MEETING FLIPPER IN THE WILD: MANAGING SWIM WITH DOLPHIN TOURISM IN AUSTRALIA
(Full Paper)

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ABSTRACT

Between 1998 and 2003 cetacean tourism in Australia expanded at a rate of 15 percent per annum (IFAW, 2004). Bottlenose dolphins are the primary target species for commercial dolphin tourism in Australia. This includes dolphin-watching boat trips, swim with wild dolphin tours and habituated wild dolphin-feeding programs. Specific groups of resident bottlenose dolphins in areas such as Shark Bay, Bunbury and Rockingham Bay (WA), Port Phillip Bay (Vic), Port Stephens, Jarvis Bay and Forster (NSW), Moreton Bay (Qld), Baird Bay and Adelaide (SA) have frequent encounters with boats or swimmers. The Australian National Guidelines for Whale and Dolphin Watching 2005 specify legal standards and best practice guidelines for cetacean interaction. However, there are still variations between different government jurisdictions and also the practices of dolphin tour operators. This paper focuses on commercial swim with wild dolphin tours in Australia. These tours have varied modes of in-water encounters with wild dolphins, from free swimming, mermaid lines, boom nets, and the use of motorised water scooters. The impacts on wild dolphins of these different types of swim tours, has not been examined. Commercial practices that are contrary to national or state guidelines for dolphins include operators breaching approach distances and times, the direction of approach and swim time. This paper examines the guidelines and practices of swim with dolphin tours, and makes some key recommendations for management of wild dolphin tourism.

Keywords: Swim-with-dolphins, Australia, national guidelines, tourism impacts

INTRODUCTION

Bottlenose dolphins (Tursiops spp.) are the primary target species for commercial dolphin tourism in Australia. This includes dolphin-watching boat tours, swim-with-dolphins tours and habituated wild dolphin-feeding programs at Monkey Mia and Bunbury (WA) and at Tangalooma Resort (Qld). Specific groups of resident bottlenose dolphins in areas such as Monkey Mia, Shark Bay, Bunbury and Rockingham Bay (WA), Port Phillip Bay
DOLPHIN SPECIES IN AUSTRALIA

There are 45 species of whales, dolphins and porpoises (i.e. cetaceans) found in Australian waters and all are protected species under Federal and state legislation. There are 14 dolphin species with the most frequently encountered species in coastal waters around Australia including the Bottlenose dolphin (*Tursiops spp.*), Common dolphin (*Delphinus spp.*), Spinner dolphin (*Stenella longirostris*), Indo-Pacific humpback dolphin (*Sousa chinensis*), and the Australian snub-fin dolphin (*Orcaella heinsohni*) recently identified as a separate species from the Inravaddy dolphin of Southeast Asia. Visitors at Tin Can Bay (QLD) feed two habituated Indo-Pacific humpback dolphins, although government approval has not been granted to this site (Garrett & Garbett, 1997; Green, 2005; Mayes, 1999; Stone, 2006). These dolphin species are part of the *Delphinidae* family group of oceanic dolphins that includes 26 dolphins and 6 toothed whales (Dolphin Planet, nd). In addition, there are two recognised species of Bottlenose dolphins in Australian waters; the resident or inshore Bottlenose dolphin (*Tursiops aduncus*) and the coastal or offshore Bottlenose dolphin (*Tursiops truncatus*). Commercial operators of dolphin watch boat tours and swim with wild dolphin tours in Australia mainly interact with Bottlenose dolphins (*Tursiops spp.*, both forms) and groups of Common dolphins (*Delphinus spp.*) further offshore. In New Zealand, commercial wild dolphin tours focus on Bottlenose dolphins in the Bay of Islands, Marlborough Sounds and Fiordland; Dusky dolphins at Kaikoura; Common dolphins; and endemic Hector’s dolphins at Porpoise Bay and Akaroa (Orams, 2004).

DOLPHIN TOURISM IN AUSTRALIA

Between 1998 and 2003 cetacean tourism in Australia expanded at a rate of 15 percent per annum (IFAW, 2004). Most of this growth in whale watch and dolphin watch tours has occurred along the east coast and west coast of Australia (Orams, 1997). Dolphin watch and dolphin swim tours focus on specific groups of bottlenose dolphins in areas such as Shark Bay, Bunbury and Rockingham Bay (WA), Port Philip Bay (Vic), Port Stephens, Jervis Bay and Forster (NSW), Moreton Bay (QLD) and Adelaide (SA) have frequent tourism encounters. This paper focuses on commercial swim with wild dolphins in Australia. These tours have varied modes of in-water encounters with wild dolphins, from free swimming, mermaid lines, boom nets, linked human chains and the use of motorised water scooters. The impacts on wild dolphins of these different types of swim tours, has not been examined. This paper reviews the guidelines and practices of swim-with-dolphin tour operators in Australia and makes some key recommendations for sustainable management of wild dolphin tourism. Information is derived from both academic studies about the impacts of boats and/or swimmers on dolphins in Port Phillip Bay and Port Stephens, media articles about dolphin tourism and the websites of dolphin tour operators, where there is no research on dolphins and other information is not available. Comparison is made with dolphin watching activities and the impacts of swim-with-dolphin tours in New Zealand.

