[1] "\r\n\r\n\t\r\n\r\n\r\n \r\n \r\n \r\n Lepidochelys olivacea\r\n — Olive Ridley Turtle, Pacific Ridley Turtle\r\n \r\n \r\n \r\n \r\n \r\n Glossary\r\n \r\n\r\n\r\n\r\n\r\n \r\n SPRAT\r\n Profile\r\n \r\n\r\nFor information to assist regulatory considerations, refer to Policy Statements and Guidelines, the Conservation Advice, the Listing Advice and/or the Recovery Plan.\r\n\r\n\r\n\r\n \r\n EPBC Legal Status and Documents\r\n \r\n \r\n Top\r\n \r\n\r\n\r\nEPBC Act Listing Status\r\n \r\n\t \r\n\t\t\t\r\n\t\t\t Listed as Endangered\r\n\t\t\t \r\n\t\t\t \r\n\t\t\t\t(Date effective 16-Jul-2000)\r\n\t\t\t \r\n\t\t\t Listed marine\r\n\t\t\t \r\n\t\t\t \r\n\t\t\t\r\n\t\t\t\t\r\n\t\t\t Listed migratory -\r\n\t\t\t \r\n\t\t\t\tEPBC Act, \r\n\t\t\t\r\n\t\t\t\tBonn\r\n\t\t\t \r\n\t\t\t\r\n\t\t\t\r\n\t\t\t\r\n\t\t\t\r\n \r\n \r\n\t Approved Conservation Advice\r\n\t\t\r\n\t\t\r\n\t \r\n\t\tThere is no approved Conservation Advice for this species\r\n\t \t \r\n\t\t\r\n \r\n\t Listing Advice\r\n\t\t\r\n\t\t\r\n\t\t\t\r\n\t\t\t\t\r\n\t\t\tThere is no Listing Advice for this species\r\n\t\t\t\r\n\t\t\r\n\t\t\r\n \r\n\t Recovery Plan Decision\r\n\t\t\r\n\t\t\r\n\t \r\n\t Recovery Plan required, this species had a recovery plan in force at the time the legislation provided for the Minister to decide whether or not to have a recovery plan (19/2/2007).\r\n\t\t\t \r\n\t\t \r\n\t\t\r\n \r\n\t Adopted/Made Recovery Plans\r\n\t\t\r\n\t\t\r\n\t\t \r\n\t\t\t \r\n\t\t\t Department of the Environment and Energy (2017). 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Threatened Species of the Northern Territory. (Taylor, R., R. Chatto, J. Woinarski, S. Whiting & S. Ward, 2012a) [Information Sheet].QLD:Olive ridley turtle (Pacific ridley) (Department of Environment and Heritage Protection (DEHP), 2013as) [Database].\r\n State Listing Status\r\n\t \r\n\t NT:\r\n\t\t\t\r\n\t\t\t\tListed as Vulnerable\r\n\t\t\t\t (Territory Parks and Wildlife Conservation Act 2000 (Northern Territory): 2012 list)\r\n\t\t\t\t\r\n\t\t\t \r\n\t\t \r\n\t\t\t\r\n\t\t\t\tQLD:\r\n\t\t\t\r\n\t\t\t\tListed as Endangered\r\n\t\t\t\t (Nature Conservation (Animals) Regulation 2020

(Queensland): August 2020 list)\r\n\t\t\t\t\r\n\t\t \r\n\t\t WA:\r\n\t\t\t\r\n\t\t\t\tListed as Endangered\r\n\t\t\t\t (Biodiversity Conservation Act 2016 (Western Australia): September 2018 list)\r\n\t\t\t\t\r\n\t\t \r\n\t\t \r\n Non-statutory Listing Status\r\n\t \r\n\t IUCN:\r\n\t\t\t\r\n\t\t\t\tListed as Vulnerable\r\n\t\t\t\t (Global Status: IUCN Red List of Threatened Species: 2020.2 list)\r\n\t\t\t\r\n\t\t\t\r\n\t\t \r\n \r\n \r\n Naming\r\n \r\n \r\n Top\r\n \r\n\r\n\r\nScientific name\r\n \r\n Lepidochelys olivacea [1767]\r\n \r\n Family\r\n \r\n Cheloniidae:Testudines:Reptilia:Chordata:Animalia\r\n \r\n \r\n Species author\r\n (Eschscholtz,1829)\r\n \r\n Infraspecies author\r\n \r\n Reference\r\n \r\n \r\n \r\n Distribution Map\r\n \r\n \r\n Top\r\n \r\n\r\n\r\n\r\nDistribution map\r\n \r\n \r\n\t\tThe distribution shown is generalised from the Departments Species of National Environmental Significance dataset. This is an indicative distribution map of the present distribution of the species based on best available knowledge. Some species information is withheld in line with sensitive species polices. See map caveat for more information.\r\n\r\n \r\n \r\n \r\n \r\n Illustrations\r\n \r\n \r\n Top\r\n \r\n\r\n\r\n\r\n\r\n\r\nIllustrations\r\n \r\n Google Imageshttp://www.gbrmpa.gov.au/corp_site/key_issues/conservation/threatened_species/turtles/olive_ridley_turtles.html\r\n \r\n \r\n Other Links, Including Superseded Commonwealth Documents\r\n \r\n \r\n Top\r\n \r\n \r\n \r\n \r\n Commonwealth of Australia (2000). Declaration under s178, s181, and s183 of the Environment Protection and Biodiversity Conservation Act 1999 - List of threatened species, List of threatened ecological communities and List of threatening processes. F2005B02653. Canberra: Federal Register of Legislative Instruments. Available from: http://www.comlaw.gov.au/Details/F2005B02653. In effect under the EPBC Act from 16-Jul-2000.\r\n \r\n Commonwealth of Australia (2000b). List of Migratory Species (13/07/2000). F2007B00750. Canberra: Federal Register of Legislative Instruments. Available from: http://www.comlaw.gov.au/Details/F2007B00750.\r\n \r\n Commonwealth of Australia (2000c). Declaration under section 248 of the Environment Protection and Biodiversity Conservation Act 1999 - List of Marine Species. F2008B00465. Canberra: Federal Register of Legislative Instruments. Available from: http://www.comlaw.gov.au/Details/F2008B00465.\r\n \r\n Department of the Environment, Water, Heritage and the Arts (2009t). Threat abatement plan for the impacts of marine debris on vertebrate marine life. Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/marine/publications/threat-abatement-plan-impacts-marine-debris-vertebrate-marine-life. In effect under the EPBC Act from 01-Jul-2009. Ceased to be in effect under the EPBC Act from 21-Jul-2018.\r\n \r\n Environment Australia (2003ai). Recovery Plan for Marine Turtles in Australia. Prepared by the Marine Species Section, Approvals and Wildlife Division, Environment Australia in consultation with the Marine Turtle Recovery Team. Available from: http://www.environment.gov.au/coasts/publications/turtle-recovery/index.html. In effect under the EPBC Act from 21-Jul-2003.\r\n \r\n Taylor, R., R. Chatto & J. Woinarski (2006). Olive Ridley Pacific Ridley Lepidochelys olivacea. Threatened Species of the Northern Territory. Department of Natural Resources, Environment and the Arts, Northern Territory Government. https://nt.gov.au/environment/animals/threatened-animals.\r\n \r\n \r\n\r\n\r\n\r\n\t\r\n\r\n\r\n \r\n Newsletters\r\n \r\n \r\n Top\r\n \r\n\r\n\r\n\r\n\r\n\r\nEPBC Act email updates can be received via the Communities for Communities newsletter and the EPBC Act newsletter.