



The **COD** Line

The COD needs friends like us!

Where the Mary meets the Six Mile

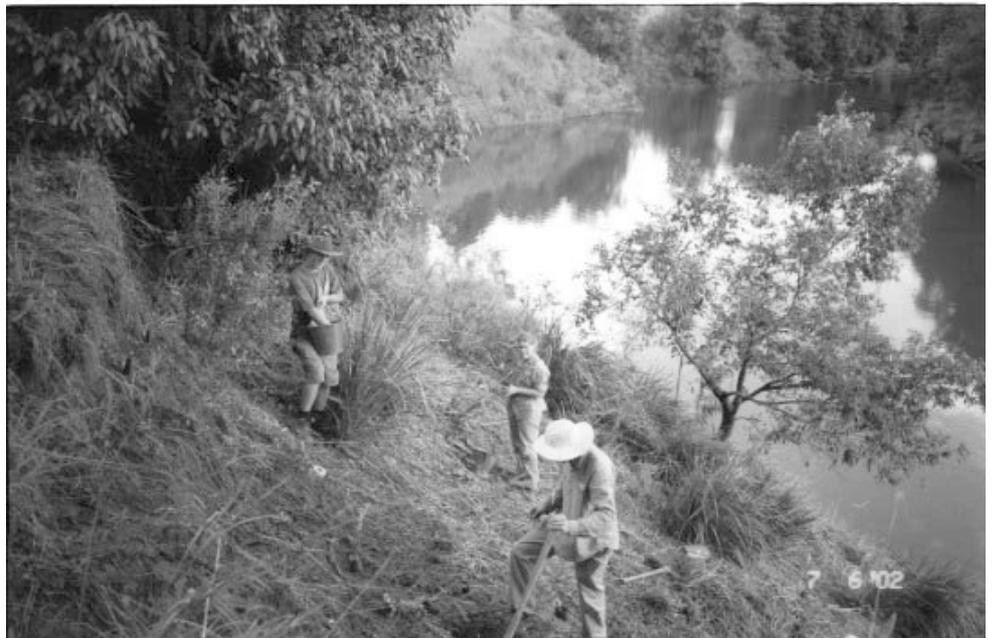
Serina Sherrad
Seven Sisters Equestrian Centre

Dad was a builder by trade and drove trucks for 20 years, but his dream was to be a farmer. We move here 27 years ago. Dad was attracted to the position, close to town with highway frontage and the Mary River, Six Mile Creek and an adjoining neighbour as boundaries. The property is 160 acres with a lot of flat areas, unusual for the Gympie area.

My father said 'you can always tell a good property by the size of the trees', and this one has about a dozen beautiful big gums (his theory was that to grow so big there must be a good water supply). The property had been a dairy farm, quite savagely cleared; it really does need a lot of replanting.

About five years ago we were involved with the MRCCC's Riverbank Restoration Grant Scheme, with 3.5 km of fencing erected and about 300 trees planted. That year there was a savage drought and one of the hottest summers on record; the survival rate for the trees was not high. Then the fence was destroyed by flood. About 50 trees are doing well, and the fencing did give the banks time to revegetate naturally.

Now the Six Mile Creek is the project. The team has constructed the fence and will begin planting in the spring. With hard work and a bit of luck, this site should do well. I'm looking forward to seeing a corridor of lush rainforest along the Six Mile, around and along the Mary and on into the neighbour's.



Green Corp participants planting the banks of Six Mile Creek

[John Fenton]

Major focus for cod habitat rehabilitation

Paul Marshall
Projects Manager
Gympie & District Landcare

Six Mile Creek has become a major focus for rehabilitation efforts with Noosa & District Landcare working on the upper reaches and Gympie & District Landcare working on the lower reaches.

Their combined efforts, along with support from Noosa and Cooloola Shire Councils, the landholders and other stakeholders, funding from the federal and state governments, and the efforts of landcare trainees and volunteers have

started to turn around the decline in this strategic creek system.

There are many reasons why Six Mile Creek has been identified as a focus for rehabilitation efforts, and why so many people are willing to lend their time and energy to help rescue this important and strategic creek.

Benefit endangered species

The lower reaches of Six Mile Creek, just south of Gympie, have been identified as key breeding habitat for the endangered Mary River cod. This is no

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doubt due to the large amount of large woody debris in the creek and the shade and protection offered by the fringing riparian rainforest, such as the many gnarled old *Waterhousia floribunda* trees.

Riparian rainforest is considered to be the most degraded component of the landscape within Cooloola Shire and worthy of protection in its own right. This site provides high-quality fish habitat and has been mapped as a key breeding site for the endangered Mary River cod, making it an important target for rehabilitation.

Endangered Mary River turtles have been observed feeding at the site and the exposed sandbanks near the mouth of the creek could, once protected from stock, provide suitable breeding sites for this iconic species.

Cat's claw creeper threat to site

The greatest threat to the integrity of the site is the severe infestation of cat's claw creeper, which has already completely smothered and killed some trees and was threatening many more.

Controlling this infestation is a tedious affair. Not only does cat's claw find its way up the trees, it also carpets the forest floor in many places, smothering seedlings before they get the chance to grow. Before the cat's claw carpet can

be sprayed with herbicide, all the native seedlings must be flagged with pink tape. Care must also be taken to distinguish between cat's claw vines growing on the trees and the native vines that are also a significant feature of the site. Several herbicide treatments are required before the cat's claw's massive underground tubers are exhausted.

Fencing to control stock access

Another threat to the integrity of this site was the very narrow width of the riparian corridor along much of the southern bank and the damage being caused to the creek banks by stock. Fortunately the landowner is very sympathetic to the project's objectives and willing to see just over 5 hectares of prime creek flats fenced off and revegetated. This fencing work has been completed, as has an upgrade to the landholder's off-stream watering.

Plant trees and hope for rain

Some 15,000 plants riparian rainforest plants are scheduled to go into the southern side of the creek as part of this project. However we are greatly concerned about the weather situation. With the district currently facing its driest period in a hundred years, and predictions of another El Nino episode on the horizon, we're unsure whether we'll be able to meet these targets. But all El Nino episodes are different in their regional impacts and we remain hopeful

that our region won't suffer reduced rainfall.

