

DOUBTFUL ISLAND BAY
Western Australia
By Greg Heberle

"Doubtful Island Bay, Western Australia" by Greg Heberle, submitted to publisher January 2016.

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Cover photos:

Top: Heberle professional fishing camp, from look-out, Easter 1970. East is ~ left side of 1st island.

Bottom: House Beach from west end 1985. 1 tonne school of salmon just left of centre.

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INTRODUCTION

Correct name

Doubtful Island Bay and Doubtful Islands Bay are both used in publications and maps. Doubtful Island Bay is the name used in the Gazetteer of Australia, a compilation of more than 322 000 geographic names of Australia. The custodian organisations include Geoscience Australia for the Australian Government and Landgate for the Western Australian Government.

This book is based on information from 3 Internet sites covering Heberle Fishing, Doubtful Island Bay and Whaling stations at Doubtful Island Bay. These Internet sites can be found by Google searches of Heberle with fishing, Doubtful Island Bay or whaling.

The book covers Doubtful Island Bay, the main place for professional fishing activities by the Heberle family 1946 onwards.

Volume 1 of Heberle salmon fishing history was prepared in 1985. Details of salmon seasons from 1946 to 1985 are included. Volume 2 of Heberle salmon fishing history covers salmon seasons 1962-2004, which are seasons covered by Fishermens log books. Access to my family history data, including my 2006 book "Heberle Fishing Western Australia 1929-2004" and 5 other books, are available from my web site on the Internet:

[Heberle family genealogy \(Greg Heberle's home page\)](http://freepages.genealogy.rootsweb.ancestry.com/~gregheberle/)

freepages.genealogy.rootsweb.ancestry.com/~gregheberle/ or search "Greg Heberle".

This new book will also be available via the above home page.

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ABBREVIATIONS

b	born
c, ~	circa, approximate
C	Centigrade (degrees)
d	died
E	East
ENSO	El Nino Southern Oscillation
Et al	and others
GPS	Global Positioning System – latitude & longitude
km	kilometres
m	metre
mm	millimetre
Max	maximum
Min	minimum
N	North
S	South
W	West
WA	Western Australia

WHAT IS DOUBTFUL ISLAND BAY ?

Some maps appear to define Doubtful Island Bay as only between the islands and House Beach. Other maps show the bay extending to Point Anne, the eastern end of Trigelow Beach and even further.

This book covers places historically associated with Doubtful Island Bay, including the Doubtful islands, Drages, Reef Beach in Doubtful Island Bay, House Beach, Trigelow/Tooregullup, Peppermint, Quaalup. Gairdner River to Quaalup, Heberle Landing.

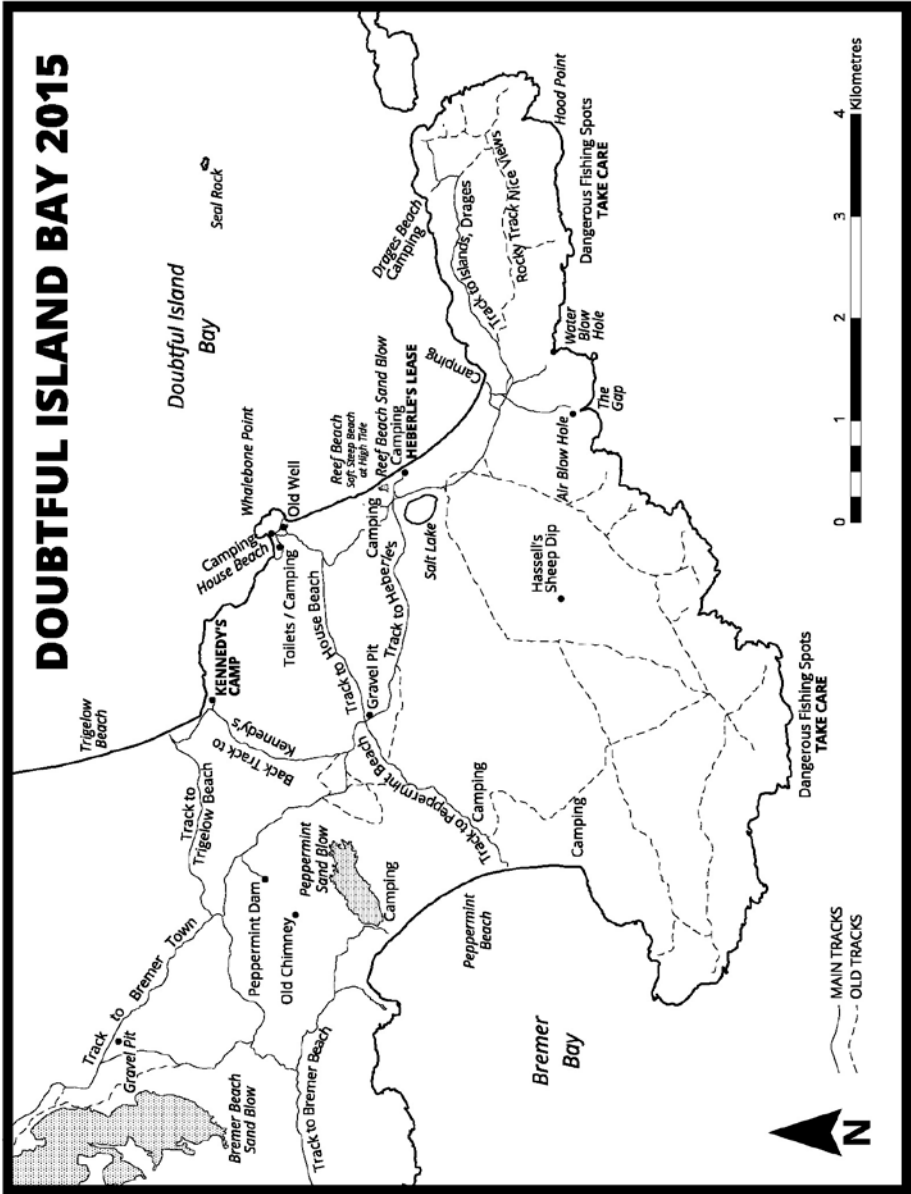


Figure 1 – Doubtful Island Bay map 2015

LOCATION & ACCESS

Doubtful Island Bay is located at about 34°20'S latitude 119°30'E longitude (~34.31S, 119.54E), some 12-15km in a straight line E and NE of Bremer Bay. Doubtful Island Bay is c540km by road, SE of Perth Post Office.

Doubtful Island Bay is now in Jerramungup Shire. Earlier it was partly in Gnowangerup Shire and partly in Ravensthorpe Shire. The boundary was north south on longitude 119°30".

One way there, is Perth to Kojonup via Albany Highway, turn E to Broome Hill, then pass through Gnowangerup, Ongerup and Jerramungup. Travel S from Jerramungup and turn off South Coast highway either taking Devils Creek Road (just before Gairdner School) or continue to S past Gairdner School on Gairdner Road South to Bremer Bay Road, then E to Bremer Bay.

Rather than going through Ongerup and Jerramungup, another route is via Chester Pass Road, Borden and Borden-Bremer Bay Road to Bremer Bay and across the Bremer River sand bar (if passable) or via Swamp Road if not.

Access via Devils Creek Road

Once Devils Creek Road is bitumenised from Highway 1 to Fitzgerald River National Park (2016 ?), the best access from Perth to Doubtful Island Bay might be via Devils Creek Road. Turn E off South Coast Highway 1 at Gairdner townsite, travel c37km on Devils Creek Road and a short section of Pabellup Road, to the turnoff to Quaalup. Travel c15km S along Quaalup Road, past Quaalup and the Gairdner River crossing on Quaalup Road, to Doubtful Islands Road. Travel for 3km E along Doubtful Islands Road to the crossroads (between Doubtful Islands Road, Gairdner Road and Gordon Inlet Road, then a further c13km to House Beach or Heberle's camp on Reef Beach. Trigelow Beach is c3km less.

Doubtful Islands Road

Doubtful Islands Road is from Swamp Road to the coast but it is a track from the end of the formed road, to the coast. The formed road ends c4km E from the crossroads between Doubtful Islands Road, Gairdner Road and Gordon Inlet Road. Presumably Doubtful Islands Road ends on the cliff adjacent to the first island, c14km from the end of the formed road. House Beach and Heberle's camp are c9km from the end of the formed road. Some of the road names are different on different maps. Part of Doubtful Islands Road was named Gordon Inlet Road.

Access via Bremer River bar

Vehicle access from Bremer Bay is across the Bremer River bar, if the river is not running into the sea, then travel c11km N on Gairdner Road to the cross roads with Doubtful Islands Road, then c13 km SE along the Doubtful Island Bay Road to House Beach or Heberle's camp on Reef Beach.

Access when Bremer River is running into the sea

When the river is impassible, access from Bremer Bay is W for c10km along bitumenised Bremer Bay Road, then c12km NE along Swamp Road (this section bitumenised 2012), then c22km along Doubtful Islands Road to the crossroads (between Doubtful Islands Road, Gairdner Road and Gordon Inlet Road, then a further c13km to House Beach or Heberle's camp on Reef Beach. Trigelow Beach is c3km less.

Formed road, clay, tracks

There are no formed roads close to Doubtful Island Bay. Moving E from the crossroads (junction of Gairdner River Road and Doubtful Islands Road), there is about 4km of formed road, rarely graded. Some of this is clay. All the access E of here is on bush tracks, with few

road signs. The condition of the tracks changes with time. Some of the oldest tracks are no longer visible. In the sandiest and boggiest (clay) areas there are numerous (parallel) tracks. New tracks are made as the older tracks become difficult. Maps and aerial photos of different ages may show different tracks.

Access to Doubtful Island Bay is critically dependent on recent rainfall, as the clay bog holes on the formed road and some sections of track can be virtually impassable when wet.

Suggestion. Unless you know the track very well, or are travelling in a convoy, with winches and/or tow ropes, avoid visiting Doubtful Island Bay during the wet months of May, June, July, August, when the clay track may be impassable on many days. Labor Day, Easter, Queens birthday, Christmas and New Year are usually OK.

Access for caravans

When the professional fishing teams were catching truck loads of salmon and herring, some of them brought caravans to their camps. Access to House Beach, Reef Beach and Trigelow Beaches was feasible for caravans. Big wide fish trucks broke off many branches. Some branches which might damage trucks or caravans were removed by axe or chainsaw. Since 2004 branches have grown and caravans wider than the typical 4 wheel drive vehicle are likely to be scratched and there is a risk of broken windows, broken external lights and dents to the roofs and sides of caravans. Bulldozers brought in for the 2012 fire did widen sections of track in to Heberle's camp, permitting caravan access to there. The track in to Peppermint Beach has never been suitable for caravan access.

FACILITIES

Public facilities at Doubtful Island Bay are negligible. One public toilet, some signage and some camping area boundary posts were erected at House Beach c2002. There has been negligible maintenance since then. A few tracks are signposted, most are not.

The nearest townsite, public water supply, electricity, telephone lines, houses, caravan parks, tavern, shops, petrol station etc is at Bremer Bay (population 240 in 2006), some 45 minutes travelling time from Doubtful Island Bay. The nearest big hospital is at Albany (180km W of Bremer Bay). Albany had a population of 31,000 in 2011. Limited vehicle repairs and spare parts are available at Jerramungup (population 270 in 2011) and Gnowangerup (population 620 in 2006). There is no public water supply or shops at Doubtful Island Bay. Everything you want has to be brought in.

