

Lecture 11

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Wildlife Tourism: Marine Turtle Tourism

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1. Background

1.1 All marine turtles are an endangered species and are under threat from human pressures

All marine turtles are vulnerable to a variety of human threats, including: commercial trawling; boat strikes; pollution; reef bombing; ingestion of litter; vehicular traffic on beaches; and tourism development (Arianoutsou, 1988; Johnson *et al*, 1996; Wilson and Tisdell, 2000).

However, the major cause of global decline in marine turtle populations is still attributed to intensive subsistence harvesting by developing countries, and this is certainly the case in the Indo-Pacific region. (IUCN, 1995; Environment Australia, 2000). Brazil faced the same problem 30 years ago, but has gone through some pretty amazing changes since then. In fact, turtles were once harvested along the Ningaloo coast during the 1960s.

1.2 Turtles have existed for over 150 million years

Marine turtles have given palaeontologists an insight into the Jurassic period. Marine turtle are thought to have evolved from an ancient lineage of terrestrial reptiles developing paddle-like limbs and streamline bodies for swimming, yet continuing to nest on coastal beaches as they did over 150 million years ago (Pritchard, 1997). The marine turtle is one of few animals that exist today that link humans to the dinosaur era.

1.3 Turtles play an important role in maintaining cultural values

In Indonesia, the second incarnation of Wisnu, the Hindu deity, is said to have been a marine turtle (Grinwis, 1996). The Balinese believe that the turtle carries the world on its back (Grinwis, 1996). Native American mythology is remarkably similar.

In Brazil, a minority of Indian tribes believe that the turtle back represents the land areas of the world. On the Miskito Cays of Nicaragua, the natives believe that the turtle is a mediator between the worlds of animals and humans (Ripple, 1996). Aborigines of Northern Australia honour the turtle as a totem. Sign of manhood

Besides the mythology that surrounds the marine turtle, they are also considered by many as mystical, uncommon, a unique aquatic reptile and a source of living wonder and of curiosity. These attributes make marine turtles a valuable wildlife attraction for tourists and a value symbol of fertility, productiveness, steadfastness, and immortality for many different religions.

1.4 Turtles migrate between international boundaries

Adult green turtles are unevenly distributed throughout the circumglobal tropical and subtropical seas as a consequence of their feeding and habitat requirements (Dodd, 1988). This makes it difficult to quantify all existing populations throughout the world. However, most major nesting colonies can be found on mainland shores (such as northwestern Costa Rica, or the coast of eastern Surinam), and barrier reef islands (in Queensland, and WA, Australia; New Caledonia), and on remote oceanic islands (eg, Ascension Island, Atol das Rocas) (Pritchard, 1997).

In addition, all species of marine turtle migrate to varying degrees (Hirth, 1971, 1980). The migrations of the green turtle across international borders are well documented (Limpus and Reed, 1985; Limpus and Miller, 1993).

Tag return data have established that although some turtles migrate greater than 2600km, most travel less than 1000km between their foraging areas and their nesting area with a high degree of accuracy (Limpus *et al*, 1992)

Some studies have shown that Australia and Indonesia share the same marine turtle populations (Limpus, 1994). Many of these turtles nest on Australian beaches and return to feed in Indonesia waters (Prince (CALM), *pers. comm.*, 2001; Symons, 2001).

This suggests that the over-harvesting of marine turtles within the Indo-Pacific region is likely to have a significant impact on Australian turtle populations. Therefore, the Australian government needs to take the appropriate measures to prevent a decline in Australian nesting turtles, as a result of over-harvesting in Indonesia.

1.5 Turtles possess ecological, educational, and economic values

Marine turtles are important to a wide cross section of the communities throughout the world, incorporating a diverse range of environmental, socio-cultural, educational, scientific and economic values. Therefore, it is important to balance the levels of utilisation between stakeholders, and to ensure marine turtles are shared proportionately.

1.5.1 They are important for Ecosystem Maintenance

In particular, the green turtle plays an important role in ecosystem maintenance in the form of nutrient cycling and community structure in their foraging habitats (Bjorndal, 1997). Furthermore, it is suggested that grazing on algae by green turtles on coral reefs would decrease the percent cover by algae in these ecosystems, hence, enhancing coral growth.

