progressed. Also it was observed that aquatic animals and fish were exploring the piles during each tidal inundation of the pond.

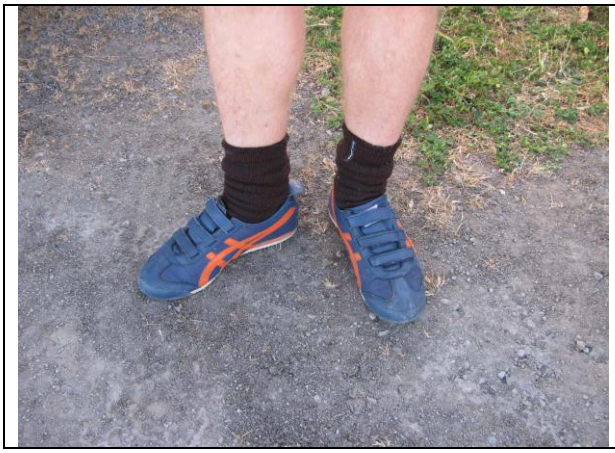
In making the piles we are also clearing the ground to make way for the re-establishment of saltmarsh. If the felled trees and saplings were to be left strewn about they would form a blanket over much of the ground and make re-establishment much more difficult.

Finally, the act of creating piles has a very practical purpose as well – workers can tell where they have been. This is most prevalent when clearing seedlings etc from established saltmarsh communities.

Forest under-scrubbed.

Forest felled and placed in piles.

A total of 7 days work comprising 216 hours was completed by the TIN crew.



Mangrove Removal - Volunteer Effort

The defined area for volunteer work is basically the most upstream 10.5ha of the 11.9ha site. Prior to 2009 the volunteer effort probably only managed about 3ha. Ultimately the entire site will be the responsibility of volunteers to manage.

The usual winter follow-up work by volunteers started on 19th June 2009 with hand removal of seedlings from the upper reaches of Milham Pond.

This work was primarily achieved by physically pulling the seedlings from soft mud substrate or cutting with secateurs at ground level. Seedlings requiring cutting most usually were those growing within the saltmarsh community. After only 2 days the majority of follow-up was completed and the challenge of clearing re-established mangroves could be seriously considered.

Over the next 2 volunteer days a mixture of follow-up and "new" work was carried out.

Mature saplings (mostly less than 1.5m in height) growing along the western margins were removed and placed in piles using a combination of hand-saw and lopper techniques. Dependant on the condition of the substrate, the saplings were either lopped at ground level (stiff substrate) or "crowned" by hand-saw if found standing in soft mud. Crowning involves the cutting of the angled root system just below the stem base. This method is quick with practise and much easier on the back of the worker. It also creates less disturbance to the substrate than what happens with complete removal. Lopper cuts are necessary, however, when the substrate becomes stiffer and offers more resistance to the saw blade.

Seedlings found in a section of previously worked ground towards the end of the follow-up area were growing in higher densities than elsewhere. An inspection revealed that many re-sprouts had occurred. The previous year this patch was cleared trialling a different technique and in an attempt to reduce the amount of hands-and-knees work loppers were utilised from a standing position. It was realised at the time that cutting stems at ground level was not completely attainable but perhaps a couple of centimetres above would suffice. Not so.

Re-sprouted seedlings are the direct result of cutting stems too high.

It has been proven at other sites that a cut mangrove stem will die if low enough to be covered by the next tide.

The previously proven method, of cutting stems as close to the ground as possible, must be followed to realise success with killing mangroves.

The equivalent of 1 additional day was necessary to follow-up over this area.

A total of 6 more days work removing mature saplings was necessary to complete the goal of reaching the old fence line. The work method (hand saw and loppers) may be considered redundant now since the brush-cutter trial but will remain valid while ever a volunteer is without a 'buddy'. It is essential that operators of machines like chain saws and brush-cutters work in tandem with a mate.

