



Submission to the Inquiry into the establishment of marine protected areas within the Bruny Bioregion

Introduction

Thank you for the opportunity to make a submission to this Inquiry.

With reference to the Draft Biounits listed in Appendix 4 of the Background Report, this submission relates to Biounit 7 (Derwent) in particular, and also to Biounit 3 Moderately Exposed (Derwent influence).

Save Ralphs Bay Inc contends that there is an urgent need for increased protection of natural, social and cultural heritage values in Ralphs Bay and nearby areas of the lower Derwent estuary. In relation to section 3.2 of the Background Report, we will make the case for such reservation by reference to the listed Criteria for identifying and selecting marine protected areas (MPA's).

Criteria for identifying and selecting marine protected areas

a) Identification Criteria

Save Ralphs Bay Inc contends that most of the Identification criteria apply to Ralphs Bay and associated parts of the lower Derwent estuary. In this submission, we have reordered the Identification criteria to reflect the extent to which they apply to this particular part of the Bruny Bioregion. We have only addressed in detail a selection of the criteria we feel most able to comment on. However, we request that the Panel examine the remaining criteria in respect of the Ralphs Bay area, when determining the final nature and extent of the Bruny Bioregion MPA's.

a.1 Uniqueness

The Derwent is notable for its "extremely high level of endemism" (Background Report p.124, quoting Edgar 1999). Among the endemic species present is the Spotted Handfish, *Brachionichthys hirsutus*. This species has suffered a drastic population decline in recent decades and is now restricted to a small number of remnant critical habitat sites. One of these is inside Ralphs Bay. Two areas of confirmed critical breeding habitat occur nearby, along the South Arm peninsula. A further area is also on the Eastern Shore, but closer to Hobart. Although previously found in Frederick Henry

Bay, the Spotted Handfish was not found at this location during a 2005 survey. (Mark Green, CSIRO, pers. comm. and media reports). The presence of the fish at other previously described locations in the D'Entrecasteaux channel is also in doubt (Graham Edgar 2006, pers. comm.). Hence Ralphs Bay and nearby locations along the Eastern shore of the Derwent estuary are of unique importance in relation to the protection of this species, which is listed as Critically Endangered in the IUCN red list.

It is also worth noting that, while Tasmania is known for having for a wide range of endemic marine species in general, the state has very few endemic marine fish. Furthermore, while the Spotted Handfish is possibly teetering at the brink of extinction, we are unaware of any other marine fish species that has become extinct since records began. Thus the Spotted Handfish has the tragic potential to become the world's first extinct marine fish. It is in urgent need of protection. (Details confirmed by Peter Last, CSIRO).

The ecological values of Ralphs Bay are important estuarine habitats, including mud and sand flats, saline flats and salt marshes and coastal dunes. No other region in the Derwent estuary has this combination of habitats, or such large functioning examples of each habitat type. The area is recognised as habitat for threatened and/or protected species including dolphins, small whales and saltmarsh moths. Ralphs Bay tidal mudflats and salt marshes are recognised as critical habitat worthy of preservation and protection in the Derwent Estuary Environmental Management Plan, prepared in 2001.

Ralphs Bay is also recognised as significant habitat for many types of seabirds, particularly waders and shorebirds. Birds Tasmania has noted increases in the number of Pied Oyster Catchers feeding in Ralphs Bay, and links the increase to the loss of suitable habitat elsewhere. Up to 7% of the total Australian population of the Pied Oystercatcher can be found feeding in Ralphs Bay at certain times. This unique area is of critical importance as a refuge for shorebirds displaced by human activity elsewhere.

Ralphs Bay is close to the city of Hobart (15 minutes' driving time from Hobart to Lauderdale). The presence, within an urban context, of many migratory and threatened species under State and Federal legislation, is unique within Tasmania.

a.2 Ecological importance

- *Contributes to maintenance of essential ecological processes or life-support systems*

The biogeochemistry of sandflats and mudflats is complex, and varies from site to site with particle size, oxygenation, depth of sediments and other parameters. However, it is fair to say that sandflats, mudflats and the benthic sediments of bays and estuaries play important roles in nutrient cycling and regulating the quality of the overlying water body. Costanza *et al.* (Nature 15 May 1997) gave estuaries an annual value of US \$22 832 per hectare, for ecosystem services, including nutrient cycling. This was higher than the value calculated for any other ecosystem type on earth.