All sea turtles serve as nutrient exporters from their foraging habitats. Although some species export nutrients on a daily basis through defecation, all species export nutrients on an annual basis when migrating to nesting rookeries where they deposit nutrient filled eggs (Bjorndal, 1997).

This process will, in turn, produce millions of hatchlings to serve as an important seasonal food source for large populations of fish, birds, crabs and humans. In this way, turtles actually deliver nutrients from the ocean to the terrestrial environment and back again.

1.5.2 Educational value

Interpretation and education has been advocated as being the most effective management strategy in tourist-wildlife interactions because it increases awareness about a species and encourages a conservation ethic (Howard, 2000).

Education, through passive (in the form of reading material, maps, signs, information centres) and perhaps active interpretation (such as guided tours, talk groups, theatre), are forms of tourist management in themselves (Ross and Wall, 1999). Therefore, the experience of viewing a female turtle laying her eggs or releasing hatchlings into the wild can increase tourists awareness about marine turtle life cycles and the pressures that threaten their existence (Gampell, 1999).

More importantly, educating the local community can provide a knowledge and understanding of the biology and conservation of marine turtles, including issues that threaten turtle populations in less developed countries.

The establishment of visitor educational centres and museums dedicated to marine turtles can provide education in marine turtle biology, ecology, current research, and threats, including the harvesting of green turtles for visitors.

1.5.3 Economic Value

Studies have demonstrated that there is large economic potential for exploiting wildlife resources in a non-consumptive way (Hoyt, 1996; Davis and Tisdell, 1998). Such tourism

can offer long-term conservation of wildlife, particularly when its existence is threatened by habitat destruction, poaching and other human pressures (Wilson and Tisdell, 2000).

Possible economic benefits to local people from turtle-based ecotourism include increased employment opportunities as guides, transportation, construction of restaurants, motels, shops, retail, and the distribution of tourist revenues (Ross and Wall, 1999).

Given the opportunity costs involved in consuming green turtle meat and eggs, it can become practical to apply economic instruments to improve conservation management of green turtles, justify legal sanctions and provide a strong argument for inter-governmental efforts between Australia and Indonesia (Wilson and Tisdell, 2000).

The threats to green turtles from harvesting are growing as a result of the turtle trade, and this underlines the importance of finding an economic rationale to conserve the remaining populations. Wilson and Tisdell (2000) posit that "the economic benefits from turtle-based tourism can provide such a rationale".

2. Case study 1: Bali

2.1 The Indo-Pacific region contains six of the seven species of marine

The Indo-Pacific region contains six of the seven species of marine turtles that nest on beaches within the tropical and sub-tropical regions of the world; *Dermochelys coriacea* (leatherback turtle), *Chelonia mydas* (green turtle), *Eretmochelys imbricata* (hawksbill turtle), *Lepidochelys olivacea* (olive ridley turtle), loggerhead turtle (*Caretta caretta*), and *Natator depressus* (flatback turtle) (Aglionby, 2001; WWF, 2001).

Although all marine turtle species share a common life cycle with only minor variation (Hirth, 1980; Van Buskirk and Crowder, 1994), the green turtle is the predominant target species for the turtle trade in Indonesia, and is the preferred species for consumption.

2.2 Up to 100,000 turtles are slaughtered every year in the Indo-Pacific region

Although international and Indonesian laws prohibit all forms of trade in Indonesia, it is estimated that 100,000 green turtles (*Chelonia mydas*) are harvested from within the Indo-Pacific region each year to supply local and overseas markets. Up to 25,000 of these turtles are transported to Bali every year, and are subsequently slaughtered for their meat, eggs, shells and leather (Marinos, 1997; KSBK, 2001).

2.3 80% of turtle are consumed in Indonesia

Eighty percent of these turtles are consumed in Indonesia, whereas the remainder are exported to Japan, Singapore, Hong Kong, China and Taiwan (KSBK, 2001).

In Bali, where the majority of people practise Hinduism, green turtles have been sacrificed for religious purposes for centuries (Putra, 1996). However, Hindu people have gradually become accustomed to eating green turtles as a common food source and a means to survive, rather than strictly for religious Hindu ceremonies (Limpus and Miller, 1993). Consequently, the adult green turtle population has declined to a state where juvenile turtles are becoming more commonly caught (KSBK, 2001).

2.4 No government support or enforcement

Without adequate assistance from the authorities to enforce the laws set by the Indonesia government, controlling the illegal turtle trade is difficult.

