EXURBAN
RURAL & REGIONAL PLANNING

ATTACHMENT 6 – SUSTAINABLE MANAGEMENT PLAN

DIRK HARTOG ISLAND

Sustainable Management Plan

2016

Updated Annually
Last update: June 2017

eco CERTIFIED Advanced Ecotourism

DIRK HARTOG ISLAND
RETURN TO 1616

DIRK HARTOG ISLAND DISCOVERED 1616
SHARK BAY WESTERN AUSTRALIA
A WORLD HERITAGE ISLAND

DIRK HARTOG
1616 - 2016
Marking our history, celebrating our future.

Introduction

This Sustainable Management Plan has been developed for Dirk Hartog Island Pty Ltd on the basis of a business operation including accommodation, tours and transport ferry's operating from the freehold land on Dirk Hartog Island.

The plan is a guideline for protecting and conserving the environmental, social and economic impact of the tourism business. The intention of the plan is to successfully integrate conservation initiatives and values with an acceptable level of tourist use. The plan acts as an introduction and point of reference for both employees and guests in regards to the sustainability philosophy, policies, efforts to date and goals for the future.

Environmental Management Objectives

Dirk Hartog Island Pty Ltd is based on Dirk Hartog Island, 19 nautical miles off the coast of Western Australia and operating all year.
Our key objectives are as follows;

1. Protect the islands World Heritage values
2. To provide a sustainable infrastructure for a successful Nature Based Tourism facility.
3. To provide accommodation facilities and 4WD vehicle access to both tourists and to support scientific researchers in order to aid future management and natural resource knowledge.
4. To provide education and interpretation to recreational users on suitable and sustainable activities.
5. Educate visitors on the island's natural, cultural and historic value
6. Protect the islands biosecurity

Dirk Hartog Island Pty Ltd | Commitment to Sustainability

2010: Installed 18kw Solar Power System: $320,000
2013: Installed 3.5kw Wind Turbine: $20,000
2015: Built new Landing Barge: $500,000
Replaced engines on RIB with better fuel economy engines: $42,000
2016: Glass Crusher donated by guest
Engines replaced on Landing barge with better fuel economy: $45,000

A total of $927,000 has been spent to help reduce fuel consumption, improve island access and reduce waste.

General Description of Dirk Hartog Island

Located 800km north of WA's capital city Perth and 30kms offshore from the town of Denham, Dirk Hartog Island is largely the western border of the Shark Bay World Heritage Area. At 85kms in length and 14kms wide at its widest point, the Island covers approx 62,000hectares.

The island runs in a general north-west to south-east axis between latitudes 25 degrees 30 minutes south and 26 degrees 15 minutes south. The southern point at Cape Ransonet is approx 1.5 kms from the mainland. Currently, local government administration for the island is the responsibility of the Shire of Shark Bay that has offices in Denham.

In 1991 the Shark Bay region was declared a World Heritage Area. Dirk Hartog Island is included in this area and, in the future will play a major role in the realization of the true value of this destination by the general community.

Key Values

The key values associated with Dirk Hartog Island include:

World Heritage

- isolation of fauna habitats on islands and peninsulas resulting in survival of threatened species;
- a transition zone between major ecological provinces (both marine and terrestrial) and is of great scientific interest for the study of biogeography including the evolution and extinction of species, the effects of isolation, succession, diversity and other factors such as effects of steep environmental gradients;
- coastal scenery - Zuytdorp cliffs, Dirk Hartog Island;
- endemic Dirk Hartog Island subspecies of the southern emu-wren;
- loggerhead and green turtles; and
- presence of some threatened flora species

National Heritage

- oldest known landings of Europeans (Dirk Hartog in 1616) on the western coast of the
- Australian continent and associated landings and surveys over a 250 year period;
- effect these landings had on cartography and European worldview at the time;
- site where the oldest extant record of a European landing in Australia was found, and where
- subsequent memorials and inscriptions were left;
- earliest zoological and botanical collections of Australian specimens and their taxonomic
- classification; and
- first part of coastline of the previously unknown 'Terra Australia Incognita' to be identified
- and named, as The Land of the Eendracht.

Cultural

- one of the most historic places in Australia;
- Cape Inscription Lighthouse and Quarters provide a fine example of an off-form concrete ightstation and is listed on the WA Register of Heritage Places, classified by the National Trust of Australia (WA) and entered to the Shire of Shark Bay's Municipal Heritage Inventory;
- cultural heritage associated with the fishing, pastoral and mining (Guano) industries;
- several known and one recorded Aboriginal heritage sites; and
- presence of several nearby historic shipwreck sites.

