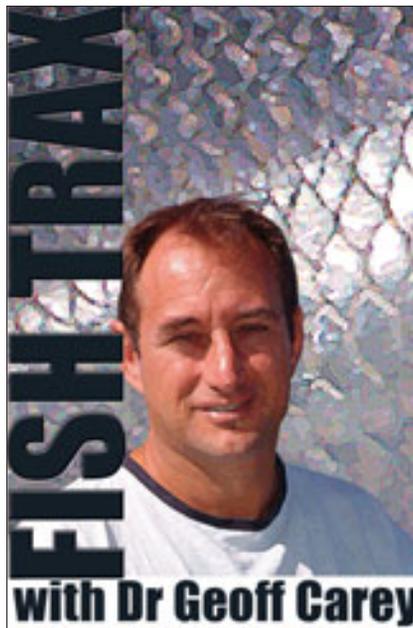


Last month we had a detailed look at one of the most popular fish in Australian estuaries, the bream. This month, we're going to have a look at a distant cousin, that is every bit as iconic as bream, but bigger, more handsome, and (many would say) better on the plate. To find this guy we have to move from the jetties, marinas, rock walls and mangroves of the sheltered rivers and estuaries, and head offshore to the bays, reefs and drop-offs of the open ocean. This month, we're dissecting one of the most sought after fish in the southern offshore waters of the continent

Dissecting Snapper

Before we start in earnest, let's take a brief look at the Snapper's family tree, and why it can call the humble bream 'cuz' and really mean it! The Australasian Snapper (we'll talk more about names and naming shortly) and all the Australian bream species are part of a family of bony fishes called Sparidae (aka Sparids) which contains about 125 species, and are part of the larger 'perch' order Perciformes. Many of these fish are called 'breams' (e.g. U.K., Australia) or 'porgies' (North America), and most have a relatively rounded to oval body shape.



Fish Trax #2 Identity Issues: Snapper

That Name . . . !!

Onto names, and if there was an Olympic event for the number of names given to one species of animal, snapper would definitely be on the

podium!

I use the word 'snapper' because most people across Australia and New Zealand will know roughly what fish I am talking about. But in the west (West Australia), this could mean a number of species (ie. nor-west snapper, etc), so to delineate, they call them pinkies or pink snapper. They also use the name dork fish. Coming around the bottom of south-west Australia to south Australia, young fish are often known as 'ruggers' and older fish, snapper. Moving east to Victoria and they are sometimes known as 'Schnapper'.

In Queensland small snapper are known as squire. Other common names used are cockney, knobby, red, red bream, red sea bream (Japan and Asia) squirefish, tamure (New Zealand); and they even have size dependent names: cockney (small), to red-bream, to squire, to snapper (sub-adult/adult), to old man snapper (large adult). Whew! Luckily, we have the scientific name (and description) to confirm we are talking about the same fish, right?

Well, yes, but it's a little confusing. Australasian (Australian and New Zealand) snapper were originally named *Chrysophrys auratus*, the genus name *Chrysophrys* is a latin term meaning a sea fish, and the species name *auratus* means gold or golden, so *Chrysophrys auratus* = a golden sea fish, not a bad description.

However, it has long been observed that the Australasian snapper *Chrysophrys auratus* looked a lot like another species of 'Sparid' found in the waters off Japan and China, called *Pagrus major* (formerly *Chrysophrys major*), the red sea bream. As we found out last month from bream, *Pagrus* means a kind of fish, and *major* is derived from the Latin word maior which means greater or large. So *Pagrus major* = a large fish.

Anyway, genetic work done on the 2 species *Chrysophrys auratus* and *Pagrus major* in the 1980's found that they were very closely related, in fact the (small) differences between them were not great enough to delineate them as separate species.

It was then put forward by some workers that they be re-classified as one species: *Pagrus auratus*. This new scientific name was accepted in Australasia for snapper, but the fish caught in Asian waters is still often known as *Pagrus major*, although it is regarded as the same species (*Pagrus*



As they grow, 'snapper' are called many things in different states, but at this point, they are becoming recognisable as the definitive *Pagrus auratus* - or to put it another way - a beaut snapper! (Note this has been caught on plastic - read how to do it from the SEA Library under "Fishing" by Aaron Concorde)

major has also been proposed as a subspecies of *Pagrus auratus*).