FREQUENT VISITORS

Aborigines were the first visitors, possibly since >38,000 years ago. European visitors probably date from 1627. Sealers and whalers probably arrived in the late 1700s/early 1800s. The first shore based whaling station in Western Australia was at Doubtful Island Bay in 1836 and operations possibly ceased c1872. Wellsteads built Quaalup homestead in 1858. Hassell grazing activities in Doubtful Island Bay area possibly commenced c1873, as an out-station of Jerramungup, which was settled 1849. Initially Hassell employees camped near Peppermint Dam but by c1890 they were based at what is now House Beach. The house that House Beach is named after was probably built c1893. Hassell Doubtful Island Bay operations ceased c1952. Heberles professional fishing operations commenced in 1936. Other professional fishermen operated in the area from c1948.

The population of the Doubtful Island Bay area may have been up to 20 people in the 1830s and up to 40 in the 1870s-1950s, for a month or 2 each year, excluding Aboriginal women and children. These people were involved in whaling and grazing activities. In the 1960s-1970s up to 25 people stayed in the area for a month or more each year, for example during the

professional fishing season. Possibly >1000 tourists visit the area each year in recent years, excluding multiple visits by the same people eg Heberles.

Whaling teams

See Whaling section.

Heberle salmon fishing teams

Team members for each season, as far as is recorded or remembered are shown in the annual summaries, in the Fishing book.

Salmon seasons by family members were as follows:

Les Heberle 1946-60, Ron Heberle senior 1946-94, Norm Heberle 1946-47, 1972; Cyril Heberle 1946-50, Eric Heberle 1947-48, Greg Heberle 1965-66, 1969-2004*; Ron Heberle junior 1967-2004*, Andrew Heberle 1998-2004, Grant Heberle 1973, Patricia Heberle 2004, Kevin Heberle 1979, 1981.

Heberle were here for the whole salmon season until 2004. Since 2004, typically they visit the area 2 or 3 times during the salmon season each year, notably at Easter. Some details of the lives of the above Heberle are in the Heberle family book by Heberle (2005).

Known team members are listed for each season. The records are incomplete.

The following were involved in 10 or more seasons:

Rod Frost 1968-70, 1972-2004; George Gilchrist 1967, 1969, 1977-94, 1996-99, 2002-03; Cleve Johns 1951-59 (some of), 1961-62, 1964-65, 1967; John Cleary 1959-70.

The following were involved in 5 or more seasons:

Roley Davis 1971-79, Colin Tindale 1982-89, Norm Casey 1977, 1981, 1994-98, Brad Tindale 1998-2003, Ernie Coyne (some of) 1949-59, Jack Coyne (some of) 1949-59, Keith Farmer (some of) 1951-58.

Others:

Family members, relations, spouses and children of team members often assisted, notably Pauline Heberle, Patricia Heberle, Milanna Heberle, Marilyn Adamson, Brian Heberle, Susan Heberle, Andrew Heberle, Matthew Heberle ; Murray Frost, Jamie Frost, Sandra Frost; Lillian Casey, Harry Casey, Julie Casey.

Other Heberle, friends and relations

Marion Tindale, Terri Tindale, Claire Middleton, Maddison Adamson-Ashford, Michael McGuire & family.

Other fishing teams

Members of other professional fishing teams are not well known to me. A few names are below. Some men were members of more than one team.

Hunt's team (1948)

Chipperfield/Andre team (1948-52): Charlie Chipperfield, George Andre, Alby Wignell & Fred Wignell & Les Wignell & Max Wignell, Alec Wann & Laurie Wann & Ray Wann & Vic Wann, Allen Daniels, Tom Doney, Roy Napier.

Frank Bentley's team (1959-1997): Brian Jackman, Wayne Larsen, Kelly O'Neill, Peter Spurr, Peter Bertola, Neil Fotheringham, Roy Brown, Brian Carter, Alan Rogers, Brett Flint, Wally Naylor, Brett Haddleton, Ron Watt, Graham Rogers, Greg Miller (truckie), Mae Roberts, Pat Wilkie, Doug Welshman.

Bill Cullinane's team/associates (1949-1967): Frank Bentley, Brian Jackman, Keith Gilchrist, Bill Cagnana, Auguston, Thompson.

Colin Kennedy's team (1982-): Kevin Palfrey, James Bell, Robert Leese, Brian Whitehurst, David Edward, John Rule.

Kevin Kennedy's team (1982-92): Craig Kennedy, Peter Crowe. Brad Kennedy, Jamie Bell, Russell Pearson.

Craig Kennedy's team (1993-2000): Brad Kennedy, Murray Field.

People who live or lived in the Dumbleyung region

Murray Frost & family, Neil Frost, Roy Frost, Lexie Frost, Diana Frost, Gary Frost, Allan Nobbs, Owen Mott, Janet Mott, Howard Mott, June Mott, Dale & Richard Mott, Colin Joye, Doug Ramm, Gilbert O'Brien & family, Rob McDougall, Trevor Armstrong, Ross Dunkerton, Mick Aggiss, Laurie Balcombe, Leanne White, Buddy O'Donnell, John Richardson, Rod Richardson, Peter Dawson, Isabel & Colin Doyle, Horace Ball, John Stewart, Phil Clark, Rod Wright, Peter Home, Kim Painter, Noel Edwards, Bob McLachlan, Jack Fittin, Wilf Bainbridge, Claire & Jack Cassane, Judy & Max Cooper, Sue & Ray Burgerson, Jill & Robert Nalder, Jean & Robert Cook, Claire & Graham Smith, Barry Wells, Arthur Sugg, Kylie & Jason Sugg, Anita & Darryl Hetherington, Arlene & Murray Saunders, Bernadette & Peter West, Chris & Phillip Bairstow, John Bairstow, Warren Bairstow, Dale Lloyd, Chris Obst, Jim Sparkman, Rochelle & Chris Tucker, Steve Hughes, Barry Bracknell, John Bateup, Eddie Molenda, Colin Ward, Leonie Nolte, Claire Ward, Michael Atkins, Jason Smith, Scott Jeferis, Malcolm Roberts, Shane Hall, Sylvia & Ron Hanbury

Other frequent visitors

Jack Drage & family, Steve Herbert, Donna Herbert (nee Drage), Ron Dowell & family, Norm Butler, Eric Thomas. Bert Wall & family, Graham Wall, Jenny Wall, Richard Wall, Wayne Larsen (senior & junior), Cheryl Larsen (nee Wall), Vanessa August (nee Larsen) & family, Keith Gilchrist & family, Lex Harland & family, Ron Harland; Steven Simmonds, Julie Simmonds (nee Casey) & family; Peter Geddis; Paul Honey & Melissa Honey, Phil Wellstead & Sigrid Wellstead (who have a webpage with history and photos of Doubtful Island Bay), John Sugg, Hank Thompson, Queenie & Roy Wittersen.

Hassell employees

See Grazing section.

Hassell family and relations

Bill Hassell & family, Don Ball & family, Bob Van den Burg, Anne Van den Burg (nee Hassell & family, Harry White, Kay White & family, Mark White, Leanne White & family, Jendrzeczak family, Keith Ohlsen, Angela Ohlsen (nee Ball) & family.

SAFETY

Safety hazards include;

- Head on collision with another vehicle. There have been several accidents. Slow down at corners as there could be vehicle coming.
- Collision with a kangaroo.
- Towing a vehicle out of a bog. If something breaks, a piece of metal could be hurled at you. Keep passengers, particularly children, out of the way.
- Other vehicle accidents eg towing, backing, jacking. Running over children, particularly young ones. There have been head-on collisions. Assume there could be vehicle approaching around any corner.

- Motor cycle and 4 wheeler accidents. Wear a helmet. Don't go too fast, consider others. Avoid steep area where the machine may turn over.
- Walking on or fishing from slippery rocks. More than one person has been killed.
- Injured (dumped in the surf) or drowned whilst swimming. Watch children.
- Attacked by a shark. There are lots of sharks in this area. Look before and when swimming.
- Camping/house accidents. Gas fires explosions. Burns.
- Insect, animal, fish, bird bites and stings. Bring insecticide/repellant.
- Bushfire hazards. Ideally put your vehicle, tent and property, where it might not burn in a bushfire. Don't light bushfires. If there is a bushfire, consider what is the best strategy, remain in safe area or flee if safe to do so.
- Cuts, bruises. Bring first aid.
- Sun burn. Apply sun cream. Bring and wear a sun hat.

CLIMATE

Doubtful Island Bay has maximum temperatures about 2 degrees cooler than Perth in winter and about 4 degrees cooler in summer.

Doubtful Island Bay monthly winter rainfalls are about 70mm (50%) less than Perth and about 10mm (50%) more than Perth in summer. Annual rainfall is about 240mm (27%) less than Perth.

Bring warm clothes and rain coats.

INDICATIVE CLIMATE DATA FOR DOUBTFUL ISLAND BAY

	J	F	M	A	M	J	J	A	S	O	N	D	Annual
Temperature Mean Maximum Degrees C	26	25	24	22	19	17	16	16	18	20	22	24	21
Temp Mean Minimum Degrees C	15	15	14	12	10	9	8	7	8	10	12	13	11
Rain mm	21	23	31	52	81	89	83	78	63	54	33	23	631

Based on Bureau of Meteorology data.

The Bureau of Meteorology (BOM) has wind data for Albany airport. Albany is the closest place to Doubtful Island Bay, for which wind data is published on the Internet. BOM wind roses have average data for 9AM and 3PM for each month and season.

The 9AM winds are mainly light (0-20 km/hour) from the W, NW, E.

The 3PM winds are more southerly, mainly light from the W, SW, SE.

In summer (December – February) winds are mainly E in the morning and SE in the afternoon.

In autumn (March – May) the winds are mainly NW in the morning and SW/SE afternoon.

In winter (June – August) the winds are mainly NW in the morning and W afternoon.

In spring (September – November) the winds are mainly W in the morning and SW afternoon.

Global warming (mainly based on NASA website)

About 97% of climate scientists agree that climate warming in the past 150 years (since c1850) is due to human activities. This is due to the continuous rise in greenhouse gas levels

in the atmosphere, notably carbon dioxide. Globally, the 10 hottest years on record have been in the past 13 years, with the hottest year on record 2015, replacing 2014. Average world temperatures have risen 1 degree C since 1850. Higher temperatures have caused glaciers to retreat, more Arctic and Antarctic ice sheets and sea ice to melt and decreased snow cover. This has resulted in an average World wide 2mm per year rise in sea level over the past 100 years, with more like 4mm/year over the past 20 years. The extra heat in the atmosphere has increased the occurrence of severe temperature, wind and rainfall events and decreased rainfall in some areas, including the SW of WA.

According to Feng et al (2012), sea level rise off the WA coast has been ~1.5 mm per year over the past century, but there has been an acceleration of the rising sea level trend in the past two decades, at ~5 mm per year.

Small changes in global average temperatures can have large effects. Global temperatures have risen 1 degree C, Current efforts are intended to avoid a further 1 degree rise, which could trigger dangerous global warming. During the last ice age, which ended some 12000 years ago, average global temperatures were typically only 2 to 4 degrees lower than in 1850. Small changes can have large effects.

Sea water temperature

Rising sea temperature has caused changes in behavior of some fish species, including Australian salmon, with a c90%+ reduction in the numbers swimming Doubtful Island Bay beaches ("white water" with no growing weed) in the past 10-15 years. Small schools of salmon are very hard to see from a distance, on the "black water" with growing weed, so it is possible the schools are swimming past, not sighted, in deeper/cooler water. Numerous individual salmon and some schools of salmon have been sighted from boats near the islands, where the water is deeper and cooler.