In South Australia, dolphin swim boat tours began in January 2002 out of Adelaide. Another dolphin swim tour operator is located at Baird Bay on the western side of the Eyre Peninsula. Resident bottlenose dolphins also live in the Port River in Adelaide. This small group of urban dolphins has been affected by deaths from various illnesses, injury from boat propellers and deliberate shooting. In 2005, the Adelaide Dolphin Sanctuary was relocated to the Barker Inlet of the Port River to protect these dolphins. In southern Tasmania, Bruny Island Charters view dolphins, fur seals, penguins and other seabirds. In New Zealand, dolphin watching and swimming tours developed at several locations since the late 1980s. By June 2001, there were 75 permits issued for commercial dolphin tours.
with 14% of international visitors to New Zealand joining dolphin swimming or watching tours (Ornans, 2004). Key locations for swim with dolphin tours include the Bay of Islands (Bottlenose dolphins), Bay of Plenty and Coromandel Peninsula (Common dolphins) in the North Island, and Kaikoura (Dusky dolphins) and Akaroa Harbour (Hector’s dolphins) in the South Island (Constantine & Yin, 2003; Luck, 2003; Cloke & Perkins, 2005).

**NATIONAL GUIDELINES FOR DOLPHIN SWIM TOURS**

Australian national guidelines for cetacean observation were developed in 2000 with these guidelines for whale and dolphin watching revised in 2005. Only authorised tour operators are allowed to swim or dive with wild dolphins. The guidelines for swimming with dolphins set approach distances for boats (50m) and swimmers (30m), stipulate movements and boat speeds around dolphins, ban swimming with calves and also while dolphins are resting or feeding (see Table 1). The Australian National Guidelines for Cetacean Observation 2000 stated do not swim with a focal fold calf and prohibited the use of SCUBA or HOOKAH equipment. The Australian National Guidelines for Whale and Dolphin Watching 2005 (DEH, 2005) do not allow swimming with a dolphin calf less than half the length of the mother but includes divers with SCUBA or hookah diving gear along with swimmers and snorkellers. All personal motorised watercraft (e.g. jet skis and underwater scooters) were also prohibited from use. Other areas have amended their regulations for cetacean interaction to follow the provisions set in the Australian national guidelines (2000 and 2005), most recently in 2006 for the Great Barrier Reef Marine Park (GBRMPA, 2006, 2007a,b; Minister for the Environment and Heritage, 2006) and in New South Wales (NPWS, 2006). States have also developed their own specific legislation and guidelines for cetacean encounters. No wild dolphin swim tours are allowed in Queensland. In New South Wales, Bottlenose dolphins and Common dolphins were excluded from 2002 fauna protection laws but included in 2006 marine mammal regulations. Guidelines for dolphin operators in Port Stephens and Jervis Bay specify a 30m-approach distance. In Victoria, the Wildlife (Whales) (Amendment) Regulations 2004 specify approach distances of 30m for swimmers and surfboarders, 50m for boats and 100m for motorised swimming aids (e.g. underwater scooters). Dolphin swim tours in Port Phillip can have a maximum of 10 swimmers and 20 minutes with one pod and up to four approaches. Boats must also stay 100m away from focal-fold calves. In New Zealand, wild dolphin tourism is regulated by the Marine Mammals Protection Regulations 1992, with dolphin permits issued by the Department of Conservation.

