

Eel Festival Talk, Lake Bolac. 2nd April 2005

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I would like to pay my respects to the traditional owners, the Djap wurrong, and acknowledge that the spirits are indeed with us on this special occasion. I am very happy to be here.

I have just made my way here from an International Extinctions Conference in Narracoorte. I talked to a woman from New Zealand who has just written a book for children on eels. It focuses on their present threatened state resulting from drainage of their wetland habitat, pollution of the waterways and general ignorance of the species. She reminded me that eels (*Anguillid* species) are threatened in many other continents due to the same worldwide ignorance and lack of concern for wetland and riverine habitats in general.

In this region of western Victoria the short-fin eel has played a pivotal role in the development of Indigenous societies in the past. There are two species of eel that migrate to Australia from an area near Vanuatu and New Caledonia in the Pacific Ocean. These are the long-fin (*Anguilla reinhardtii*), which occupies areas east of the Great Dividing Range to the north and east of the continent, and the short-fin (*Anguilla australis*) which moves into the south eastern and southern part of this continent. There is an area in the middle where the species overlap.

These eels are born as a result of the spawning of their parents upon their return to this area of the Pacific Ocean which was their own birth place a decade or so previously. The parents die following spawning. Eels are catadromous species, which means they are born and die in the ocean but grow to maturity in inshore fresh waters – this growing period can vary between seven and 20 years – depending on the warmth of the water and availability of food. Known as *leptocephali* and shaped like a leaf, the baby shortfin eels drift with the currents towards the south of the Australian continent. Other species travel to their respective destinations on other continents in the southern hemisphere. Over the months they turn into glass eels and eventually elvers as they make their way to estuaries along the coast. They will only enter an estuary if there is sufficient fresh water moving down the rivers to the sea. This knowledge is important. It allows us to appreciate the part we may be playing in whether the eels are able to continue their thousands and probably millions year old cycle of moving up river into the lakes and wetlands to grow. Obviously if it is a drought year, or if too much water is being taken out for irrigation etc, then the eels will not move up-stream – it is too risky for them. They also need the presence of lakes and wetlands to continue their growing. A reduction in these has led to huge drops in eel numbers since Europeans arrived here. Their failure to enter the inland fresh-water ecosystem is a loss to this system and human society. Eels are a source of high nutrition, valuable protein and essential oils.

The eels' place in the ecosystem is to clean up smaller invertebrates, snails etc and also the bones of larger animals that may have fallen in the water. They are a great animal for cleaning up the water ways. (In Victoria Old Aboriginal stories tell of

Bunyips feeding on eels. This may be a description of one of the now extinct mega-fauna of this continent.)

My research on eels and their part in the development of Gunditjmara socio-economy has taken place over the last 10 years and is focused on the Mt Eccles lava flow (*Budj Bim* in the *Dhauwurd wurrung* language.) Because the landscape has evolved from a 30,000 year old volcanic lava flow it was too difficult to clear for farming activities. It is still composed of rocks and in these are preserved the archaeological remains of a pre-European Aboriginal society. On other parts of western Victoria there would have been similar remains made from earth and wood demonstrating the extent and design of technology associated with eel exploitation, but these remains have been lost due to land clearing and ploughing for European farming. The first thing that would have happened is the drainage of swamps for domestic animal grazing. This was immediately a loss of habitat for the eel and loss of a major resource for Aboriginal families.

Now, back to the short-fin eel. The elvers came up the river in their hundreds of thousands – 6,000 elvers make up 1 kg. They were searching for a lake or wetland in which to make their home for the next decade or so. They are highly territorial and would stay in the same place. If it dried up the eels would go into a state of torpor. If the temperatures were too cold, as in winter in NZ, then the eels would also go into a torpor. They would resume their growing upon the return of the swampland to “normal” conditions.

In the case of the Gunditjmara on the Mt Eccles lava flow – the elvers came up the Darlots River but the people had prepared an eel-friendly environment for them throughout the lava flow based on the springs that rose up in the north of the flow. Channels had been excavated from the boundary river, through the stone of the lava flow and into penned off areas of swampland thus preventing the older eels from eating the new babies, as they do. When they were big enough they were channelled into the main swamps that had been dammed to hold water all the year round. These were therefore a cultural construction that were interconnected across the landscape. People built their dwellings and storage places around the edges of these wetlands. They were able to live permanently in these villages and make use of wetland resources such as eels, birds, aquatic vegetable tubers and nearby woodland resources. Eels could be caught daily by spearing and also during their autumn migration back to the ocean for spawning. During a two week or so period the mature silver eels make their way back to the rivers with up to 300% oil and protein for the 3,000 km journey. Gunditjmara had prepared return channels from the wetlands to the main river. Strategically along these were positioned culturally-constructed weirs to trap the highly desirable fat eels. By trading their eels and allowing “favours” to others to share in the harvest, these favours could be called in when it suited the owners. Family groups who owned particular weirs became rich and powerful within their society.

During the autumn eel migration the southern outlet from Lake Bolac, known as Salt Creek, would turn into a busy metropolis as visiting groups managed particular weirs to trap the abundant fish moving south to the ocean. For reciprocal agreements or exchange deals the traditional Djap wurrung owners of the lake would lease out sections of the creek to neighbouring family groups.

On the Mt Eccles lava flow the huge eel harvest had to be processed prior to its decomposition to prevent resource wastage. Scientific testing of sediment within particular hollow Manna (*E. viminalis*) and Swamp (*E. Ovata*) gums proved that they had been used for smoking eels. Thus we now know that this seasonally trapped and abundant resource could be preserved by smoking for future storage and trading. This supports a claim for Gunditjmara having a society with all the characteristics of a modern society. That is, a valuable and highly nutritious resource with seasonal abundance and able to be preserved for storage and trading. It featured resource specialisation and permanent settlement. The infrastructure associated with the eel aquaculture system shows high productivity with the means to feed large numbers of people.

It is important to learn from the past. Gunditjmara demonstrated the high productivity and sustainability of this wetland-based landscape. Theirs was a system of sustainable aquaculture. It lasted until Europeans took over the landscape and turned it into one they were more familiar with – but one that did not necessarily suit the conditions of this country. I am a Director of the Glenelg Hopkins Catchment Management Authority in order to try and make a difference regarding the sustainability of our land-use in this region. More people could be fed from growing eels than from grazing cattle on a given area of now-drained swampland. We need to restore swamps for our own longterm benefit not continually drain them. We need to encourage eel numbers back. They are a valuable global commodity desirable for all the qualities that Aboriginal people recognised and pursued by establishing their 100 sq km aquaculture system across Mt Eccles lava flow. Today we can learn from this past land use – or is it wetland use, in these times of less certain climatic changes. Preserve and restore not drain and ignore.

Thankyou for giving me the opportunity to share the results of my work with you.