Key environmental trends that may be affecting fish stocks of WA from Caputi et al (2010).

Include: (a) increasing frequency of ENSO events; (b) more years with a weaker Leeuwin Current; (c) increase in water temperature off the lower west coast, particularly in autumn-winter; (d) increase in salinity; (e) change in frequency and location of storms (and rainfall) affecting the lower W coast; and (f) change in frequency of cyclones (and summer rainfall) affecting the NW.

Indian Ocean surface sea temperatures have been increasing by 0.02°C per year over the last 50 years. El Nino Southern Oscillation (ENSO) is an irregularly periodical climate change caused by variations in sea surface temperatures over the tropical eastern Pacific Ocean, affecting much of the tropics and subtropics. The warming phase is known as El Nino and the cooling phase as La Nina.

Other data suggests that average surface sea water temperatures on the S coast have risen c0.5 degrees C, since c1960. As with any climate data some areas will be above and some below average. There appears to have been large change in salmon behavior in Doubtful Island Bay but less change or no change on some beaches further W and S.

FIRE

Deliberate burning

Aboriginals often set fires to particular areas every few years in areas they used, to suit their requirements. Whilst there may not have been many Aboriginals generally living within 10 or 20 km of Doubtful Island Bay, fires lit far away may have reached this area from time to time. Similarly, between the 1880s and 1950s graziers set fires to suit their requirements.

Bushfires

The occurrence and severity of bushfires is affected by climate. Higher temperatures (as a result of global warming) will increase fire severity. Some areas have not been burnt since Hassells left in 1952. Higher fuel loads also increase fire severity. I have photos of areas burnt in bushfires in 1963, 1970, 1982, 2012. There were other bushfires. Areas burnt in bushfires show on aerial photos, for a time. The photos usually show patches of burnt bush but under severe conditions large areas (>1000 ha) are sometimes burnt.

COMMUNICATIONS

Telephone lines

Construction of the overland telegraph line between Albany and Adelaide commenced in Albany on 1st January 1875 and was completed in less than 3 years. Bremer Bay telegraph station initially operated by Mary Wellstead was established c1876. In 1928 Hassells telephone line was run from Jarramongup to House Beach. This line was probably operational until c1950. I can remember seeing some telephone line insulators on posts and trees, near House Beach in the 1960s.

2 way radios

After World War II High Frequency (HF) radios were used by professional fishermen, for communicating with fish processing companies, notably Hunts. These were later replaced by Very High Frequency (VHF) and Ultra High Frequency (UHF) radios.

Television

A low powered Television translator provides Television reception to Bremer Bay but although the Bremer Bay Television aerial is visible from Doubtful Island Bay, no reception is possible from this source. Television reception is possible from Mt Barker and Esperance, with powerful antennas.

Mobile phones

Telstra mobile phone and Internet coverage is available from many high points in the area, including the lookout at Heberle's camp.

Satellite

Satellite telephone and TV is available.

GEOLOGY, PHYSIOGRAPHY, VEGETATION

Geology

There are 3 classes of rocks in the Bremer Bay area:

i) Igneous rocks formed by cooling underground or at the surface of hot fluid material (magma).

Examples are:

Granite - high silica content - light coloured - white to grey.

Adamellite - intermediate silica content

Granodiorite

Diorite - lower silica content - dark grey

Dolerite - blackish/greenish colour.

ii) Sedimentary rocks formed by deposition of rock or mineral particles derived from igneous or pre-existing sedimentary rocks or by chemical precipitation from aqueous solutions or by the activity of organisms.

Examples are:

Sandstone - consolidated sand

Siltstone - consolidated silt

Shale - consolidated clay with distinct bedding

Spongolite - consolidated sponge spicules

Conglomerate - made up of rounded pebbles

Limestone - Calcium carbonate from animal or plant remains

iii) Metamorphic rocks which were originally igneous or sedimentary but have been altered by heat and/or pressure. Examples are:

Slate - slightly metamorphosed shale

Phyllite - medium metamorphosed shale

Schist - highly metamorphosed

Quartzite - metamorphosed sandstone

Gneiss - banded or layered metamorphic rock

Physiography

Thom and Chin (1984) recognize 3 main zones.

i) The south coast is fringed by hills of limestone and dune sand and rocky headlands of gneiss rise steeply from the sea often to an elevation of over 100m.

ii) Inland is a flat coastal plain. The surface of the plain has numerous often circular depressions. The rivers Pallinup, Bremer and Gairdner have cut some steep sided trenches in this plain.

iii) North of the Gairdner River there are three groups of Barren Ranges named by Flinders. The West Mount Barren Group, south of the Fitzgerald comprises West Mt Barren (371m), Mt. Bland (329m) and the lower Mt. Maxwell- The middle group includes Mid Mt Barren (457m) and Thumb Peak (about 450m). The eastern group includes Annie Peak (about 450m) and East Mt Barren (about 275m).

Vegetation

Beard (1972) recognizes 3 vegetation systems in the Bremer Bay area.

i) The Bremer System. Along the coast including gneiss bosses and drift sand.

ii) The Quaalup System. Coincides with the "Plantaganet Group" rocks behind the coastal dunes.

iii) The Barren Ranges System. North of the Gairdner River.

Beard's Vegetation Map shows 8 formations in the area.

i) Low scrub. An open community of dwarf shrubs under 1m high on exposed coastal gneiss.

- ii) Scrub heath. Two layered. An open upper layer of tall shrubs (under and a closed lower layer of small shrubs (mainly *Proteaceae* and *Myrtaceae*).
- iii) Mallee heath. Two layered. Upper layer of mallee, often *Eucalyptus tetragona*
- iv) Scrub. Open community of tall shrubs over 1m high. Several types:
Eucalyptus angulosa/ Agonis flexuosa/Acacia on coastal drift sand; Tea tree scrub of swamps, either Boree (*Melaleuca thyooides* 2.5 - 3-5m tall) or Paperbark (*Melaleuca parviflora*) up to 6m tall.
- v) Mallee. Open community of tall shrubs over 1m high with mallee dominantV mainly *Eucalyptus redunca - Eucalyptus uncinata*.
- vi) Thicket. Dense closed tall shrub community notably in Barren Ranges. Up to 1.5m tall. Often *Eucalyptus pressiana* and *Dryandra quercifolia*.
- vii) Sclerophyll woodland .Tall or medium height open tree communities up to about 18m tall. Mainly dominated by *Eucalyptus occidentalis*.
- Viii) Low forest. Small patches occur in the mallee areas. Typically with *Eucalyptus platypus*, *Eucalyptus annulata*, *Eucalyptus spathulata*.

For a list of common plant species in the area see appendix 1. For information on orchids see Heberle & others (2006), Miller-Hornsey (2009).

ANIMALS, BIRDS, FISH

For lists of common animals, birds and fish in the Bremer Bay area see appendices 2, 3 and 4, respectively.

LAND MANAGEMENT

Land tenure

Figure 4, from Doubtful Islands area coastal plan 1994 summarises land tenure. South of Location 1307 and Location 1325 is mainly Reserve 32666 for Government requirements. Fitzgerald River National Park extends E of the last farm on Doubtful Islands Road, to c1.5km E of the crossroads with Gairdner Road and Gordon Inlet Road. The part of the national park E of Gairdner Road and Gordon Inlet Road is proposed for excision. Between the national park and locations 1307 and 1325 is also mostly included in Reserve 32666.

Purple title land

Based on a study of land title documents and Company annual reports, it appears that Empell Pty Ltd purchased Kent location 1307 of 405ha (adjoining House and Reef Beaches) from MP Lenegan Pty Ltd for \$20,000 on 6.3.1974. From 1974 until 1980 shares of the property were sold to over 200 persons for a total of over \$300,000. Similarly, a related company, West Coast Waterfront Investments Pty Ltd, purchased Kent location 1325 of 1095ha at Peppermint Beach. This property was divided into 2745 shares, some sold since 1974.

Management plans

At least 4 management plans were published for the area 1974-1994:

- Jerramungup coastal district draft management plan (1974).
- Fitzgerald River National Park management plan 1991-2001.
- South Coast Region (of CALM) management plan 1992-2002.
- Doubtful Islands area coastal plan 1994.

All of the above plans have recommendations or prescriptions which may affect access to the Doubtful Island Bay area. For example the Fitzgerald River National Park plan provides for continued access by commercial fishermen through the national park, including transport of catches. This is subject to use of designated public access and the same road closures as applying to the general public.

Tracks and farming at Doubtful Island Bay

There were no tracks linking this area to the outside world until 1870-1890. The whalers probably did not have any horses or drays, buggies etc anyway, so roads were probably not needed for whaling in the 1800s. The whalers brought everything in and out by ship. Some local Aborigines could have arrived on foot and worked for the whalers.

Squatter's and fishermen's buildings

There are about 12 squatter's buildings, excluding those of professional fishermen, between Trigelow and Drages Beach, as shown on figure 2, which is out of date.. Management plans usually propose implementation of the State government squatter policy, which provides for removal of all shacks after 6 year's notice. The policy has not been applied in this area to date. The only fishermen's lease in the area is Heberle's. Hassell's house at House Beach is also on a lease.

Townsites

In 1957 the townsite of Jerramungup was gazetted. In 1962 the Marra Bridge was constructed over the Pallinup River and the bitumenised Hassell highway from Esperance to Albany was opened. Also in 1962 the townsite of Bremer Bay was gazetted. It had been called Wellstead since 1951. Bremer Bay was named in 1849 after Sir Gordon Bremer, captain of HMS Tamar.

WHALING

The information about whaling in the Heberle fishing book (page 12) was based mainly on Merle Bignell's 1977 book about the history of the Gnowangerup Shire, which included Doubtful Island Bay at that time. Better information has become available since 1977. There is anecdotal evidence of Aborigines utilizing stranded whales at Doubtful island Bay.

Early research

There is information about whaling in West Australian waters, in the Battye Library, top floor, Alexander Library in Northbridge, Perth. Much of the initial research was by D Heppingstone, who often reported in the Journal of the W.A. Historical Society.

According to a booklet by Jack McIlroy (1987) "19th century bay whaling stations in Western Australia" (Battye Library Q994.1 Mcl), there were 20 whaling stations in the 1800s, including east of Esperance, Cape Riche, Cheyne Beach, Two Peoples Bay and Albany. French and American ship based whalers operated in the area as early as 1803. It was probably as a result of their favourable reports, that whaling was undertaken in such an isolated place.

Later research

Data in Martin Gibbs (1995) shows that Doubtful Island (House Beach) was the earliest shore based whaling station in West Australia, in 1836. This was only 7 years after Perth was settled in 1829 (was Albany settled in 1826). Thus, Doubtful Island Bay was one of the first places settled in West Australia and yet, there still isn't a good road into the place, 180 years after first settlement.

According to McIlroy (1987), Doubtful Island was the second whaling station in West Australia but he had doubts about when the whaling station east of Esperance commenced. Gibbs is more likely to be correct as his work used McIlroy's work as a basis and is more recent and more detailed.

4 shore based whaling operations

i) Sherratt & Lovett

The first was organised through a partnership between Thomas Sherratt an Albany merchant and William Lovett, a Hobart Captain. John McKail, resident of Albany, was manager. This

company operated in 1836 and 1837. Sherratt and Lovett's whaling station was at House Beach, at the eastern end, near to where Hassell's shearing shed and wool shed were located, years later.