<table>
<thead>
<tr>
<th>Table 1: Australian national guidelines for swim-with-dolphin tours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Swimming and Diving</strong></td>
</tr>
<tr>
<td>Swimming, snorkelling or diving with dolphins is prohibited, except for an authorised swim program or for scientific or educational purposes.</td>
</tr>
<tr>
<td>Swimmers and snorkellers and divers should not enter the water closer than 50m to a dolphin, and should not approach closer than 30m to any animal.</td>
</tr>
<tr>
<td><em>If approached by a dolphin move slowly to avoid startling the animal and do not attempt to touch it or swim towards it.</em></td>
</tr>
<tr>
<td><strong>Swimming and Diving</strong></td>
</tr>
<tr>
<td>Vessels should not actively tow swimmers, nor place swimmers directly in the path of dolphins, nor with dolphin calves or pods containing calves (a calf less than half the length of the mother)</td>
</tr>
<tr>
<td><em>In the water do not disturb, chase or block the path of a dolphin.</em></td>
</tr>
<tr>
<td><strong>Specific issues in developing or reviewing dolphin swimming operations:</strong></td>
</tr>
<tr>
<td>Limits on the numbers of vessels and/or swimmers; Maximum watching time with a pod per day; Establish no approach times (e.g. dolphins feeding, resting); Temporal or spatial exclusion zones; Distance of swimming to dolphins, &amp; Use of mammal lines or boom nets.</td>
</tr>
<tr>
<td>Notes: Tier 2 - Additional Management Considerations (State/Territory) Regulations, permits, licences &amp; management plans. \includegraphics{swim.png}</td>
</tr>
</tbody>
</table>

**SWIM WITH WILD DOLPHIN TOURS**

Swim with wild dolphin tours in New Zealand focus exclusively on in-water encounters with Bottlenose dolphins. Dolphin swimming boat tours operate at Rockingham, Bunbury and Mandurah (WA), Forster and Port Stephens (NSW), three in Port Phillip Bay (VIC) and at Adelaide and Baird Bay (SA) (see Table 3). These swim with dolphin tours began in 1986 at Port Phillip Bay, the early 1990s at Port Stephens, Forster, Baird Bay and Rockingham Bay; in 1999 at Bunbury and Mandurah; and at Adelaide in 2002. The only approved shore-based in-water encounter with wild dolphins is floating in the beach interaction zone at the Dolphin Discovery Centre in Bunbury (WA). The habituated dolphin feeding sites of Monkey Mia, Tangelooona and Tin Can Bay either do not allow or discourage visitors from swimming with dolphins. Visitors stand in water up to their ankle, knee or thigh but do not swim with dolphins. Swim with wild dolphin tours are not allowed in Queensland. Permits are required for commercial dolphin tours from state government environmental agencies since the late 1990s, with specific national guidelines for cetacean interactions since 2000. Visitors from eight to 86 years old have swim with dolphins (Greenwood, 2004). The minimum age for swimmers varies from eight years (Adelaide, Bunbury) to 12 years (Baird Bay) up to 15 years (Forster). In Port Phillip Bay there is a maximum of 10 swimmers in the water at one time and a maximum of 20 minutes interaction with one pod. The swim operator at Forster only allows one person at a time in the water. At Bunbury, the dolphin swim tour takes 10 swimmers with a maximum of 60 minutes in-water time (O’Neill, Barnard & Lee, 2004a,b; DCC, 2005). Some of the dolphin swim tours only operate for 8-9 months, excluding the colder winter period (e.g. Rockingham Bay, Bunbury & Baird Bay) but most operate year-round. Visitors can also swim with captive bottlenose dolphins at Sea World (Gold Coast, Qld) and the Pet Porpoise Pool (Coffs Harbour, NSW) but these are not included.
TYPES OF IN-WATER ENCOUNTERS WITH DOLPHINS

There are varied modes of in-water encounters with wild dolphins on these boat tours motorised water scooters (Table 2). The recommended boat approach is parallel or side-swimmers enter the ocean near dolphins. Swimmers usually wear a wetsuit, mask and fins), before 1995 in Port Phillip Bay and by one operator at Port Stephens. Mermaid lines attached, which swimmers hold onto at all times while watching dolphins either above or Forster and Adelaide use mermaid lines. Usually several people hold onto one mermaid holding onto this line. These mermaid lines are placed in the water near dolphins and line and are towed slowly behind the boat. Snorkel lines made swimmers feel safer, restricted by the lines (O’Neill, Barnard & Lee, 2004a). Mermaid lines are compulsory in Port Phillip would prefer free swimming with dolphins rather than using mermaid lines attached at the rear as the boat moves along. Boom netting is more of a recreational rope bow nets at the front of a vessel to observe and be close to bow riding dolphins Dolphins. Staff use underwater scooters and tow swimmers along near the dolphins. The There is a maximum of three teams in the water at one time and six people in each team were used to staff ‘herd’ or move dolphins closer to the surface for tourists to observe and interact with. The 2005 national guidelines for cetacean interaction prohibit dolphin swim operator in Port Phillip Bay previously used scooters. In 2004, private water scooters were restricted to 100m while tour boats could approach dolphins to 50m.