Future plans - and remember, Mary River cod are PROTECTED

As for the future, we are hoping to erect educational signage about the Mary River cod to reduce the likelihood of fishers inadvertently catching and keeping cod. We've heard disturbing stories of large cod being caught and cleaned by people who just weren't aware they are protected.

We are also starting to plan further project work immediately upstream of the current site, adjacent to the Roadcraft Driver Education Centre. The private landholders along this reach are also keen to become involved but the task is too big for them to tackle alone. We're convinced that the key to successful projects is community partnerships with support from the three tiers of government.

We're placing our hopes for the long-term future of Six Mile Creek and the Mary River cod which live there on research being carried out at the Alan Fletcher Research Station on a biological control agent for cat's claw creeper. But in the meantime it is critical we don't let this nasty environmental weed smother the riparian vegetation that is so critical to health of the creek and the diverse in-stream fauna it supports.

VRRGS — What did we achieve?

Brad Wedlock
Rivercare Project Coordinator
MRCCC

We evaluated the Voluntary Riverbank Restoration Grant Scheme by surveying a number of project sites.

The high points:

Native riparian vegetation dominated the overstorey and understorey canopy levels, and cover was high considering most trees were less than 3 years old.

The percentage of projected foliage cover for exotic trees and shrubs averaged less than 2 percent.

Average riparian width was excellent at 24 metres — which is 7 m more than the average riparian width published in

the State of the Rivers Report on the Mary River catchment.

Many grant recipients rated waterway restoration on their property as a high priority, understood the processes affecting their section of stream, and were aware of possible solutions to riverbank erosion — there was an attitudinal change from 'can't do' to 'can do'.

Many recipients were aware of how degradation on adjoining and upstream areas decreased the effectiveness of their restoration works, and expressed a desire to work together with their neighbours for greater effect.

And the low points:

Landholders generally found it very difficult to find time for maintenance.

Exotic vine species such as Madeira vine and cat's claw creeper had invaded a number of project sites.

Provision was needed for follow-up, to replace dead trees etc.

Fencing off areas for regeneration was less effective than fencing and replanting because of the likelihood of weed species dominating regrowth.

These concerns have been addressed in the new round of Rivercare grants administered by the MRCCC.

For more information on Rivercare grants, contact Brad Wedlock at the MRCCC on 5482 4766 or email mrccc@qldwide.net.au. Information is also available on the website www.widebay.net/icm/mrccc.

The Mary of my youth

Les Moreland

The Mary River of my boyhood was always the focus of a great deal of social activity, mainly in the form of swimming carnivals and picnics which were attended by hundreds. The favoured spots were the hole at the Kenilworth homestead and that behind Polly's Island.

The river consisted of a series of deep holes connected by shallower rapids. There were some spits of sand but the banks were generally well vegetated with black bean, water gum, sandpaper fig, Moreton Bay fig, she oak and the like. Big patches of native raspberry grew at the tops of the banks. Willows had been planted on exposed banks along the town reach in Kenilworth but these have long since been washed away.

Fishing was good, but even then the Mary River cod was a rare catch. It could only be caught in deep, cold holes full of snags, mostly in the Obi. The river teemed with mullet but these could

only ever be caught by line on hot, thundery, summer afternoons. At other times they had to be speared or trapped. We fished mainly for the jew (eel-tailed catfish) that were plentiful in deep holes, but we also caught plenty of grunters (bony bream) which were full of bones, turtles, eels and perch. Eels of 20 lb were common.

Despite the apparent bounty of species to be caught, we always fished conservatively. Lungfish were a common and exciting catch, but they are poor eating and were released alive. Likewise for platypus which were often taken on hand-lines in the late afternoon. We avoided fishing when the jewfish were nesting so as to give them a chance to breed and replenish their stocks.

Floods in those days came up more slowly than they do today, stayed up longer and took much longer to go down. During the wet season the river would remain in a state of semi-flood for weeks on end. This is when the cedar and pine were floated down to Gympie in my grandfather's time.

Floods are much more damaging now and most of the big holes have silted in. This process began in the 1950s and appears to have been associated with clearing in the headwaters. It was then that huge deposits of sand first appeared at Conondale and in the Kenilworth town reach. The sand is dropped here because the current slows dramatically at each of these places.

Enormous damage has been done by sand and gravel extraction. Irrigation practises haven't helped either with badly sited pumps causing banks to collapse.

Our beautiful river is degraded but there are signs that with our help and understanding it is beginning to heal itself. The Romans used to say that nature would return even though driven out by the pitchfork. Dare we hope that the same will hold true for the Mary.

Les Moreland has lived and worked in the Kenilworth area for more than 70 years.

Weeds — a youthful perspective

Kristen Francis
Work for the Dole,
Mission: Employment

On my first day, Phil Trendell told me we were going weed around trees. I expected a little pruning and pulling out grass. I was very wrong.

I never had any idea noxious vines could take over vegetation and trees standing 2 metres high or more. The whole area was covered and trees stood beneath thick Madeira and tropical legume vines. The day was hot, the vines were strong and heavy, and it took a lot of effort to detach them. My housemate, Stacey, who'd come along as a volunteer, was in shock; all she could say was 'weeding, huh?'. It took us a couple of hours, but the end result was great to see.

We were weeding around trees that had been planted along Yabba Creek in Imbil in 1999 by the WWF Cod Recovery Program and Gympie Landcare. It

was hard work for the first day in the field, but all in all I enjoyed the day and the accomplishment was well worth the trouble. Stacy said she'd come with us any time to do that sort of work — she enjoyed it too, even though she ended up worst off with five ticks and scuffed arms. Phil also got one tick. I was the lucky one, and seem to have missed out.

Another time our team went to work at Traveston Crossing, which had been planted with native trees and lomandra approximately three years ago and had been getting overgrown with long grass and vines like Siratro.

Our task for the day was to flag all the established trees so the site could be sprayed for weeds later that week. Viewed from along the bank, the site didn't seem to be that badly affected by weeds, more just long grass. This thought disappeared as we climbed further up the bank to find small trees among the long grass and many large trees being strangled by vines.

