WETLANDS AT COOLART AND THEIR INTERPRETATION

Steve Yorke

ABSTRACT

Coolart is an 85 hectare Crown Reserve situated near the shores of Western Port at Somers. It is managed by a Committee of Management of community and Government representatives for Conservation and Education Purposes.

Coolart's wetlands comprise several shallow, artificial impoundments and an undisturbed estuarine system of tidal creeks, salt marsh and reed beds. 176 species of birds, including about 60 associated with wetlands, have been recorded.

Amongst other attractions, facilities have been established for public use and enjoyment of wetlands and wetland wildlife. A system of walking trails and 'hides' has been developed to allow public access to wetlands with total exclusion in some areas and close approach in others. An innovative approach is taken to interpretation of wetlands, which relies on personal communication rather than on signage, displays and audio-visuals. All conservation interpretation aims to demonstrate the importance, quantitatively and qualitatively, of habitat, rather than of individual species. Furthermore, Coolart's long history of wetland development provides opportunities for the interpretation of the cultural aspects of wetlands and human interaction with wetlands.

INTRODUCTION

Coolart Reserve is located approximately 70 km south-east of Melbourne on the shores of Western Port. It is managed by a Committee of Management of community and Government representatives for Conservation and Education Purposes.

Western Port, first discovered by George Bass in 1798, is a vast shallow bay with extensive intertidal mudflats and fringing mangroves. In an area comprising less than 2% of Victoria, more than half (295) of the 437 bird species found in the State have been reported. The area has the largest numbers of the 5 species of large wader in coastal Victoria and includes 14% of the total number of ibises in southern Victoria (Lowe, 1982). The bays French and Phillip Islands, which both have significant conservation reserves. On the mainland, areas set aside for conservation are mainly narrow Foreshore Reserves. Coolart Reserve is the only significant reserve in an area predominantly agricultural but also containing port-related steel and oil industries.

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Within the 85 ha of Coolart, 176 species of birds, including about 60 associated with wetlands, have been recorded. Apart from Coolart's importance for wildlife conservation, it is also a historic farming property. Despite 150 years of agriculture, some habitat was retained and in the 1850's, an impoundment was formed, which, by the turn of the century, had become a valuable *Melaleuca ericifolia* fringed, deep freshwater lagoon. The combination of natural and cultural heritage forms the basis of recreational use of Coolart and its interpretation.

DISCUSSION

The Victorian Government purchased Coolart in 1977 and reserved under the Lands Act as a Public Purposes (Conservation and Education Purposes) Reserve. The main reasons for the purchase were the historic buildings and gardens, and the Coolart Lagoon, home to a large breeding colony of Sacred Ibis *(Threskiornis aethiopicus).* The educational values of Coolart had long been recognised - since 1958, children from the Ministry of Education Children's Camp at Somers have visited the Lagoon and woodlands for environmental education.

Coolart's Wetlands and Their Public Use

Relatively undisturbed since Coolart was first settled in 1840 is the estuary of Merricks Creek, lined with salt marsh, along the southern boundary of the Reserve. Within Coolart, Home Creek changes from salt marsh to beds of Common Reed *(Phragmites australis)* as salinity decreases upstream, and at slightly higher elevation, to Swamp Paperbark. This area is accessible to canoeists and walkers using Coolart's Woodland Walk.

The Coolart Lagoon was first formed in the 1850's when a road was constructed across a seasonally wet, shrub thicket of Swamp Paperbark *(Melaleuca ericifolia).* Water from the resulting impoundment was probably used for the orchards and vegetable gardens established at that time. The paperbarks survived the extended flooding except in the deepest parts. In 1937, Mr Thomas Luxton bought Coolart as a working farm of 350 hectares, but immediately asked the then Fisheries and Game Department to declare his property a sanctuary. Game Inspectors noted the extensive paperbark swamp and large numbers of roosting and nesting waterfowl. The 'Sanctuary for the Protection of Native Game, except Quail, at Balnarring' was proclaimed by Governor-in-Council within several weeks. Between 1938 and 1958, Mr Luxton transformed the swamp by raising an earth retaining wall to expand the water area to 5 ha, by planting trees including willows and Swamp Cypress, and by constructing islands with a bulldozer.

Sacred Ibis first nested in 1961, with 6 nests, the first recorded nesting of the ibis south of the Great Dividing Range. Breeding numbers increased steadily to between 350 and 450 nests by 1968 (Davis, Reid, 1974). In 1992, 550 nests were occupied between June and the following January.