(ii) John McKail

In 1836 John McKail was permitted to occupy a small area at House Beach and in 1837 he was granted a whaling station lease of 4.4ha at the eastern end of House Beach, 200m wide and 220m long, with boundaries at right angles to House Beach, 100m each side of the summit of Whalebone Point. These measurements don't necessarily work out on the ground. All access would have been by ship. House Beach, The south corner of Reef Beach and near Drages Beach are fairly reliable anchorages for sailing ships in this area but the ships would have to move to calmer waters to avoid rough seas.

(iii) George Cheyne

A whaling team, organised by George Cheyne, Albany merchant, was based at House Beach in 1837, working in conjunction with the Master of the American whaler "Charles Wright". Sherratt and Lovett complained to the Government but eventually entered into an agreement to sell whale oil to the American ship. Its uncertain whether whaling occurred in 1838.

(iv) John McKenzie

Gibbs considers that there was no whaling from House Beach 1839-1862. Whaling recommenced in 1863, under the direction of John McKenzie (son of Hugh), who also whaled at Torbay and possibly Cape Arid, that year. McKenzie's operations continued until at least 1867. Other reports have John McKenzie, operating from c1846 to 1865.

Location of whaling stations

Shore based whaling operations may have been in different places in some years, depending on the presence of other whalers. House Beach is probably too small to accommodate 2 whaling operations at the one time.

Some flat rocks laid in the southern corner of Reef Beach, could have been associated with whaling and/or sealing operations.

American whaling ship "Emerald" was based at Drages Beach in July-October 1839. Processing of whales could have been on ship, on land or both. There was possibly a vegetable garden. A small creek runs on to the beach, for most of the year.

Seasonal nature of whaling

Like salmon and to a lesser extent herring, whales do not live in the area, they migrate through the area. Whilst the odd whale (and salmon) may be sighted in almost any month of the year, possibly 90%+ of the whales are in the area during the period July to November.

People and accommodation

Initially many of the men might have lived in tents. Some of the whalers were young, so probably did not have wives and children. Managers might have had some family members with them. Permission was granted in 1836 to erect houses as well as whaling station buildings, tanks/vats etc at what is now known as House Beach.

Gibbs thesis lists 7 Aboriginals who worked at Doubtful Island Bay for McKenzie (based on Government gazettes), ie Jack Hansome (1863, 1865, 1867), Jack Hardy (1865-66), Nebinyan (1863), Rattler Nebinyan (1865-66-67), Pillar (years unknown), Screechowl (1867), Dicky Taylor (1865-66). Jack Hansome was a boat steerer 1863 and 1865, the rest were hands.

Gibbs lists 23 Europeans who worked at House Beach for McKenzie, hands unless stated otherwise, as W Arnot (1866-cook), William Armstrong (1867), J Baines (1867), G Baines

(1865-cook), William Barrett (1863), J Barrett (1867-boat steerer), William Bilborough (1866), Roderick Cowden (1867-boat steerer), James Foot (1867), John Foster (1865), John Graham (1863-boat steerer, 1865-66 hand), Joseph Grumley (1863), George Kelley (1863), J Morris (1867), W Morrison (1867), G Nichols (1867), J Percy (1865), John Raisin (1866), W Smith (1866), A Tansley (1865), William Walker (1863), George Weaver (1863-cook), James Young (1866).

Gibbs lists management people, in addition to Sherratt, McKail, Cheyne and McKenzie, who were present at various times, Captain William Lovett was a co-owner, with Sherratt. He arrived in 1835 on the barque "Jess", with Mr Dring from Perth, for whaling and sealing. Nehemiah H Fisher (American Captain 1863, 1865, 1866-headsman). Several other men worked at House Beach, date unknown, including Chase (headsman), Dultons, 2 Mansfield brothers, Parish, Pillar, Sinclair (headsman), Tomlins (headsman). Possibly the latter were there in the 1836-38 period.

Whaling teams, whaling season, whales taken

McKenzie's whaling team at House Beach, consisted of 13-15 men in 1863-67 and they probably only lived in the area for the whaling season and until the whaling produce was shipped out. The team consisted of management, a cook and 2 boat crews (4-6 rowers and a headsman/steerer). Sometimes one of the managers was the steerer. Each team had a cooper for making and repairing the barrels, for storing whale oil. There was also a spotter. The cooper and spotter probably joined the boat crews. Gibbs has data for the whaling season at Cheyne Beach. In the 1840s and 1850s, the season typically was from mid July to mid November, = 4 months. The main species taken 1836-1870 were Southern Right whales (*Eubalaena australis*) and Hump back whales (*Megaptera novaeangliae*). Less than 10% were other species. After 1860, few Right whales were taken, (perhaps fished out) and the catch was 90% Hump backs. Sperm whales (*Physeter catodon*) are evidently high yielding of oil but are typically located well off the coast.

Payment was by the lay system, with the men receiving a % of the seasons profit, based on their position in the team.

Based on data in Gibbs' thesis, House Beach (and West Australian) production in 1836 was about 13 tonnes of whale oil and 2 tonnes of whale bone. In that year, the whalers attempted to kill 15 whales and 7 were taken. Reliable catch data is not available per team for later years. The catch in 1837 and 1838 might have been about 20 tonnes of whale oil per year. McKenzie's team produced perhaps 10 tonnes of whale oil in 1863 and less than 20 tonnes in both 1864 and 1865, from House Beach. The catch in 1866 was possibly about 10 tonnes and 1867 about 2 tonnes. Based on this data, only about 2 to 10 whales were caught each season, per team. In those days, whaling teams only caught a small proportion of the whales they attempted to catch eg 25-50%, according to Gibbs. The teams may also have done some sealing.

Some teams worked 2 or more areas in the one whaling season eg start near Albany, move to Doubtful Island Bay, then east of Esperance. If so, they may have stayed at Doubtful Island Bay for only 1-2 months each season.

Whale oil production

McIlroy described the processes involved. When the whale has been landed, blubber is cut off (flensed) and cut into small pieces for boiling = trying. Trying was done in 2 or 3 round iron cauldrons of typically 700-1100 litre capacity, placed on iron grates, over a brick or rock base, inside a wall, with a fire door and chimney. The fire was started with wood but blubber remains were burnt later. Implements included a stirring pole, blubber forks, scoops (to remove scraps). Oil was removed with bailers into cooling tanks (often copper), before being transferred to barrels. The barrels were later transferred to a ship.

Whale spotting

Each team had a whale spotter located on a good vantage point, within signal or verbal range of the boat crew (Gibbs). When a whale was spotted, the spotter could join a boat crew. This suggests that typically whales were mainly taken within sight of the station. Some whaling teams also had cutters or schooners, which could be used to carry the boats to other locations. Usually the boats did not go out until whales were sighted but some teams sent boats out each morning, weather permitting. Possibly at House Beach, only whales within about 8km were taken. Sometimes a hut or shelter was erected for the spotter. I did find a rocked floor structure near Whalebone point, many years ago.

Whaling boats, gear

The whaling boats were typically 8 or 9 m long and about 1.8 m wide, in the 1800s (McIlroy). Whales were speared with a harpoon attached to the boat by rope. When the whale tired, it was finished off with a killing lance. If whales were caught a long way from the whaling station, or the wind was unfavourable, it might take all day and half of the night to tow the whales home. A fire would need to be lit to guide the boats in. The whaling boats could also be used to transport the whale oil out to the ship. Presumably the boats were not operated in rough seas or strong off-shore winds (which would make it difficult to bring the whales back to the station). At the station, whales were usually dragged in by a winch or capstan, over rock or a wooden deck, where they were cut for processing in the try works. Barrows and pallets might be used to move the blubber.

Archaeological evidence of whaling

Work would be needed to find any signs of occupation eg using sub surface radar and excavation (by tractor), like that in the British TV show "Time team" led by Tony Robinson. Hassell's later buildings might confuse the situation. Archaeologists probably haven't looked at House Beach because of poor access, McIlroy couldn't make it, his vehicle got bogged and broke an axle. Gibbs also couldn't visit House Beach, because of the poor access.

"Peppermints" settlement, later called House Beach, established by whalers and sealers, had a store, hut and 2 acres cleared for vegetable growing. Evidence of whaling would include remains of huts for the men and management (eg floors of flat rocks), remains of cook house, cooperage, storehouses, tryworks, ramp, lookout, remains of barrels, try pots, cooling tanks, commercial rubbish (eg broken spears, lances, barrels, oars) and domestic rubbish, whale bones, teeth. Ron Heberle senior told me that there were some whaling station remains in that area, in the early days. He and Graham Bowden found whales teeth at House Beach. Hassell found some broken try pots near Whalers/Flinders well (Gibbs) and remains of huts.

Economics, competition

Until the late 1840s, whaling was the major export earner for West Australia, providing 20%+ of the colony's export value 1836-47, thereafter its importance dramatically declined to a few % 1865-80. The whaling stations could not compete with the French and USA whaling ships. In the early 1840s there were sometimes as many as 200 whaling ships in West Australian waters. They decimated the Right whale population.

WHALE STRANDINGS

Major whale strandings in the Doubtful Island area since the 1950s are listed in Mell (1988) as follows:

- September 1962 33 *Physeter catodon* (Sperm whales) Reef Beach.
- May 1964 34 *Pseudorca crassidens* (False killer whales) Reef Beach.
- October 1976 17 *Physeter catodon* (Sperm whales) Trigelow.
- August 1979 13 *Orcinus orca* (Killer whales).



1. East-west fence (c1895) across the Salt Lake, along the southern boundary of location 1307 (Simon & Annabella Reynolds). 2014 photo.



2. Hassell's Doubtful Islands Bay Sheep Dip 2014. May have been built c1894.



3. Peppermint Dam 2013. Possibly established c1873. It is now shallow and dries out some summers.



4. Old chimney 2015, from shack built c1873. It is c500m SW of Peppermint Dam.

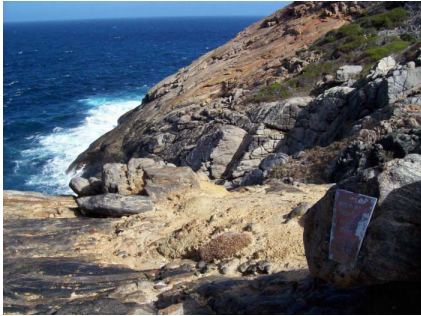


5. Heberle Landing, a fishing camp and boat launching area, on the Bremer River, 7km from Bremer townsite, used 1940s-60s. This area was burnt in 2012. 2013 photo.



6. Left: The Gap 1983.

7. Right: Water Blow hole 1987. (Left to right: Susan Heberle, Ron & Andrew Heberle).



8. Left: Monument at water blow hole to Fred Atkins 1914-1985. Presumably he died near here. Photo taken 2012. Unfortunately people prized this plaque off the rock in 2013.
9. Right: Air Blow Hole 2010.



10. Flinders/Whalers Well, near to the run way on to Reef Beach, north end, in the "Well corner" 2010.

11. Monument to Colin Gray's son, who died near here. The monument is near Flinders/Whalers Well. 2010 photo.



12. Public toilet, House Beach west end, 2003. Vegetation has grown up since 1913-37. Runway to beach on the right.



13. House Beach east end, 2003.



14. House at House Beach, west end, next to run way on to beach, 1976. Water tank to right. Beach is to left. Used by Heberles 1957-63.