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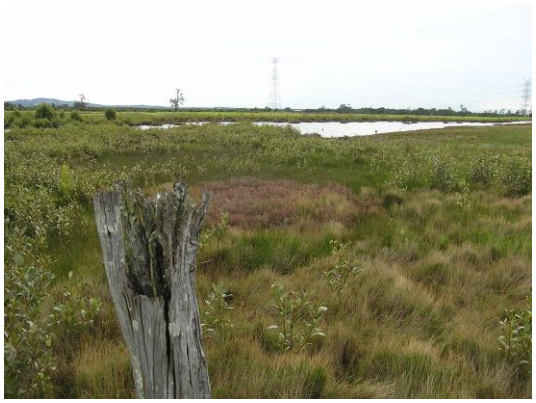
<td> 
Old fence line looking west with still a bit of work to do.</td>
<td> 
And looking east with definitely some work to do.</td>
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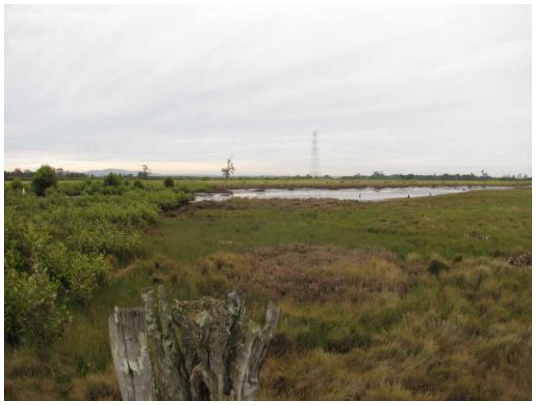
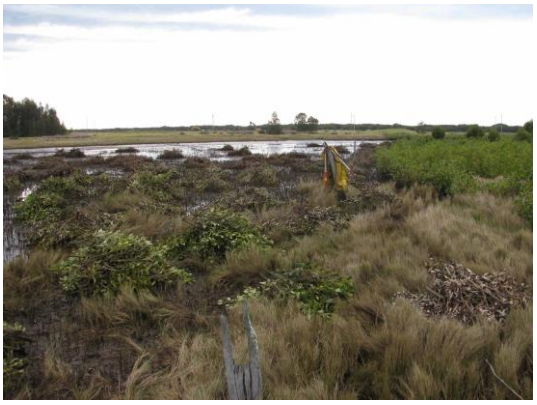
<td> 
Old fence line reached and how good it looks already.</td>
<td> 
More work this side of course. Mangroves in the grass were lopped and mangroves on the mud were crowned.</td>
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The volunteer effort continued for another 10 days with work now centred in the Contractor end of Milham Pond. Days were spent augmenting the Contractor effort, giving direction to the Contractors and matching the Contractor progress with seedling removal from the Pheonix Flat side of the creek. This work continued to use hand remove techniques but brush-cutter operation made life easy dealing with those mature saplings standing in the non-saltmarsh margins.

A total of 20 days work comprising 199.5 hours was completed by the HBOC volunteers.

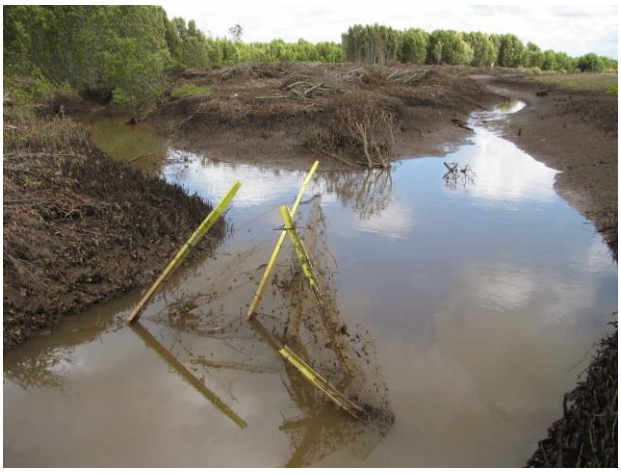
Mangrove Propagule Exclusion Devices (MPEDs)

To properly protect the investment by volunteers and funded Contractors it is necessary to exclude further invasion of mangrove seeds into the designated area. MPEDs can best be described as a line of chicken wire usually supported by a frame of star pickets and placed in a stream known to carry mangrove seeds on a high tide. The mesh is held clear of the stream bed to allow fish passage and high enough to collect seeds at the highest of the tides. Previous experience at Swan and Wader Ponds has shown that mangrove seeds are collected against the mesh, become waterlogged, fall to the bottom of the stream and die. Previous experience also shows that this method is not necessarily 100% efficient but the resulting invasion is minimal and the immediate follow-up is markedly reduced. Follow-up for the entire Swan and Wader Ponds area requires only 2 days of volunteer time and represents an area easily twice that of Milham Pond.

It was agreed that two MPEDs would suffice and the locations best suited for them were marked with star pickets during a site inspection the previous year. At two points where flood tide waters enter the Milham Pond system along creek lines a MPED was placed on 28th September 2009 by volunteers.