We took just over two hours to flag all the trees, and we thought we'd found almost all of them. However when the spraying and clearing was done, many more trees were found under the grass and vines. Unfortunately some of these trees were sprayed by accident and have since been replaced by new seedlings. Around 50 more seedlings have also been planted to increase the diversity of the site.

I have learnt a lot through this project — I am finding it a lot easier now to distinguish between weeds and natives!

I never had any idea of how much damage we've done to our environments and how we've neglected many of our waterways.

A huge effort is being undertaken to restore these environments and I am much more aware and grateful for the effort of groups like WWF, Landcare, the MRCCC and Waterwatch.

Kayaking the Mary River

John Price
Librarian
Noosa & District Landcare

Anybody kayaking the Mary should be prepared to wear more than one hat. What you see on the river depends on much more than your eyesight. The ecologist, ornithologist, geologist, botanist, photographer and artist will all observe the river differently. Certainly the artist will delight in the vistas particularly on a calm sunny day with some cloud when reflections in the water are quite entrancing.

And if one of your objectives is to get far from the madding crowd, what better place to go? Apart from your fellow kayaker, you won't see anybody on most visits, and this is a good part of what makes kayaking the Mary River a unique experience.

When I accompanied Glenda Pickergill surveying the river, we explored from a little above Kenilworth to well below Gympie. Further upstream you are more likely to get stuck, particularly in dry weather. Further down, the river widens and carries more water, which means fewer rapids (and rapids for me were the highlights).

Organising your trip:

1. Equip yourself with 1:100,000 maps. The river may be accessed where a road or track runs close. You may have to ask the landholder.
2. Select your starting point. Don't try to paddle upstream. The current in narrow sections of the river can be quite strong, so the most enjoyable

stretches going downstream — the rapids — become the least enjoyable going up, because you will be forced to carry your kayak up most of them. On the map rapids are where the Mary reduces to a thin blue line.

3. And so go in pairs — two kayaks, two drivers/paddlers, two cars. Obviously both cars need either a roof rack or trailer big enough to take both kayaks. I'm not saying a lone paddler can't enjoy the river, but two paddlers can enjoy it far more. Use only single kayaks — the rapids are often too twisty to accommodate a double, which will get stuck.
4. Decide where you will finish. (This may be the place you start your next trip.) Depending on your age and fitness, set realistic distances — we found 8–16 km per day about right. If in doubt make the trip shorter, particularly on the first few visits.
5. Pack what you need for the day in waterproof bags — maps in their own transparent clip-bags, sunscreen, insect repellent, food, drink, camera, notebook or whatever. Take particular care of the car keys — fastening them to the boat is a good idea: you could turn the boat over, particularly at rapids, if an overhanging branch unexpectedly threatens you! The same applies to other valuables.
6. On the day of your trip, go to your exit point, check you can get the kayaks out of the river, and leave one car. Go to the starting point, leave the other car, and paddle on down.

OK, so you're afloat. The advantages of being on the river instead the bank are immediately obvious. You can drift

downriver peacefully, not being held up by fences, landslips, vegetation, entering creeks and irate cattle and landholders (if such there be).

Everywhere you get close to wildlife: turtles basking on rocks, lizards on the banks, a rich variety of birds and the occasional fish. Enjoy.

Exploring the creeks is worth a try, but don't expect to get very far — shallow water and snags will prove more troublesome than adverse water flow, except after heavy rain. And paddling out backwards isn't that much fun.

The rapids are fun. On the Mary the rapids aren't to be classified as white water, but you still need to take care. To deal with rapids you must be competent to turn the kayak quickly to avoid rocks, shallows, cul de sacs and, most importantly, overhanging branches. If in doubt, park your boat just above the rapid and explore a little on foot, particularly if it looks like solid vegetation ahead. Keep the two boats well apart so that if the frontrunner gets stuck the second doesn't ram into it. The first through waits lest the second should run into difficulties.

Also take care when approaching the weir at Gympie. Shooting the weir is, of course, optional! If your kayak has an apron, put it on. Approach the weir precisely head on and with plenty of speed is my advice. But perhaps I also need to advise prudence: look at it first before deciding whether to go for it! If in doubt leave it out.

COD contacts

Cod habitat advice and mapping

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Worldwide Fund for Nature
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Rivercare grants

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Mary River Catchment Co-ord. Comm.
Ph: 5482 4766 or 0408 745 840
email: mrccc@qldwide.net.au

Corridors of Green

Marilyn Connell
Greening Australia
Ph: 4129 2012 Fax: 4129 2012
email: tiarogaq.bigpond.com

Riparian vegetation removal permits and water licences

Mark Perry, DNR Gympie
Ph: 5482 2555 Fax: 5482 9278
email: Mark.Perry@dnr.qld.gov.au

Hatchery operations

Darren Knowles
Gerry Cook Fish Hatchery, Cooroy
Ph: 5442 5341

Research, restocking, fish ladders

Bob Simpson
DPI Fisheries, Deception Bay
Ph: 3817 9590 Fax: 3817 9555
email: simpsoabr@prose.dpi.qld.gov.au

FISHWATCH 1800 017 116
free call 24 hrs to report illegal fishing

Sweet relief for the amazing Mary River turtle

Marilyn Connell
Extension Officer
Greening Australia

Chocoholics and turtles rejoice! There is now a delicious excuse to indulge and you are helping to protect the unique *Elusor macrurus*, more commonly known as the elusive, long-tailed Mary River turtle.

Thanks to a joint effort between Greening Australia, Tiara & District Landcare and the local community, chocolates in the shape of turtles are being sold to help raise money for future projects and research into the endangered Mary River turtle.

This initiative has been a direct result of the increased community awareness resulting from the pilot Mary River turtle conservation project. The project, funded by the Threatened Species Network and undertaken during the last breeding season, was a partnership project between Greening Australia Qld, Tiara & District Landcare and the Queensland Parks and Wildlife Service.

Key threats to the turtles include predation of eggs and hatchlings by goannas and foxes, potentially feral pigs, reduced oxygenation, reduced overhanging fruiting riparian vegetation, flooding, loss of instream and terrestrial habitat, sandmining, and changes to the the waterway (eg Mary River Barrage).