\r\n\r\n\r\n\r\n\r\n\r\n \r\n Caveat\r\n \r\n \r\n Top\r\n \r\n\r\n\r\n\r\n\r\nThis database is designed to provide statutory, biological and ecological\r\ninformation on species and ecological communities, migratory species, marine\r\nspecies, and species and species products subject to international trade and\r\ncommercial use protected under the Environment Protection and Biodiversity\r\nConservation Act 1999 (the EPBC\r\nAct). It has been compiled from a range of sources including\r\nlisting advice, recovery plans, published literature and individual experts.\r\nWhile reasonable efforts have been made to ensure the accuracy of the\r\ninformation, no guarantee is given, nor responsibility taken, by the\r\nCommonwealth for its accuracy, currency or completeness. The Commonwealth\r\ndoes not accept any responsibility for any loss or damage that may be\r\noccasioned directly or indirectly through the use of, or reliance on, the\r\ninformation contained in this database. The information contained in this\r\ndatabase does not necessarily represent the views of the Commonwealth. This\r\ndatabase is not intended to be a complete source of information on the\r\nmatters it deals with. Individuals and organisations should consider all the\r\navailable information, including that available from other sources, in\r\ndeciding whether there is a need to make a referral or apply for a permit or\r\nexemption under the EPBC\r\nAct.\r\n\r\n\r\n\r\nCitation: Department of the Environment\r\n(2022).\r\nLepidochelys olivacea in Species Profile and Threats Database,\r\nDepartment of the Environment,\r\nCanberra.\r\nAvailable from:\r\nhttps://www.environment.gov.au/sprat.\r\nAccessed

Tue, 18 Jan 2022 21:14:49 +1100.\r\n\r\n\r\n\r\n\r\nWhere available the sections below provide a biological profile for the species. Biological profiles vary in age and content across species, some are no longer being updated and are retained as archival content. These profiles are still displayed as they contain valuable information for many species. The Profile Update section below indicates when the biological profile was last updated for some species. For information to assist regulatory considerations, please refer to Conservation Advice, the Recovery Plan, Policy Statements and Guidelines.\r\n\r\n\r\n\r\n \r\n \r\n \r\n Taxonomy\r\n \r\n \r\n Top\r\n \r\n \r\n \r\n Jensen and colleagues (2013) suggest that there may be two independent management units of the Olive Ridley Turtle in Australia.\n\r\n \r\n \r\n \r\n \r\n Description\r\n \r\n \r\n Top\r\n \r\n \r\n \r\n The Olive Ridley Turtle is the smallest of the Australian sea turtles with a mean curved carapace length of approximately 70 cm and weight of 40 kg (Limpus et al. 1983a; Whiting 1997). It is characterised by more than five pairs of costal (between the centre and outer margin of shell) scales. Adults are olive-grey in colour and whitish below. The hatchlings are blackish brown and measure 4.1 cm in straight carapace length (Limpus 1995a; Whiting 1997).\n\r\n \r\n \r\n \r\n \r\n Australian Distribution\r\n \r\n \r\n Top\r\n \r\n \r\n \r\n No concentrated nesting has been found in Australia, although low density nesting occurs along the Arnhem Land coast of the Northern Territory, including the Crocodile, McCluer and Wessel Islands, Grant Island and Cobourg Peninsula (Chatto 1998; Chatto & Baker 2008; Cogger & Lindner 1969; Guinea 1990, 1994c). Scattered nesting occurs in the Gulf of Carpentaria (Limpus 1995a; Hamann et al. 2006) and in Fog Bay, Northern Territory (Whiting 1997), with low density nesting in north-western Cape York Peninsula, Queensland, between Weipa and Bamaga (Limpus 2008). No records of nesting have been collected for the eastern Australian coast (Limpus 2008) and while nesting has been recorded as west as Port Keats, Northern Territory (Chatto & Baker 2008), in 2008 Olive Ridley hatchlings were found by the Bardi-Jawi Rangers in Western Australia (NAILSMA 2008). Low density nesting occurs in neighbouring countries such as Papua New Guinea (Spring 1982), Indonesia (Limpus 1997) and possibly Timor-Leste. There is limited nesting of this species in the western Pacific Ocean and South-East Asia and therefore the Australian population may represent an isolated breeding population.\nChatto and Baker's long term study of nesting turtles in the Northern Territory (Chatto & Baker 2008) found that Olive Ridley Turtles were the second most widespread nesting species (after Flatbacks) in the Northern Territory, though they nest in low numbers through much of their range. On some beaches, however, such as along the northern coast of the Tiwi Islands and some islands in north-eastern Arnhem Land, they nest in nationally significant numbers (Chatto & Baker 2008).\nThe current area of occurrence is 10 370 092 km². There is no evidence to indicate a substantial decline (Limpus 2008) and there is no empirical data to indicate future changes in the extent of occurrence. However, changes to air and sea temperatures, sea level rise and other physical aspects that may change with climate change have the potential to alter the species occurrence (Hamann et al. 2007).\nThere is not enough data to separate occurrence from occupancy.\nThere are no captive or propagated populations that have been re-introduced to the wild in Australia.\nThe species distribution is not severely fragmented.