Pedestrian access to the Lagoon is restricted to paths, but glimpses ~~are~~ can be had of the wetland and some birds as people approach the hide. The Minsmere Hide, positioned to face away from the sun, was constructed in 1980 and seats 50 people and includes access for wheelchair users. Visitors are able to see ibis nesting within 20 metres of the hide, as well as raptors, waterfowl, cormorants, any many others including the rare Blue-billed Duck.

Closer to the Coolart Homestead and formal gardens are two wetlands, constructed in 1980 and 1982 on what was a low-lying, gently sloping paddock. The former was formed by pushing up a 250 m, curving earth wall to intercept the Lagoon overflow. It is a seasonal freshwater marsh which attracts Latham's Snipe, Black-fronted Plovers, grebes and waterfowl. Public access is provided by a small hide which seats 6 people and is approached from the Woodland Walk. Each side of the hide is screened by Swamp Paperbark.

The second wetland is a permanent pondage, up to 1.5 m deep, fringed with dense stands of Common Reed, with islands for roosting and nesting. In 1985, the Wetlands Observatory was built to function as a 'hide' and an auditorium, seating 92 people. One-way glass was installed to enable viewing of undisturbed wetland wildlife including Black Swans, Hoary-headed Grebes, several species of waterfowl including, on occasions, Cape Barren Geese, Royal Spoonbills, Sacred Ibis feeding, Purple Swamphens, Coots and Dusky Moorhens. In summer, Long-necked Tortoises are often seen.

Pedestrian access to the Observatory is achieved by steep steps from the homestead and also by a path suitable for wheelchair use. The approaches are screened by indigenous plantings of Common Reed, Swamp Paperbark, Woolly Tea-tree *(Leptospermum lanigerum),* Blackwood *(Acacia melanoxylon),* Swamp Gum *(Eucalyptus ovata),* Drooping She-oak *(Allocasuarina verticillata),* Coast Beard-heath *(Leucopogon parviflorus)* and Tussock Grass *(Poa poiformis).*

In 1986, three small wetlands were constructed adjacent to the entrance drive. These have been colonised by a range of wetland plants including Water Plantain *(Alisma plantago-aquatica),* Common Spike-rush *(Eleocharis acuta)* and Swamp Wallaby-grass *(Amphibromus nervosus).* It is possible for drivers or walkers to see Latham's Snipe in and around these ponds.

The Wader Pond was built in 1991 between the wetlands, constructed in 1980 and 1982, and the Coolart Lagoon. It has very shallow areas, designed to provide a wide littoral zone. This pond was planted with Common Reed, Pale Rush *(Juncus pallida)*, Water Plantain, Water Milfoil *(Myriophyllum propinquum)*, Swamp Wallaby-grass and Tall Sedge *(Carex appressa)*. A walking track was constructed along the impoundment to provide unfettered access and a glimpse of the less visible fauna such as fish and invertebrates. Birds generally disappear from the pond during opening hours, but return to feed and roost at other times.

In 1992, another impoundment was created, primarily to provide water for the historic gardens, but also to demonstrate the principles of 'Dams for Wildlife'. This is a two-part pondage, connected when full, but as water is used, an island is exposed and a shallow pond becomes isolated and is allowed to dry naturally. Revegetation is proceeding.

Coolart is open to the public from 11 am to 5 pm daily, except for Christmas Day, Boxing Day and Good Friday. Admission fees are charged. Approximately 30000 people visit each year, including about 8000 children on school excursions. Facilities include a Visitor Centre with toilets, picnic area with wood-fired barbecues, a system of walking trails and access to the bird viewing hides and historic buildings.

Staff at Coolart comprises three Wardens, an Administrative Assistant and two part-time helpers. The Friends of Coolart also help with staffing of the Visitor Centre and plant shop, and attend working bees.

Management of Coolart aims to provide recreational and educational opportunities, subject to the protection of natural and cultural values. To do so requires that in any location on the Reserve, the intensity of visitor use is inversely proportional to the sensitivity of the site. By providing a wide range of attractions and activities, visitor activity can be dispersed. Unless opportunities are provided for people, they will create their own. Therefore, walking tracks are carefully sited and approaches to wetlands are screened to some extent. However, total screening can be counter-productive - a high fence or earth dyke may well encourage people to climb, simply to see what's on the other side. Glimpses of an attraction before arrival often build a sense of anticipation and enhance enjoyment.