Table 2: Dolphins habituated to ‘swim with dolphins’ boat tours

<table>
<thead>
<tr>
<th>Location</th>
<th>Affected dolphins</th>
<th>Type of dolphin interaction</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rockingham, WA</td>
<td>130-150 resident dolphins, some known individuals (Lego, Boomrang)</td>
<td>swimming free swim</td>
<td>SW operator since early 1990s c. 30 swimmers per day max. 5 teams in water at once 1 SW tour a day, Sept-May seasonal SW operator 1999-2004 max. 8 tourists, 1 trip per day</td>
</tr>
<tr>
<td>Mandurah, WA</td>
<td>80-100 resident dolphins, some known individuals (Lego, Boomrang)</td>
<td>free swim</td>
<td>seasonal SW operator since 1999 Nov. to April, 1 tour a day max. 10 swimmers, min. age of 8 max. 50 min. in-water time also SW provided dolphins</td>
</tr>
<tr>
<td>Bunbury, WA</td>
<td>50 resident dolphins 150-200 dolphins, S-S regular dolphins known individuals (Linda, Sharkie)</td>
<td>mermaid line (blue) free swim</td>
<td>since 1991, voluntary code max. 2 boats/100 min. pod Marine Park zoning in 2007</td>
</tr>
<tr>
<td>Forster, NSW</td>
<td>100-150 coastal dolphins, c.50% resident, c.50% involved in DW tours resident &amp; common bottlenose dolphins, common dolphins</td>
<td>sit in bow nets, free swim</td>
<td>since 1998s, 1 person at a time take turns, min. age of 15</td>
</tr>
<tr>
<td>Port Phillip Bay, VIC</td>
<td>80-100 resident dolphins, 50 dolphins interact with tour boat, 6 key dolphins</td>
<td>mermaid lines (since 1993) free swim (prior to 1995)</td>
<td>SW from 1984 operating code 1995 state licensing since 1997 max. 10 swimmers, 20 minutes max. a approaches per 1000 tour c.50% compliance in 2001</td>
</tr>
<tr>
<td>Adelaide, SA</td>
<td>resident bottlenose &amp; common dolphins, 100 coastal dolphins 2 known dolphins (Jack, Mollusk)</td>
<td>mermaid line</td>
<td>SW operator since Jan. 2002 max. 20 mins with 1 pod min. age of 8 (up to 86) use electronic shark shields</td>
</tr>
<tr>
<td>Baird Bay, SA</td>
<td>resident dolphins</td>
<td>free swim</td>
<td>mask &amp; snorkel only (no fins) min. age of 12 no sunscreen/chemicals</td>
</tr>
</tbody>
</table>

Notes: SW = Dolphin watch, in-water encounters by wetsuit with wild dolphins, DW = Dolphin watching boat, All bottlenose dolphins SW provided dolphins exceptional & disoccupied at Monkey Mia. SW provided dolphins prohibited at Tangalooma. Other dolphin watching (DW) boat tours operate in Jarvis Bay, NSW, Shark Bay WA, Moreton Bay QLD & Tasmania. Moreton Bay N/A. Pods & Great Barrier Reef Marine Park (Qld) prohibit feeding & swimming with dolphins. Source: Based on Summalls, Beijer, Constable and Heidrick, 2003 [SW Dolphin operators in Forster & Baird Bay are new additions]

IMPACTS ON DOLPHINS

The Action Plan for Australian Cetaceans (Bannister, Kemper & Warneke, 1996) highlighted potential impacts on wild bottlenose dolphins from the growth in dolphin tourism (i.e. dolphin watching, dolphin swim tours & dolphin feeding). Key research studies identify and evaluate the impacts of cetacean tourism (i.e. boats, swimmers) on wild dolphins (Allen, 2005; 2006; Beijer & Summalls, 2003; Higham & Lusseau, 2004; Lemon et al., 2006; Rees, 2006; Summalls et al., 2003; Scarscini et al., 2003, 2004).
IMPLICATIONS OF DOLPHIN WATCH BOATS

In Australia, research on the biological impacts of tour boats on wild dolphin behaviours has been conducted in Port Phillip Bay, Victoria (Doolan, 2002; DRI, 2005; Hale et al., 2003) Port Stephens NSW (Allen, 2003, 2005; Allen in Clarke, 2005; Allen in Dasey, 2006; Shark Bay WA (Bejder et al., 2006; Bejder in Dasey, 2006). This research found increased avoidance behaviour by dolphins around tourist boats (e.g. deep dive, changing direction), increased whistling, dispersal from key habitats, decreased resting, increased into subgroups, displacement of mothers and calves and reduced dolphin births and survival (see Table 3). Other recreational boaters, jet skiers and canoists also harassed dolphins by going too close or crossing through pods.