\n\r\n \r\n \r\n \r\n \r\n Global Distribution\r\n \r\n \r\n Top\r\n \r\n \r\n \r\n The Olive Ridley Turtle has a circumtropical distribution, with nesting occurring throughout tropical waters (except the Gulf of Mexico) and migratory circuits in tropical and some subtropical areas (Pritchard 1969). Nesting occurs in nearly 60 countries worldwide. Migratory movements are less well studied than other marine turtle species but are known to involve the coastal waters of over 80 countries. With very few exceptions they are not known to move between ocean basins or to cross from one ocean border to the other (Albreu-Grobois & Plotkin 2008).\nAbreu-Grobois and Plotkin (2008) estimate the size of the annual breeding population (females) is 852 550 and that the global population has decreased by 28\u009632% over one generation (20 years). Spotila (2004) put the global population of nesting females at about two million. Information from diverse sources has made it possible to evaluate a global decline for this widely distributed species over time periods ranging from decades to two to three generations (Abreu-Grobois & Plotkin 2008). Mexico had more than 10 million Olive Ridley Turtles nesting in 1950 while India supported 600 000 Olive Ridleys in 1994 (Spotila 2004). Regional differences suggest far lower survival probabilities in some of the regions than suggested by total estimates (Abreu & Plotkins 2008).\nThe Australian population appears to be the largest breeding population remaining in the south-east Asia-western Pacific region, with other previously significant breeding areas (such as Peninsula Malayasia and Thailand) having declined significantly as a result of long-term over-harvest of eggs (Limpus 2008).\nGenetic surveys have not been conducted to determine the relationship between Olive Ridley Turtles in Australia to those breeding overseas such as in Indonesia, Timor-Leste or Papua New Guinea, though other studies have confirmed the genetic distinction between populations in Australia to those in Malaysia, India and the eastern Pacific (Bowen et al. 1998, Dutton et al. 2002 cited in Limpus 2008). It is likely that Olive Ridley Turtles

residing in or breeding in Australia have spent some time in international waters at particular times in their lives (e.g. as post hatchlings). It is not established whether global threats affect the Australian population of Olive Ridley Turtles.\n\r\n \r\n \r\n \r\n \r\n Surveys Conducted\r\n \r\n \r\n Top\r\n \r\n \r\n \r\n The species has not been reasonably well surveyed for population size in Australia. While breeding for the Olive Ridley Turtle has been recorded in several marine turtle surveys in northern Australia, the only detailed accounts of nesting biology come from Whiting and colleagues (2005) who completed a year of monitoring in the Tiwi Islands of the Northern Territory. Estimates of the size of the Australian nesting population are derived predominantly from aerial survey data (Limpus 1995a) which, while thought to be around 500\u00961000 in 1995 (Limpus 1995a) has been revised upward by Taylor and colleagues (2006) to between 1000\u00965000 in the Northern Territory and by Limpus (2008) to several thousand nesting females (Limpus 2008) in Australia.\nThe nesting locations in Queensland and Northern Territory are reasonably well known. This knowledge is based on regular surveys for other sea turtle species and aerial surveys by Chatto (1998) and Limpus (1995a) and the long-term survey work described in detail in Chatto and Baker (2008). Despite surveys along much of the Western Australian coast for other marine turtle species no nesting for Olive Ridley Turtles had been recorded until 2008 (NAILSMA 2008).\n\r\n \r\n \r\n \r\n \r\n Population Information\r\n \r\n \r\n Top\r\n \r\n \r\n \r\n The Olive Ridley Turtle is the most numerous of all marine turtles in the world, largely due to a few, but enormous, nesting aggregations found in Costa Rica, Mexico and India (Pritchard 1997). In Australia detailed information on the size of nesting and foraging populations is unknown although the nesting population (number of adult females breeding each year) is expected to be in the order of a few thousand females annually (Limpus 2008). Taylor and colleagues (2006) suggest a \"very rough\" estimate of breeding females in the Northern Territory as between 1000\u00965000.\nThere is also no data on adult sex ratios or breeding rates to help determine total population size (Limpus 2008).\nThere have been no studies of Olive Ridley Turtles in Australia to identify whether one or more genetic stocks occur. Under the Natural Heritage Trust Program (Marine Turtle Conservation Grants) a project was funded in 2006\u009607 to conduct population genetic studies in support of conservation and management of Australia's marine turtles, including Olive Ridley Turtles, though results are not yet available.\nNo data are available to indicate a change in the Australian population size (Limpus 2008) and there are no data available to indicate whether future changes in size for the Australian population/rookeries are likely/not likely.\nThere is no data to indicate fluctuations in the size of the Australian population. However, other populations throughout the world do not undergo extreme natural variations in population numbers (Abreu-Grobois & Plotkin 2008).\nAge to maturity has been estimated at 13 years (with a range of 10 to 18 years) in one population from the north-central Pacific (east) (Zug et al. 2006). In the IUCN Red List assessment for the species the assessors used 20 years as the estimated generation age (age at which 50% of adults have survived) (Abreu-Grobois & Plotkin 2008). There is also no data on age of first reproduction or last reproduction.