Two weeks later an inspection of the MPEDs showed that they were standing up to the conditions and both had trapped seeds. The puzzling thing about it was the fact that the seeds were trapped on the upstream sides of the mesh. Two likely answers were considered; seeds were only being produced within the system and/or the tides carrying introduced seeds were over topping the MPEDs. This situation would see seeds carried into the system and get trapped only as the tide ran out and water levels dropped to below the top of the mesh.

MPED looking quite magnificent but yet to experience a 1.8m tide.



MPED couldn't stand the pressure. A third will be placed just upstream where the depth is not so great.

It was immediately apparent that for certain the MPED placed in the deep stream (main confluence) was not tall enough to cope with tides approaching the 2m mark. Struts of a greater length were procured and a replacement MPED was installed on 26th October 2009. This model incorporated two overlapping sheets (to account for the dramatic differences in water levels) of mesh and looked great. After one week this taller MPED remained in perfect condition, standing up magnificently to the conditions but a week later was found to be falling over and looking a bit sad. During that week, Full Moon tides of over 1.8m had proved too great a force and the strength of the current along that deep section must have been tremendous. The stream is over 1.5m deep at this point.

Next year we will look to make narrower this MPED to relieve it of some of the pressure as well as place a third upstream of the confluence for added protection. All the previously placed MPEDs had not the severity of fast flowing tidal waters to contend with.

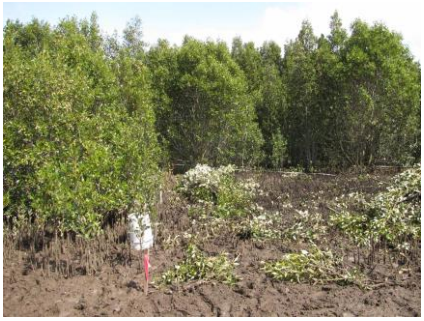
Estmate of Mangroves Removed

A requirement of the Fisheries Permit is to report the total number of plants removed. This is quite an impossible task to perform however an estimation of numbers will be offered at the completion of the contractor based primary treatment.

In an effort to gauge the density of plants a 10m x 10m quadrat was pegged out in a typical section of the first area to be treated. A controlled and systematic removal of all seedlings that could be pulled by hand was carried out and incorporated rest points. At each rest, each bush regenerator was asked to declare their tally before restarting the count until the next rest. At the completion of that process all the scores were added up. A similar process was then carried out counting the number of saplings that required the use of loppers to clear. Finally, those trees that required chain saw treatment were counted within the quadrat. The result was as follows; 6124 seedlings, 59 saplings and 38 trees all standing within a 100 square metre space.

Quadrat prior to hand removal of 6,124 seedlings.

Quadrat after 59 saplings were lopped.



Quadrat after 38 trees were felled.

Simply multiplying from this initial data it might be suggested that 857,360 seedlings, 8,260 saplings and 5,320 trees will be removed – a total of 870,940 mangrove plants.

To test the validity of that process a previously under-scrubbed section of 225 square metres yielded 113 saplings and trees (50 per 100 square metres) but unfortunately the removal of saplings was not gauged in the same way as that of the quadrat so a direct comparison cannot be made.

To put greater validity into the exercise it is planned to carry out similar quadrats in sections typical of the remaining two areas to be treated. Some sort of average may then be calculated or summed densities from each area will hopefully give some indication of total plants. The pegged and marked quadrats will remain in place and it is hoped that over time they may be useful in determining the density and rate of re-establishment of saltmarsh plants.

Project Funding

Funding for this project currently exists in two forms.

A Caring for our Country Community Coastcare grant of $18,200 from the Federal Government is held by KWRP through its parent organisation Hunter-Central Rivers Catchment Management Authority (H-CRCMA). This funding has been available since the start of 2009 and needs to be spent by end of financial year 2010. Progress reports at key Milestones are facilitated by KWRP. Three milestones were reached during 2009 and a report for Milestone 3 was lodged in October 2009. Next year's final report will be Milestone 5 and is due 30 June 2010.

A gift of $10,000 from the Twitchathon 2008 Funds is held by HBOC. This funding has been granted without conditions and can be spent as required. As a matter of courtesy, a report is sent to the organiser for tabling at Bird Interest Group Network (BIGnet) meetings so that Twitchathon sponsors can be aware of how the funds are helping birds.