These impacts on wild dolphin behaviours were mainly observed in high-use areas with four or more dolphin watch operators in Port Stephens and Port Phillip Bay. The 2004, 205, 2006; Hale, 2002; Scapac et al., 2003, 2004). One dolphin cruise operator at commercial boats on dolphins. The main dolphin watching area in Port Stephens was an area where dolphin mothers would congregate in the summer with 12 to 15 new calves but also reduced operator's compliance with a voluntary code of conduct for dolphin operators went closer to 50m to dolphins (Hawkins & Gartside, 2004). Research in dolphins avoiding boats, milling, dispersing into other areas and lower birhds. At Shark Bay and also found that these impacts on dolphins occurred within four years of a second dolphin cruise that started in 1998 (Bejder et al., 2006). Research studies in New Zealand have also identified similar impacts on wild dolphins by four tour boats or swimmers at Mercury and Akaroa Harbour (Constantine et al., 2003, 2004; Nicols et al., 2001; Orams, 2004, 2005).

<table>
<thead>
<tr>
<th>Location</th>
<th>Affected dolphins &amp; Biological impacts on dolphins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rockingham, WA</td>
<td>120-150 resident dolphins, some known individuals, 1 SW operator</td>
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<tr>
<td></td>
<td>Underwater scooters ‘herd’ dolphins near surface; boat near swimmers (Wales, 2004)</td>
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<tr>
<td>Bunbury, WA</td>
<td>50 resident dolphins, 100/150 dolphins in Koombana Bay, 1 SW operator</td>
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<tr>
<td></td>
<td>Dolphins avoid floating normal lines in water (O’Neill, Barnard &amp; Lee, 2004)</td>
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<tr>
<td></td>
<td>15% decrease, reduced dolphin births &amp; survival rate (Bejder in Dasey, 2006)</td>
</tr>
<tr>
<td></td>
<td>Loss of 1 in 7 dolphins, shift in habitat use to non-tour areas (Bejder et al, 2006)</td>
</tr>
<tr>
<td>Port Stephens, NSW</td>
<td>100-150/200 coastal dolphins, c.50% resident, c.50% involved in DW tours 9 permanent &amp; 6 occasional tour boat operators; 250,000 tourists a year</td>
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<td></td>
<td>Decrease in resting behaviour, splitting into subgroups (Allen, 2005; Clarke, 2005)</td>
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<td></td>
<td>Displaced mothers &amp; calves from dolphin watching area, less interaction &amp; decrease in dolphin playing, resting &amp; socialising (Griffiths in Clarke, 2005)</td>
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<td></td>
<td>Changes in dolphin movement patterns, behaviour &amp; social grouping, exclusion from preferred habitat etc (Allen, 2003, 2005; Allen in Dasey, 2005)</td>
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<tr>
<td></td>
<td>Increase in travel and milling by dolphin pods affected by boats; decreased foraging, resting and socialising by dolphin schools (Allen, 2003, 2005)</td>
</tr>
<tr>
<td>Jervis Bay, NSW</td>
<td>60-80 resident dolphins, 120 with transient dolphins, 2 DW tour operators</td>
</tr>
<tr>
<td></td>
<td>Dolphin behaviour changed from travelling to milling, &amp; changed their direction away from an incoming boat beyond 30m (Lemon et al., 2006; SHIMS, 2006)</td>
</tr>
<tr>
<td>Port Phillip Bay, VIC</td>
<td>80-100 resident dolphins, many known individuals, 3 SWI DW tour operators</td>
</tr>
<tr>
<td></td>
<td>(pre-1995) Boats herding dolphins close to the shore, people grabbing dolphins &amp; trying to ride or climb onto their backs, 1 dolphin approaches boat as a decoy while rest of pod swims away, chased by powerboats &amp; jet skis, harassment by boats, dorsal fin of dolphin cuffed in half by boat propeller; dolphins avoiding boats, fewer dolphins around, to swim with dolphins, increased dolphin whistling near tour boats (Jarvis &amp; Ingleton, 2001; Doolan, 2002; Hale 2002; Higgiebottom, 2002; Scapac et al., 2000, 2003, 2004)</td>
</tr>
<tr>
<td></td>
<td>Increased avoidance behaviour by dolphins around boats (deep dive, changing direction)</td>
</tr>
<tr>
<td>Adelaide, SA</td>
<td>2006</td>
</tr>
<tr>
<td></td>
<td>Resident dolphins, some known individuals, 1 SW operator (Temptation Sailing, Electronic field from shark shield deterrent has no effect on dolphin interaction)</td>
</tr>
</tbody>
</table>
IMPACTS OF DOLPHIN SWIM TOURS