\nWhile Olive Ridley Turtles are known for very large congregations of nesting on beaches (a phenomenon called arribidas) in countries such as Costa Rica and India (Spotila 2004), no major breeding areas have been recorded in Australia (Limpus 2008). Instead, Olive Ridley's appear to undertake solitary or low-density nesting. Areas that Chatto and Baker (2008) classify as \"significant areas of Olive Ridley nesting\" include\nBathurst Island (west side, mostly toward north)Melville IslandGrant IslandLaswon Island (inferred)Oxley Island (inferred)New Year Island (inferred)Mooroongga IslandNorth-west Crocodile IslandDrysdale Island (inferred)Burgunngura Island (inferred)Stevens Island (inferred)Raragala Island (inferred).Nesting also occurs along the north-western coast of Cape York Peninsula (Limpus 2008).\nNo hybridisation between Olive Ridley Turtles and another marine turtle species has been recorded in Australia. However, hybridisation between Hawksbill Turtles (Eretmochelys imbricata) and Olive Ridley Turtles has been recorded in Mexico (Lara-Ruiz et al. 2006).\n\r\n \r\n \r\n \r\n \r\n Land Tenure of Populations\r\n \r\n \r\n Top\r\n \r\n \r\n \r\n The Great Barrier Reef World Heritage Area (GBRWHA) is an important foraging area. A number of the nesting areas in the Northern Territory occur within Conservation Reserves, including Casuarina Coastal Reserve, Garig Gunak Barlu National Park, Kakadu National Park and Nanydjaka Indigenous Protected Area (Taylor et al. 2006).\n\r\n \r\n \r\n \r\n \r\n Habitat\r\n \r\n \r\n Top\r\n \r\n \r\n \r\n Female Olive Ridley Turtles lay clutches of eggs on sandy beaches, hatchlings disperse into offshore currents and have a pelagic phase of unknown length (Musick & Limpus 1997). Small juveniles through to adults reside in coastal zones along the northern coast of Australia and historical bycatch data indicates that large immature and adult-sized Olive Ridleys are present all year round over soft bottomed habits of northern Australian continental shelf waters (Musick & Limpus 1997).Nesting\nSuccessful incubation of eggs requires the nesting sand temperature to be between 25\u009633 ºC (Ackerman 1997). No studies of nest site selection for Olive Ridley Turtles have been

undertaken in Australia. Olive Ridley Turtles were recorded nesting in all bioregions of the Northern Territory, nesting on both mainland and on island beaches (Chatto & Baker 2008).\nPost-hatchlings and small juvenile turtles occur in the surface waters of the open ocean (Bjorndal 1997; Musick & Limpus 1997).\nForaging\nA substantial part of the immature and adult population forage over shallow benthic habitats from northern Western Australia to south-east Queensland (Harris 1994 cited in Limpus 2008) though large juvenile and adult Olive Ridley Turtles have been recorded in both benthic and pelagic foraging habitats (Musick & Limpus 1997). Foraging habitat can range from depths of several metres (Conway 1994) to over 100 m (Hughes 1974a; Whiting et al. 2005). However, most individuals captured by trawlers in the East Coast Otter Trawl fishery in Queensland were in depths of between 11\u009640 m (Robins 2002). Trawling data from the east coast of Queensland indicate that this benthic foraging habitat supports turtles between 20 and 80 cm curved carapace length (Robins 1995). Apart from one exception, Olive Ridley Turtles have not been recorded in coral reef habitat or shallow inshore seagrass flats (Limpus 2008). \nOlive Ridley Turtles do not rely on a listed threatened ecological community and they are not associated with any listed threatened species.\n\r\n \r\n \r\n \r\n Life Cycle\r\n \r\n \r\n Top\r\n \r\n \r\n \r\n The population biology of Olive Ridley Turtles has not been studied in Australia. Elsewhere, age to maturity has been estimated at 13 years (with a range of 10 to 18 years) in one population from the north-central Pacific (east) (Zug et al. 2006). Life expectancy and survival rates have not been estimated (Limpus 2008). Hatchling sex ratio has not been measured for any Australian nesting population but, as with other turtle species, is temperature dependant. Higher temperatures produce female hatchlings, lower temperatures, male hatchlings (Ackerman 1997).\nIn Australia, there are no records of this species forming large synchronous nesting aggregations (arribadas) that are typical of the Olive Ridley Turtles in Mexico, Costa Rica, Suriname and India (Hirth 1980; Marquez 1990). Thus, Olive Ridley Turtles in Australia are likely to be solitary nesters. No information on breeding rates exists for females in Australia, but overseas data suggest females breed annually (Abreu-Gobois & Plotkin 2008). Olive Ridleys are relatively quick to complete their nesting activity (within 60 minutes compared to 60\u009690 minutes of other species; Spotila 2004). Breeding in northern Australia occurs from March to October and seasonal breeding in Olive Ridley Turtles, as is the case for all species, is tied to incubation conditions, hatchling dispersal and courtship (Hamann et al. 2002). Olive Ridley Turtles are known for their shallow nesting habits (Spotila 2004) and in Australia suffer widespread loss of eggs to predation by dogs, dingoes, goannas and pigs (Whiting et al. 2005). Olive Ridleys females are known to nest during the day and usually nest in open sand. Around 109 eggs are laid per clutch. Nesting is undertaken two to three times per nesting season (Spotila 2004) and Olive Ridley Turtles exhibit a longer internesting period (compared to other species) of 17\u009630 days (Ackerman 1997). In general, marine turtle eggs incubate over a period between 50\u009680 days (Ackerman 1997). Olive Ridley hatchlings weigh 17 g and generally emerge from the nest at night (Spotila 2004).\n\r\n \r\n \r\n \r\n \r\n Feeding\r\n \r\n \r\n Top\r\n \r\n \r\n \r\n The most comprehensive feeding study in Australia documented mostly gastropod and bivalve molluscs from the stomachs of 36 adult Olive Ridley Turtles (Conway 1994). Crabs, shrimp, tunicates, jellyfish, salps and algae have been found in their diet in studies outside Australia. (Mortimer 1982; Bjorndal 1997). Post-hatchlings and small juveniles occur in the surface waters of the open ocean (Bjorndal 1997) but little is known about their diet during this stage. \nNo studies have been carried out on feeding behaviour in this species.