



CENTRAL ACCLIMATISATION SOCIETY INC.
(FOUNDED 1937)

4 December 2015

Dear madam/Sir
nrc@nrc.nsw.gov.au

Re State-wide review of NSW pest animal management

The Central Acclimatisation Society (“the Society”) is a corporate entity having statutory responsibilities and functions pursuant to the Fisheries Act 1935, and has a large membership of recreational anglers residing throughout the Central West of NSW, with Branches in Mudgee, Sofala, Bathurst, Blayney, Cowra, Canowindra, Burruga, Oberon, Wallerawang and Lithgow, and individual members residing in Sydney.

Each year, pursuant to its statutory functions and specific permits issued by Fisheries NSW, the Society’s volunteers stock streams in the region with fish, being brown and rainbow trout fry provided by NSW DPI Fisheries. Although trout are an introduced species, they have considerable value economically and for recreation.

The Society also stocks streams with native fish provided under NSW DPI Fisheries dollar for dollar scheme.

In addition to working on stocking programmes, the Society has been engaged rehabilitation of fish habitat, and supporting the recovery programmes for the trout cod and Macquarie Perch.

The Society has major concerns with respect to pest animals and their impact on the freshwater fishery.

It needs be understand that the water in which the fish live occurs in the drainage of the Central Tablelands. Accordingly, everything that happens within each catchment in the Society’s area of operations and responsibilities impacts on the freshwater fishery.

As far as pest animals are of concern, feral goats stripping away the vegetation that holds the soil together on the ridgeline can be almost as destructive of Macquarie Perch habitat (through promotion of erosion and siltation) as the English Perch (*perca fluviatilis*; more colloquially “redfin”) in the stream below.

The main catchments within the Society’s area are the Hawkesbury Nepean and the Murray Darling Basin; more particularly, Coxs, the Grose and Colo Rivers, and the Lachlan and the Macquarie Rivers.

The recreational value of freshwater fishing in the Central Tablelands is significant as is the economic value.

The recreational value of freshwater fishing should not be underestimated, especially for the younger and older anglers. The health benefits are also significant (*Identifying the Health and Well-Being Benefits of Recreational Fishing*, Prof A. McManus, Dr W. Hunt, J. Storey, J. White Fisheries Research and Development Corporation, Australian Government 2011 project No. 2011/217)

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No economic study of the economic value freshwater fishing in the Central Tablelands has been conducted but some inference can be drawn from studies elsewhere.

According to a study by Ernst & Young, the MDB Freshwater fishery in 2010-2011, attracted an estimated direct expenditure of \$1,352 million, a direct value added expenditure of \$375 million, a contribution to the GDP of \$403 million, and a contribution to employment of 10,950 jobs (*Economic Contribution of Recreational Fishing in the Murray-Darling Basin*, August 2011, Ernst & Young).

A measure of the economic importance of trout fishing is provided by a study by Dominion Consulting Pty Ltd in 2001, which established the economic value of the Snowy Mountains Recreational Trout Fishery as at least \$46.5 million spent within the area by visiting anglers during trout fishing trips per annum supporting about 550 jobs associated with trout fishing expenditure in the area.

While the Central Tablelands is not as attractive to trout anglers as is the Snowy Mountains area, its closer proximity to Sydney and significant regional centres such as Bathurst and Orange make it relatively attractive by reason of convenience.

These submissions are divided into remarks as to purely aquatic pest species, terrestrial pest species and remarks responding to some specific matters in the Issues Paper.

A. PURELY AQUATIC PEST SPECIES

There is a significant number of aquatic pest species affecting freshwater habitat in NSW. The NSW DPI list can be accessed at http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0007/369106/Freshwater-pest-fish-in-nsw.pdf

The species of the major concern to CAS and its members are, in order of priority, Tilapia, Redfin and Carp.

It must be emphasized that once an aquatic pest animal becomes established, it is nearly always impossible to eradicate.

TILAPIA

Following their introduction to Australia as a species for the ornamental fish trade, tilapia found their way into natural waterways in Queensland in about 1975.

Of the three species of tilapia known to have been introduced into the Australian environment, the Mozambique mouth brooder (*Oreochromis mossambicus*) is of the most concern.