Research about the impacts of wild dolphin swim tours on dolphins has been conducted for Bunbury (O'Neil, Barnard & Lee, 2004a) and Port Phillip Bay (Scapacci et al., 2000, distributing swimmers, towing and retrieval increased avoidance behaviour by dolphins hazard like fishing nets in the water. At Rockingham Bay, one operator also noted that tourists interact with. At Baird Bay South Australia there is a 50% in-water encounter Adelaide, a 'Shark Shield' device at the end of the mermaid line creates a electrical field device has not affected dolphin interactions, with an average swim with dolphin time of swimmers holding onto a flotation line (Greenwood, 2004; Temptation Sailing, 2007).

In Port Phillip Bay, research about the impacts of boats and swimmers on wild dolphins began in 1996 (Weir, Dunn, Bell & Chatfield, 1996). Boats herded dolphins closer to the ride or climb onto their backs (Jarvis & Ingleton, 2001). Whale regulations in 1998 Ingleton, 2001). New regulations in 2004 though prohibit dolphin swimming only within Philip were unsuccessful; while in 2001 the average dolphin interaction time time was 35 two to three dolphin trips per day by each operator (Weir, 2000; Samuels et al., 2003), and the average of total swim time from 32 between approaches to dolphins and an average of three minutes for individual swims. Staff on two dolphin boats stated that it was getting harder to have a good swim Zealand, bottlenose dolphins in the Bay of Islands also increasingly avoided boats and whistled more when swimmers entered the ocean water nearby, while Common dolphins metres and mainly interacted in larger groups over 50 dolphins (Neumann & Orans, referred area with dolphins bunching in tighter groups (Bejder, Dawson & Harraway,

with empty mermaid lines in the water and with no time limits on the lines left in the water, previously set at a maximum of 20 minutes at one time in 1998 (DSE, 2004). In 2001, there was an average of 50% compliance by operators with dolphin interaction guidelines (Samuels et al., 2003). According to Scapacci et al (2003) the compliance level in 1998-2000 with four key permit conditions was: No swimming with fetal fold calves (69%); parallel or side-on approach type (54%); swim time (39%); and time spent in proximity to dolphins (38%). A review of dolphin swim tours in Port Phillip Bay recommended further restrictions on proximity of boats to dolphins and a maximum of 10 people participating in a dolphin swim (Hole, 2002). A follow-up study of 16 dolphin swim trips in 2002/03 evaluated 149 boat approaches and 25 swims with dolphins. Results from 1998-2000 were also compared with 2002-2003 (Scapacci et al., 2004). It found a decrease in compliance with dolphin swim permit conditions such as parallel boat approach (53%, n=79) and an increase in illegal boat approaches (i.e. direct or ‘J’ hook turns) from 36% to 47%. There was a slight increase in compliance with dolphin swim time from 39% to 42% but a decrease of 9% in compliance with proximity times within 100m of dolphins. However there was 100% compliance with the maximum of 10 swimmers at one time with an average of 6 people swimming with dolphins (Scapacci et al., 2004). Compliance with dolphin swim permit conditions has not been evaluated at other sites in Australia. At the Bay of Islands in New Zealand, bottlenose dolphins mainly avoided swimmers that entered the water directly in the path of travelling pods or in the middle of a group of milling dolphins, rather than side-on (Constantine, 2001). In Doubtful Sound, only 34% of 73 dolphin-boat interactions complied with approach guidelines of the Marine Mammals Protection Act (Lusseau, 2003; Lusseau & Higham, 2004).

MANAGING DOLPHIN SWIM TOURISM

The Australian National Guidelines for Whale and Dolphin Watching 2005 identified specific issues in developing or reviewing dolphin swimming operations. These are:

- Limits on the numbers of vessels and/or swimmers
- Maximum watching time with a pod per day (individual and cumulative)
- Establishment of no approach times (e.g. Dolphins feeding, resting)
- Need for temporal or spatial exclusion zones
- Distance of swimmers to animals
- Use of mermaid lines or boom nets (DEH, 2005).