15. New house built on lease at House Beach, to replace old house burnt down in 1980. New house has same floor plan as old house. 1985 photo.



16. Drages Beach, 2010.



17. Drages Beach, December 2012. Shack destroyed by fire.



18. Cliffs east of Water Blowhole, after bushfire. December 2012.



19. Doubtful Islands from the top track. Rough track, nice views. Photo from Graham Bowden, 1963.



20. Seal Rock from Islands track, 1983.



21. Doubtful Islands from Hood Point, December 2012. Part of the 1st island burnt. Left to right: Marilyn Adamson, Claire Middleton; Susan, Milanna, Ron & Matthew Heberle.



22. Doubtful Islands Bay Salt Lake 1978, covered by water. Almost every person who has driven a vehicle on this salt lake has been bogged on it.



23. Gairdner River sand bar on Trigelow Beach, 1963. Photo by Graham Bowden.



24. Kellys Creek sand bar on Trigelow Beach, 1963. Photo by Graham Bowden.



25. Left photo - Hunter River, between Bremer Bay and Doubtful Island Bay 1963. Photo from Graham Bowden.



26. Right photo – Limestone formations at Peppermint Beach sand blow 1963. Photo from Graham Bowden.



27. Trigelow Beach, south end, 2010. Kennedy's shack to right.



28. Peppermint Beach, north end, 1970. Rod Frost throwing a salmon. Photo by Graham Bowden.



29. Peppermint Beach, south end, 2010. This end is sheltered from most winds, so is usually calm.



30. Peppermint Beach, north end, 2010. This end is exposed to SW, W and S winds, so is often rough.



31. Reef beach from south end, looking north west. "Kewpie" Cullinane's shelter shed in the corner. 1963 photo from Graham Bowden.



32. Heberle camp 1977, in small sand blow, with lookout on sandhill. Shelter shed, with roof of Peppermint branches to provide shade. This camp used 1973-.



33. 6 tonne school of salmon just outside the reef on Reef Beach, at low tide. 1985 photo.



34. Heberle fishing camp from look out, looking east, in 2000.



35. Some of the whales stranded on Reef Beach 25.9.2003. Photo from Susan Heberle.



36. Doubtful Island Bay from the southern ridge, looking north, 1989. Salt Lake to left, Whalebone Point to the right. Probably Mt Bland and Mt Mid Mount Barren in the distance. Pauline (left) and Patricia Heberle (right).



37. Near the south corner of Reef Beach, March 2012. Pulling in the fishing net. From left is probably Harry Casey, Ron Heberle and George Gilchrist.



38. Graham Bowden with Heberle's "Forby", 1942 Ford 3 tonne 4x4, next to house at House Beach, 1963. Looking towards Fig tree. "Photo from Graham Bowden.



39. Royal Hakea (*Hakea victoriae*)1963. Photo by Graham Bowden.



40. Bushfire damage at lookout above Heberle camp 1982.

- September 1979 22 *Physeter catadon* (Sperm whales) near Gordon Inlet.

Other whale strandings since then include:

- July 2002 58 *Pseudorca crassidens* (False killer whales) Trigelow.
- September 2003 9 *Physeter catadon* (Sperm whales) Reef Beach.

Live strandings of whales almost exclusively occur where lines of the earth's magnetic field cross the coast or are blocked by islands and where whales typically use this magnetic field for navigation, as discussed in Klinowska (1985). Certainly repeated strandings occur in some areas and rarely elsewhere.

GRAVES, MONUMENTS

According to the Management plan (page 12) 2 whalers were killed by a whale in 1878, according to some reports, one was never found, John Raisin was buried near whalers well. Whaling may have ceased well before 1878. According to Gibbs, the whalers were killed in 1866, their names were Abraham Appleyard and John Raisin and they were buried a few metres from Whalers/Flinders well. The spot was marked with an inscribed whale bone. Chinese cook Ping Hweng, employed by Hassell, died 1892 and was later buried nearby. A man named Stotley may have been buried near Stotley Soak.

There is a monument to Colin Gray's son near Whalers well. There was a monument to Fred Atkins near the water blowhole but this disappeared 2013.

HISTORY (Mainly from Bignell, 1977)

Aborigines

Aborigines are believed to have lived in the south west of WA for at least 38,000 years. There is some evidence of habitation as long ago as 150,000 years. At the time of white settlement the Goreng (Koreng) tribe occupied the Gnowangerup-Bremer Bay area. The local population was probably quite small (<120?) as the Aboriginal population of the entire south west corner in 1829 is estimated as 6,000. (Berndt, 1973). The language spoken was Noongar (Nyungar). According to the Doubtful Islands area coastal plan, Colin Grey (European but married an Aboriginal) shepherded sheep for Hassell's at Quaalup in 1947 and at Doubtful Island Bay in the 1950s.

Europeans

The first recorded ship to visit the area was the "Guiden Seepaart" in 1627, captained by F Thijssen (Dutch) and carrying P Nuyts. The first recorded British ships to visit the area were "Discovery" and "Chatham" in 1791, captained by George Vancouver. He named Point Hood and the Doubtful Islands. The first Frenchman was B D'Encrecasteaux in 1792, who was in charge of two vessels "Recherche" and "Esperance". Aboard one of these ships was a Mr. Riche after whom Cape Riche was named.

Matthew Flinders was in the area in 6-7 January 1802 in the ship "Investigator". He named Cape Knob, west of Dillon Bay, and proved that the Doubtful Islands were islands by sailing between them. Flinders also named West, Middle and East Mount Barren. Some say that he landed at House Beach and dug a well to obtain water in "well corner" of Reef Beach. This well was referred to as "Whalers well" by early settlers. Examination of Flinders chart of the area and his book, shows that there is no evidence that he landed at House Beach and he would not have needed water, as his ship's water tank would have been filled in "Albany" 2 days previously.

In July 1842 Edward Eyre (25) and Wylie passed through the area on their journey from Adelaide to Albany. Other early visitors were the botanist Drummond in 1843, Surveyor

General J Roe in 1848 (he named the Fitzgerald and Gordon Inlets) and the geologist Von Somner (who examined coal deposits at Fitzgerald River) and the Gregory's in 1849.

The first white men to stay more than a few days in the area were sealers in the late 1700s or early 1800s. In 1835, two youths (including Jimmy Newell) walked from Esperance to Albany, a distance of 640 km, after a disagreement with some sealers, including a negro called Jack Anderson. Evidently one of Anderson's crew was killed in a disagreement near Doubtful Island Bay. During the 1700s and 1800s rabbits and goats were landed on islands in the Albany to Esperance area to provide food for mariners. Sealers are believed to have been in the area up until about 1850.

Development

In 1838 George Cheyne settled at Cape Riche and later established a port there. Sandalwood cutters operated in the area from about 1847. Captain John Hassell settled at Jarramongup in 1849. When regulation made provision for pastoral leases in 1851 the first claimants east of Albany were Cheyne and Hassell. The next settlers were the Barrett Brothers (1850) who settled on the Pallinup River at "Mongup". Relations of Mrs. Cheyne, the Moir's, eventually took over Cheyne's properties in the Cape Riche area and the Barrett's property at "Mongup". A relative of George Cheyne, WA Graham was another early settler in the area, in about 1858.

GRAZING

John Wellstead

In the 1850s, John Wellstead began squatting on land in the Bremer Bay area, where he later acquired freehold titles. He settled firstly at "South West Bay" and later at "Peppermint Grove". In the late 1850s, he established an out-station at Quaalup. He built Quaalup homestead in 1858. In 1881, Mary Ann Isabella Wellstead married John Harris and they went to live at the homestead at Quaalup.

John Hassell

John Hassell arrived in Tasmania in 1822. On the 17th May 1824, the "Belinda" under Captain Thomas Cloverdale sailed from Sydney for the sealing grounds off the SE coast of West Australia. The "Belinda" was wrecked at Middle Island in the Archipelago on the 19th July 1824. The ship's First Mate was 26 year old John Hassell. Hassell later returned to the South Coast as Captain of his own ship, the "Dawson". He returned to England in 1837, married, returned to Australia, settling in Albany. Hassell became one of the largest landholders in the SW of West Australia. In the 1880s-1900s the Hassell family had land holdings near Bridgetown, Beaufort, Frankland, Cranbrook, Mt Barker, Kendenup, Gnowangerup, Jerramongup and Jacup, with coastal land near Walpole, Albany, Warriup and Doubtful Island Bay. John Hassell purchased Kendenup station from George Cheyne. In 1849 he took up Jarramongup station (later spelt Jerramongup), which was eventually taken over by AY Hassell. John Hassell opened the first gold mine in West Australia, on the Kendenup property.

First settlement, near or in Location 1306

In 1895, surveyors defined Kent location 1306, some 500m from Peppermint Beach, an area of 16ha (400m x 400m), around a sheep camp, vegetable garden, water tank and possibly a well. An old chimney was also present, the remains of an overseer or shepherds shack. It is referred to as an old chimney, it may have been there since c1873. The garden was still in use in 1895 but may have been replaced by gardens at House Beach, soon after. Most of the shepherds may have been Aboriginals, but the shepherd in charge of each flock would have been white. The Aboriginals probably camped nearby. Harlands located the old chimney whilst aggristing sheep in the area 1968-70. Ron Harland established its GPS coordinates more recently.



Figure 5: Hassell land holdings 1880-1900 near Doubtful Island Bay from Cleve Hassell 1972

Location 1307 House Beach-Trigelow, Location 1325 Peppermint Beach-Trigelow

The larger locations (1307, 1325) were probably surveyed soon after 1306 (c1895). Fencing was installed c1895 onwards. Some fence posts and wire are still present. Some of the posts of the east-west fence across the salt lake, along the southern boundary of location 1307 (House Beach to Doubtful Island Bay) are still in place.

Water supplies

Reliable water supplies are needed for farm operations. At some stage, possibly in the c1873, a dam was established, shown as Peppermint Dam on some maps. The dam is some 300m NE of the NE corner of location 1306. The Harland family aggisted stock in this area in 1968-70. They camped close to the dam and put a fence around it. They also located the old chimney and sheep dip.

The main water supplies south/east of Gairdner & Gordon Inlet Roads are:

- Peppermint Dam, almost 5km by track, from House Beach, established as early as 1873.
- Hunter River – Water Reserve /\2524 288ha, 7km W of Peppermint Dam.
- Stotly Soak, 3km W of Peppermint Dam, near track to east end of Bremer Beach.
- Tooregullup Swamp – Water Reserve /\2507 81ha, 5km N of Peppermint Dam.
- Kellys Creek, 1.5km N of Tooregullup Swamp.
- Pullitup Swamp – Resting Place for Travellers & Stock /\3251 40ha, 8km NW of Peppermint Dam, 1.5km E of crossroads of Gairdner & Gordon Inlet Roads.
- Point Swamp, 4km SE of Peppermint Dam.
- Near Peppermint sand blow, adjoining track to Bremer Bay, 1km SW of Peppermint dam.

Wells, water tanks

Any settlement requires drinking water. This was usually well water in the early days. The whalers had at least one well at House Beach. It was later named Whalers well. Some called it Flinders well but there is no evidence that Flinders landed at "House Beach". Each whaling station would have had its own well. Hassells had at least one well at House Beach. Whalers well did not have a lot of water by 1894 and had a rocky bottom and would have been difficult to deepen, so Hassells put in a new well, near the cook house. Some maps show Homestead well, c70m NW of the N corner of Reef Beach and c160m from the E corner of House Beach. This is c140m E from Hassell's house, where there was probably another well. The house had a water tank. Most shack owners in the area have a well for washing water and tank for rain water.