Therefore, due to the intensive harvesting of marine turtles in the Indo-Pacific and the lack of governmental support, it has become apparent that research into alternative methods of conserving turtles is needed. Although some non-government organizations (NGOs) have commenced marine turtle conservation programs in Bali, no scientific studies have been conducted investigating the potential for using tourism as a means of conserving marine turtles in this region.

3. Using turtle tourism for conservation

In the last decade, there has been a change in the thinking of many, with increasing interests in augmenting tourist visitation to nesting beaches in the form of turtle-based ecotourism (Godfrey and Drif, 2001). The Marine Turtle Specialist Group (MTSG) have endorsed ecotourism, as a solution on a global scale, for the problems facing conservation programs, particularly in developing countries (IUCN, 1995). Ecotourism has been defined as:

environmentally responsible, enlightening travel and visitation to relatively undisturbed natural areas in order to enjoy and appreciate nature (and any accompanying cultural features both past and present) that promotes conservation, has low visitor impact, and provides for beneficially active socio-economic involvement of local populations (Ceballos-Lascurain, 1996).

According to this definition, ecotourism can involve both cultural and environmental tourism and, in addition, benefits to the local people should be an integral part of the activity.

Marine turtles are an excellent target species for wildlife tourism because they are easily viewed when they come ashore to nest and are therefore an important resource. Wilson and Tisdell (2000) suggest that non-consumptive wildlife-oriented recreation tourism, such as turtle-based ecotourism, can result in the long-term conservation of turtles.

In this way, turtle-based tourism can generate income and provide employment whilst supporting the conservation of marine turtles. The experience from viewing is educational

and can create awareness about the threats facing marine turtles and their habitats (Wilson and Tisdell, 2000). Furthermore, with the support of conservation groups and government agencies, turtle tourism can contribute to other tourism markets, and also lead to an increase in marine turtle populations (Encalada *et al*, 1999).

3.1 Existing Conservation Programs in Bali

The turtle trade in Bali has been receiving international attention for the past 15 years. As a result of the lack of commitment on behalf of the Indonesian government to adequately enforce legislation, a number of non-government organizations (NGOs) have been established to appease the turtle trade problem, including Animal Conservation for life (KSBK), Humane Society International (HSI), Earths Advocates, and World Wildlife Fund for Nature (WWF).

3.1.1 Adopt a nest program

The adopt a nest program, run by WWF, is at early stages of developing turtle-based tourism in Bali. A pilot study is currently being conducted in Perancak, a village 90km southwest of Denpasar, where former turtle hunters have established a community-based organization named "Kurmu Asih" (Map 3.2).

The aim of the program is to strategically place turtle hatcheries in areas easily accessible to tourists and close to nesting beaches where the eggs can be carefully transported to incubation enclosures.

The adopt the nest program involves charging visitors Rp. 500,000 (\$A100) to receive a certificate of adoption with updated information on the nesting program and gives visitors an opportunity to contribute marine turtles conservation (WWF, 2001). The money generated from the program will be reinvested into protecting marine turtle nesting beaches, and used to provide alternative incomes for local communities.

3.1.2 Reef Seen Aquatics Turtle Program

In Pemuteran, on Bali's northwest coast (Map 3.2), Reef Seen Aquatics (RSA) operates a marine turtle release program. The program has been in operation since 1994, and has become a popular destination for tourists to view marine turtles. The program has released about 1,600 young turtles into the wild (Paddock, 2001b).

The release program attempts to eliminate the threats to marine turtles at early stages of life, and provides an educational experience for tourists. Tourists from all over the world pay Rp. 100,000 (\$A20) to release a marine turtle to the wild, and receive a certificate acknowledging their contribution to the conservation of marine turtles (Paddock, 2001b).

The program provides an alternate income for local turtle egg hunters. RSA offers the local egg hunters twice the street price of turtle eggs in Bali (Rp. 400 or \$A0.08) (Brown (RSA), pers. comm., 2001). The local egg hunters locate marine turtle nest sites, and relocate the eggs to an incubation site protected from predators, beach erosion and poachers.