Swim with wild dolphin tourism in Australia is managed with a range of regulatory, physical, economic and educational strategies (see Table 4). The Australian National Guidelines for Whale and Dolphin Watching 2005 standards for approach distances (50m boats, 30m swimmers), vessel movements, time periods, placement of vessels and swimmers and guidelines for dolphin swim encounters. Exceptions include the use of motorised underwater scooters in dolphin swim tours at Rockingham Bay, not allowed in the national guidelines, and a 30m minimum boat approach distance in NSW. Swimming

imply permits for dolphin swims

Port Phillip Bay, dolphin swim tours can have a maximum of 10 swimmers in the water and 20 minutes with one dolphin or pod (within 100m) and up to four approaches per day. New regulations in 2004 allow operators to reposition their boats
Table 4: Management strategies for swim with wild dolphin tourism

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Management of dolphin swim tourism</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWIM WITH DOLPHIN TOURS</td>
<td></td>
</tr>
<tr>
<td>Regulatory</td>
<td>Standards set in the Australian National Guidelines for Whale and Dolphin Watching 2003</td>
</tr>
<tr>
<td></td>
<td>Swimmers to not enter the water closer than 50m &amp; not approach closer than 30m to a dolphin</td>
</tr>
<tr>
<td></td>
<td>Vessels to not actively tow swimmers, nor place swimmers directly in the path of dolphin(s)</td>
</tr>
<tr>
<td></td>
<td>nor with dolphin calvies or pods containing calves (less than half the length of the mother)</td>
</tr>
<tr>
<td></td>
<td>No approach white dolphins are resting or feeding, have calves or are disturbed by swimmers</td>
</tr>
<tr>
<td></td>
<td>Sanctuary areas for dolphins e.g. Thunder Bay (Port Phillip Bay); 200m minimum approach.</td>
</tr>
</tbody>
</table>

Physical

- Tourists hold onto floating mermaid lines, farm linked human chains, or sit/lie in boom nets
- Personal motorised watercraft (e.g. jet skis and underwater scooters*) are prohibited
- Mask & snorkel only, float in dolphin interaction zone (Bunbury, WA), shark shield pod (SA)
- Parallel or side on approach strategy to dolphins by boats and swimmers

Economic

- Higher fees charged for swim with dolphin tours, portion of fee used for dolphin research*
- Permit fees paid by commercial swim with dolphin tour operators

Educational

- Dolphin interpretation to visitors on the boat, dolphin books, fact sheets, charts & brochures
- Seminars by dolphin researchers for swim with dolphin tour operators & local residents
- Voluntary codes of conduct by dolphin watching association (Port Stephens/operators (Port Phillip) Agency education about dolphin guidelines and permit conditions for commercial operators

Notes: *includes swimmers, snorkellers & divers with SCUBA or breathing gear.
* Underwater scooters used only in consultation, etc. with qualified operators (Port Phillip) (Port Phillip)

DISCUSSION AND RECOMMENDATIONS

The UN International Year of the Dolphin 2007 aims to raise awareness of wild dolphins and human impacts that threaten dolphins. Management of dolphin tourism in Australia ranges from voluntary operator codes to national guidelines and strict legislative regulation of dolphin watching, swimming and feeding programs. The Australian National Guidelines for Whale and Dolphin Watching 2003 specify legal standards and best practice guidelines for cetacean interaction (Lee & O'Neill, 2000). However there are still variations between different government jurisdictions and also the practices of dolphin tour operators (Harcourt, 2004; Kearns, 2005). The national guidelines ban underwater scooters; but at Rockingham Dolphins (2007) staff tow swimmers along using these devices (Waites, 2004). National guidelines also specify a minimum boat approach distance of 50m from dolphins but at Port Stephens and Jervis Bay the minimum approach is 30m. Other commercial practices that are contrary to national cetacean guidelines and/or state regulations for dolphins include operators breaching approach distances and times, the direction of approach and swim time (Scarpaci et al., 2003, 2004). Dolphin operators have promoted voluntary codes of conduct in Port Phillip Bay and Port Stephens since the mid-1990s, though with limited success in the peak summer season, entry of new operators and increased competition (Allen, 2003). Dolphin tourism has been regulated in Port Phillip Bay since 1997 while Port Stephens is now part of the Great Lakes-Port Stephens Marine Park with new dolphin sanctuary zones effective from March 2007. In Port Phillip Bay, despite revised dolphin interaction guidelines in 2002, compliance by operators with most dolphin swim permit conditions did not improve. The exception was full compliance with the maximum of 10 swimmers at one time in the water with dolphins. The other breaches in boat approaches, swim times and time spent in proximity to dolphins are mainly to satisfy visitor expectations of close encounters with wild dolphins (Scarpaci et al, 2004). At other sites in Australia with a sole dolphin tour operator (e.g. Adelaide, Baird Bay, Forster, Bunbury & Rockingham Bay), compliance with dolphin swim permit conditions has not been evaluated.