As this species does not mature until 15–25 years of age, increasing the juvenile population is critically important. A



David Parkes, Greening Australia Extension Officer, Mary River Turtle project, preparing to plant cluster figs [Marilyn Connell]

major focus of the project was protecting nesting banks from cattle by installing solar-powered electric fencing and protecting individual nests by installing flat-release caging. Spring rains stimulate nesting, so after each rain event nesting banks were patrolled on foot four hourly during the night or just before first light. Every nest that wasn't protected as soon as it was laid was predated, presumably by foxes or goannas.

Fruit is part of the diet of the Mary River turtle, so feed trees were planted with the help of volunteers and canoes, cluster figs (*Ficus racemosa*), weeping lilly pillies (*Waterhousea floribunda*),

creek lilly pillies (*Syzygium australe*), buttonwood (*Glochidion sumatranum*) and sandpaper figs (*Ficus coronata*).

While a Recovery Plan has not yet been developed, recommendations for recovery actions by researchers, government agency staff, local government and the community were discussed at a highly successful Mary River Turtle Forum organised as part of this project. Speaking at the Forum, Olga Miller, a Butchulla elder, said that a 'new generation of river people' is required to make sure this special turtle survives.

For more information, contact Marilyn on 4129 2012 or tiarogaq@bigpond.com

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Codsword solution



High life at the Hatchery

Darren Knowles
Technician

Noosa & District Community
Hatchery Assoc.

With the weather finally cooling down, the broodstock are back out in the ponds ready for another season of living the high life. Where else would they get fed a varied diet of whole whiting, cow's liver, yabbies and shrimp, whilst living in their own well-maintained pipe

in a pond shared with two beautiful fish of the opposite sex?

With all these luxuries, it's no wonder our last season was our best ever, with 63,500 fingerlings released.

With all the perks available to hatchery fish, you'd think we'd have them lining up ten deep at the gate to get a start. But this isn't the case and the hatchery still needs more broodstock. So if you know the whereabouts of any big cod,

the hatchery would like to hear from you.

One reason we need more broodstock is we've been hit by senseless #@*#@* idiots again. When we drained the ponds at the end of last season, we found a couple of broodstock missing and a broken-off hook and sinker still hanging in the tree.

To contact Darren at the hatchery, call early in the morning on 5442 5341.

Wanted – Logs for Cod

Phil Trendell
WWF Mary River Cod Habitat
Recovery Project

Logs or 'woody debris' are vital for restoring instream habitats.

However wood floats easily so for instream works we need large logs, preferably with the root wads still attached for the added weight. Suitable timber may perhaps be lying in a paddock, or it may become available due to roadworks or storm damage or clearing for development.

Some may view this timber as 'rubbish' to be burnt, but it is a valuable resource in restoring our waterways for native fish such as the Mary River cod.

This type of instream work will be restricted to the creeks and smaller tributaries because of the nature of floods in the main stream. Many sites where streambank or instream restoration works have been carried out are restocked with Mary River cod.

If you know of suitable logs that are available or may be becoming available, or if you are interested in undertaking works to benefit your property and the cod, contact Phil Trendell at philtwfw@spiderweb.com.au or on 5482 5642. Phil assists with general advice, weed identification, site management plans, and possibly funding.

Fish not of the Mary

Bob Simpson
DPI Fisheries

At least ten introduced fish species swim the Mary River system. Some are native to other parts of Australia and others are from overseas. Several are considered pests and others are, rightly or wrongly, considered fairly benign. However all potentially cause problems.

This is why it is unlawful under the Queensland *Fisheries Act 1994* to release any non-endemic or exotic fish into Queensland waters without a permit. In addition, CARP, TILAPIA and GAMBUSIA are DECLARED NOXIOUS FISH in Queensland, making it illegal to possess, rear, buy or sell them.

Of the introduced Australian fish, only golden perch (yellowbelly) and silver perch from the Murray-Darling River system appear to have become well established. Both have been stocked into farm dams and storage impoundments and found their way into creeks and the main river during floods. It is hard to believe they have no impact on the cod. A golden perch among cod fingerlings would not stay hungry for long!

Southern saratoga from the Dawson River have been stocked into Lake Macdonald and Lake Borumba. A population has become established in Borumba and individuals are sometimes caught downstream in Yabba Creek.

Sooty grunter and sleepy cod from central and north Queensland have reportedly been released and caught in parts of the Mary. Unlike golden and silver perch and saratoga (released under permit from DPI Fisheries), it has never

been legal to release these species into the Mary River system.

The Mary hasn't fared as badly with exotic pest fish as some other areas ... so far. Only one carp (a Koi) has been reported caught in the Mary (see CODLine No. 8), and no tilapia or their relatives have been reported.

Most exotic pest fish are aquarium species released by careless or thoughtless aquarium enthusiasts. Swordtails, guppies and platys are quite abundant in some areas. They can be prolific breeders, and occupy similar habitats and eat similar foods to the native rainbowfish and blue-eyes.

Goldfish have found their way into many Australian rivers, but apparently not the Mary. In ten years of study I haven't found any, although I'd be surprised if they aren't around given how common they are in garden ponds and fish tanks. Last year several goldfish found in a dam in the Coondoo Creek catchment were duly dispatched, but others may have already escaped.

One of Australia's, and the Mary's, most widespread pest fishes is gambusia (4-5 cm long). Gambusia's introduction rivals that of cane toads and rabbits as a well-intentioned but hopelessly misguided attempt to fix a problem or 'improve' on nature. Gambusia were deliberately introduced in the 1920s and 1930s to control mosquito populations, but all they've managed to control are native fish populations — the declines of at least ten Australian species, including several now listed as endangered or vulnerable, are partly attributed to gambusia.

Fishway success at Tinana Creek and Mary River Barrage

Andrew Berghuis
Queensland Fisheries Service

The upgraded vertical-slot fishways at the Tinana Creek and Mary River tidal barrages have greatly improved opportunities for fish to move past these structures.

These new fishways have been designed specifically for local fish species. The fishways have extra-wide slots to accommodate large Queensland lungfish and Mary River cod. Smaller species and juvenile fish are also catered for, with water velocity and turbulence in the fishways maintained at low levels.