\n\r\n \r\n \r\n \r\n \r\n Movement Patterns\r\n \r\n \r\n Top\r\n \r\n \r\n \r\n The only data on movement patterns in Australia comes from satellite telemetry data from Whiting and colleagues (2005). This study tracked five turtles from nesting beaches on Tiwi Islands in the Northern Territory. The turtles migrated straight line distances of between 230 to 1050 km and none of the five turtles left the waters of the Continental Shelf. The five females also differed in their migration directions; two turtles headed south-west, one west, one north-east and one turtle went east into the Gulf of Carpentaria. Whiting and colleagues (2005) did not examine daily or seasonal patterns of movement. Of 44 turtles caught in ghost nets in the Gulf of Carpentaria, 45% of the haplotypes had not been observed at any rookery in Australia or south-east Australia (Jensen et al. 2013).\nStudies in the eastern Pacific and Atlantic Ocean also show long distance reproductive migratory behaviour for Olive Ridley Turtles which is similar to other sea turtle species (Meylan 1982). Specifically, journeys of up to 1900 km have been recorded for Olive Ridleys in the Atlantic Ocean (Schulz 1975) and satellite tracking data revealed that an adult male Olive Ridley Turtle in the eastern Pacific Ocean travelled over 2600 km in 113 days (Beavers & Cassano 1996). However, migration pathways vary seasonally (Plotkin 2002).\nWhiting and colleagues (2005) estimated the home range for two adult females. These two females had foraging area home ranges of 1182 km² and 138 km².\n\r\n \r\n \r\n \r\n \r\n Survey Guidelines\r\n \r\n \r\n Top\r\n \r\n \r\n \r\n The Olive Ridley Turtle is characterised by more than five pairs of costal (between the centre and outer margin of

shell) scales. For trained people, Olive Ridley Turtles are relatively easy to distinguish from other marine turtle species using both the identification of the turtle itself or by viewing tracks, distinguished by the waddling, alternative flipper movement made by the female which leaves tracks about 76 cm apart (Spotila 2004).\nNesting beachesThere are essentially three methods which can be used singly or in combination to monitor nesting populations: aerial track counts; beach based track counts; and individual marking. Each method has associated error, costs, advantages and disadvantages.\nThe specific methods used for nesting beach surveys for Olive Ridley Rurtles will be site specific and depend on ease of access to the sites, cost of surveys, availability of staff/volunteers and time of year (TWG in prep.).\n\r\n \r\n \r\n \r\n \r\n Threats\r\n \r\n \r\n Top\r\n \r\n \r\n \r\n Marine turtles face a number of threats associated with the following broad categories of human activity: commercial and recreational fishing; coastal infrastructure and development (including industrial, residential and tourism development); Indigenous harvest; feral animal predation; and climate change.\nFishing - commercial and recreational\nWhile commercial harvest of turtles in Australia is no longer allowed, death or injury to turtles as a result of incidental capture (or bycatch) is a threat.\nTrawling\nHundreds of marine turtles used to be killed annually in trawling activities in northern Australia (EA 2003ai; Limpus 2008) prior to the introduction of Turtle Excluder Devices (TEDs); data from the Northern Prawn Fishery indicate that adult sized Olive Ridley Turtles were frequently captured in this fishery prior to the introduction of TEDs (Poiner & Harris 1996; Robins et al. 2002). Guinea and colleagues (1997) documented the possible link between the death of Olive Ridleys in Fog Bay, Northern Territory and prawn trawling activity in this area prior to the introduction of TEDs. Robins (2002) concluded that Olive Ridley Turtles comprised around 6% of all turtle species caught in the East Coast Trawl Fishery. From 2002\u00962004, only two Olive Ridley Turtles were recorded as killed by trawling in the Northern Prawn Fishery (Perdrau & Garvey 2005) and three and four were captured but released alive each year. Other unquantified effects of bottom trawling include the damage to benthic habitats and consequently on prey items.\nGill nets\nMarine turtles may also become entangled in nets set for inshore fish species, such as barramundi and shark (DEWHA in prep.). Around 255 Olive Ridley Turtles were captured in a single shark mesh net in Fog Bay, 100 km south-west of Darwin, in 1991 (Guinea & Chatto 1992). The crew estimated that the single net killed approximately 300 sea turtles over 30 days in November 1991. These dead turtles included large immature and adult sized Olive Ridley Turtles (Limpus 2008). This type of fishery was banned in the Northern Territory following this event. There is no bycatch data from the current gill net fishery though the volunteer observer program in eastern Carpentaria indicated no capture of Olive Ridleys in this fishery (Limpus 2008).\nLongline and Pot Fishing\nTurtles can be hooked on the front and hind flippers, head, mouth, neck and carapace or get entangled in either the monofilament, mainline or balldrop/buoy line. In pot fisheries, turtles may become entangled in the float lines or enter pot traps and drown (DEWHA in prep.). Data on the Eastern Tuna and Billfish Fishery indicate that of the 50 sea turtles captured and identified to the species level, only 2% were Olive Ridley Turtles (Robins et al. 2002). Overseas, the Costa Rican longline fishery is reported to impact on Olive Ridley Turtles (Robins et al. 2007), and observer records from 1994 to 1999 in the Hawaiian-based longline fishery record an incidental take of 32 Olive Ridleys: all were hooked (Western Pacific Regional Fishery Management Council 2002 cited in Robins et al 2002).