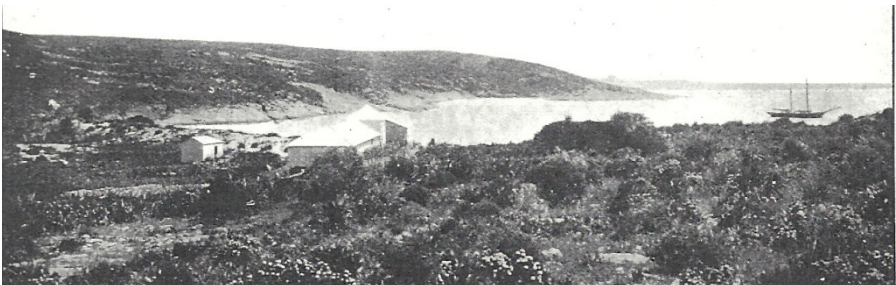
Sheep dips

The Doubtful History website refers to (Hassell's) sheep dip, c1.7km SSW of the salt lake. This sheep dip, which is a concrete enclosure, may have been built in c1894. There was a similar sheep dip at the Jerramongup farm, where sheep from Doubtful Island Bay may have been dipped, as they passed through Jerramongup after shearing, up until 1894. The Doubtful Island Bay sheep dip has been relocated and a walk trail to it has been marked with flagging tape and some signposts, for 550m from the nearest track junction.

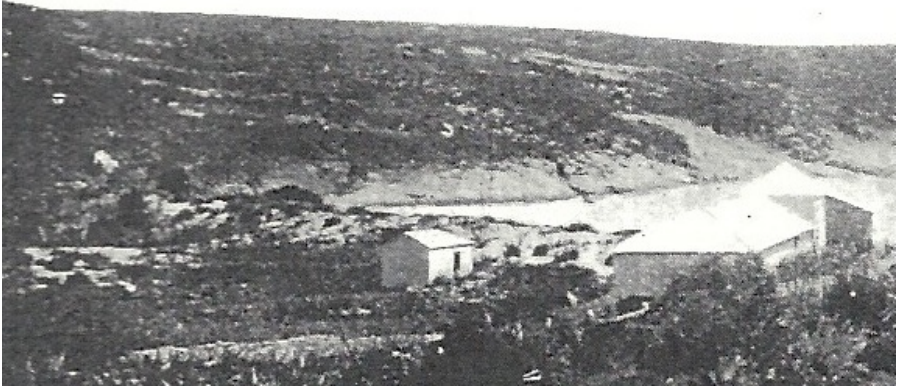
Shearing shed, house at House Beach

Initially, Jerramongup and Doubtful Island Bay sheep were shorn at Kendenup. By 1894 the Hassell estate had been divided between the brothers and it was no longer possible for the Jerramongup sheep to be shorn at Kendenup, so a new shearing shed was required. AY Hassell built a shearing shed, wool shed and living quarters at Doubtful Island Bay, now known as House Beach in c1894, so that wool could be shipped from there to Albany. It is likely that the farm head quarters was moved from inside location 1306 (to be) c1893. Shepherds then camped at House Beach, known at that time as Whalers camp.

According to the Shire of Jerramongup Municipal Heritage Inventory (undated), from 1894 to 1916, all shearing from the Jerramongup-Quaalup-Doubtful Island Bay operation was done at Doubtful Island Bay, where 30 shearers worked seasonally. Sheep were droved there from Jerramongup, Quaalup and about 10 nearby farms, also owned by Hassell. From 1916 shearing was done at Jerramongup and the wool sent by road to Ongerup and then by rail to Fremantle.. Later, there may have been a shearing shed at Quaalup. The 12 stand House Beach shearing shed was built 1894 and completely pulled down by 1924.



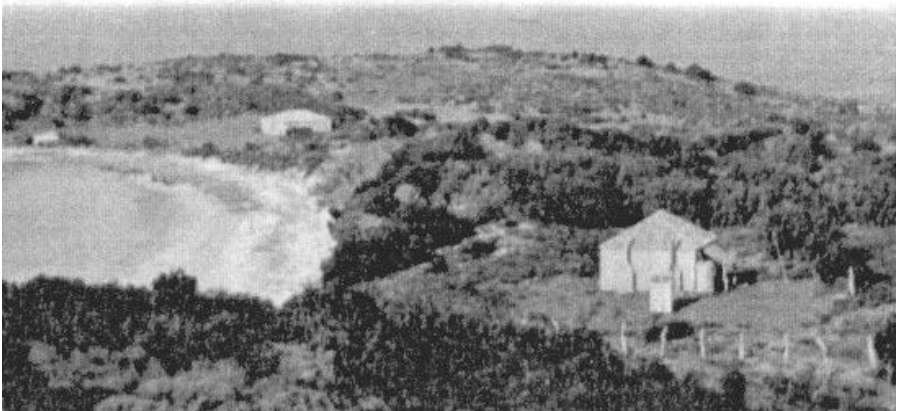
A. House Beach 1913, from east end, showing shearing shed and wool shed, from Cyclopedia of W.A.



B. Part of photo A enlarged for better view of the shearing shed.



C. House Beach 1937, from west end. Photo from Cyril Heberle.



D. Part of photo C enlarged for better view of house & shearing shed.

Albert Young Hassell

When John Hassell's properties were divided between his sons, 2nd son Albert Young Hassell (b Albany 1841, d 1918), who had managed Jarramongup 1861-63 before managing Kendenup, inherited Jarramongup, together with all the eastern properties, including Quaalup. Details about Albert Young Hassell are in the Cyclopaedia of Western Australia, including photos of Hassell (c1910) and House Beach (c1913) showing the shearing shed and wool shed.

Hassell's pastoral leases extended from Jerramongup to Doubtful Island Bay, where the small beach west of Whalebone Point became known as House Beach, where the original house/humpy was built in c1893. It and/or the 2nd house was shifted from Albany and transported on the "Grace Darling". It was replaced in c1900, by the house shown on the 1913 photo below, which burnt down in 1980. AY Hassell married in 1878. His wife Ethel and some of their 10 children sometimes stayed at Doubtful Island Bay.

Housing, tents for the workers at House Beach

Extensive living quarters would have been needed. Tents could have been used for seasonal workers. Most of the farm workers were Aboriginals (who would have had their own camp) and some Chinese were employed, notably for fencing. There would have been some huts, tents and camping shelters near the wool shed.

Quaalup

In 1881, there was correspondence between the Commissioner of Crown Lands and John Wellstead, who had purchased 100 acres (40ha) of land at Quaalup, Gairdner River, and John Hassell, who had purchased 200 acres (80ha), after Wellstead informed Hassell he had taken possession of the 40 acres (16ha) Hassell had cleared because 'by the map, Hassell's land was some one mile (1.6km) further up river. This was resolved by creation of 2 adjoining locations, one for each. Through the 1880s and into the early 1890s, both the Hassells and Wellsteads continued to take stock to the pastures at Gairdner River. In c1890, the Hassell's took over Quaalup from Wellsteads.

McGlades

James McGlade (who lived in the cottage at Quaalup) was in charge of shepherding the sheep from Quaalup to House Beach. They were shorn there and the fleece loaded onto rafts that were then floated out to ships just off the coast. James' daughter, May McGlade, died in 1927 at the age of 18 years from a chest complaint. On return from shepherding sheep (2 days later) James took a tall kitchen cupboard out of the Homestead, knocked the shelves out and that became Mary's coffin. Mary was buried on the side of the track leading to Quaalup (the lonely grave on the nature walk).

Aboriginals

Some Aboriginal families worked for pastoralists for several generations, including John Knapp who married Lilly Bevan. He worked for Hassell's, Dunn's and Moir's. Their daughter, Kathleen, married Colin Gray (non-Aboriginal), who worked for Hassell in a similar role to James McGlade. Most of the farm workers and shearers employed by Hassells at Doubtful Island Bay were Aboriginals. Possibly as many as 30 were employed at peak times such as shearing time. Ethel Hassell's book "My Dusky Friends" has a photo of Hassells employees outside the shearing shed at House Beach c1910. There are c22 Aboriginals and 3 whites.

Mick Hassell

Arthur Young Marsland Hassell (Mick), Ednie's 2nd son married in 1930 and the Quaalup Homestead was extended for his family. AY Hassell moved his sons around his properties,

thus Harold (b.1889) lived and worked at Quaalup for a number of years, while Edmund Arthur "Ednie" (b 1881, d 1950), managed Jerramungup, and Harold transferred to Warriup. In the 1940s, Mick Hassell continued to reside and work at Quaalup, and his older brother, Albert Edmund "Joe", lived and worked at the main station at Jerramungup. By then, Ednie Hassell had built up his flock of sheep at Jerramungup and Quaalup to around 10,000, and the wool clip at Jerramungup was the largest produced in the agricultural areas of the state.

End of Hassell involvement

Ednie Hassell (one of AY Hassell's sons) was the last Hassell to operate the Jerramungup - Doubtful Island Bay property. By 1946, due to family differences, both of his sons had left the property. In 1948 the government commenced negotiations to purchase the Jerramungup - Quaalup - Doubtful Island property for inclusion in the War Service Land Settlement Scheme. The deal was completed after Ednie Hassell's death in 1950 and Jerramungup town established there in 1953. Stock were rounded up but some were missed and occasionally sheep and cattle were sighted until about 1970.

Quaalup owners since Hassells

The Lugg family were next to live at Quaalup, from 1954, after swapping land they owned with the government. They sold the property in 1973.

Geoff and Norma Keen bought Quaalup Homestead in 1974. He was the Park Ranger at that time and the family spent years restoring the Homestead, which was badly vandalised.

In 1989, the Gilbert O'Brien family purchased Quaalup. They furnished the Homestead as a museum and offered meals in the dining room.

In 2004 Quaalup was purchased by Carsten Wagner-Richelmann and Karin Quetschke from Hamburg, Germany. It is now the Quaalup Homestead Wilderness Retreat with the Homestead being part of it.

Aggisting in the 1960s-70s

Some stock from local farmers (the Harlands) were aggisted at Doubtful Island Bay during drought in the 1968-1970 period.

Orchards for fruit trees and gardens for vegetables

According to the Doubtful Islands area coastal plan (1994) page 12, the whalers (and graziers) grew vegetables where they could. Vegetables would have been grown at House Beach, where the cook was based. The south corners of Reef Beach and Trigelow would also be suitable for gardens, as would a small area at Drages Beach. There was also a vegetable garden in Location 1306, near Peppermint Dam <1895.

Fig trees and apricots were among the plantings in the well-established orchard at Quaalup and probably House Beach as well. In the 1950s, there was a fig tree c150m NW of the house at House Beach. By 1994 there was no fig tree but numerous suckers. These probably died in the late 1990s and fell over, leaving no trace in 2015. The area hasn't been burnt since c1950.

Rabbit proof fence

As early as 1897 rabbits were reported crossing the South Australian border into WA. To halt their progress the government commenced constructing the No 1 Rabbit Proof Fence in 1902 from Starvation Bay near Hopetoun, northwards. However by this time rabbits had already moved further westwards, so construction of a second fence (No 2) was commenced from Point Ann northwards. However this failed to stop the rabbits, which by 1914 were reported at Bremer Bay.