Older fishways have fixed entrances, which cause migrating fish to congregate below tidal barrages waiting for the water height to match the fishway entrance — providing easy pickings for predatory birds and other fish. The Mary River Barrage fishway overcomes this problem by allowing the lower entrance to move with the tide.

Dry conditions in recent years mean the Tinana Creek fishway has operated only intermittently since its upgrade in 2000. However a QFS survey identified 30 species of fish, from a 12 mm gudgeon to a 1 m Queensland lungfish, that have successfully negotiated the fishway on their way upstream.

The Mary River Barrage fishway has operated continuously since its upgrade in November 2001. During monitoring in the 2002 summer/autumn period, more than 60,000 fish of 24 species



Upgraded fishway on the Mary River Barrage, and three barramundi that successfully negotiated the new fishway
[Andrew Berghuis]

were captured as they exited the top of the fishway. Species that successfully negotiated the fishway included barramundi, Australian bass, striped mullet, tarpon, yellow-finned bream and estuary perchlet. During the same period in the previous year, only 1500 fish of 12 species were captured. Clearly the upgraded design is a vast improvement over the original.

However fishways don't account for all obstacles faced by migrating fish. Upstream of the Mary River Barrage, extensive rafts of the introduced weed, water hyacinth, have built up. This effectively blocks the way for surface-swimming fish attempting to migrate downstream, such as striped mullet, a major commercial fish species. The hyacinth will need to be removed to pro-



vide access for such fish and to ensure the fishway operates optimally.

Successful fishways need biologists, engineers and weir operators working as a team. DNR&M and QFS are cooperating to design, construct and monitor fishways in Queensland. Monitoring results are constantly fed back into the design process, improving the future for Queensland's migrating fish.

More success with cod restocking

Bob Simpson
DPI Fisheries

A record 63,650 Mary River cod fingerlings reared at the Lake Macdonald Fish Hatchery were released into the wild in November/ December 2001. This brings the overall tally since the riverine stocking program started in 1998 to just over 200,000 cod released.

The hatchery manager, Darren Knowles, has every reason to be pleased with his

efforts, but he is already looking forward to an even bigger year in 2002. New rearing troughs, water filters and storage tanks have made a big difference at the hatchery, and a target of 100,000 cod is now feasible.

Around 17,000 of the 2001 fingerlings were released into the Mary itself between Conondale and Tiaro, with the rest spread out among thirteen tributaries including Widgee, Station, Scrubby, Kandanga, Amamoor, Diamondfield,

Yabba, Little Yabba, Booloumba, Obi Obi, Kilcoy, Six Mile and Deep Creeks.

Around 11,000 cod were released outside the Mary catchment into Somerset, Wivenhoe, Cressbrook and North Pine dams. Some were also stocked into the Logan River, and for the first time, the Stanley River. These are all areas where cod used to be common, but for various reasons they have either become very scarce or completely disappeared.

Various views on FROST

Brad Wedlock

Frost occurs where cold air settles. Elevated, north-facing slopes are the least prone to frost. Because cold air is denser than warm air, it flows down slopes to low lying areas, such as gullies, hollows, and streambanks. Slopes themselves are less prone to frost because cold air can't settle there as easily.

Brad Wedlock
Rivercare Project Officer
MRCCC

Plant near forest edges and under large trees These tend to create environments where frost doesn't settle.

Spray the plants Frost is attracted to certain bacteria on the surface of leaves that act as nucleation points for ice crystals. Bacterial inoculants that kill ice-nucleating bacteria can combat against frost. A controversial product called Frostban uses genetically modified ice-nucleating bacteria to prevent frost forming on plants. Polymer coatings such as 'Envy' form a semi-permeable membrane over the leaf surface, allowing the plant to breathe and reducing moisture loss, and forming a barrier between the frost and the ice-nucleating bacteria. Copper sprays also combat frost.

Use fertilisers with elevated potassium levels This increases plants' frost tolerance by making the cell walls stronger or more turgid.

Don't fertilise before winter, and don't use high nitrogen fertilizers Excess nitrogen, besides inducing susceptible new growth, inhibits the uptake of potassium and so should be avoided during winter.

Remove mulch during winter Pulling mulch away from the trunks of very young trees will help reduce frost damage. Mulch will attract ground frost where bare ground usually will not.

Water before a suspected frost Water the vegetation area thoroughly before nightfall prior to a suspected frost. The soil will release moisture during the night, keeping the air somewhat warmer.

The proximity of 'heat banks' in the form of large water bodies or freshly tilled land can offer some protection against frost. Large areas of clean, firm soil, full of moisture from autumn rains, release substantial heat that may drift across adjacent land during the night. Airline pilots can attest to the effects of heat released by large areas of freshly tilled farm land.

Spencer Shaw
Brush Turkey Enterprises
Maleny

It's that time of year when, after still and clear nights, we make our way to see what damage frost has wreaked.

On frost-prone sites, the key is using species that are naturally frost resilient. This limits your initial species selection but fortunately these plants are usually quick growing. Within one or two years the improved microclimate will allow you to add diversity to the site.

Frost damage occurs when plants freeze during the night then thaw quickly at sunrise. If shaded by nearby trees first thing, your young trees can thaw gently. It may be worth initially retaining weed trees for this reason.

The best tree guard I've seen is a two-sided guard placed upslope of each tree which, in theory, causes the frost to flow around the trees. The open side toughens growth, leading to greater frost resistance.

Many landcare and private nurseries have information on local frost-hardy species. Pop in and take advantage of their expertise, and don't be left out in the cold when it's time for your next planting. Here are a few species to consider for starters:

Acacia sp., *Allocasuarina* sp.,
Araucaria sp., *Callicoma*
serratifolia, *Callistemon* sp.,
Casuarina cunninghamiana,
Eucalypt sp., *Grevillea robusta*,
Hymenosporum flavum,
Melia azederach.

Brush Turkey Enterprises specialises in supplying rainforest seed and tubestock. Contact Spencer on 5494 3642 or brushturkey@myplace.net.au

Frosts typically occurs when a large and strong high-pressure system is overhead. If this high follows within one to two days after a strong cold front, severe frost may occur, especially if the previous front has left a cold pocket of air in the upper atmosphere. Frost rarely occurs when the weather is disturbed or cloudy.