\nGhost Nets\nWhile ghost nets (lost and discarded fishing nets) pose a serious threat to marine turtles as they float in the ocean and coastal waters and indiscriminately capture marine animals (DEWHA in prep.), this threat is not well quantified for Olive Ridley Turtles; Limpus (2008) in his review of data suggests that hundreds and perhaps thousands of marine turtles, a proportion of which would include Olive Ridley Turtles are killed in ghost nets of the Gulf of Carpentaria while, between 1996\u00962003, 25 Olive Ridley Turtles were entangled in nets in north-eastern Arnhem Land. Ghost nets are a documented threat to Olive Ridley Turtles in the Cape Arnhem area of the Gulf of Carpentaria, and a probable threat in other areas of the Gulf (Leitch 1999).\nIndigenous Harvest\nMarine turtles are economically and culturally significant to Indigenous Australians (Aboriginal and Torres Strait Islanders) (DEWHA in prep.). While not quantified, in Arnhem Land, eggs and nesting females are part of the traditional harvest (Guinea 1990 & Kennett et al. 1998 cited in Limpus 2008) and Olive Ridley Turtle eggs are also collected in western Cape York Peninsula, Queensland.\nAnimal Predation\nGoannas destroy a significant number of nests in northern Australia: in Fog Bay and Cobourg Peninsula, Northern Territory, 52% (Blamires 1999) and 58% (Hope & Smit 1998) of all nests were raided by goannas. Pigs destroy up to 90% of the nests on western Cape York (Limpus et al. 1993). Foxes and dogs destroy hundreds of nests in eastern Queensland (EA 2003ai). Chatto and Baker (2008) record that around 8% of all nestings recorded in the Northern Territory between 1994\u00962004 were disturbed by goannas (over 500 nests), dogs (over 400 nests) or other unknown predators (nearly 300 nests). In Whiting and colleagues' (2005) study of Olive Ridley nesting on the Tiwi Islands, Northern Territory, feral dogs were the main source of mortality of eggs at the nesting beach of

Cape van Diemen. Turtle eggs were vulnerable to dog predation during the start and end of the season. Baiting was successful for some months of the nesting season but by the end of the nesting season, dogs had returned. Nesting adults at Cape van Dieman are preyed upon by the Saltwater Crocodile (Crocodylus crocodylus) and hatchlings from crabs and birds (Whiting et al. 2007).\nMarine Debris\nDeath can occur when turtles become entangled in, or ingest, marine debris. Carr (1987 cited in DEWHA in prep.) records that fishing line, rope and cord fragments, styrofoam beads, tar balls, plastic bags and balloons are all known to have killed marine turtles through ingestion or entanglement. Limpus (2008) details only one death of an Olive Ridley Turtle in Queensland as a result of entanglement with fishing line over an eight year period.\nCoastal Infrastructure and Development\nCoastal developments, including residential, industrial and tourism development, can directly destroy or degrade beach habitats used as nesting sites. Given the remote location of beaches used by nesting Olive Ridley Turtles in Australia, this threat is considered to be relatively low within Australia.\nLight Pollution\nLight pollution on nesting beaches alters nocturnal behaviors in sea turtles, including; how sea turtles choose nesting sites; how they return to the sea after nesting; and how hatchlings find the sea after emerging from their nests (Witherington & Martin 1996). Given the remote location of beaches used by nesting Olive Ridley Turtles in Australia, this threat is considered to be relatively low within Australia.\nBoat Strike\nFast moving boats have the potential to cause marine turtle injury or death (DEWHA in prep.). Limpus (2008) details five deaths of Olive Ridley Turtles from boat strike in Queensland between 1996\u00962003.\nSeismic Survey\nWhile seismic surveys, which produce noise pollution in the water, are unlikely to cause the death of turtles, they may impact on the foraging, inter-nesting, courting or mating behaviour of turtles. McCauley and colleagues (2000, cited in Limpus 2007) document the circumstances in which turtles will change behaviour as a result of seismic surveys and recommend the timing and location of seismic surveys take into account time and place of specific activities of turtles. No information on seismic impact on Olive Ridley Turtles is available.\nClimate Change and Extreme Events\nChanging termparatures and weather patterns associated with climate change are likely to have both direct physiological impacts on marine turtles, as well as indirect effects through impacts on critical turtle habitats (DEWHA in prep.). The sex of marine turtle hatchlings is determined by the incubation termperature of the eggs, with warmer incubation temperatures leading to the production of female hatchlings and cooler incubation temperatures leading to production of male hatchlings (Spotila 2004). Climate change may alter the temperature of nesting beaches, thereby affecting the male/female ratio. Cyclones and associated storm surges are aperiodic events that can alter hatchling production in particular seasons by washing away and/or inundating clutches or create erosion banks so females cannot emerge to nest (Hamann et al. 2007). Whiting and colleagues (2005; 2007) document the frequent inundation of nests on the Tiwi Islands by high tides and on the impact of cyclones on nesting success.\nLongevity, slow growth and delayed sexual reproduction are all life history traits of Olive Ridley Turtles that hinder efforts to identify population trends and also act to prevent fast population recovery.