Natural

- an area where the temperate climate of the southern part of Australia gives way to semidesert climates and where a transition zone occurs between two major botanical provinces - the South West dominated by Eucalyptus species and the Eremaean dominated by Acacia species;

Conservation on Dirk Hartog Island

Situated within the Shark Bay World Heritage Area, 19 miles of the coast of Denham, Dirk Hartog Island is the perfect environment for some of Australia's most unique animals to survive and thrive. A lack of human traffic, both on and around the island, means that much of Dirk Hartog is in pristine condition - the perfect setting for eco tourism.

An agreement has been made with the Government of Western Australia to purchase Dirk Hartog Island and establish a national park. Ecological Restoration plans and Recreation Management strategies have been made and the Wardles are committed to ensure that all tourism activities undertaken on the island are environmentally sustainable and hope to be a vector of environmental and historical awareness, appreciation and experience.

DIRK HARTOG ISLAND
RETURN TO 1616

Island Protection | Return to 1616 – Ecological Restoration Project

When Dirk Hartog landed on Western Australia's largest island in October 1616, the island had intact vegetation and a rich mammal fauna. Since this first European landing on Australian soil, introduced plants and animals have degraded the island and native animals have disappeared. Return to 1616 is an ambitious program to restore the island's natural ecosystems to how Dirk Hartog would have seen them. Introduced sheep and goats are being removed because their grazing and trampling reduced the food and shelter available for native species. Feral cats are being eradicated as these efficient hunters make it impossible for many native species to survive. Ten species of small mammals that became extinct on the island will be reintroduced when the feral animals are eradicated. These are the western barred bandicoot, chuditch, mulgara, dibbler, greater stick- nest rat, desert mouse, Shark Bay mouse, heath mouse, woylie and boodie. Two additional marsupials will also be introduced on the island to improve their conservation status, the mala and banded-hare wallaby.

Island Biosecurity

The Return to 1616 project operated by the Department of Parks & Wildlife has been focusing on biosecurity issues that need to be addressed. As the number of visitors & 4WD's increase, the issue of introduced weed's and pests will increase.

A DRAFT Biosecurity Plan was prepared in 2012 by DPaW with input from major stakeholders on the island including Dirk Hartog Island Eco Lodge | Kieran Wardle. (See attached)

<u>Biosecurity Initiatives</u>

<u>Operations</u>

- All supplies are transported in plastic containers where possible and then unpacked in enclosed store room.
- Vehicles and equipment are washed and checked for seeds and weeds before transportation
- Building supplies are checked for vermin, weeds and seeds
- Vessels are installed with mice and rat traps

<u>Visitors</u>

- Are provided with detailed information on biosecurity
- Encouraged to clean 4WD vehicles before arrival
- Encouraged to check footwear, clothes, packs and camping gear are free of soil, seeds, insects, spiders and other animals
- No pets are allowed onto the island

Monitoring Biosecurity

The DPaW team regularly inspect visitor vehicles and encourage continued monitoring by Lodge staff whilst transporting food and equipment to the island.

- Mouse traps are checked regularly on all vessels
- Unpacking of food is monitored by all staff
- Any weeds are removed from the Lodge area to the mainland and reported to DPaW staff
- Feral animal sightings are reported to DPaW staff

Cape Ransonnet, Dirk Hartog Island
4WD Access & Biosecurity Hot Spot

Environmental Waste Management Plan & Procedures

The waste streams from Dirk Hartog Island Eco Lodge is managed to comply with the environment, health and safety regulations in mind. The endless task is to ensure a continued reduction in waste and use new innovative methods in the future to achieve these goals.

Waste Reduction initiatives

- Prevention and minimisation of waste production at the source | Buy Bulk
- Reuse of resources where possible | refill fuel/water/gas containers
- Recycling of generated waste | Ali Cans recycled, glass crushed and used.
- Remove landfill waste to mainland depots for further recycling
- Encourage guests to refill water bottles
- We do not supply take away coffee cups

Power | Solar & Wind

The accommodation facilities require considerable amounts of power and water to maintain a civilized way of living.

For the past 16 years the island had operated a standalone diesel generator power system that used considerable amounts of diesel, producing both air and noise pollution. In October 2010 a 18kw RAPS (remote area power system) was installed reducing both diesel consumption and noise pollution. Generator run times have been reduced by almost 92%.