Phil Moran
Riparian Project Officer
Noosa & District Landcare

Frost happens. We need to carefully assess the site, plant as wisely as possible, and then graciously accept some losses as part of the deal.

One of Noosa Landcare's first riparian plantings was at Middle Creek, just north-west of Pomona. With an enthusiastic and committed landowner this site was looking good. Three years on, the usual suspects (*Commersonia* b., *Alphitonia* p., and *Elaeocarpus grandis*) were outstanding — up to three metres tall. Until the FROST. Absolute carnage! Some species did cop-pice, but a lot just up and died.

So, what do we do? My advice:

A product called 'Envy' is the current panacea for frost. It does work, but how long can you afford to spray trees? I did it for the first two winters at Middle Creek and still lost a stack of trees.

Leaving grass long between plants I think helps. Also the wisdom of removing mulch from around plants appears to be borne out by local experience.

I have found the following species to be reasonably tolerant of frost. More diversity in plantings (vitaly important in my view) can be added once a bit of a canopy has been established.

Acacias, *Acmena smithii*, *Brachychiton acerifolius*, *Brachychiton discolor*, *Callistemon salignus*, *Casuarina cunninghamii*, *Commersonia bartramia*, *Dodonaea triquetra*, *Eucalypts* for creekbanks, *Ficus* species, *Flindersia* sp., *Glochidion ferdinandi*, *Mallotus philippensis*, *Melaleuca quinquenervia*, *Pittosporum* sp., *Tristania laurina*, *Syzygium oleosum*, *Waterhousia floribunda*.

Silence of the lambs' tails ...

Brad Wedlock
Rivercare Project Coordinator
MRCCC

Cream-coloured lambs' tails high in the tree tops in February-March herald the advance of yet another nasty environmental weed that likes moist areas, such as creek banks and sheltered mountain gullies.

Madeira vine (or lamb's tail vine) is on the march, and rapidly at that. In short order it has spread from one end of the Mary River catchment to the other.

When flowering in February-March, a strong sweet smell is exuded which is noticeable even at great distances. When not flowering, Madeira vine is quite inconspicuous. The leaves are

fleshy and rounded, ranging from golf-ball to tennis-ball in size.

Madeira vine spreads via a unique adaptation. After flowering it produces small tubers, loosely resembling small potatoes, on the stem. When disturbed, the tubers fall off the vine to grow beneath the parent plant, forming a dense thicket of vines that smothers the host — generally riparian vegetation.

Because the leaves are so fleshy (and full of moisture), a dense mat of Madeira vine is extremely heavy and will break branches off the host plant. Very little light penetrates to the host, which will struggle to photosynthesize and eventually die. Madeira vine climbs up the stem of host trees or uses long grass to climb into the branches.

The recognised method for control is 'stem-scraping'. This means exposing about 10 cm of the green layer underneath the surface of the vine and spraying with a mixture of 50% Glyphosate and 50% water.

A shallow scrape is needed — about 2 mm deep is ideal. The kill will not be as effective if the scrape is too deep because the chemical will not be sent around the whole vine through the outer sap-carrying tissue (called phloem).

The Alan Fletcher Weeds Research Station in Brisbane has developed some interesting methods to control Madeira vine, and the MRCCC and WWF are trialling various methods. In later editions of the CODLine we will illustrate various techniques for Madeira control.

Growing native plants ... under water!

Phillip Moran
Lake Macdonald Catchment
Care Group
Noosa and District Landcare

Cabomba is not just your average nefarious, insidious, evil (sorry, got carried away), garden variety weed. *Camphor*, *Privet*, *Celtis* ... vile things that they are, are wimps compared to *Cabomba*!

Consider an adversary that now covers about 70% of an area (lake), completely dominates and kills close to 90% of the existing native flora, reduces light levels dramatically ... not to mention tangling and possibly drowning people who try to swim in the lake!

Scary? ... Then imagine all this in under 10 years!

As part of a project to address the problem of *Cabomba caroliniana* in Lake Macdonald, I have been growing native aquatic plants to reintroduce into the lake.

This NHT-funded project is part of the Weeds of National Significance (WONS) Programme.

After mechanical harvesting, native aquatic plants will be reintroduced to

compete with the *evil one*. The harvester driver (or terminator), Ross, has done a great job of softening up our foe.

Underwater video along transects shows a sick-looking *Cabomba* lying on the bottom of the lake. There may be a 'window of opportunity' for the good guys to get a start.

So under the adroit direction of Tom Anderson (Alan Fletcher Research Station), and Conor Neville, Project Officer, I get to grow and learn about *Hydrilla spp.*, and *Vallisneria spp.*

Hydrilla and *Vallisneria* have been collected from within the Six Mile catchment and grown on at our Aquatic Nursery at Pomona.

We have constructed eight 'ponds', approximately 2.4 m square and 1.2 m deep.

The *Val* throws 'pups' on stolons and these have been potted in peat pots. *Hydrilla* has been propagated by tip cuttings and from 'nodes'.

The *Val* has been growing very well, whilst the *Hydrilla* has been slower.

Temperature in the ponds has been down to about 12 degrees and, as with

terrestrial plants, growth slows considerably.

On Wednesday 17 July, more than 5000 individual peat pots were sunk to the bottom of Lake Macdonald.

I admit to a tinge of emotion, seeing Tom, Conor and Ross drop my new friends out of the pontoon ... Good luck guys!

I am indeed fortunate ... to work with guys like the above-mentioned, as well as Keith Garraty, Dave Burrows, Brad Wedlock, the members of the Lake Macdonald Catchment Care Group, Mary River Catchment Co-ordinating Committee, Noosa Shire Council and Noosa and District Landcare.

To learn more about our natural environment and get an opportunity to undo some of the damage done is a real hoot.

All this, and I get to be involved in attacking another weed!

For more information about aquatic revegetation at Lake Macdonald, call Phil Moran (Noosa Landcare) on 0412 507 363 or Conor Neville (LMCCG Project Officer) on 0416 200 254.

