Edition – October 2015

Appendix Two
Water Animals – Identification Guides

This is a product of The Water Research Commission: Project No. K5/2350

WRC: Project No. K5/2350

APPENDIX TWO

SMALL WATER ANIMALS

The Fieldwork Modules in Section B, C and D refer to one or more of the Identification Keys in this Appendix.

Why not look at them all and decide for yourself which would be most suitable for your learners and for your own fieldwork site?

Why not make your own identification sheet to include examples of the most commonly seen wetland birds, animals, reptiles and insects?

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Water Creatures – Macro Invertebrates

DICHOTOMOUS KEY

START!

Shell

Snails/Clams/Mussels

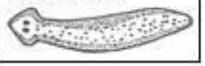
No shell

Legs

No legs

Unsegmented body

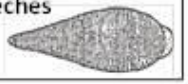
Flatworms



Segmented body

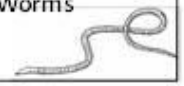
Suckers on both ends

Leeches



Long, thin body

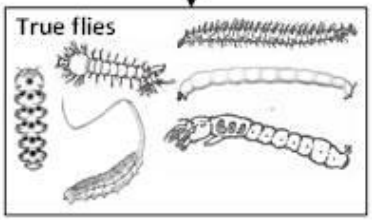
Worms



Clearly defined legs

Short, stubby legs (prolegs)

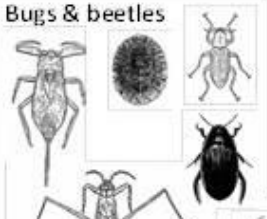
True flies



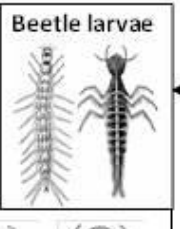
4 or more pairs of legs

3 pairs of legs

Bugs & beetles



Beetle larvae



Hard, leathery front wings (NB: Wings may be folded)

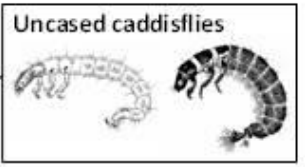
Wings

No wings

Tail

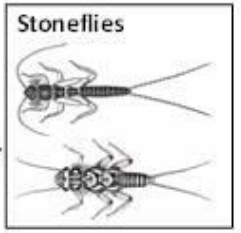
Tufted tail

Uncased caddisflies



Elongated tail

Stoneflies



Generally 3 tails

2 tails

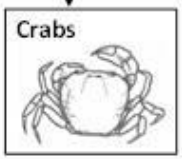
No Tail

Pincer-like front legs

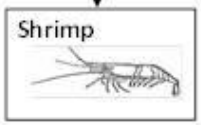
Yes

No

Crabs

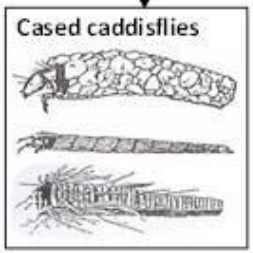


Shrimp



Portable shelter/ covering (made of sand, leaves, sticks)

Cased caddisflies

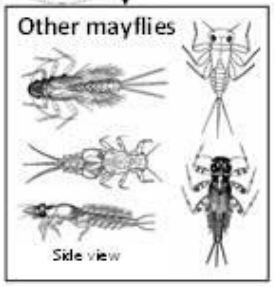


Bulging eyes

Dragonflies

Feathery-like gills on abdomen

Other mayflies



Side view

Plate-like gills on abdomen

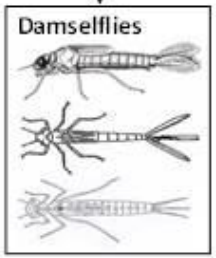
Minnow mayflies

Side view

Humped back, fish-like way of swimming

No feathery gills on abdomen; long body

Damselflies



Flat worms

Flat worms are characterised by their flattened shape and soft bodied, worm-like form. They have an arrow-shaped head with two dorsal eyespots and are generally mottled or dark grey in colour. Flat worms move with a gliding action and are generally scavengers or carnivores.

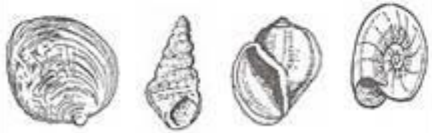
Leeches

Leeches are segmented organisms that have very flexible bodies. When moving they expand to become long and thin, and then contract to become short and stubby. They have suckers on both ends of the body used for feeding and locomotion. Leeches are variable in colour, from grey, to red-brown and black. They swim with a fast, snaking movement and are found under stones, vegetation and debris.