System Details

- 3 x 6kw Xantrex Inverters
- 36 x 2v Magnum battery storage
- 6 x Xantrex Solar Charge controllers
- 72 x 175w Sungrid Solar Panels
- 12 x solar panel tracking systems (6 solar panels per tracker)
- 1 x Schneider Conext ComBox monitoring system with APP for remote access
- 1 x 37kva Diesel generator
- 1 x 3.5kw Windspot wind turbine

Monitoring

Total kWhr usage is retained on a load meter installed. The ComBox also retains daily power usage, solar harvest, generator usage and peak usage times.

Average daily power usage:	113kwh per day
Average Solar & Wind Harvest:	86kwh per day
Average generator kwh per day:	27kwh per day
Average generator hrs per day:	1.9hrs per day

Operational Practices

- Heat Pump Hot water systems are placed on timers to only operate between 8am and 4pm daily | This reduces energy consumption from battery bank.
- Lighting is only used when necessary and guests are encouraged to turn off lights in bedrooms and bathrooms when not in rooms.
- Revers Osmosis is only operated during sunny days between 9am & 3pm
- All water pressure is provided by water storage tanks being located on a high hill 100m behind the lodge. No water pressure pumps are used.

Solar Panels

Water
The water for showering, watering gardens, toilets etc.. is pumped from over 7km away by both wind power (windmill) and solar pumps. A reduction in garden size and lawn areas has reduced the requirements for extra water being produced via desalination / reverse osmosis.

Water Storage
Storage of bore water is located 100m away from the Lodge on a high hill. The water is then gravity fed through a 50mm poly pipe and is monitored via total tank daily usage.

Shower, toilet and general use water storage;
2 x 25,000lt poly tanks
4 x 15,000lt poly tanks

Drinking water storage;
2 x 15,000lt poly tanks

Monitoring
Water storage tanks are checked twice daily and recorded. At peak times (school holidays) the usage is approximately 8,000lt per day with 26 guests in the Lodge and 70 guests in the camp grounds. 10 Staff members during peak season.
Total of 106 people equates to 75lt of water used per person per day for toilets and showers.

- Tank level on tank being used
- Tank level on tank being filled
- Is there water flow into tank from inlet pipe

Water Reduction Initiatives

- Installation of water saving shower heads
- Toilet systems replaced with water wise
- Do not provide water access other than showers and sinks


3.5kw Windspot Wind Turbine

Waste & Recycling Procedures

Solid & Liquid Waste

- 3 clearly marked bins are located at all accommodation & camping areas encouraging the separation of waste
  - Glass: Crushed and stored for use in building materials
  - Aluminium Cans: Crushed and sent to mainland recycling in Geraldton
  - General Waste: land filled
- The kitchen has additional waste bins & containers
  - Food scraps: fed to chickens daily
  - Oils & fats: containerised and shipped to Denham waste area
- Revers Osmosis Water Treatment plant operates using bore water pumped from a well located approx. 7km away from the Lodge. The freshwater is stored in rainwater tanks
  - Reject water is pumped onto the lawns and gardens
- Washing Machine waste water
  - Waste water is pumped onto lawns and gardens
- Vehicle & Vessel Oils
  - Oils, used filters and consumables are returned to the mainland disposal area in Denham for recycling

Waste	Item	Recycling & Disposal	Reduction Strategies	Staff	Monitoring
Glass	Glass bottles	A glass crusher is used to reduce bulky bottles down to sand size particles. This is then stored and used in cement for any future developments	Encourage guests to only bring aluminium cans where possible	Island Managers	Crushed glass is recorded in terms of 20lt buckets. 100lt's of glass bottles is crushed down to a 20lt bucket
Metals	Aluminium Cans	Can's are crushed down into wool bales using the old woolpress and then transported via boat back to mainland each year. They are then transported to Geraldton via road for recycling.	Guests are encouraged to crush each can before placing in the marked bins to reduce volume	Island Managers	The lodge produces 6 full wool bales full of aluminium cans per year.
Organic	General Waste	Food scraps are fed daily to the chickens.	Portion controls are used when serving meals and adjusted to suit individual guests.	Kitchen Staff & Chef	A 5lt waste bucket is produced daily from the kitchen.
Oils	Cooking Oils & engine oils	Stockpiled and returned to mainland waste disposal area with the Shire of Shark Bay		Marine Operations Manager	20lt sealed containers are monitored when returned to mainland.

Climate Action Plan

Climate change is likely to impact on WA's North-West through increased warming, changed rainfall patterns and more extreme weather events. To minimise climate change impacts on World Heritage values in Shark Bay, management practices will be adapted as new knowledge is acquired.