Yabba Anabranch works continue

Phil Trendell
WWF Cod Recovery Project
Officer, &
Kristen Francis
Work for the Dole,
Mission: Employment

The Yabba Creek Anabranch at Imbil is now being targeted for weed removal, revegetation and in-stream habitat restoration by the WWF Cod Recovery Project in conjunction with Gympie and District Landcare and with assistance from Mary Valley College and Brisbane Girls Grammar School. Funding has been provided from NHT through the Rivercare Program.

Camphor laurel removal

After seeking approval from DNR&M to remove the camphor laurel trees from the riparian zone, all the native trees in the zone were flagged. The camphor laurel trees were then stem injected and left for 3-4 weeks. The weed trees were then cut down and the useable logs moved off-site. Smaller debris was

mulched down by an excavator with a chipper. This mulch and more camphor laurel chip mulch which will be brought to the site will be used for weed control until August. During spring, the site will be revegetated with about 2000 trees.

Imbil locals are commenting how nice it is to see the camphor laurels removed — some helping to cut the trees at no cost for the use of the wood — and how this will improve enjoyment of the creek.

Revegetation at the southern end

Again, all the natives were flagged then the non-flagged weed plants were sprayed with bioactive Round-Up. Large privet bushes and lantana were also cut and sprayed. Following a couple of small planting days by Mary Valley College and Brisbane Girls Grammar School, the Gympie & District Landcare Greencorp Team cleared the rubbish and piled up the debris to open up the site. Over 250 trees went in before winter, and at least another 200 will go in during spring. Site maintenance is

planned during winter and after the spring plantings.

The Mary Valley College Grade 7 class of 2000 has helped out since that year, and nine groups of 25 students from the Brisbane Girls Grammar School Yabba Creek Camp will assist during 2002 to get all the trees planted, mulched and watered.

Instream habitat restoration

Approval is being sought from DNR&M for the instream works. Four hollow logs from a nearby property and three concrete pipes from Cooloola Shire Council will be used. Additional materials required include epoxy resin, drill bits, cable and rocks. These works will occur between the camphor laurel removal and the spring tree planting, so that an excavator (to move the rocks and logs) can access the site. The instream structure will be joined on the bank before being placed into the stream intact. This stretch of stream will be restocked with Mary River cod toward the end of 2002.

Cooroy students help 'Clean Up Oz'

Phil Moran
Riparian Project Officer
Noosa & District Landcare

On Friday 1 March, approximately 80 students from Grades 6 and 7, Cooroy State School, spent the morning at Cooroora Park. Together with their teachers and parents, they were ready to do their bit to 'Clean Up Australia'. The students divided into three groups to tackle the activities.

The first group checked the health of Cooroora Creek, which runs through the Park and into Six Mile Creek. This popular activity was conducted by Phil Berrill, Landcare's erudite Waterwatch Project Officer, elegantly assisted by Anna Oliver. Catching water bugs and testing water quality is important for assessing the health of the creek, and fun was had by everyone. Some students even found a previously unseen

'bug', which pushed the recently ill Phil Berrill into a frenzy.

The next group assembled at the recently constructed 'Aboriginal Speaking Circle' before touring Noosa Museum. Conor Neville, Landcare's Kin Kin Creek Project Officer, conducted this activity and was impressed by the level of interest in our unique indigenous history. Thanks to Cath Fleming for opening the Museum and helping on the day.

The last group was stuck with me! Fortunately, the Council's Bushland Reserve crew of Geoff Black and Neil Greer more than compensated for this shortfall. Since their genesis less than a year also, these guys are really making an impact on the Shire's weed problem. It has to be said, however, that 'Batman and Robin' need all the help they can get in the fight against environmental weeds. With this in mind, this group toured the Park identifying and discuss-

ing environmental weeds, particularly 'garden escapees'.

The students were enthusiastic and the questions flowed freely. Brad Wedlock (MRCCC), Paul Steels (our erstwhile Chair) and Zoe (Chairperson's Dog) ensured there were no stragglers.

Activities over, students, teachers and parents were treated to Geoff and Neil's other skill ... Creative Catering! These guys make the humble sausage look like 'Chateau Briand' (but it still tastes like a sausage!).

The result of all these activities was a highly successful day, proving education can be fun.

Many people make a day like this work ... Phil Giblit, Cooroy State School's parents and teachers, Keith Garrity (Noosa Council's weeds guru), Alison Buchanan (Vice-Admiral, Bushland Reserves), Brad Wedlock (MRCCC), and Noosa Landcare staff — all contributed and I express my gratitude to them.

Lastly, thanks to the students, whose enthusiasm for things environmental gives us some hope for the future.