The benthic communities of Ralphs Bay and nearby areas in the Derwent estuary are surprisingly rich and biodiverse (Ecological Status of the Derwent and Huon Estuaries, Catriona Macleod and Fay Helidoniotis, November 2005, *NHT/NAP Project No. 46928*, http://www.utas.edu.au/tafi/PDF_files/NRMHuonDerwentReport.pdf).

Food chains in the area are under-researched, and thus there is much more to be learnt about the ecological processes and interrelationships between organisms in the Ralphs Bay/lower Derwent estuary area. However, invertebrates in the sandflats and mudflats are clearly essential food for the shorebirds, and benthic invertebrates in deeper water are food for the Spotted Handfish, among other species.

- *Contains habitat for rare or endangered species*

See comments already made in relation to “Uniqueness”.

- *Preserves genetic diversity ie is diverse or abundant in species*

Large resident Pied Oystercatcher population indicates the Ralphs Bay area is important as a reservoir of genetic diversity for this species.

Spotted Handfish populations are so low that safeguarding all remaining genetic diversity is a priority. Populations previously thought to be stable in other locations have been recently found to be completely absent, thus increasing the significance of Ralphs Bay populations with respect to the preservation of genetic diversity even further.

Species diversity in benthic communities has been recognized in recent survey work (Catriona Macleod and Fay Helidoniotis, November 2005).

High quality saltmarsh communities. See details under a.3 below, taken from the National Estate listing.

- *Contains areas on which other species or other systems are dependent, eg contain nursery or juvenile areas or feeding, breeding or rest areas for migratory species.*

All of these apply to Ralphs Bay and nearby parts of the lower Derwent estuary.

Sandflats and mudflats are recognized as fish nurseries, where young fish find food and refuge from predators, which are unable to follow them into shallow water.

Ralphs Bay contains important breeding sites for Pied Oystercatchers and other resident shorebirds, as well as for Swamp Harriers, which breed at the South Arm Neck. Ralphs Bay is particularly important for Pied Oystercatchers in the winter months, as there is a significant rise in their numbers in the Bay at this time.

Saltmarsh vegetation provides feeding and breeding habitat for threatened moth species.

Rest and feeding habitat around the Ralphs Bay sandflats and mudflats is critical for migratory birds, especially since this area is at the southern extremity of the East Asian/Australasian flyway. On arrival at the end of long migratory flights, it is essential that the birds find adequate undisturbed habitat for resting, feeding and moulting. These birds are under pressure from human encroachment on their habitat throughout the world, and have no alternative destination if they arrive at Ralphs Bay only to be met by habitat loss following inadequate reservation and protection.

- *Contains one or more areas which are a biologically functional, self-sustaining ecological unit.*

While Ralphs Bay contains a number of distinct habitat types, the whole bay is to some extent a separate ecosystem from the Derwent estuary. However, tidal flows naturally lead to exchange between the Bay and the estuary.

a.3 International or National significance

Ralphs Bay is on the register of the National Estate, ID number 17905. The entry recognizes the importance of Ralphs Bay for resident and migratory shorebirds, saltmarsh, geometrid moths and studies of invertebrate ecology.

Migratory birds using the area are listed under the Japan Australian Migratory Bird Agreement (JAMBA) and the China Australian Migratory Bird Agreement (CAMBA).

The Spotted Handfish and other Ralphs Bay species are listed in the Federal Environment Protection & Biodiversity Conservation (EPBC) Act, 1999.

The National Estate listing describes the “complex mosaic of vegetation communities [which] occurs within the saltmarsh and its peripheral vegetation according to variations in salinity, water and disturbance regimes. This mosaic is made up of eleven separate native communities. The saltmarsh community contains two plants considered rare in Tasmania: the Salt Lawrenca (*Lawrenca spicata*) and the Many-stemmed Bluebell (*Wahlenbergia multicaulis*). In addition, the saltmarsh contains vegetation communities that are rare in Tasmania: Puccinella grassland, *Sarcocornia blackiana* herbland and *Wilsonia* herbland.

On an unofficial visit to the bay with several members of Save Ralphs Bay Inc last year, the head of the International Ramsar Secretariat gave an informal opinion that the Ralphs Bay saltmarsh communities are of Ramsar quality, quite apart from the significance of the bird and fish species.

Although Ralphs Bay does not have Ramsar listing, Birds Tasmania studies have demonstrated interchange between bird populations at the Pitt Water/Orielton Lagoon Ramsar Site and Ralphs Bay. Thus impacts at Ralphs Bay can be expected to threaten

the ecological character of the listed Ramsar site, and, conversely, enhanced protection of Ralphs Bay will add further protection to bird populations at the nearby Ramsar site.