However, it is important to fully understand the animal, before a wildlife tour operation is developed. For example, the relocation of a nest from its natural placement can have implications for the turtles nesting site fidelity. Although not yet fully conclusive, studies have shown that turtles might recognise their natal beaches by detecting chemical features unique to each nesting area (Lohmann *et al*, 1997). Therefore, if all nests are relocated to the same incubation pen, those turtles that have survived to reproduce will all emerge onto the same beach 30-50 years later to lay their eggs.

Furthermore, the temperature of the sand in the incubation pen needs to be similar to that in a natural environment, as it determines the gender of each nest. If the pen is located under a tree, in the shade, the hatching turtles will be male. Likewise, if the pen is located under intense sunlight and heat, the turtles will be female (Bjorndal *et al*, 1985).

This can have devastating biological and ecological consequences for the entire population. For example, an increase in male turtles will effect the reproduction capacity for a female. Generally, 3 to 4 male turtle will attempt to mate an individual at one time, inflicting wounds and weakening the female turtle (Limpus *et al.*, 1992). If there is an influx of males, the female may have to contend with 6 to 8 males during mating. The balance of nature is sometimes so precise, that it cannot be replicated, and therefore it is essential to select areas that represent the original nesting location.

3.1.3 The Bumbu Restaurant Turtle Program

In Tanjung Benoa, several hundred metres from the main turtle slaughterhouses (Map 3.2), Bumbu Restaurant operates a marine turtle rehabilitation and release program. The restaurant runs a sponsorship program, where tourists can adopt a turtle for \$A40 or donate money to help continue the program (Von Holzen (Bumbu restaurant), pers. comm., 2001).

The rehabilitation operation involves reviving unhealthy and injured turtles that have been bought from the markets in Tanjung Benoa. The turtles are fed and strengthened for a few days until they are well enough to return to the open ocean.

However, the rehabilitation operation has been under much scepticism. By purchasing the turtles from the market, the program is fuelling the trade and contributing to the success of the turtle meat industry. Bumbu Restaurant also manage a hatchling release operation, similar to that at Reef Seen Aquatics, however, the eggs are bought from the market, and placed in sand filled vegetable boxes. Again, there is no regulation of sand temperatures.

The eggs are collected from female turtles that have already been killed by the market butcher. In 1999, Bumbu restaurant released 3000 olive ridley and 2000 green turtles into the wild (Von Holzen (Bumbu restaurant), pers. comm., 2001).

3.1.4 Turtle Park Ecotourism Operation

Turtle Park in Sampalan on the northern tip of Penida Island off Bali (Map 3.2), has been known to immorally exploit marine turtles under the definition of sustainable ecotourism.

An investigation at Turtle Park found about 100 green turtles and 4 hawksbill turtles enclosed in holding pens (Marinos (Earths Advocates), pers. comm., 2001).

It has also been reported that the Turtle Park was selling turtle shell jewellery and other ornaments to the tourists (Marinos (Earths Advocates), pers. comm., 2001). This type of operation undermines other turtle-based ecotourism operations with the intent of genuinely conserving marine turtles in Bali.

4. Case Study 2: Brazil

4.1 One of the most successful marine turtle conservation programs is Projeto TAMAR-IBAMA in Brazil, where turtle-based ecotourism has been used as an alternative to hunting marine turtles

One of the most successful marine turtle conservation programs is Projeto TAMAR-IBAMA in Brazil, where turtle-based ecotourism has been used as an alternative to hunting marine turtles (Godfrey and Drif, 2001).

The success of the program is based on local participation of the community in educational programs, tour-guide training, festivals, and the employment of former egg poachers to patrol the beaches and protect the nests (Marcovaldi and Marcovaldi, 1999).

In this way, turtle-based ecotourism has become an extremely useful tool in providing an alternative income for hunters and the community, whilst conserving marine turtles for future generations.

In the case of Bali, the infrastructure for developing tourism further already exists, however the potential for developing turtle-based ecotourism for the purpose of stopping the turtle trade has not yet been recognised.

4.2 Component of Projeto TAMAR

Up until the end of the 1970s, no marine turtle conservation activities existed in Brazil, and the turtle populations were declining rapidly, due largely to their intensive harvesting by indigenous communities and the collection of their eggs on the beaches (Marcovaldi *et al*, 1999). Despite advances in the domestic legislation, Brazil came under increasing international pressure to enforce more comprehensive legislation and to implement sea turtle conservation programs.