Interpretation of Coolart's Wetlands

Coolart's role in environmental education is based on both natural and cultural values. Management aims to provide an enjoyable visit, thereby pre-disposing people to gain some understanding of ecology and species conservation, and of the role the community or individual can play in conservation. A special emphasis is placed on the history of land management at Coolart to demonstrate the cultural interaction between Australians and their environment. It is perhaps unusual to have an area, farmed for 150 years, which has always had such a rich vegetation and fauna, in public ownership.

Interpretation of Coolart addresses history, especially in relation to changes in land use and cultural attitudes, coastal woodlands and their revegetation, and wetlands, both natural and artificial. Because wetlands generally have suffered extensively since European settlement of Australia, their value in nature conservation is heavily promoted at Coolart. Wetland wildlife is usually more visible than bushland fauna and food webs more readily observed. Wetlands are living classrooms.

All visitors to Coolart arrive at the Visitor Centre and are greeted by a Friend of Coolart. A comprehensive brochure, including maps, is provided. Visitors may, for $1.00, hire binoculars. More detailed guide notes to the garden, Woodland Walk and History Walk may be borrowed. There is a 'What's On Today' board with current events and recent bird sightings. The Visitor Centre does not include interpretive displays, but does house a gift shop. Clear signage (routed into timber with a pantograph engraver) then directs people to the various attractions.

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For visitors who miss contact with a Warden, there are, in the Observatory and Minsmere Hide, bird identification charts. These are photographic reproductions of watercolour paintings of birds most likely seen on and around the wetlands. In the past, Gould League posters were used but it is the experience of Coolart's Wardens that they are excellent for people with some birdwatching experience, but, with 50 birds illustrated, confusing for the beginner. Even with simpler charts, birds in eclipse or juvenile plumage are rarely identified by visitors without the assistance of the Warden.

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Extension services are also provided by Coolart with written information on farm dams and wildlife and by attending Agricultural Field Days. In 1992, a Wetlands Field Day was conducted at Coolart in conjunction with Land For Wildlife and 70 landholders attended.

A Personal Approach to Wetlands Interpretation

Despite a growing environmental awareness within the community, it is apparent to Coolart's Wardens that generally there is a lack of knowledge of ecological processes and therefore of measures needed to protect or enhance wildlife habitat. For example, media information on such issues as the Greenhouse Effect, duck hunting, algal blooms or animal rescues is usually biased, misleading and incomplete. When a Warden shares his knowledge and experience with visitors at a personal level, many common misconceptions about the environment can be overcome. Wetlands provide an excellent starting point for discussion because so many ecological processes can be observed. Several examples are presented here:

1. Having heard of toxic blue-green algal blooms in Australia's rivers and reservoirs, people often remark that the 'green slime' in a wetland must be a problem for Coolart's management. The reply given is that there are 11 species of aquatic algae here, including 2 species of cyanobacteria which, under some circumstances, may become toxic. Algae, including cyanobacteria, photosynthesise and produce oxygen which supports many life processes within a wetland. Indeed, cyanobacteria created the oxygen in the earth's atmosphere. Algae are the most important part of the wetland food web - they support zooplankton, which in turn supports higher animals such as predatory invertebrates, fish, amphibians, reptiles and the birds which are enjoyed by all. Australian fish and waterfowl are immune to the toxins produced by cyanobacteria and have apparently evolved together. And where algae are a problem, it is necessary to control the source/s of nutrients which feed and create the blooms.

2. Whilst viewing Coolart's colony of Sacred Ibis, visitors often comment that the numbers appear to be getting out of control. It is explained that numbers each year vary with seasonal conditions which govern their food supply. Ibis naturally feed from damp soil beneath nearby farmer's crops or pasture, mostly on farm pests such as cockchafer larvae, and the birds are known as the 'Farmer's Friend'. But if rubbish tips or human handouts become the ibises' main source of food, their population can explode to the point where they become a smelly nuisance. The same applies to populations of Silver Gulls, which are now driving other species from their roosting and nesting sites.

3. Occasionally, visitors see a White-breasted Sea-eagle or a Marsh Harrier take a Sacred Ibis chick or a duckling. This is a wonderful event which allows the interpretation of food webs, energy flows, predation and mortality. All living things are ultimately food. It is explained to visitors that mortality amongst ibis up to breeding age is probably around 95%. The 5% survivors carry the best genes to equip them for their environment. Therefore mortality is important in an evolutionary sense. Human emotions do not exist in a wetland. An explanation follows on the competition between individuals within a species for finite territories or food. Therefore, it is futile to raise orphan ducklings (or possums) for release to the wild. They cannot possibly compete with a fully competent animal of breeding age. It is a maxim that unless physical habitat is expanding, wild populations of a species cannot expand. The only way to assist population growth is to protect existing habitat and add to it with revegetation and the creation of wetlands.