With wild dolphins is prohibited in Queensland and at dolphin provisioning sites. State legislation is mainly based on national guidelines for whale and dolphin watching. In Victoria, specific regulations apply to dolphin swimming and dolphin watching in Port Phillip Bay while in New South Wales there has been minimal regulation of commercial dolphin tourism at Port Stephens. There is limited or inconsistent enforcement of current regulations for wild dolphin tourism. Physical strategies include the use of floating mermaid lines by dolphin swim operators in Port Phillip Bay, Adelaide and Forster. Two dolphin swim operators in Bunbury and Baird Bay use the free swim method, the latter not using fins. All states recommend the parallel or side-on approach strategy by boats to wild dolphins. Economic strategies include charging higher fees for a wild dolphin swim tour, usually double the dolphin watching fee, with a small portion of the tour fee funding dolphin research in Port Phillip Bay, Port Stephens and Adelaide. Educational strategies include dolphin interpretation onboard boats or at visitor centres. Dolphin operators have promoted voluntary codes of conduct in Port Phillip Bay and Port Stephens, though with limited success. Government agencies also educate commercial operators about dolphin watching or swimming guidelines. In New Zealand, a similar range of regulatory, economic and educational strategies are used to manage wild dolphin tourism (Orams, 2004). The side-on approach strategy to dolphins is adopted, however, mermaid lines and underwater scooters are not used on dolphin swim tours.

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operators at Shark Bay also increased the impacts on resident bottlenose dolphins, with only one permit to be offered by the West Australian government in 2007 (Bejder et al., 2006; The Australian, 2006). At Port Phillip Bay, by 2003 there was a decrease in average total swim time from 32 to 26 minutes, four minutes between approaches to dolphins and three minutes for individual swims (Scarpaci et al., 2004). A survey at Bunbury found tourists watching dolphins from a boat saw more dolphins and were more satisfied than those swimming with dolphins. Swimmers (n=223) were unhappy with visibility underwater (37%, 3m at best), cold water and weather (30%) and lack of proximity to dolphins (17%) with half of those of came within 5 metres stating this was still too distant (O’Neill, Barnard & Lee, 2004a). The proximity, number of dolphins and length of time that tourists need to swim with wild dolphins to be satisfied has not been studied. Nor has tourist and operator preference for the type of in-water dolphin encounter method such as mermaid lines, free swimming, underwater scooters and boom nets.

CONCLUSIONS

Bottlenose dolphins are the primary target species for commercial dolphin tourism in Australia. This includes dolphin-watching boat tours, swim-with wild dolphins and three habiuated wild dolphin-feeding programs. Specific groups of resident bottlenose dolphins in areas such as Shark Bay, Bunbury and Rockingham Bay (WA), Port Phillip Bay (Vic), Port Stephens, Jervis Bay and Forster (NSW), Moreton Bay (Qld), Adelaide and Baird Bay (SA) have frequent encounters with tour boats and/or swimmers. The sustainability of wild dolphin tourism in Australia depends on consistent application of national cetacean guidelines in all states such as the 50m minimum boat approach distance, no swimming with calves and a side-on approach. The impacts on wild dolphins of different types of swim tours, needs to be examined. The revision or rewriting of some dolphin interaction guidelines (e.g. maximum of 10 swimmers in the water at one time) and government consultation along with education may also improve compliance by dolphin tour operators (Scarpaci et al., 2004). State regulations for dolphin swimming and dolphin watching activities need to be enforced, with penalties for breaches by commercial operators and by recreational visitors. Sanctuary zones, setting daily interaction times and reducing the number of operators/boats around pods would help to reduce impacts on dolphins. Promoting alternative marine activities such as snorkelling with fish (e.g. Moreton Bay) or seals (e.g. Phillip Bay, Baird Bay), water sports (e.g. boom netting, Port Stephens) and seeing other marine life (e.g. seabirds, turtles) broadens the emphasis away from just swimming with wild dolphins, which is not allowed in Queensland. It may also reduce potential visitor dissatisfaction with the brevity, distance or method of swimming with wild dolphins and number of other boats in the vicinity. Ongoing research about the impacts of tourism on the behaviour of wild dolphins should also underpin relevant management strategies, regulations and guidelines. This is required for longer-term sustainability of resident dolphins and dolphin-based tourism in Australia.

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