\n\r\n \r\n \r\n \r\n \r\n Threat Abatement and Recovery\r\n \r\n \r\n Top\r\n \r\n \r\n \r\n National Recovery Plan\nThe Recovery Plan for Marine Turtles in Australia (EA 2003ai) outlines actions for the protection, conservation and management of the six marine turtles listed under the EPBC Act, including the Olive Ridley Turtle. A review of this Plan is currently being undertaken (DEH 2005a).\nFishing\nBoth Commonwealth and State governments manage fisheries in Australia and each are subject to a mix of legislative, regulatory and policy instruments that contribute to reducing the threat that bycatch poses to marine turtles (EA 2003ai). The Australian Fisheries Management Authority (AFMA) shares responsibility for managing some fisheries with the states and Northern Territory, though in general states and the Northern Territory manage inshore species, such as rock lobster and abalone, whereas AFMA generally manages deeper water finfish and tuna species. AFMA is the Commonwealth agency responsible for implementing the Fisheries Management Act 1991 and managing Commonwealth fisheries. The EPBC Act broadly requires that actions taken when fishing do not have a significant impact on the Commonwealth marine environment and its biodiversity, including protected species such as marine turtles. All Commonwealth fisheries have to be assessed and accredited under Part 13 and 13A of the EPBC Act. Other more specific actions are controlled through recovery plans, wildlife conservation plans and threat abatement plans made under the EPBC Act as a result of a protected species listing or type of fishing activity being listed. For instance, Incidental catch (bycatch) of Sea Turtle during coastal otter-trawling operations within Australian waters north of 28º South (TSSC 2001x) was listed as a key threatening process in 2001 under the EPBC Act and harmful marine debris was also listed as a key threatening process in 2003.\nRelevant Commonwealth policies and programs include the Guidelines for the Ecologically Sustainable Management of Fisheries 2007 (DEWR 2007bd) and AFMA's Bycatch and Discarding Program (AFMA 2008). The Australian Government released the Commonwealth Policy on Fisheries Bycatch in 2000 to guide Commonwealth fisheries in the pursuit of legislative objectives relating to non-target species

and the broader marine environment. The key tool used to pursue bycatch minimisation under the Commonwealth bycatch policy is the requirement for each fishery to implement a Bycatch Action Plan. AFMA (2008) established a Bycatch and Discarding Implementation Strategy to provide additional resources and direction for pursuing policy and legislative objectives in relation to bycatch and discarding.\nTo assist in the management and mitigation of bycatch in longline fleets a DVD called \"Crossing the Line\" has been produced by Belldi and Hatchling Productions\" and the Australian Government's Fisheries Research and Development Corporation (Belldi and Hatchlings Productions 2005) and provided to the Australian longline fleet. \nResearch into mitigation of bycatch in the longline fisheries in Australia has been undertaken and includes design and testing of numerous modifications to longline practices, including deep setting of lines (Beverly 2004) and the use of circle hooks (Ward et al. 2008) as well as the education of fishers. No mitigation measures have been devised specifically for Olive Ridley Turtles. AFMA and the Fisheries Research and Development Corporation are providing funding assistance for a research project to test the efficacy of the smart hook system in tuna longline fisheries to reduce accidental injury to seabirds and marine turtles (AFMA 2008b). The mitigation measure has been developed by a modification to any tuna longline hook, allowing a shield to be attached after the hook has been baited. The shield disarms the hook, increases the sink rate and prevents ingestion of the baited hook. Technology used to hold the shield in place releases once it is below the feeding range of the seabirds and marine turtles, providing a normal baited hook. Preliminary results are promising (AFMA 2008b).\nBycatch Action Plans\nThe Australian Tuna and Billfish Longline Fisheries Bycatch and Discarding Workplan (AFMA 2008a) addresses the minimisation and management of interactions with marine turtles; six monthly reports detail progress of implementation of the workplan. For instance the Eastern Tuna and Billfish implementation plan reports that arrangements are being developed for turtle releasing devices to be placed on board all their vessels and research is under way to assess circle hooks to reduce turtle impacts.\nState governments are also responsible for managing a large number of commercial fisheries and each state has its own range of legislative, regulatory or policy instruments that serve to reduce bycatch of marine turtles.\nGhost nets\nThere is a substantial network of communities working together to remove ghost nets from beaches, quantify its impact and reduce turtle mortality (Ghost Nets).\nA comprehensive assessment of the nature and impact of marine debris was made in 2003 (Kiesling 2003). This study detailed 25 activities that could be implemented to help reduce the volume and impact of marine debris, including in matters of research and monitoring, communication, education and outreach, incentives, regulation and technical advances.\nA key advance in the monitoring of ghost nets was the release of the tool \"The Net Kit: A Fishing Net Identification Kit for Northern Australia\" by the World Wildlife Fund in 2002 (with support from the Natural Heritage Trust) (White 2006).