Greenhouse Gas Emissions

The greenhouse gas emissions created by the tourism establishment on the island and for the transport of visitors, 4WD vehicles, general stores and building materials.

Accommodation:

Total Power Requirement:	41,245 kwh per year 29 metric tons of CO2
Diesel Power Generator:	9,855 kwh per year 6.9 metric tons of CO2
Gas Hot water & BBQ's:	11,016 kwh per year 7.7 metric tons of CO2
Solar & Wind Harvest:	31,390 kwh per year **22.1 metric tons of CO2**

Eco Lodge Greenhouse gas emissions of CO2: 7.5 metric tons of CO2 saved

Marine Ferry Services:

Barge service Steep Point to DHI:	17,000lt per year 151 metric tons of CO2
Barge freight & stores Denham to DHI:	9,620lt per year 85.5 metric tons of CO2
8.5m RIB Denham to DHI:	8,380lt per year 74.5 metric tons of CO2
Barge & RIB charters:	9,300lt per year 21.8 metric tons of CO2
Marine Greenhouse gas emissions CO2:	**332.8 metric tons of CO2**

4WD Vehicles:

Island based 4WD Tour vehicles:	3,650lt per year 8.6 metric tons of CO2
Mainland vehicles:	4,300lt per year 10.1 metric tons of CO2
4WD Greenhouse gas emissions of CO2:	**18.7 metric tons of CO2**

Total Greenhouse gas emissions of CO2: 344 metric tons of C02

Emission Reduction Initiatives

	Eco Lodge	Actions	Staff	Timeline/Budget	Monitoring Process
Energy Efficiency	Hot Water systems	Replace Heat pumps with gas systems	Kieran Wardle	Commenced 2016 Ongoing $10,000	Reduced kwh usage
	Lighting	Replace traditional lights with LED lights	Kieran Wardle	Commenced: 2013 Ongoing $8,000	Reduced kwh usage
	Dishwasher	Use only when full	Tory Wardle	Ongoing	Reduced kwh usage
Energy Supply	Solar Batteries	Replace lead acid batteries with new technology batteries	Kieran Wardle	Commenced: 2016: research Purchase in 2017: $75,000	Reduce generator run time / fuel usage
	Solar array	Increase the number of solar panels	Kieran Wardle	2017: $10,000	Reduce generator run time/fuel usage
Barge Ferry	Upgrade engines	Replace 7 year old engines with new more fuel efficient engines	Kieran Wardle	2016: $45,000 Completed	Reduced fuel consumption by 8%
	Secure a closer landing area at Steep Point	Reduce the distance travelled via DPaW approval will reduce fuel usage	Kieran Wardle	Commenced 2015. Ongoing	Calculations on 2015 work almost 7,000lt of fuel would have been saved.
	Freight services out of Denham	Limit the number of journeys out of Denham to full loads only	Kieran Wardle	12 months	Reduce fuel usage
8.5m RIB	Upgrade Engines	Replace engines with new energy efficient engines	Kieran Wardle	Completed Feb 2015: $42,000	Reduced fuel consumption by 19% per trip to Denham
IGA Supermarket	Orders are placed in Bulk	Supplies are packed in large reusable containers	Tory Wardle	Ongoing since 2015	Reduces packaging and plastic bags/landfill
Office/Admin	Smart Phone ticketing	New online booking system will issue tickets via a smart phone app	Kieran Wardle	Commenced Dec 2016 Implement July 2017 $11,000	Reduce paper usage
Marketing	Reduce paper brochure production	Reduce brochure runs and encourage future guests to visit the website for further details	Kieran Wardle	Commenced Nov 2015 Ongoing	Reduce paper usage

	CO2 Calculators	**Add calculators to website**	**KW**	**November 2017**	**Inform visitors of carbon footprint and how this is being managed and reduced**

Carbon Offset Program

A carbon offset program is being investigated to help reduce the environmental impact of tourists visiting Dirk Hartog Island. There are many factors being considered including how a carbon offset program can be linked to the;

Return to 1616 | Island Restoration Project | DPaW

- Since handing the pastoral lease back to the Government in 2009 our 57 hectares of freehold land has considerable regrowth through the removal of sheep.
- 2000 Sandalwood trees have been planted on the freehold area
- Discounted accommodation is provided to DPaW staff for the project
- Discounted barge & ferry services are supplied to DPaW for the project

Woolpress Can Crusher – Glass Crusher – Kitchen waste