Can the Bruny Bioregion assessment Panel recommend Ramsar listing for Ralphs Bay?

a.4 Vulnerability Assessment

- *Contains ecosystems and/or communities vulnerable to natural processes*

It can be reasonably anticipated that ecosystems around the shores of Ralphs Bay and nearby areas along the eastern shore of the Derwent estuary will be impacted by sea level rise resulting from global warming. Already, piles of shellgrit, on which Pied Oystercatchers nest, have been tossed onto the roadside at Lauderdale and along the South Arm Neck.

b) Selection criteria

Again, Save Ralphs Bay Inc contends that all or almost all of these criteria apply to Ralphs Bay and nearby parts of the Derwent estuary. However, in this case, it is difficult to assign a priority order to the criteria, so they will be assessed in the order in which they appear in the Background Report.

b.1 Economic Interests

- *Existing or potential contribution to economic value by virtue of its protection, e.g. for recreation or tourism, or as a refuge or nursery area, or source of supply for economically important species.*

Recreation. The spectacular windsurfing area around Doran's Point is worthy of protection for recreational purposes and would not interfere with the natural values of the Bay. This is one of the best windsurfing areas in Tasmania. Bird watching, photography, painting, canoeing, kayaking and fishing from small boats are among other recognised recreational uses of the area.

Tourism. Ralphs Bay has the potential to be a major tourism destination, with suitable interpretation and visitor facilities. This part of Hobart's eastern shore is rich in natural and cultural heritage but lacks a tourism focus, which could be provided through appropriate interpretive facilities.

The rare and threatened species, saltmarsh communities and long-distance migrants would be one part of the Ralphs Bay story, but there is more: see also b.2 Indigenous Interests, b.3 Social Interests and b.5 Practicality/feasibility.

The Derwent is the estuary on which Tasmania's state capital is built, and Ralphs Bay, situated at the mouth of the Derwent estuary, is an ideal location for a new reserve. This reserve could increase community awareness of the importance of estuarine ecosystems and the ecosystem services they provide to human society. Given the bay is barely 15 minutes from the Hobart city centre, it presents a remarkable opportunity for a high conservation value reserve close to the city.

Refuge or nursery area. As mentioned previously, the Ralphs Bay sandflats and mudflats are likely to be refuge and nursery areas for juvenile fish. As such, they merit protection.

b.2 Indigenous Interests

Ralphs Bay has cultural significance to members of the aboriginal community as a whale birthing area and as a seasonal swan egg gathering area. Ralphs Bay also contains aboriginal middens. Early interactions between the aboriginal inhabitants of the area and European settlers were positive, with instances of cooperation and mutual help recorded (Kaye McPherson, pers. comm.)

b.3 Social Interests

Ralphs Bay is valued by the local and wider community for all its heritage, cultural, traditional, aesthetic, educational and recreational values.

In particular, light reflections on the sandflats and mudflats, especially early and late in the day, are appreciated by residents travelling across the South Arm Neck and along the Lauderdale foreshore. The tidal nature of the bay is a constant reminder to passers-by of the cycle of nature. The shorebirds feeding on the sandflats are greatly appreciated by the local community, especially in view of the astonishing distances travelled by some of the smallest migratory species. The unimpeded views across to Mt. Wellington are also valued.

Besides the aboriginal significance mentioned above, the Ralphs Bay area has a rich history since the days of early European exploration and settlement. The history of bay whaling in the Derwent estuary and associated bays, and the historic role of Droughty Point in the whaling story is highly significant, and a reserve in the area would create a focus for its interpretation. D'Entrecasteaux's early exploration of the place he named "Double Bay", Robert Mather's haulage service, and the failed Lauderdale canal are all worthy of interpretation to the public.

As an important tourism destination in the southeast, interpretation of more recent history would include the story of the pollution of the Derwent estuary by heavy industry, and the promising results of greatly improved management of the Derwent in recent times. The partnership between all three levels of government and industry players in the Derwent Estuary Program (DEP) could be showcased to serve as a model for similar situations elsewhere in Australia. It is possible the industry partners in the DEP may be

interested in contributing to the cost of interpreting the Ralphs Bay and Derwent estuary story.

b.4 Scientific interests

The Ralphs Bay area is of significant value for research and monitoring. The list below is only indicative of a range of important research topics in the area:

Spotted handfish. The Recovery Plan for Four Species of Handfish (DEH) lists research priorities in relation to this species. Adequately funded research on the current distribution, colony sizes, population dynamics and threats to the survival of the Spotted Handfish are high priorities. This much-needed research is significant at a Tasmanian, national and international level.