Tilapia pose a risk to the ecology and water quality of waterways because of their fecundity, ability to prosper under a wide range of ecological conditions, and aggressively territorial behaviour. These characteristics enable tilapia to outcompete and displace native fish species and have earned tilapia the title of 'cane toads of the waterways': http://www.riverconsulting.com.au/reports/Greiner-Gregg_2008_Tilapia.pdf

Tilapia severely compromise water quality, comparable to an extent to the harm caused by carp. (see <http://www.mdba.gov.au/sites/default/files/pubs/Tilapia-report.pdf>)

According to recent movements, less than three kilometres now separates the pest fish tilapia from the watershed of the Condamine catchment. <http://www.mdba.gov.au/media-pubs/basin-news/help-keep-tilapia-out-of-the-basin> . There have been reports that in the 2010-2011 floods, waters were observed to be flowing west instead of east over a particularly low part of the watershed, only a few kilometres from known populations of tilapia in the eastern catchment..

Tilapia are present in NSW only in the Tweed, as far as is known.

However, there appears to be a very significant risk of an extreme flood eventually allowing tilapia to get into the headwaters of the MDB; a question more of when rather than if.

Furthermore, given the significance of illegal human intervention as a vector for tilapia to get into new catchments, the reality is that tilapia could turn up anywhere in NSW, save for those parts of the montane regions which are too cold for them to thrive.

If Tilapia to become established in any new catchment, their capacity for being able to out-eat, out-survive and out-breed, and their capacity for direct predation on and modification of the habitat of native fish is such that tilapia should have a top priority.

There needs to be some recognition that opportunity exists for release of KHV and arrival of tilapia to occur in sufficient temporal proximity for the demise of cap to occur at a time especially favourable to tilapia, and for this reason the sooner KHV is deployed the better.

NSW has set up a hotline to report tilapia sightings. Educational materials have been prepared and a tilapia leadership group has been established. The MDBA has provided some funding to assist in the Condamine.

In addition to impact on biodiversity, the level of risk and the potential impact of tilapia infestation on valuable recreational freshwater fisheries is such that more should be done.

Given their potential, tilapia should be awarded a very high priority in research directed towards biological control, mitigation of illegal human intervention as a vector of infestation, and development of response planning and availability of resources for possible early eradication of incipient infestations.

In respect of tilapia, there needs to be

- A higher and clearer profile with respect to availability of educational materials and other forms of communication (and more effective modes and media of communication) to mitigate the risk of persons translocating fish and disposing of unwanted pet fish in rivers and streams.
- A clearer and more public response plan for possible tilapia sightings in new waters.
- Significant reform of legislation relating to noxious fish is needed in NSW.

- NSW should work towards a strong national agreement to adequately fund research directed towards biological control of tilapia.

REDFIN

We note with disappointment that redfin were omitted from specific mention in the issues paper.

Redfin have been responsible for the catastrophic decline of native fish such as the Macquarie Perch, which, in addition to concerns as to bio-diversity, was a fantastic sporting fish (and of high culinary value).

Redfin have also severely degraded valuable exotic recreational fisheries, such as Oberon Dam, with consequent impact on regional tourism and local recreational amenity.

The redfin is a hardy fish, which out-breeds and out-grows native and valuable exotic fish, and is a direct predator of their young.

Once redfin have become established, they severely reduce the numbers of other species of fish and shortly form a large population of stunted redfin. They have a particularly serious impact on Macquarie Perch due to being carriers of EHN virus, which is lethal to Macquarie Perch and silver perch (Whittington, R., Becker, J., Tweedie, A. and Gilligan, D., 2007. *Susceptibility of previously untested fish species to EHN Virus, and the epidemiology of EHN Virus in the Murray Darling Basin*. Presentation given at the Fisheries Research & Development Corporation's Aquatic Animal Health Subprogram Conference, 25–27 July 2007, Cairns, Australia).

Human intervention is a major vector of redfin infestation. A number of quantum leaps in their penetration of the Lachlan and Coxs River catchments can be traced back to the introduction of redfin into farm dams, from where they have eventually escaped during overflow of the dams in or shortly following heavy rain.

Redfin infestation of the upper waters of the Coxs River catchment near Lithgow appears to have resulted from their release into just one farm dam. Although NSW DPI Fisheries personnel promptly had the dam drained to eliminate the redfin, once they became aware of their presence, it appears that the redfin had time in which to escape the dam prior to the discovery of their presence.

Just recently, the Society received information identifying one individual who was responsible for deliberately translocating redfin from infested to uninfested waters, and who could not resist bragging about his endeavours.

In respect of redfin, there needs to be

- A higher and clearer profile with respect to availability of educational materials and other forms of communication (and more effective modes and media of communication) to mitigate the risk of persons translocating fish and disposing of unwanted pet fish in rivers and streams.
- A comprehensive control plan for redfin, comparable to the carp control plan (http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0010/306010/nsw-control-plan-for-carp.pdf)
- Investigation of strategies aimed at mitigating the impact of redfin.