To further add to the confusion, Australasian snapper are to this day known as *Chrysophrys auratus* in many quarters (although the Australian museum calls them *Pagrus auratus*).

So to cut a long story short, if you see *Chrysophrys auratus*, *Pagrus auratus*, or *Pagrus major*, read: Snapper (the one this article is about!).

Distribution

Snapper *Pagrus auratus* is an inshore species that is found throughout temperate and subtropical parts of the western Pacific Ocean. They are found in the waters off the Philippines, Indonesia, China, Taiwan and Japan at depths of up to 200m. In Australia and New Zealand they are found from the continental shelf, to bays, lagoons and even in coastal estuaries. Snapper are quite common throughout the southern half of Australia, from the southern Great Barrier Reef (Capricorn Bunker Group) north Queensland around the coast of southern Australia (and Tasmania) to Coral Bay in Western Australia.

Morphology

Reminiscent of bream, snapper (remember the general Sparid body shape) are also fairly deep bodied with a relatively thick tail wrist, suggesting he is a powerful swimmer and not a super speedster. However, the long thin pectoral fins and terminal fins of the tail suggest that this guy is not only built for power, but is also quite fast (as anyone who has hooked one in shallow water and had a scorching run can attest to!).

Like bream, snapper have quite large and powerful dorsal, caudal and pelvic spines to deter predators, and are covered in tough scales. These two features together may give a clue as to the often rugged terrain that snapper prefers as habitat.

But for the really interesting features of snapper, we have to take a look at the head. Again like bream, snapper have a reasonably large eye, and a medium to small sized mouth, indicating they do not ambush and swallow particularly large meals all at once.

Inside the mouth, snapper have large canine teeth in the front and small, rounded or flat molars in the back of the jaw. This would indicate that

snapper have a wide range of prey items and varied methods of feeding.

This is indeed true, as snapper will actively hunt fast moving prey such as fish and squid (hence the need for canines to grip struggling prey items), or will graze on other food sources such as crabs, mussels and sea urchins (hence the need for molars to crush the shells of these prey items).

Of course to crush these, snapper have a large and very powerful jaw. The strength of its jaw muscles is also demonstrated by the amount of 'cheek' meat from larger specimens, this meat is actually part of the complex of muscles responsible for closing the jaw (and also very tasty). The breadth of diet is one of the facets that make snapper such an excellent angling target, as they can be caught on a range of live baits, dead baits, and lures.



From the F&B files . . . Ben Thrower with what we'd all call a 'classic' snapper; great fishing, anywhere!

By far the most distinctive and definitive feature of the snapper, especially for those who live on the east coast of Australia, is the large lump (or knob) that often protrudes from the head of larger models.

Known as hyperostosis, this describes the enlargement of particular areas of bones in fish, in this case the supraoccipital (knob) and frontal (forehead) bones.

When this occurs in snapper, it is usually in larger fish, may occur in both males and females, and may be accompanied by a large bulge on the snout. Originally thought to be more pronounced in female fish in Queensland or south Australia, studies

have since shown that males display more of a 'lump' and 'bulge' in snapper on the west coast.

We don't really know what causes hyperostosis, but several hypotheses have been put forward such as a response to pollution, a disease, or a side effect of their behaviour and environment i.e. butting into rocky nooks and crannies etc in search of food. However, studies have shown that it has a strong genetic base, and some populations of snapper in relatively close proximity to one another may have fairly major differences in the degree of hyperostosis seen.

To bump or not to bump? Does a large lump affect the eating qualities of these fish? Studies say no, but it does affect our ability to sell them in Asia (especially Japanese markets). Their

local species *Pagrus major* or red sea bream (remember they are virtually identical to our snapper) have a much lesser degree of hyperostosis in their fish. To be specific, the supraoccipital bone in our fish is swollen at the top and slender at the base, whereas the Japanese version is slender at the top and swollen at the base. The Japanese like their seafood to look just so (they have a right to, they are prepared to pay top dollar for it!), therefore our rugged knob-headed fish, are off the menu!

Oh well, more for us!

Life History

So how do snapper begin their journey?

As there are a lot of different populations of snapper in Australia and New Zealand (and Asia for that matter)

which each have the same basic parameters but also a bit of local variation, I have here presented a generalised snapper life history which incorporates most of the basic facts.