4.2.1 Research

During the nesting season, the program recruits about 60 trainees, usually university students that have recently graduated or are about to graduate from various disciplines, such as biology, oceanography, fisheries and veterinary science (Marcovaldi and Marcovaldi, 1999).

At this time, the main rookeries are patrolled nightly by trainees, researchers, and fishermen employed by Projeto TAMAR-IBAMA. These teams tag the nesting female turtles to gather important information about their nesting populations, particularly reproductive behaviour and migratory routes.

Following the methodology employed at various nesting sites, a database has been developed to organise and standardise the data collected on a national level (Marcovaldi *et al*, 1999)

Some of the nests that are at risk from erosion or predation, from both animal and human interference, are relocated, either to safer areas of the beach, or to central open-air hatcheries located at the nearest station (Marcovaldi *et al*, 1999).

These hatcheries are designed to emulate as closely as possible the natural conditions of the nesting beach. In this way, relocation provides protection from potential risks that might otherwise impede upon the hatching success of these nests. However, the long-term aim is to reduce the number of nests relocated until it is no longer required. Therefore, more nests remain in place where the eggs are laid, and monitored by the research team.

4.2.2 Turtle-based ecotourism

The villagers now protect and rely on marine turtles because they are a major tourist attraction and generate income. Marine turtles attract both national and international tourists to the different stations within Brazil.

There are visitor centres at each regional headquarters, which offer additional attractions for tourists, schools and local community members. The centres contain museums, tanks and aquaria with examples of marine turtle species, animal skeletons, video presentations, lecture halls, as well as containing catering facilities (Marcovaldi *et al*, 1999).

A small number of turtles (15-30) at various stages of maturity, are also maintained in healthy condition for public education purposes. The development of this visitor centre has not only provided an educational facility, but has also generated funds to finance the program by selling non-turtle material merchandise.

At the same time, it creates more employment opportunities for community members not only in Projeto TAMAR-IBAMA itself, but also in the bars, restaurants, and inns that are built to support the increasing number of tourists'.

Several precautionary measures have been enforced to reduce the impacts of increased tourism development. The program has also implemented strict codes of conduct to minimise the amount of disturbance caused by the presence of tourists. These include limiting the number of tourists (14 each tour), children under 14 years of age must be accompanied by an adult, no use of flashlights. To prevent uncontrolled human disturbance from increased tourists, only 2 kilometres of the beach has been allocated for turtle observation at each site.

In the presence of artificial illumination on the beach, hatchlings are attracted to the light and move landward, increasing the chances of predation, foot trampling and heat exhaustion causing death. In a natural setting, the horizon over the ocean is brightest, and the hatchlings use this as a cue to find the sea (Arianoutsou, 1988). Therefore, the resorts and houses have been constructed in such a way to minimise their impact on turtles. For instance, illuminations from lighting have been reduced to a level where turtles are not affected and nearby lights have been screened.

4.2.3 Education and community participation

The programs philosophy is that participation of local communities is essential for the success of any project of nature conservation. Projeto TAMAR-IBAMA has developed environmental education programs targeted at local coastal communities, transforming these people into active partners and allies in conserving marine turtles in Brazil.

The program mainly targets the youth of the community, providing short summer courses that educate local children about sustainable tourism and conservation. Each summer 8-13 year old children spend 2 weeks learning about marine turtle biological characteristics, conservation, and tour-guide procedures.

After this training, the guides who demonstrated the greatest ability to communicate their knowledge will continue work at the visitor centre for the remainder of the year. The duties conducted at the visitor centre are rotated and the students help each other by teaching their previous task.

Furthermore, the first year graduates help in programming and teaching the following years course. In this rotative way, education becomes inexpensive and essential to involving coastal communities in conservation projects and ecotourism activities, as well as, creating new opportunities and sources of income for children.

4.3.3 Job creation

Projeto TAMAR-IBAMA has developed new ways of creating alternative incomes and providing support networks for the local community. Projeto TAMAR-IBAMA employs over 400 staff, many of these people are former hunters and work patrolling nesting beaches and protecting turtle nests (Marcovaldi *et al*, 1999).

This gives these fishers status within the communities, a greater knowledge of marine turtles (which they can share with others), and an enhanced conservation ethic.

The decision to spend the entire budget within the fishing communities was based on the simple reality that marine turtles in Brazil were declining (Marcovaldi and Marcovaldi, 1999).