- Strategic research into mitigation of redfin impact.
- Significant reform of legislation relating to noxious fish is needed in NSW.

CARP

Carp are well known for their hardiness, fecundity and capacity for habitat modification. Until the millennium drought, they dominated the biomass of the MDB, but with the effluxion of time and some assistance from injudicious environmental water flows, they have returned in large numbers.

The main reason for carp being at number 3 in priority is the imminent release of Koi Herpes Virus (KHV).

Although KHV will provide huge initial knockdown, it will not eradicate carp, and for this reason research should be continued and funded in respect of the daughterless carp remedy.

Such genetic modification would also pave the way to an extent for extension of the technology to form a remedy for redfin and tilapia.

At the moment, the Society sees no need for specific submissions relating to carp save that

- Environmental water flows need to be regulated with regard to present knowledge as to the breeding and recruitment of aquatic pest species, especially carp.
- The sooner KHV is deployed the better.
- Significant reform of legislation relating to noxious fish is needed in NSW.

NEED FOR LEGISLATIVE REFORM IN RESPECT OF AQUATIC PESTS ANIMALS

Significant reform of legislation relating to noxious fish in NSW, which presently is simply pathetic. The Fisheries Management Act & Regulation fail to provide a clear legislative message, clear restrictions and significant penalties.

While NSW legislation provides for three classes of noxious fish the fact is that even restricting the comparison to the highest level of liability, NSW legislation is severely wanting compared to Queensland.

Unlike NSW, Queensland makes it illegal to possess any noxious fish, whether dead or alive. It requires any noxious fish which is caught to be killed humanely and NOT returned to the water.

The penalties relating to noxious fish in Queensland are very significant, the maximum penalty being \$220,000, whereas the Fisheries Management Act (NSW) provides for maximum penalties of 100 penalty units for a corporation, or, 50 penalty units in any other case, a penalty unit being worth \$110

In Queensland, "People must not possess noxious fish or keep, hatch, rear, sell or consign them. Noxious fish must not be released into Queensland waters or be used as bait, either dead or alive. After they are caught, all noxious fish must immediately be killed humanely and must not be

returned to the water.” (emphasis added) <https://www.daf.qld.gov.au/fisheries/pest-fish/noxious-fish>

If one contemplates the value of the recreational fishery and the impact of deliberate release of noxious species, the reality is that a custodial sentence should be available for the more serious instances. Comparing the potential for destruction in large part of the recreational fishery in the MDB and the loss of bio-diversity that would be the inevitable consequence of release of tilapia, for example, the maximum penalty for offences of his nature should at least be comparable with malicious damage, for which a custodial sentence of 5 years is available (Section 95 Crimes Act 1900).

There is a particular problem with the lack of clarity in the Fisheries Management Act regarding defences. For example Section 11 (*Possession of noxious fish or noxious marine vegetation prohibited*) provides; “*It is a defence to a prosecution for an offence under this section if the person charged satisfies the court that the person neither introduced the noxious fish or noxious marine vegetation into the waters concerned nor maintained the noxious fish or marine vegetation in those waters.*”

Taking a typical scenario of an offender catching noxious fish in waters where they are known to be present, and placing them in a bucket with an aerator to keep them viable on the pretext of keeping them fresh until leaving for home but intending to transport them to release elsewhere in uninfested waters, one asks whether *waters* can be taken to be limited to the water in the bucket, or would a court accept that *waters* refers to the very proximate waters in which they are being caught? There is a degree of ambiguity in the drafting and it is a well-known principle of criminal law that any ambiguity in a statute that applies a penalty upon conviction is to be resolved in favour of the accused.

It would cost little to amend the act to remove any ambiguity and to provide for a custodial penalty for the worst offences, that is, a penalty commensurate with the scale of harm that could result from release of noxious fish in uninfested waters.

It should be noted that it is at the point of capturing their stock that translocators of fish are most vulnerable to apprehension, since in most cases it may require a matter of hours of exposure to risk of detection in a public place to catch enough fish for the purpose, whereas during transportation the fish are easy to conceal and it takes but a matter of a few minutes or less to effect the release into uninfested waters.

Because the point of catching stock provides the greatest window of opportunity for detection and apprehension, the legislation must provide real and unambiguous measures for a successful prosecution and significant penalties.

Serious consideration should be given to offering a standing reward for information received that leads to a successful prosecution for these types of offences, having regard to the difficulties of detection and gathering sufficient evidence, and to the scale of the harm likely to be caused.