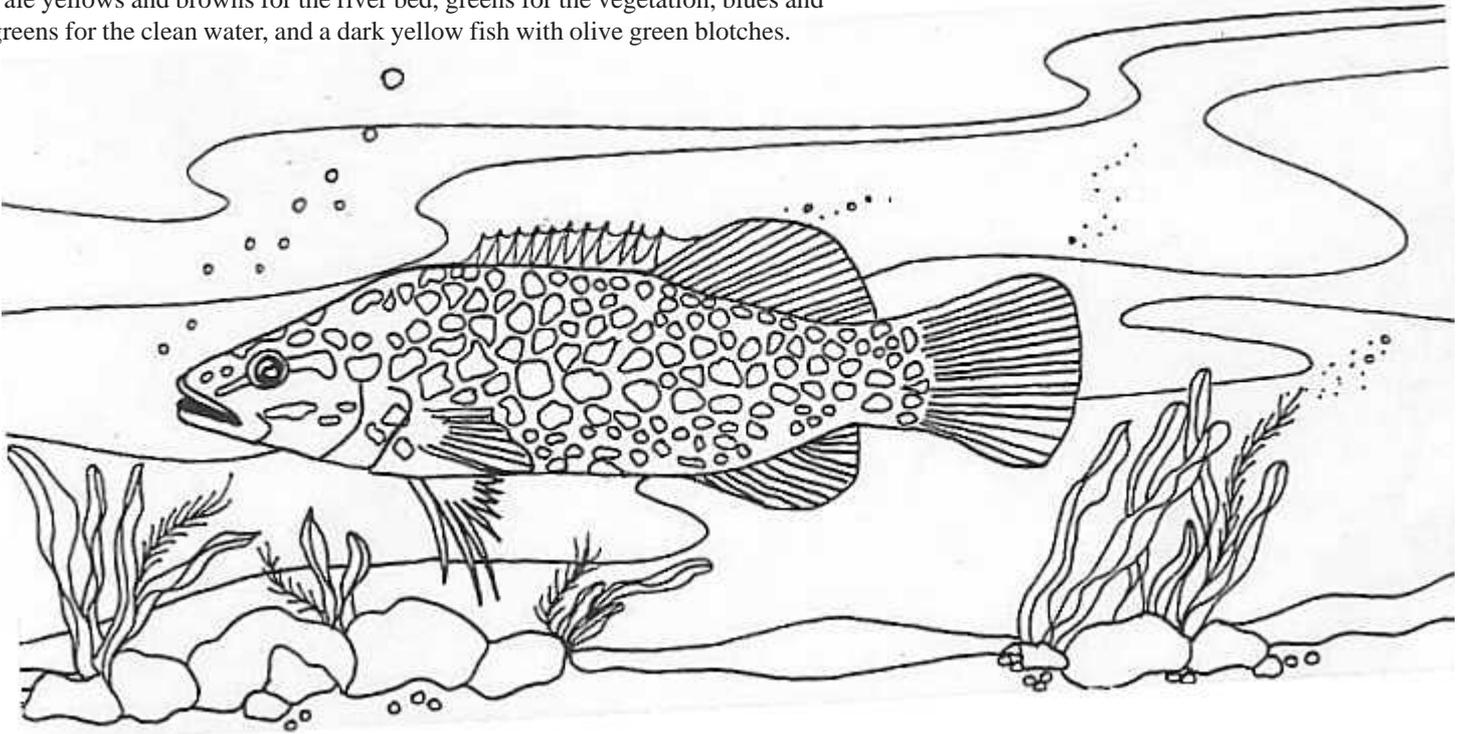
Fishy Friends and Foes

Anne Oliver, Maleny

Here are two fish — the Mary River cod is very much at home in the Mary River, but the Koi carp is making a mess of the river environment. Colour the fish and their environments as follows:

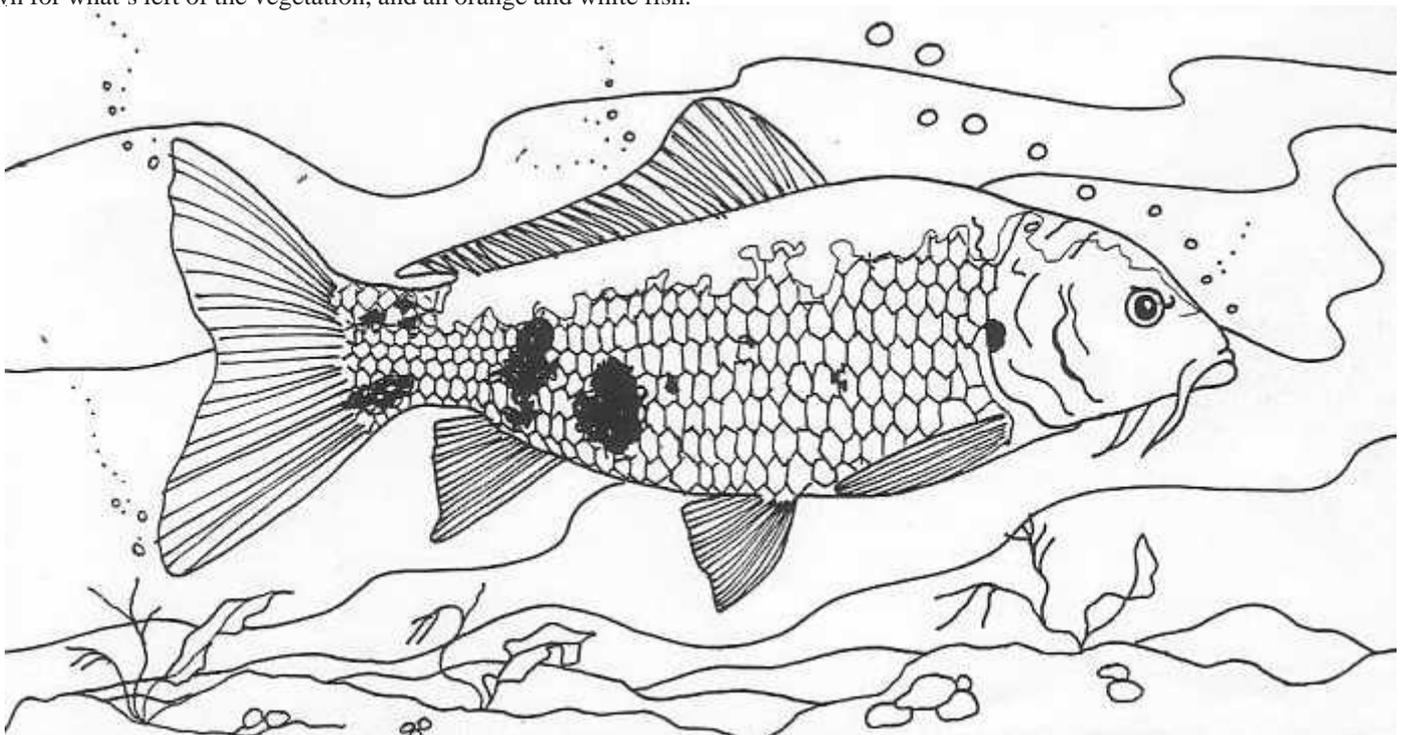
Mary River cod

Pale yellows and browns for the river bed, greens for the vegetation, blues and greens for the clean water, and a dark yellow fish with olive green blotches.



Koi carp

Murky brown mud colour for the river bed, muddy brown water, green and brown for what's left of the vegetation, and an orange and white fish.



The COD Line

is hosted by Barung & District Landcare Group.

Additional support from Mary River catchment local authorities is gratefully acknowledged.



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MARYBOROUGH
CITY COUNCIL

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