Larval snapper hatch out of transparent eggs after 28-48 hours, around 0.7mm to 1mm in diameter. They are one of tens or hundreds of thousands of such eggs spawned by a single female at a time. Research has estimated that large females may spawn up to 60 times in a season, which can last up to 3.5 months, and her ovaries can have many millions of eggs contained at any one time.

Studies indicate that spawning usually takes place in relatively shallow coastal waters and bays etc (ie <60m deep), but there are reports of snapper larvae occurring over the continental shelf, so perhaps there are spawning congregations in deeper water.

Most studies indicate little movement of larvae from the spawning site just after spawning (they are usually spawned when annual currents are low such as in winter on the east coast of Australia).

Anyway, the little transparent just-hatched larvae is around 2 to 3 mm long, and drifts around with the prevailing tides and currents. In a couple of days when his yolk supply is exhausted, he will start feeding on any small crustaceans, worms etc that are floating with him that he can fit into his mouth. They then gradually move from the plankton to settle onto the bottom, and then move gradually into bays, estuaries and shallower waters at about 1 cm in length.

Here they will basically 'pick a patch' where they will feed, avoid predators, grow and develop, and generally not move great distances.

Most studies show that the majority of juvenile snapper (<25cm) only move a few hundred metres at most from their home range, and most adults are also resident fish and do not move much more (although a small proportion ~1% may move over 100km).

This is an important point for fisheries management, as it means areas such as bays and inlets with good

snapper populations (eg Moreton Bay and Port Phillip Bay) may not be a particularly important source of recruitment to truly 'offshore' fisheries in the adjacent area; and good snapper habitat can be easily fished out and not replenished in a hurry.

So we need careful management of these areas (without ruining it for everybody (read-fishos!)). Enough said.

Back to the life cycle. Studies indicate that snapper start life sexually undifferentiated (ie. no male or female gonads), and from about 1 year old develop as females. These either continue to develop as females and

Di Ross' shot from last month's F&B of Ashley Talbot and his Whyalla 2009 winning 15.65kg snapper - check this fish's head and nose bumps.



mature at around 25cm and 2-5 years old (a little larger if they mature at 5), or between 2 and 4 years old, they may change sex (a relatively common occurrence in the world of fish) and continue to develop as males, reaching sexual maturity at around the same size and age as females. When sexually mature, fish will congregate (perhaps involving migration) at recognised areas to spawn.

These are usually in relatively shallow waters with minimal oceanic currents, and are specific sites for specific populations. Once fish have spawned, there is a deal of variation in habitat choice of mature fish, with fish of some populations moving to deeper waters as they get older, others remaining in relatively shallow waters and still others moving to deeper waters and subsequently back to shallower waters at 12 to 13 years of age, to remain there for the rest of their lives.

Snapper may reach a weight of 20kg

and a length of 1.3m, and at this size they would be very old fish indeed, most likely 20-30 years old (and maybe more!).

Aquaculture

The Japanese 'snapper', red sea bream has been intensively cultured for at least 40 years, and even before this, snapper were reared by capturing juvenile fish and growing them out in sea cages.

Relatively recently (late 80's, early 90's) successful hatchery techniques were developed (based largely upon techniques for spawning and growout of *Pagrus major*) for the Australasian snapper, with intensive larval rearing followed by growout in sea cages most common in Australia.

This species has a great deal of aquacultural potential, and is currently

grown (in research and/or commercial capacity) in all Australian states. Limiting factors include relatively slow growth (market size ~250mm in around 21 months c.f. ~6 months for a similar sized barramundi) although this can be improved in warmer waters; and a lack of suitable sites (at a reasonable price) for cage culture. But with flesh quality as good as it is, and looking as good as it does, snapper is likely to become one of the more popular marine finfish cultured in Australia.

In Summary

Well, what a fish. They're abundant, great to catch, great to eat and they look fantastic. They'll take all sorts of baits and lures too, and put up a great fight anywhere from the shallow estuaries to the deep blue waters of the continental shelf. Like their inshore cousins the bream, they are great all-rounders of offshore waters that tick boxes in nearly all the categories you need for an iconic fish species. And that flash of brilliant pinky red seen down deep often marks a 'coming of age' for an offshore fisho. Put all these things together in the one package, and it's no wonder that snapper are one of the most popular angling species in Australia.

Next Month: Geoff prepares an amazing biologist's scientific 'skinny' on the ubiquitous flathead; don't miss it, this is special!

F&B