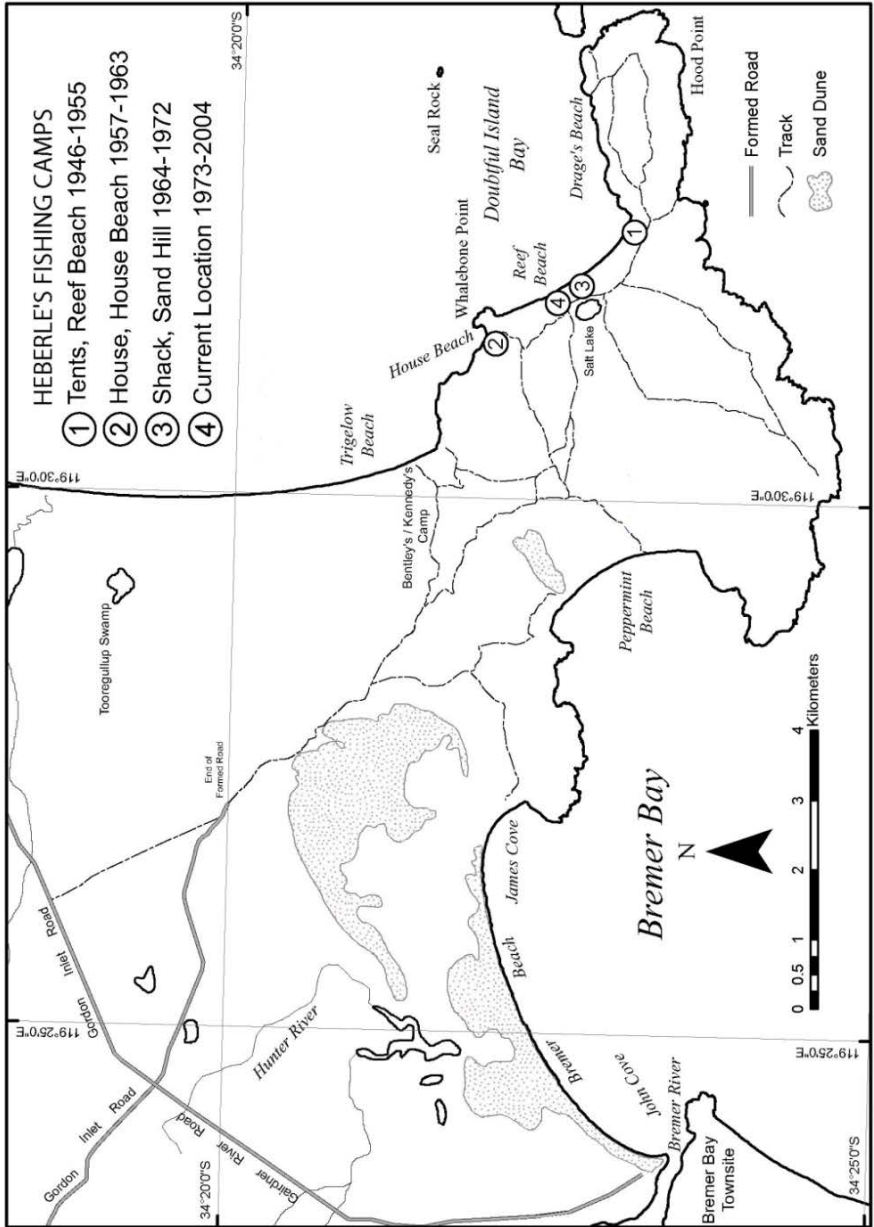


Figure 6 – Heberle's fishing camps



E. Les, Ron and Cyril Heberle (left to right) un-meshing salmon on the rocks at the south end of Reef Beach. 1946 photo by Cyril Heberle.



F & G. Cleaning salmon on Trigelow Beach 1949. Left: Cleaning machine. Right: Cutting throats of salmon to release blood. Photos by Cyril Heberle.

PROFESSIONAL FISHING

Professional fishing is a seasonal activity in this area, mainly because at certain times the seas are generally too rough and at times the clay tracks are typically impassible.

Professional fishing teams

A team is needed for salmon and set net herring fishing. To catch commercial quantities of salmon, the team size required depends on the roughness of seas, whether the beach can be driven on by trucks, fish school size, whether the fish have to be cleaned (heads and guts removed) and whether the fisherman transports the catch in his own truck or can get a carter. More men are needed in rough seas and for large schools. Wage costs and fish prices are also relevant. Mechanization can reduce requirement for labour.

Originally, all salmon had to be cleaned for sale to the canneries. In c1977, the canneries commenced accepting whole salmon. From 1980, all salmon were sold whole. Before 1977, Heberles salmon teams were typically about 7 persons. From 1980, teams were usually about 5 persons. Often less at the beginning and end of season, when average catch per day was less (about 1 tonne/day, down from a peak of about 3 tonnes/day).

Heberle fishing seasons 1929-2004

Details about Heberle fishing activities, for each year, are presented in the Heberle Fishing book. A history of the Country fish supply (the business name for Heberle fishing operations 1937-1960) is provided in the Katanning Shire history (Heberle, 1988).

Heberles average salmon catch was about 73 tonnes whole weight per year, about 4% of the West Australian commercial catch.

The average herring catch during the salmon (and herring) season was about 8 tonnes per year, about 1% of the commercial West Australian catch. Possibly at least as much herring was caught between salmon seasons up to 1963, in general fishing, but family records are not available, with the exception of data for Pallinup 1945-54, which is in Appendix 17 of the Fishing Book. This data suggests that catches may have been at least 1 tonne/week or 50t/year.

Heberle landing is a fishing camp and boat launching area, on the Bremer River, 7km from Bremer townsite, used 1940s-60s. It is one of the places where the Heberles fished when they weren't fishing at Doubtful Island Bay.

See frequent visitor section for salmon team members. More detail is available in the Heberle Fishing book.

Heberle fishing seasons since 2004

Fishing has continued but at a very low level. There is now no commercial canning of Australian salmon in Australia, so the market for Australian salmon is extremely small. The amount of salmon swimming the beaches at Doubtful Island Bay is also very small. Schools of salmon have been seen moving past Point Hood and the islands but few visit the beaches. This is probably as a result of global warming, salmon preferring cooler water as found off shore. Also very few schools of pilchards/mulies (probably salmon's preferred food) have been seen from the beaches in recent years. Hundreds of tonnes were often sighted each year up to c1990s. Salmon would presumably be in greater numbers where their food fish is found.

Heberle salmon fishing camps, cleaning sheds

- 1946-55 in tents at south end of Reef Beach.
- 1956 Cape Riche, Bremer Bay.

- 1957-63 in house at House Beach, with a shelter shed on the beach.
- 1964-72 in shack on sand hill, half way along Reef Beach, with a shelter shed below the shack, on Reef Beach initially and then at the current location.
- 1973-2004 at current location (200m N of 1964-72 camp), half way along Reef Beach, with a concrete floored shelter shed there, behind the beach.

Camp locations are shown in Figure 5.

Reef Beach, Doubtful Island Bay – faces NE

This beach is typically fishable in strong S, SW, W, SE winds and difficult in N, NE, E winds. In recent years Heberles only fished on this beach, because after 1965, they had no legal right to fish on the other beaches. In 1956-62 Heberles fished with Cullinane, in 1963-67 opposed Cullinane.

House Beach – faces NW

This beach is usually calm, except in strong NW winds. Heberles had no legal right to fish for salmon on this beach 1965-. Up until 1972 they often netted herring here. They occasionally caught salmon here. Kevin Kennedy fished here for herring 1982-92. His son, Craig Kennedy fished here 1993-2000.

Drages Beach – faces N

This beach is usually calm, except in strong NW, N, NE winds. Heberles had no legal right to fish on this beach 1965-. Heberles caught very few salmon here as virtually all the schools swam along Reef Beach first. Colin Kennedy fished here 1982-1997, for salmon and herring.

Trigelow Beach – faces E

This beach is difficult in strong SE, E, NE, winds. In 1950-52 Heberles fished for salmon here, with Charlie Chipperfield, George Andre & Wignells from Hopetoun. Heberles had no legal right to fish on this beach 1965-. Before then they occasionally caught salmon here. In 1953, Cullinane's team (which included Jack Morris, Frank Bentley and Brian Jackman) were based at Bremer but caught some fish at Trigelow. Cullinane fished here 1954-55. Frank Bentley fished here 1960-1997. Colin Kennedy fished here 1998-.

Peppermint Beach – faces SW

This beach is difficult in strong SW, W winds. The N corner is also difficult in S winds. Heberles had no legal right to fish on this beach 1965-. Before then Heberles and Bentley occasionally caught salmon here. Cullinane & Cagnana fished for salmon here 1949. Morris occasionally fished for salmon here.

MINING

Economic Geology

Mineral occurrences in the area such as lignite, montan wax, manganese and heavy minerals have been investigated but judged uneconomic. Manganese deposits occur at Copper Mine Creek and Naendip. Heavy mineral deposits (ilmenite, zircon, garnet, rutile etc) occur at Cape Riche and Gordon Inlet. Lignite (and montan wax) occurs in the lower Fitzgerald River basin. In 1921 an exploratory oil well was drilled to 108m near the Fitzgerald lignite deposit but was dry. Spongolite has been quarried near Twertup Creek for building stone. Lead ore occurs 8 km north of Bremer Bay and near the Hamersley River and Naendip.

Mining

There is some interest in mineral sands in the area. Mining leases have been issued.

TOURISM (excluding Fitzgerald River National Park)

Due to the very poor access and negligible signage, Doubtful Island Bay is probably only visited by a 1000 or so tourists each year (20+ per week), many of them during long weekends and school holidays. If good road access was established for 2 wheel drive vehicles, this could increase 10+ fold.

Locations of interest to tourists include the following:

- Beaches: Tooregallup-Trigelow Beach, House Beach, Reef Beach (Some call this Heberle Beach, others call it Whalebone Beach), Drages Beach, Peppermint Beach (actually part of Bremer Bay but usually accessed from Doubtful Island tracks).
- The Doubtful Islands and Seal Rock.
- Heberle professional fishing camp and lookout on Reef Beach.
- Fishing camp in the south corner of Trigelow Beach.
- Water blowhole (only blows 50% of time), Air blowhole.
- Gap, south coast cliffs.
- Peppermint sand blow and Bremer sand blows, limestone formations.
- Salt lake.
- Flinders/Whalers well near House Beach, north end of Reef Beach.
- Rivers: Gairdner River, Kellys Creek.
- Fishing, swimming, surfing (Peppermint Beach is best), camping.
- Whales (in season, July - October), Dolphins, Salmon (in season, late February to early April).
- Wildflowers (in season).
- Historical sites . House Beach, Whalers well, Heberle professional fishing camp, Drages Beach, Hassell's sheep dip, Hassell's fence line on the Salt lake..

GPS COORDINATES

	Latitude	Longitude
Air blowhole	S 34 23.481	E 119 32.435
Alan John Gray monument	S 34 21.965	E 119 31.707
Gap	S 34 23.465	E 119 32.436
Heberle fishing camp, Reef Beach	S 34 22.614	E 119 32.043
Kennedy fishing camp, Trigelow Beach	S 34 21.595	E 119 30.483
Old chimney near Peppermint dam	S34 22.169	E119 29.106
Peppermint dam	S 34 21.919	E119 29.415
Peppermint Beach limestone formations	S 34 22.403	E 119 29.420
Peppermint Beach south runway	S 34 23.202	E 119 29.542
Sheep dip	S 34 23.498	E 119 31.277
Water blowhole	S 34 23.369	E 119 32.807
Whalers well	S 34 21.944	E 119 31.696

Old chimney and Sheep dip coordinates provided by Ron Harland. Others by Garmin eTrex10.