Heavy metals. Monitored Natural Recovery is a key strategy of the Derwent Estuary Program (DEP). Sediments throughout the Derwent need to be left undisturbed, while changes in heavy metal levels in the sediments and in the food chain are assessed and monitored over an extended timeframe.

Bioaccumulation of heavy metals in Ralphs Bay and Derwent food chains is another important research priority. Although data have been collected by the DEP in respect of flathead and deployed oysters, other researchers hope to extend their studies to a range of fish species and investigate bioaccumulation throughout the food chain. This has social and public health significance as the heavy metal levels in Derwent estuary seafood are a concern.

Sediment chemistry is another significant area. Detailed mapping of the heavy metal levels in relation to varying sediment types, and studies of the sediment chemistry, will allow some important questions to be tackled: are acid sulphates in Ralphs Bay sediments likely to be a problem, now or in the future? Can pulsed acid releases and release of heavy metals in more bioavailable forms be expected, if sediments are disturbed? Are heavy metals bound in lower sediment levels in the form of metal sulphides, with low bioavailability?

Food chains & ecological interactions in Ralphs Bay and surrounding areas of the lower Derwent estuary merit further study.

Invertebrate physiology in relation to heavy metals. Are invertebrates in Derwent and Ralphs Bay sediments avoiding, tolerating or excreting heavy metals? What is their susceptibility to heavy metal poisoning in the event of sediment disturbance?

Resident and migratory shorebird populations, including age structure and breeding success are important concerns, as are detailed studies of food species, abundance and availability at mapped locations in Ralphs Bay.

Fish nursery status of Ralphs Bay merits study, including attempts to estimate the economic value of the Bay in respect of commercial species, and modeling of future sea level rise impacts.

Current and sediment flows in Ralphs Bay and the surrounding area have been modeled by CSIRO researchers for the DEP, but there is scope for further research in this area. In the event of any major disturbance of Ralphs Bay sediments (eg following coastal development and dredging), it will be important to assess the likely flows of any sediments resuspended into the parent water body, both upstream with the incoming tide and downstream along the South Arm peninsula. This may be of critical importance in assessing the threat to remnant colonies of the Spotted Handfish in the event of such development.

Another important question concerns water flows (and possible sediment and/or heavy metal transport) around the South Arm Peninsula to Pipeclay Lagoon. This is important because aquaculture operations in Pipeclay Lagoon are critically dependent on good water quality. There are 40-50 people directly employed in aquaculture in Pipeclay Lagoon, and 60% of the oyster spat for the Tasmanian and South Australian oyster culture industry is supplied from Pipeclay Lagoon. Since oyster production in these two states is valued at \$40 million per annum, this suggests business worth \$24 million per annum is dependent on good water quality in Pipeclay Lagoon. It is no easy matter to resite an oyster nursery.

Climate change and sea level rise studies are needed, to address a variety of questions. What level of storm surge protection do the Ralphs Bay wetlands provide to the village of Lauderdale? How is this likely to change in years to come? How will shorebirds adapt to shoreline movement? What can be done to mitigate such impacts on shorebird populations? What impacts can be expected on saltmarsh communities? Is there scope for mitigation of such impacts? How might current and sediment flows change with rising sea levels? How will this affect sediment movements and the topography of the seabed?

The list could go on. There is no doubt that Ralphs Bay and nearby areas of the Derwent estuary have significant value for research and monitoring.

b.5 Practicality/feasibility

- *Degree of insulation from external destructive influences.*

If the Walker Corporation's proposed canal style development is rejected following its formal assessment, this area is remarkably free from external destructive influences.

The DEP has been very successful in improving the quality of stormwater and industrial effluent flows into the Derwent estuary, and it is to be hoped this improvement will continue. The diversion of treated effluent to the Coal River Valley represents a significant investment of Federal funding into reducing nutrient loads in the Derwent.

Zinifex is continuing to invest significant sums into reducing the flow of metals into the Derwent, and is currently focusing on reducing contaminated flows into the Derwent resulting from heavy rainfall events and exceptional stormwater flows.

- *Social and political acceptability, and a degree of community support*

The social and political acceptability of an MPA in and around Ralphs Bay is untested. However, concern for the safety of the Bay and appreciation of its natural values has been well tested by surveys of constituents carried out by a variety of politicians.

Constituent surveys by Harry Quick MHR, Senator Paul Calvert, Lin Thorp MLC and Will Hodgman MHA demonstrated around 70% community opposition to the proposal to excavate the sandflats of the Ralphs Bay Conservation area and build a canal style development.