Worms

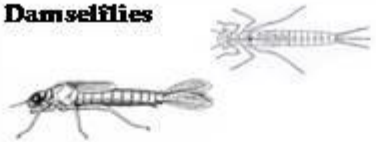
Worms are long and segmented, with a cylindrical shape much like small earth worms. Their colouring is usually pink to brown. They are usually seen writhing around in debris, digesting the substrate they fed on.

Snails / Clams / Mussels



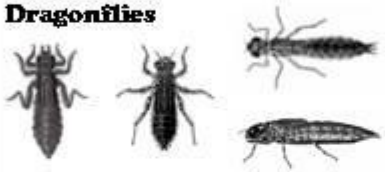
Snails are molluscs with hard shells that vary in size, shape and colour. Habitats vary, with some snails, such as limpets, clinging to rocks, whereas clams and mussels are found in sand. The more common snails move over stones and vegetation. Some snails are host to bilharzia, a serious health hazard for humans.

Damselflies



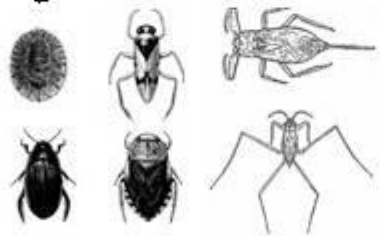
Damselflies have elongated bodies generally with three broad tails/gills on the tip of the abdomen. Damselflies are carnivorous and have a 'mask' over the lower part of the face, which hinges out to reveal a pair of pincers used to catch their prey. They are often found in vegetation growing on the edges of rivers.

Dragonflies



Dragonflies are robust creatures that are stout and have a large head and protruding eyes. Some have short legs whilst others have long legs. They do not have tails, but swim using 'jet propulsion' by forcefully ejecting water from the abdomen. Dragonfly nymphs are usually the largest organisms found in a sample and are the most powerful invertebrate predators in the water.

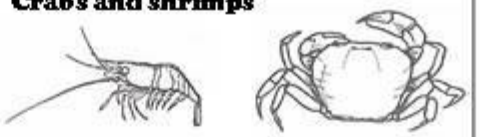
Bugs and Beetles



Bugs can be defined as having a piercing and sucking beak for mouthparts, and two pairs of membranous wings. Beetles on the other hand have 'jaws' and outer wings that are hardened to protect the inner wings. Some bugs and beetles are well adapted to swimming, such as water boatmen, backswimmers, pond skaters and water striders. Most bugs and beetles are carnivorous, but some feed on algae.

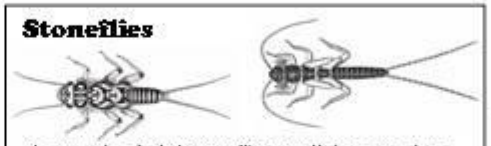
Images not to scale

Crabs and shrimps



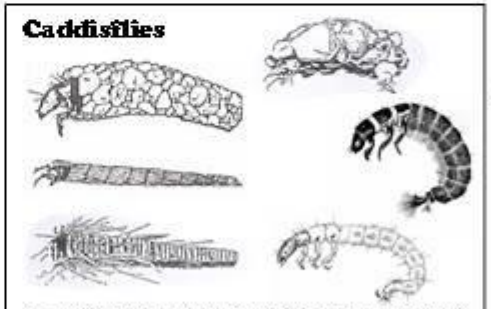
Crabs and shrimp form part of the order Decopoda (ten legs) and have bodies and legs hardened to form a tough shell. They have four or five pairs of legs. Their eyes that are carried on stalks and are movable. Crabs are scavengers that feed mainly on leaf litter but will feed on animals when given the chance. Shrimps are mostly scavengers or deposit feeders.

Stoneflies



The nymphs of adult stoneflies usually have two long tails and three pairs of legs, each having two claws at the tip. A characteristic feature of stonefly nymphs are the tufts of gills on the side of the body as well as gills between the two tails. Wing pads on the thorax are often dark and obvious. Some species run across the substrate very efficiently and are potent invertebrate predators. Other species are smaller and feed on plant material. Most live in well-oxygenated, clean water.