At the cessation of site works in 2009 a total expenditure of $11,654 had been accounted for. The remaining Caring for our Country funds should easily be spent by end of financial year as the TIN crew resumes site works in May 2010. Cost of continuing site works will then be met by the activation of the Twitchathon funds.

Schedule for 2010

To make best use of low tides and to satisfy funding requirements the following 2010 dates have been chosen for the ongoing contractor component of the project.

Friday 9th April Friday 16th April Friday 23rd April Friday 7th May	Four days of HBOC volunteer follow-up. The TIN crew may like to get involved at this stage if work schedules permit.
Monday 10th May Monday 17th May Monday 24th May Monday 31st May Monday 7th June Monday 21st June	Six opportunities for the TIN crew to carry out site works prior to end of June 2010 will certainly complete the Caring for our Country funding within the prescribed time frame. These days will almost certainly be chain saw / brush cutter efforts and comprise of primary treatment of the mangroves.
Friday 6th August Friday 20th August Friday 3rd September Friday 17th September	After a break of six weeks a further four days (max) of site works will utilise Twitchathon funding. These days will almost certainly be hand remove efforts and comprise a mix of primary treatment and follow-up.

It is envisaged that the Twitchathon funding will not be depleted at this stage and that further works (follow-up) will be undertaken from about May to July 2011.

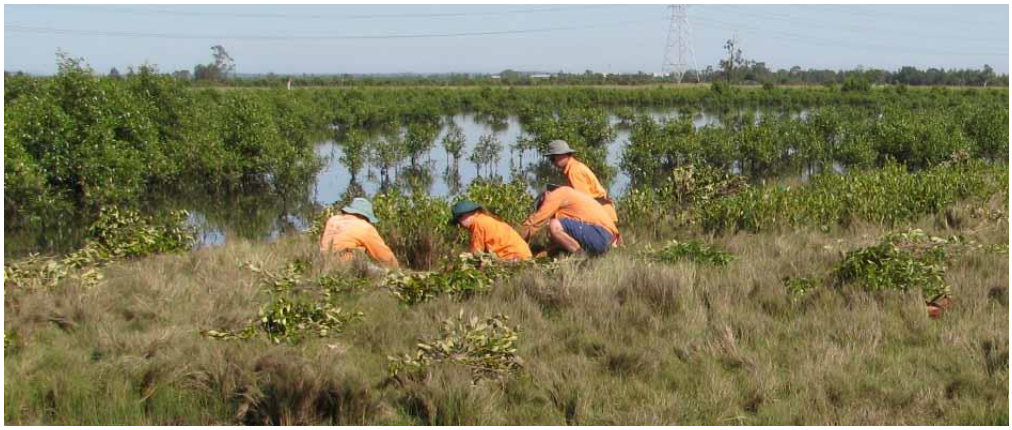
Acknowledgements

This project represents only one small item listed as a priority action for restoration works within the Hunter Estuary. It really is only part of the 'big picture'. Acknowledgement needs to be directed towards those with the scope of vision to bring all these parts together and in particular Chris Herbert of HBOC. Other members of HBOC have certainly added their weight but it is mostly due to his persistence that this project exists.

As stated in the introduction above this project is run as a partnership. All the organisations mentioned in the body of this report have a solid interest and commitment to the successful restoration of saltmarsh (shorebird habitat) at Milham Pond. Each organisation is blessed with people passionate and willing to get involved, contribute knowledge and lend support.

With particular reference to this project I would like to acknowledge the constant support from the KWRP gang. Peggy Svoboda who is always full of praise for mud bedecked fools that troop in to her office at the end of a day's work; Rob Henderson with his no nonsense approach to all matters logistical on Ash Island; and Terry the procurer of all things needed today.

Also congratulations to the TIN crew for their continued interest in the project and for the safe and professional way they have approached the job. It is vital to have contractors engaged that can work with care and develop a sense of ownership.



On high tide days there is always plenty of hand remove work to be done.

I have mentioned on many occasions the stark realities of not having a committed volunteer base to carry out follow-up work into the future. A project like this is underpinned by the volunteer effort and will ultimately fail without it. With that little outburst off my chest I need to acknowledge the stalwart support of Robert McDonald. It is, of course, with mixed emotions that I look forward to Robert realising his potential and taking charge of conservation work in the Macquarie Marshes next year. Congratulations to him on securing a future.

Now the challenge is to find another off-sider!

Tom Clarke
January 2010