COMMUNICATIONS - MORE EFFECTIVE MODES AND MEDIA OF COMMUNICATION TO MITIGATE THE RISK OF PERSONS TRANSLOCATING FISH AND DISPOSING OF UNWANTED PET FISH IN RIVERS AND STREAMS

DPI Fisheries produces some excellent, accurate and informative publications relating to aquatic pest species in NSW (See e.g. http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0003/156945/redfin-perch-poster2.pdf)

In addition to these efforts, messages similar in intent should be provided in media which is most likely to be used by the type of people most at risk of offending; for example, electronic media, Facebook etc, and in print, beer coasters.

Such communications should also be couched in a variety of community languages, including registers of English used by those most at risk of offending,

The services of marketing experts should be obtained and use made of free community service advertising on TV and radio.

B. TERRESTRIAL PEST ANIMALS IMPACTING THE FRESHWATER HABITAT

A number of terrestrial pest animals have, or are capable of having, a significant impact on the freshwater habitat and so on biodiversity and the value of the recreational freshwater fishery. The impact consists mainly of contributing to siltation, which can destroy spawning beds (being key habitat for the endangered Macquarie Perch, for example) and filling in refuge holes which are essential to virtually all fish survival in warmer months and times of low flows, besides degrading water quality, reducing growth of fodder species for fish through turbidity.

Feral goats may destroy the understory that holds the soil together and they are a hard-hooved animal that has the habit of walking straight uphill (unlike sheep, which tend to contour up the hill), providing ideal conditions for erosion of the loosened soils. They can alter the structure of the understory, completely eating it out or acting as a selective force favouring dominance by at least one native shrub which has very long thorns. Along some parts of Coxs River, for example, where the subdivisions are ridiculously small, making control difficult, such thorny scrub has come to dominate the understory, making it impossible to access the River for some distance along its course.

Feral pigs root up river flats, making scouring likely during flood events. They have also been observed in stream, making waters turbid and adding to siltation with wallowing behaviour and rooting up stream beds and banks, preying on aquatic invertebrates such as yabbies and frogs. They have been observed preying upon freshwater turtles, having a biting force sufficient to crush the turtles' shell.

Wild cattle have an impact out of all proportion to their numbers, owing to their size and weight. They collapse the banks of streams and break down the pads of more benign animals such as sheep, leaving the soil loose and establishing a break through on a sheep trail, for example, for rainwater to sluice down, scouring the loosened soils.

Wild cattle produce a huge amount of dung, fouling water and contributing to hypoxic conditions and toxic algal blooms.

In the past, CAS has been disappointed with the lack of effective AND ongoing control methods of feral animals in National Parks. Large (tens of hectares at a time) swathes of pig damage have been observed surrounding critical Macquarie Perch habitat in a number of National Parks. Damage of that type and scale and frequency has **NOT** been observed in State Forests, save as to wild cattle (which may reflect the fact that recreational hunting of wild cattle is not permitted in state forests, as is the hunting of other pest species.)

C. ISSUES PAPER

3.1 Roles and responsibilities

Table 2. Summary of responsibilities for pest management in NSW describes the Department of Primary Industries' role as *Legislation and policy framework, range of responsibilities from raising awareness to conducting research to leading recovery programs*

In fact, DPI Fisheries also has responsibilities similar to those ascribed to OEHL in Table 2, but with respect to aquatic environment and fish, and develops and implements strategies for invasive species that threaten biodiversity in respect of fish. See Fisheries Management Act, Part 7 Division 6 and Part 7A.

The former Office of State Water is now under the control of the DPI, being known as "DPI Water". DPI water has responsibility for managing water releases from impoundments, including environmental flows. If this responsibility is not carried out properly, DPI Water can contribute to recruitment of pest species. CAS is concerned at recent reports that an environmental flow released by DPI Water occurred at a time and in a manner that could not have been more perfect for carp reproduction. The event is said to have been a "perfect storm" of carp recruitment.

Local Land Services, besides being engaged in Development of key strategies, large scale coordination and advice for best practice, on ground control methods, training and compliance, also play a role in respect of biodiversity generally and improving aspects of fish habitat. Its work in terrestrial pest animal management can be very important for the protection of the riparian environment.

3.3 Priority pest species

1. Within the defined parameters of the ToR, which pest animals do you think the review should focus on and why?

See above priorities as to aquatic species.

3.4 Landscape approach

See above as to impact of terrestrial pest animals on aquatic habitat.

3.5 Emerging issues

Proliferation of hobby farms and lifestyle blocks has created opportunities for terrestrial pest animals to proliferate.

3.6 Adequate resourcing

See above as to adequate funding of research and strategic research.

Yours faithfully

Don Barton
Secretary