When beginning a program with endangered species in a developing country, it is crucial to initiate an immediate halt on the harvesting of marine turtles. By offering key hunters a

more attractive income, to patrol beaches and discourage poachers, hunting becomes a less viable position. Once confidence is developed between former hunters and management, educational strategies and training will follow.

5. Case Study 3: Ningaloo

5.1 The Problem

There has been increasing concern that the growing tourism industry based in Exmouth and Coral Bay may have significant impacts on marine turtles and their nesting habitat. At present, the management plans and specific guidelines for tour operators pertaining to marine turtle conservation within this region are inadequate. In order to conserve marine turtles, management frameworks based on quantitative data need to be developed.

5.2 Status of marine turtles in Australia

The marine turtle populations in northern Western Australia comprise a significant conservation resource on a worldwide scale (Prince, 1997). The beaches of North West Cape Peninsula and Coral Bay within the Ningaloo Marine Park have been recognized as an important turtle nesting rookery for predominantly green turtles and loggerhead turtles (Johannes and Rimmer, 1984; Prince, 1994; Osbourne, 1995, unpubl.).

Four out of the six species of marine turtles found in Australian waters are seen on Western Australian beaches between November and February, and are listed under the Commonwealth's Environment Protection and Biodiversity Conservation Act 1999. The loggerhead turtle (*Caretta caretta*) is listed endangered and the green turtle (*Chelonia mydas*), hawksbill turtle (*Eretmochelys imbricata*), and flatback turtle (*Natator depressus*), which is endemic to Australia, Papua New Guinea and Indonesia, are all listed as Vulnerable to Extinction.

The number of tourists visiting Exmouth has doubled in the past decade, and will continue to grow through the development of the Coral Coast Marina Resort at Coral Bay. The potential impacts on marine turtles from tourism include, light pollution, beach traffic, fox predation, accidental boating strikes, coastal development and tourist activities (Arianoutsou, 1988; Johnson *et al*, 1996; Pointer and Harris, 1990; Wilson and Tisdell, 2000).

It is, therefore, essential to develop management frameworks to prevent these impacts from occurring and to promote the recovery of marine turtles in the wild. However, the impacts on marine turtles from tourism in northern Western Australia are unsubstantiated and require further investigation.

5.3.1 Light Pollution from Tourism Development

Lights that attract nesting turtles and hatchlings are likely to contribute to increased mortality (McFarlane, 1962; Arianoutsou, 1988; Witherington, 1992). Sources of light derived from tourism development that affect marine turtle orientation include torches used in nest viewing tours, street lights, coastal marina developments, and boats moored at sea and in harbours.

5.3.2 Tourists and Recreational Activities

Recreational activities on nesting beaches have the potential to impact on marine turtle hatching success (Environment Australia, 2000). Johnson *et al* (1996) found that organised turtle watch tours in Florida had a significant effect on marine turtle behaviour.

The turtles were mainly disturbed during the camouflage phase of the nesting process (see page 15 for details), which could possibly have further implications relating to fox predation (Lutz and Muscick, 1997). Introduced and native fauna is known to prey upon marine turtle eggs and hatchlings (Morris, 1997).

In Western Australia, foxes and large predatory lizards, such as the Perentie are considered to be the major predator of eggs (K. Morris pers. comm.). Furthermore, the development of picnic areas near marine turtle nesting sites has attracted predators, such as foxes (Prince *pers. comm.*).

5.3.3 Vehicle Traffic

Vehicles travelling along nesting beaches can impact on marine turtle hatchling success. Vehicles can damage marine turtle nests and nesting habitat by compacting sand, crushing nests and creating wheel ruts that impede or trap hatchlings on their way to the ocean (Environment Australia, 2000). Mauds Landing has been identified as being a hot-spot for intensive four wheel drive traffic.

5.3.4 Litter

Marine turtles sometimes swallow plastic bags mistaking them for squid or jelly fish. The plastic blocks the passage to the turtles gut causing starvation.

6. Management and Sustainability

There are 4 main components of developing a successful conservation program that encompasses wildlife tourism. These include:

Research

Code of conduct

Management Frameworks

Community participation

Think about how these attributes can be linked to create a circulating process that can encourage self-sufficiency.

To view the Save Ningaloo video, please refer to <http://www.saveningaloooreef.org/>

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Bali and Brazil

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