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Appendix 1 - SOME COMMON PLANTS OF THE BREMER BAY AREA.

Phyllum etc. (s)	Family	Genus & Species	Common name
Thallophyta			algae & fungi
Bryophyta			mosses
Pteridophyta			ferns
Monocotyledoneae	Gramineae	<i>Spinifex hirsutus</i>	Ammophila arena
	Restionaceae		rushes
		<i>Lepidosperma gladiatum</i>	coast sword sedg
	Liliaceae	<i>Dasypogon bromeliaefolius</i> <i>Xanthorrhoea gracilis, nana</i>	blackboys
	Juncaceae		reeds
	Amaryllidaceae	<i>Anigosanthus humilis, rufa</i> <i>Conostylis seorsiflora</i>	kangaroo paws
	Orchidaceae	<i>Caladenia aphylla</i>	leafless orchid
		<i>Caladenia heberleana</i>	Heberle spider
		<i>Caladenia latifolia</i>	pink fairy orchid
		<i>Caladenia flava</i>	cowslip orchid
		<i>Elythranthera brunonis</i>	purple enamel
		<i>Eriochilus dilatatus</i>	white bunny
		<i>Leptoceras menziesii</i>	rabbit orchid
		<i>Leptoceras fimbriata</i>	hare orchid
		<i>Burnettia nigricans</i>	redbeak orchid
		<i>Cyrtostylis robusta</i>	mosquito orchid
		<i>Thelymitra antennifera</i>	vanilla orchid
		<i>Thelymitra benthamiana</i>	leopard orchid
		<i>Microtis media</i>	mignonette
		<i>Prasophyllum parvifolium</i>	scented leek
		<i>Prasophyllum fimbria</i>	fringed leek
		<i>Pterostylis nana</i>	snail orchid
	<i>Pterostylis turfosa</i>	bird orchid	
	<i>Diuris corymbosa</i>	donkey orchid	
	<i>Diuris laxifolia</i>	bee orchid	
	Casuarinaceae	<i>Casuarina humilis</i>	
Dicotyledoneae	Proteaceae	<i>Adenanthos cuneatus</i>	
		<i>Banksia media, nutans, rep</i>	banksias
		<i>Conospermum anoenum</i>	smoke bush
		<i>Dryandra cuneata,</i> <i>arcifolia,</i>	dryandras
		<i>Hakea oleifolia, victoriae</i>	hakea

	<i>Isopogon buxifolius, tridens</i>	
	<i>Petrophile ericifolia, teretifolia</i>	
Loranthaceae	<i>Nuytsia floribunda</i>	xmas tree
Chenopodiaceae	<i>Arthrocnemum, Salicornia</i>	halophytes
Aizoaceae	<i>Carpobrotus aequilaterus</i>	pigface
Mimosaceae	<i>Acacia cyclopis, decipiens</i>	wattle
Papilionaceae	<i>Bossiaea rufa</i>	water bush
	<i>Gastrolobium reticulatum</i>	poison plant
	<i>Gompholobium nightianum</i>	
Zygophyllaceae	<i>Zygophyllum apiculatum</i>	
Rutaceae	<i>Boronia crenulata, viminea</i>	boronia
	<i>Eriostemum nodiflorus</i>	pepper & salt
Euphorbiceae	<i>Phyllanthus calycinus</i>	
Thymelaeaceae	<i>Pimelea ferrunginea</i>	
	<i>Agonis flexuosa</i>	peppermint
	<i>Calothamnus pinifolius</i>	
	<i>Chaemetaucium</i>	wax plant
	<i>gapetalum</i>	
	<i>Eucalyptus angulosa</i>	ridge fruited mallee
	<i>Eucalyptus platypus</i>	round leaf moort
	<i>Eucalyptus occidentalis</i>	flat topped yate
	<i>Eucalyptus preissiana</i>	bell fruited mallee
	<i>Eucalyptus redunca</i>	black marlock
	<i>Eucalyptus sheathiana</i>	ribbon barked mallee
	<i>Eucalyptus tetragona</i>	tallerack
	<i>Melaleuca thyoides</i>	boree, paper bark
	<i>Verticordia densiflora</i>	
Epacridaceae	<i>Leucopogon flavescens</i>	
	<i>Lysinema ciliatum</i>	curry & rice
Goodeniaceae	<i>Dampiera juncea</i>	
	<i>Scaevola crassifolia</i>	

Appendix 2 - SOME COMMON ANIMALS OF THE BREMER BAY AREA

Phyllum etc	Order, Class	Species	Common name
Coelenterata			jelly fish, coral anemones
Nematoda			worms
Athropoda	Crustacea		lobsters,

Mollusca	Gastropoda		crabs,
	Pelecypoda		snails, slugs
			mussels,
			oysters,
Chordata		Cephalopoda	scallops
			squid,
			cuttlefish,
			octopus
Mammalia	Asteroidea		star fishes
	Echinoidea		sea urchins
	Chondrichthyes		sharks, rays,
	Amphibia		frogs
Mammalia	Reptilia	<i>Demansia nuchalis</i>	dugite
		<i>Notechis scutatus</i>	tiger snake
		<i>Macropus fuliginosus</i>	western grey kangaroo
		<i>Macropus irma</i>	brush wallaby
		<i>Tarsipus spencerae</i>	honey possum
		<i>Cercartetus concinnus</i>	pygmy possum
		<i>Rattus fuscipes</i>	bush rat
		<i>Isodon obesulus</i>	short nosed bandicoot
		<i>Canis familiaris</i>	dingo, dogs
		<i>Oryctolagus cuniculus</i>	rabbit
		<i>Vulpes vulpes</i>	fox
		<i>Felix catus</i>	cat
		<i>Megaptera noveangliae</i>	humpback whale
		<i>Physeter catodon</i>	sperm whale
		<i>Nephoca cinerea</i>	sea lion
	<i>Arctocephalus doriferus</i>	fur seal	
	<i>Delphinus delphis</i>	dolphin	

Appendix 3 - SOME COMMON BIRDS OF THE BREMER BAY AREA.

Casuariidae	<i>Dromaius novaehollandiae</i>	emu
Podicipedidae	<i>Podiceps</i>	grebes
Spheniscidae	<i>Pelecanus conspicillatus</i>	pelican
Sulidae	<i>Sula bassana</i>	gannet
Phalacrocoracidae	<i>Phalacrocorax</i>	cormorants
Ardeidae	<i>Ardea</i>	heron

Anatidae	<i>Cygnus atratus</i>	black swan
	<i>Tadorna tadornoides</i>	mountain duck
	<i>Amas superciliosa</i>	black duck
Accipitridae	<i>Elanus</i>	kite
	<i>Aquila audax</i>	wedge tailed eagle
	<i>Haliaeetus leucagaster</i>	sea eagle
	<i>Pandion haliaetus</i>	osprey
Falconidae	<i>Falco peregrinus</i>	peregrine falcon
	<i>Falco cenchroides</i>	kestrel
Megapodiidae	<i>Leipoa ocellata</i>	mallee fowl
Turnicidae	<i>Turnix varia</i>	quail
Rallidae	<i>Fulica atra</i>	coot
Otididae	<i>Otis australis</i>	bustard
Haematopodidae	<i>Haematopus longirostris</i>	pied oyster catcher
Charadriidae	<i>Pluvialis squatarola</i>	grey plover
Recurvirostridae	<i>Cladorhynchus leucocephala</i>	white headed stilt
Laridae	<i>Larus novaehollandae</i>	silver gull
	<i>Larus pacificus</i>	pacific gull
	<i>Sterna bergii</i>	crested tern
Psittacidae	<i>Platycercus spurius</i>	red capped parrot
	<i>Neophema petrophila</i>	rock parrot
	<i>Calyptorhynchus latirostris</i>	cockatoo
Cuculidae	<i>Cuculus, Chrysococcyx</i>	cuckoo
Strigidae	<i>Ninox</i>	owls
Podargidae	<i>Podargus strigoides</i>	tawny frogmouth
Alcedinidae	<i>Dacelo g1gas</i>	kookaburra
Pachycephalidae	<i>Petroica cucullata</i>	hooded robin
Monarchidae	<i>Rhipidura leucophrys</i>	willie wagtail
Ploceidae	<i>Emblema oculatum</i>	finches
Grallinidae	<i>Grallina cyanoleuca</i>	magpie lark
Cracticidae	<i>Cracticus torquatus</i>	grey butcherbird
	<i>Cracticus tibicen</i>	magpie
Corvidae	<i>Corvus coronoides</i>	raven

Appendix 4 - SOME COMMON FISH OF THE BREMER BAY AREA.

Class	Family	Genus & species	Common name(s)
Chondrichthyes	Heterodontidae	<i>Heterodontus</i>	Port Jackson shark
		<i>portusjacksonii</i>	
	Orectolobidae	<i>Orectolobus</i>	wobbegong
	Odontaspidae	<i>Odontaspis taurus</i>	grey nurse shark
	Lamnidae	<i>Isurus oxyrinchus</i>	mako

Osteichthyes	Triakidae	<i>Furgaleus vantralis</i>	whiskery shark
	Carcharhinidae	<i>Mustelus antarcticus</i>	gummy shark
	Rhinobatida,e	<i>Carcharhinus brachyurus</i>	bronze whaler
	Dasyatidae	<i>Trygonorhina fasciata</i>	southern fiddler
	Clupeidae	<i>Dasyatis brevicaudata</i>	smooth stingray
		<i>Sardinops neopilchardus</i>	pilchard
		<i>Sardinella lemuru</i>	scaly mackerel
	Plotosidae	<i>Cnidoglanis</i>	cobbler
		<i>macrocephalus</i>	
	Hemiramphidae	<i>Hyporhamphus melanochir</i>	Southern sea garfish
	Syngnathidae	<i>Phyllopteryx taeniolatus</i>	common sea dragon
	Platycephalidae	<i>Platycephalus speculator</i>	flat head
	Serranidae	<i>Epinephelides armatus</i>	breaksea cod
	Teraponidae	<i>Pelsartia humeralis</i>	trumpeter
	Sillaginidae	<i>Sillaginodes punctatus</i>	King George whiting
	Pomatomidae	<i>Pomatomus saltator</i>	tailor
	Carangidae	<i>Pseudocaranx dentex</i>	skipjack trevally
	Arripidae	<i>Arripis trutta esper</i>	Australian salmon (west)
		<i>Arripis georgianus</i>	Australian herring
	Sparidae	<i>Acanthopagrus butcheri</i>	black bream
	Kyphosidae	<i>Kyphosus sydneyanus</i>	buffalo bream
	Scorpidae	<i>Scorpis aequipinnis</i>	sweep
	Mugilidae	<i>Aldrichetta forsteri</i>	yellow eye mullet
		<i>Mugil cephalus</i>	sea mullet
	Sphyraenidae	<i>Sphyraena obtusata</i>	sea pike
	Labridae	<i>Achoerodus gouldii</i>	blue groper
	Gempylidae	<i>Leionura atun</i>	barracouta
Scombridae	<i>Thunnus maccoyii</i>	southern blue fin tuna	
Pleuronectidae	<i>Ammotrefis rostratus</i>	flounder	
Monacanthidae	<i>Scobinichthys granulatus</i>	leather jacket	
Tetraodontidae	<i>Torquigener pleurogramma</i>	blow fish	