Caddisflies



The aquatic larvae of adult caddisflies have a hard head with three pairs of legs attached to an elongated, soft body. Finger-like gills on the abdomen and anal appendages can be seen with the naked eye. Some caddisflies construct portable shelters from sand grains, bits of vegetation and/or silk that are glued together to form a characteristic case shape. Most case-building types cannot swim whereas the caseless types swim freely across the substrate. Some feed on algae and detritus whereas others are predators.

Mayflies

Mayfly nymphs vary greatly in shape and size and can survive for months in the water. However, the adults only live for a day or two. In this time, adults never feed, only mating and lay eggs in the water.

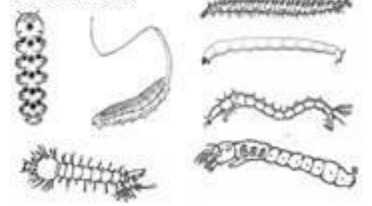
Minnow mayflies

These mayflies have a narrow head and a small, slender, but not flattened body. They have leaf shaped gills on both sides of the abdomen and two but more commonly three tails, depending on the species.

Other mayflies

Other mayflies are characterised by an elongated body, large head, well-developed mouthparts and stout legs. They live in a variety of habitats, including burrowing in mud, crawling amongst decaying leaves, and scurrying over stones in fast flowing water.

True flies



Most fly larvae have a fairly indistinct head but elaborate tail ends. They often have small, soft legs (prolegs), segmented bodies and have the appearance of maggots. Some have bristles/spines and antennae. True flies live in a variety of habitats including sand, mud and stones in fast flowing water. They can either be carnivorous or filter feeders.

Images not to scale

Amphibians of Wetland Systems

	Cape Caco *(Cacosternum capense)*	This frog is an endemic South African species that occurs in wetlands.
	Common Caco *(Cacosternum boettgeri)*	Also known as Boettger's Dainty Frog, it lives in marshy areas.
	Flat Back Toad *(Amietophrynus maculatus)*	This toad has very prominent warts and it's colour varies. They are associated with water because they breed in shallow water. They are usually nocturnal unless there has been heavy rainfall.
	East African Puddle Frog *(Phrynobatrachus acridoide)s*	This frog is very well adapted to many different environments, including wetlands. It is usually found in puddles but also in swamp-type environments.
	Natal Sand Frog (Tomopterna natalensis)	This species is found in many different habitats including wetlands. These frogs sit on exposed mud or rocks near water and call.
	Greater Leaf-Folding Frog *(Afrixalus fornasinii)*	This frog grows to a maximum of 4cm but has a very prominent stripe pattern so it can be easily identified.

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	Long Toed Tree Frog *(Leptopelis xenodactylus)*	This species is endemic to KZN; it perches on grasses during misty/rainy conditions.
	Natal Leaf Folding Frog *(Afrixalus spinifrons intermedius)*	This species inhabits wet areas, usually dams and ponds but it is possible to find this frog in wetland environments. It is bright yellow and covered in tiny black spines.
	Natal Puddle Frog ***(Phrynobatrachus natalensis)***	This frog is covered in warts. It occurs in a variety of places and habitats including wetlands.
	Cape River Frog *(Amietia fuscigula*)	This frog occurs in wetlands and can grow to a length of approximately 12cm.
	Clicking Stream Frog *(Strongylopus grayii)*	Despite the name, this frog is a relatively common wetland species.
	African Bullfrog *(Pyxicephalus adspersus)*	This is one of the most iconic frogs in South Africa. It is a carnivorous frog that eats small rodents, birds and other amphibians.

Fish of Wetland Systems

	Sharptooth Catfish *(Clarias gariepinus)*	This species is well adapted to a live in wetlands because it has the ability to survive in shallow mud during dry periods. It feeds on living and dead animals.
	Large Mouth Bass *(Micropterus salmoides)*	Although this fish is an introduced alien species and its main habitat is dams, its preferred habitat is reed beds which creates the potential for it to occur in wetland systems.
	Small Mouth Yellowfish *(Labeobarbus aeneus)*	This species occurs predominantly in river systems but it is a highly adaptable, tolerant species, so it should be noted that it is possible to find them in wetland systems.
	Mozambican Tilapia *(Oreochromis mossambicus)*	This fish feeds on invertebrates, diatoms and algae.
	Vlei Kurper *(Tilapia Sparrmanii)*	The Vlei Kurper is the prey of bass in South Africa. Its population does extremely well in water with abundant vegetation.