4. In January and February 1993, the Coolart Wardens were able to point out Long-necked Tortoises hiding amongst Blunt Pondweed *(Potamogeton ochreatus),* lying in wait for egg-laying dragonflies. The insects approach in tandem with the male dragonfly attached to the females thorax. As the female lowers her abdomen into the water to inject the eggs into stems of pondweed, she is seized by a tortoise. Almost as quickly, a Dusky Moorhen runs to seize the male before he can detach himself. Later, the eggs will hatch to produce a dragonfly nymph which preys on smaller insects attracted to the pondweed. This is an excellent way of explaining to people some of the complexities of wetland, and general, ecological principles.

5. Coolart's sewerage is run from a package treatment plant to the wetland adjacent to the Observatory. It is explained to visitors that the wetland provides tertiary treatment of waste water by fixing the phosphates and nitrates. Wetland vegetation, existing in usually high nutrient situations, is equipped to utilise these nutrients better than land plants. In a nutrient poor land ~~like~~ Australia, wetlands, flood plains and slow-moving rivers trap topsoil runoff and prevent the loss of nutrients to the sea. In other words, land-based disposal of waste water is preferable to ocean dumping.

6. In March 1993 at Coolart, there are juvenile Chestnut Teal, Blue-billed Ducks, Hoary-headed Grebes, Dusky Moorhens, and several passerine species. Many visitors remark that they must be confused by the strange weather. The reply is that the birds are not confused - the saying that 'birds breed in spring' does not necessarily apply in Australia. Breeding is a nutritional process based on the availability of protein. Most protein comes

from invertebrates which generally increase their populations in response to plant growth and ultimately rainfall, especially thunderstorms.

CONCLUSION

Personal communication provides the most flexible and effective form of interpretation. Highly complicated information can be imparted according to the age and background of the audience. Communication is interactive and people can ask specific questions or relate their own experience. Warmth between managers and customers is developed, lessening any sense of authoritarian 'do's and don'ts'.

Because of relatively low visitor numbers, the decision was taken to devote staff time to personal interpretation of the Reserve and its wetlands. Temporal changes in demand for interpretation present no problem at Coolart because all Wardens have a wide range of duties and a flexible approach to their employment. Given staff time previously spent in operation of audio-visuals, the personal approach here is no more expensive. Staff communication skills have improved and this has led to income-generating holiday programs and Field Days which were previously outside the scope of Coolart operations.

Visitor surveys show a high level of satisfaction with this approach and also that 80% of first-time visitors became aware of of Coolart through 'word-of-mouth'. To increase visitor satisfaction through personal contact is therefore a means of marketing and increasing income.

Australian culture is generally city-based and remote from the environment. Personal contact can better involve people with nature, and contribute to a broadening of a national culture which includes interaction with the environment. At Coolart, the wetlands and their history provide the perfect opportunity to demonstrate this interaction.

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INTRODUCTION

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Warden Coolart Bay 84 Balnarring Vic 3926

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A Personal Approach to Wetlands Interpretation

Despite a growing environmental awareness within the community, it is apparent to Coolart's Wardens that generally there is a lack of knowledge of ecological processes and therefore of measures needed to protect or enhance wildlife habitat. For example, media information on such issues as the Greenhouse Effect, duck hunting, algal blooms or animal rescues is usually biased, misleading and incomplete. When a Warden shares his knowledge and experience with visitors at a personal level, many common misconceptions about the environment can be overcome. Wetlands provide an excellent starting point for discussion because so many ecological processes can be observed. Several examples are presented here:

1. Having heard of toxic blue-green algal blooms in Australia's rivers and reservoirs, people often remark that the 'green slime' in a wetland must be a problem for Coolart's management. The reply given is that there are 11 species of aquatic algae here, including 2 species of cyanobacteria which, under some circumstances, may become toxic. Algae, including cyanobacteria, photosynthesise and produce oxygen which supports many life processes within a wetland. Indeed, cyanobacteria created the oxygen in the earth's atmosphere. Algae are the most important part of the wetland food web - they support zooplankton, which in turn supports higher animals such as predatory invertebrates, fish, amphibians, reptiles and the birds which are enjoyed by all. Australian fish and waterfowl are immune to the toxins produced by cyanobacteria and have apparently evolved together. And where algae are a problem, it is necessary to control the source/s of nutrients which feed and create the blooms.