The Save Ralphs Bay Inc response to the first Walker proposal was delivered to Minister Judy Jackson on 24 September 2004. It contained 2500 letters and personal messages opposing the proposal, and a detailed examination of the issues. In August 2005 we delivered a further 500 letters in the lead-up to the first anticipated cabinet decision on Project of State Significance status for the proposal.

Thousands more letters were sent directly to members of the government by the public. Minister Jackson's office began tallying the responses but was soon overwhelmed. Save Ralphs Bay Inc received the first 9 summary sheets of the tally following a Freedom of Information request: Out of the first 227 items of correspondence summarised in the Minister's office, 224 communications were opposed to the development; 2 supported it and 1 was neutral. This is 99% opposition, in unsolicited letters from concerned members of the public.

Whilst this does not equate directly to support for an MPA in the bay, it certainly indicates a concern to protect the natural values of the area.

Regarding political acceptability, once again we have no direct evidence of political support for an MPA in the area, but Save Ralphs Bay Inc has received strong support from politicians of all three major Tasmanian political parties, at the State and Federal level.

- *Access for recreation, tourism and education*

As mentioned already, the Ralphs Bay area is close to Hobart, and easily accessible for recreation, tourism and education.

Due to its unusual hooked shape, with landmasses facing onto Storm Bay, Frederick Henry Bay, Ralphs Bay and the Derwent estuary, the South Arm peninsula in general is an excellent "outdoor classroom" for the study of marine and coastal ecosystems. Within very short driving distances, students from Primary to University level can compare high

wave energy ecosystems facing onto Storm Bay (the surfing beaches at Clifton Beach and South Arm); very low wave energy, sheltered Ralphs Bay ecosystems (easily studied at Rokeby, Lauderdale, Mortimer Bay, South Arm and Opossum Bay), and the rock platforms and beaches facing the Derwent, at South Arm and Opossum Bay.

Thus students can be introduced to sandflats, mudflats, saltmarsh, dune systems and rock platforms with good zonation, all in the space of a few hours. The distinct communities of plants and animals found at such contrasting locations are easily observable, as are the abiotic factors shaping the ecosystems.

- *Lends itself to practical management (cost effectiveness, compliance etc)*

Proximity to Hobart and to Seven Mile Beach may be helpful in terms of the logistics of managing a reserve in the Ralphs Bay area.

The Derwent Estuary Program, which already has interpretation objectives, may be expected to make a positive contribution. DEP partners may be interested in contributing to the costs of a interpreting the Derwent estuary “story” in all its many facets.

b.6 Vulnerability Assessment

- *Extent to which the site is vulnerable and susceptible to human induced changes and threatening processes*

Most of the values of the Ralphs Bay area are currently threatened by the proposed Walker Corporation development in the north-east of the bay. The identified threats to the survival of the Spotted Handfish are principally those which impact on their habitat, including siltation caused by coastal development, and pollution (Recovery Plan for Four Species of Handfish, Department of Environment and Heritage). However, if this proposed canal-style development is rejected, and if enhanced protection is achieved for the area, and if the objectives of the State Coastal Policy are upheld in the future, Ralphs Bay and nearby areas in the Derwent estuary should not be unduly vulnerable or susceptible to human induced changes and threatening processes.

Conclusion

Save Ralphs Bay Inc strongly supports enhanced protection for the natural, social and cultural values of Ralphs Bay and nearby areas in the Derwent estuary. We look forward with interest to the Resource Planning and Development Commission’s recommendations on the establishment of Marine Protected Areas within the Bruny Bioregion.

References

No attempt has been made in this submission to provide comprehensive references. Material in the submission is mainly derived from publicly available documents such as the Background Report to the current Inquiry, the State of the Derwent report, Draft

Water Quality Improvement Plan for Derwent heavy metals, Derwent Estuary Environmental Management Plan prepared in 2001, Recovery Plan for Four Species of Handfish (Department of Environment and Heritage) and advice received from a variety of scientists and experts around Hobart.

Details of the two scientific papers referred to are given below:

NHT/NAP FINAL REPORT

ECOLOGICAL STATUS OF THE DERWENT AND HUON ESTUARIES, Catriona Macleod and Fay Helidoniotis, November 2005, *NHT/NAP Project No. 46928*

http://www.utas.edu.au/tafi/PDF_files/NRMHuonDerwentReport.pdf.

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**The value of the world's ecosystem services and natural capital,
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