\nWhile the majority of nets found in the Gulf of Carpentaria are of foreign origin, a pilot study to model drift and circulation patterns (Griffin 2008) found no evidence that nets stranding on the shores of Arnhem Land and Gulf of Carpentaria were likely to have been lost or discarded in south-east Asian waters further away than the Arafura Sea. Instead, modelling indicated that marine debris passing through Torres Strait was likely to come close to the Arnhem Land coastline, or enter the Gulf of Carpentaria, where it might strand in the Cape Arnhem-Groote Eylandt region in the Dry Season, or in the Weipa region during the Wet Season (Griffin 2008). Understanding where marine debris is coming from is an important prerequisite for management of the threat that marine debris poses to Leatherback and other turtles.\nPredation\nChatto (2004a) documented the dog baiting program carried out on Olive Ridley Turtle nesting beaches on northern beaches of Melville Island, Northern Territory and recommends annual baiting to be undertaken. Whiting and colleagues (2007) documented predation of Olive Ridley Turtle nests in Cape Van Diemen on the Tiwi Islands, Northern Territory between 2004\u00962006 and the success of predator control. They found that while dog baiting was successful at removing the threat that dogs posed, once dogs were removed in 2004, the predation by goannas and bandicoots increased.\nThe Tiwi Land Council Marine Ranger Program is an initiative, supported by state and federal governments, as well as fishing industry and the Tiwi Land Council, that is assisting in the data collection and threat abatement of marine turtles (Whiting et al. 2007). Significant new information is being collected on the Olive Ridley Turtle population on the Tiwi Islands and targeted conservation measures, such as predator control, are being undertaken.\nClimate change\nMore effort should be placed on understanding patterns of nest site selection and how nesting sites may change under different climate regimes (Hamann et al. 2007) and on understanding the ecological roles of Olive Ridley Turtles and possible impacts of climate change to important diet species (Hamann et al. 2007).\n\r\n \r\n \r\n \r\n \r\n Marine Bioregional Plans\r\n \r\n \r\n Top\r\n \r\n \r\n \r\n Marine bioregional plans have been developed for four of Australia's marine regions - South-west, North-west, North and Temperate East. Marine Bioregional Plans will help improve the way decisions are made under the EPBC Act, particularly in relation to the protection of marine biodiversity and the sustainable use of

our oceans and their resources by our marine-based industries. Marine Bioregional Plans improve our understanding of Australia's oceans by presenting a consolidated picture of the biophysical characteristics and diversity of marine life. They describe the marine environment and conservation values of each marine region, set out broad biodiversity objectives, identify regional priorities and outline strategies and actions to address these priorities. Click here for more information about marine bioregional plans.\nThe Olive Ridley Turtle has been identified as a conservation value in the North (DSEWPaC 2012x) and North-west (DSEWPaC 2012y) marine regions. See Schedule 2 of the North-west Marine Bioregional Plan (DSEWPaC 2012y) and the North Marine Bioregional Plan (DSEWPaC 2012x) for regional advice. Maps of Biologically Important Areas have been developed for olive ridley turtle in the North (DSEWPaC 2012x) and North-west (DSEWPaC 2012y) marine regions and may provide additional relevant information. Go to the conservation values atlas to view the locations of these Biologically Important Areas. The \"species group report card - marine reptiles\" for the North-west (DSEWPaC 2012y) and North (DSEWPaC 2012x) marine regions provide additional information.\n\r\n \r\n \r\n \r\n \r\n Major Studies\r\n \r\n \r\n Top\r\n \r\n \r\n \r\n One minor study investigating nesting and migration behaviour for a single year (Whiting et al. 2005) has been undertaken but no major studies have occurred in Australia. Whiting and colleagues (2007) report on Sea Turtle Conservation and Education on the Tiwi Islands provides the most comprehensive insight into Olive Ridley Turtles of Australia to date.\n\r\n \r\n \r\n \r\n \r\n Management Documentation\r\n \r\n \r\n Top\r\n \r\n \r\n \r\n Management documents include:\nMarine turtle recovery plan (EA 2003ai) (under review as of June 2008)Australian Tuna and Billfish Longline Fisheries Bycatch and Discarding Workplan November 1 2008 to October 31 2010 (AFMA 2008a)Threat Abatement Plan for the impacts of marine debris on vertebrate marine life (DEWHA 2009t)North West Marine Bioregional Plan Bioregional Profile (DEWHA 2008b)North Marine Bioregional Plan Bioregional Profile (DEWHA 2008).\nAn issues paper on protection of sea turtles is in preparation (DEWHA in prep.). In addition, fisheries, both Commonwealth and State managed, are guided by bycatch action plans and ecological assessment processes.\n\r\n \r\n \r\n\r\n\r\n\r\n \r\n \r\n Species Profile References\r\n \r\n \r\n Top\r\n \r\n \r\n \r\n \r\n Abreu-Grobois, A. & P. Plotkin (2008). Lepidochelys olivacea. IUCN 2008. 2008 IUCN Red List of Threatened Species. .\r\n \r\n Ackerman, R.A. (1997). The Nest Environment and the Embryonic Development of Sea Turtles. In: Lutz, P.L. & J.A Musick, eds. The Biology of Sea Turtles. Page(s) 83-107. Boca Raton, Florida: CRC Press Inc.\r\n \r\n Australian Fisheries Management Authority (AFMA) (2008). AFMA's Program for Addressing Bycatch and Discarding on Commonwealth Fisheries:an Implementation Strategy. Australian Government. Available from: http://www.afma.gov.au/environment/bycatch/is_env_bycatch-prog_feb08_20080417.pdf.\r\n \r\n Australian Fisheries Management Authority (AFMA) (2008a). 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