2. Whilst viewing Coolart's colony of Sacred Ibis, visitors often comment that the numbers appear to be getting out of control. It is explained that numbers each year vary with seasonal conditions which govern their food supply. Ibis naturally feed from damp soil beneath nearby farmer's crops or pasture, mostly on farm pests such as cockchafer larvae, and the birds are known as the 'Farmer's Friend'. But if rubbish tips or human handouts become the ibises' main source of food, their population can explode to the point where they become a smelly nuisance. The same applies to populations of Silver Gulls, which are now driving other species from their roosting and nesting sites.

3. Occasionally, visitors see a White-breasted Sea-eagle or a Marsh Harrier take a Sacred Ibis chick or a duckling. This is a wonderful event which allows the interpretation of food webs, energy flows, predation and mortality. All living things are ultimately food. It is explained to visitors that mortality amongst ibis up to breeding age is probably around 95%. The 5% survivors carry the best genes to equip them for their environment. Therefore mortality is important in an evolutionary sense. Human emotions do not exist in a wetland. An explanation follows on the competition between individuals within a species for finite territories or food. Therefore, it is futile to raise orphan ducklings (or possums) for release to the wild. They cannot possibly compete with a fully competent animal of breeding age. It is a maxim that unless physical habitat is expanding, wild populations of a species cannot expand. The only way to assist population growth is to protect existing habitat and add to it with revegetation and the creation of wetlands.

4. In January and February 1993, the Coolart Wardens were able to point out Long-necked Tortoises hiding amongst Blunt Pondweed *(Potamogeton ochreatus),* lying in wait for egg-laying dragonflies. The insects approach in tandem with the male dragonfly attached to the females thorax. As the female lowers her abdomen into the water to inject the eggs into stems of pondweed, she is seized by a tortoise. Almost as quickly, a Dusky Moorhen runs to seize the male before he can detach himself. Later, the eggs will hatch to produce a dragonfly nymph which preys on smaller insects attracted to the pondweed. This is an excellent way of explaining to people some of the complexities of wetland, and general, ecological principles.

5. Coolart's sewerage is run from a package treatment plant to the wetland adjacent to the Observatory. It is explained to visitors that the wetland provides tertiary treatment of waste water by fixing the phosphates and nitrates. Wetland vegetation, existing in usually high nutrient situations, is equipped to utilise these nutrients better than land plants. In a nutrient poor land like Australia, wetlands, flood plains and slow-moving rivers trap topsoil runoff and prevent the loss of nutrients to the sea. In other words, land-based disposal of waste water is preferable to ocean dumping.

6. In March 1993 at Coolart, there are juvenile Chestnut Teal, Blue-billed Ducks, Hoary-headed Grebes, Dusky Moorhens, and several passerine species. Many visitors remark that they must be confused by the strange weather. The reply is that the birds are not confused - the saying that 'birds breed in spring' does not necessarily apply in Australia. Breeding is a nutritional process based on the availability of protein. Most protein comes

from invertebrates which generally increase their populations in response to plant growth and ultimately rainfall, especially thunderstorms.

CONCLUSION

Personal communication provides the most flexible and effective form of interpretation. Highly complicated information can be imparted according to the age and background of the audience. Communication is interactive and people can ask specific questions or relate their own experience. Warmth between managers and customers is developed, lessening any sense of authoritarian 'do's and don'ts'.

Because of relatively low visitor numbers, the decision was taken to devote staff time to personal interpretation of the Reserve and its wetlands. Temporal changes in demand for interpretation present no problem at Coolart because all Wardens have a wide range of duties and a flexible approach to their employment. Given staff time previously spent in operation of audio-visuals, the personal approach here is no more expensive. Staff communication skills have improved and this has led to income-generating holiday programs and Field Days which were previously outside the scope of Coolart operations.

Visitor surveys show a high level of satisfaction with this approach and also that 80% of first-time visitors became aware of of Coolart through 'word-of-mouth'. To increase visitor satisfaction through personal contact is therefore a means of marketing and increasing income.

Australian culture is generally city-based and remote from the environment. Personal contact can better involve people with nature, and contribute to a broadening of a national culture which includes interaction with the environment. At Coolart, the wetlands and their history provide the perfect opportunity to demonstrate this interaction.

LITERATURE CITED

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