

# Milford Opportunities Project

## Phase 1 Gap Analysis



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## Glossary

<b>Milford Sound/ Piopiotahi</b>	Includes the Fiord itself, settlement, infrastructure - the natural and physical environment at Milford Sound.
<b>Milford Corridor</b>	State Highway 94 'The Milford Road' from Te Anau to Milford Sound and immediate surrounds from ridgeline to ridgeline up each valley (i.e. includes Eglington Valley and Hollyford Valley).
<b>Milford Regional Context</b>	Wider Southland and Otago areas (Fiordland, Te Anau, Queenstown, Northern Southland Townships, Invercargill, Southern Scenic Route, Catlins, Rakiura, State Highway's 94, 95, 97, 99 and 6).

<b>AEE</b>	Assessment of Environmental Effects
<b>CMA</b>	Coastal Marine Area
<b>DOC</b>	Department of Conservation
<b>ES</b>	Environment Southland (Southland Regional Council)
<b>FNP</b>	Fiordland National Park
<b>FNPMP</b>	Fiordland National Park Management Plan
<b>MBIE</b>	Ministry of Business Innovation and Employment
<b>MOP</b>	Milford Opportunities Project
<b>MST</b>	Milford Sound Tourism
<b>NZTA</b>	NZ Transport Agency
<b>pSWLP</b>	Proposed Southland Water and Land Plan
<b>QLDC</b>	Queenstown Lakes District Council
<b>QMS</b>	Quota Management System
<b>RCP</b>	Regional Coastal Plan
<b>RMA</b>	Resource Management Act 1991
<b>RPS</b>	Regional Policy Statement for Southland
<b>RWP</b>	Regional Water Plan (Operative)
<b>SDC</b>	Southland District Council
<b>SDP</b>	Southland District Plan
<b>SH</b>	State Highway
<b>SSR</b>	Southern Scenic Route
<b>TDM</b>	Tourism Demand Management
<b>TTM</b>	Tourism Transport Management

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# 1. Executive Summary

## The Aims of this Project:

The Milford Opportunities Project (MOP) aims to:

- Provide strategic direction and leadership to ensure the opportunities of increased visitor experiences of Milford, Fiordland, and Southland are realised;
- Establish the current baselines in Milford and along the corridor for:
  - The state of the environment;
  - The conservation values;
  - The number of visitors;
  - The level/type of commercial activity; and
  - The level/type of physical infrastructure.
  - Consider the future demands/opportunities/effects for Milford tourism;
- Advocate for the development of projects that are identified from the work-streams.

## The Gap Analysis:

The purpose of this Gap Analysis is to demonstrate current gaps in knowledge that require further research to inform the eventual development of a masterplan for Milford Sound/Piopiotahi. The Gap Analysis and eventual masterplan work align with the overall guiding principle for the project which is;

*Enhancing Milford Sound, its corridor, and Fiordland National Park as key New Zealand visitor 'icons' providing a 'world class' visitor experience that is accessible, upholds the conservation values, reflects the unique nature of the place, and adds value to Southland and New Zealand Inc.*

To understand what gaps in knowledge exist, an information gathering exercise has been completed to understand what is already known about the project area which is Milford Sound/ Piopiotahi, its corridor and the wider region.

The information was gathered between February – May 2018 from a wide range of sources. The process for gathering information is described more fully in Attachment 1 and includes the Gap Analysis Scope. For a full list of information sources, refer to Attachment 2.

The topics of interest for this Gap Analysis are categorised into 'the Place', 'the Customer', 'the Interventions' and 'Best Practice'. The topics of interest and rationale for investigating in this way, are described more fully in Section 2.1.1.

## Response to Specific Projects:

As part of the Phase 1 Gap Analysis, several specific projects were requested for specific research. These are listed below and with specific responses to each, provided in Attachment 3.

- Visitor Information Data and Statistics
- Queenstown Visitor Market Influencers
- Conservation Values (Milford & corridor)
- Stocktake of organisations associated with 'Milford' now – what they do and what they provide

- Understanding the current visitor experience and expectations
- Future Visitor numbers prediction modelling for 5, 10, and 20 years

### Key Conclusions:

The information gathering process, and subsequent analysis of content found that;

- A lot is known about Piopiotahi. While some gaps in knowledge about the ‘place’, and the ‘customer’ have been identified, we consider that to a large extent, the amount of information available is adequate to be able to progress the conceptual masterplan exercise.
- With this said, several further key investigations to fill current gaps in knowledge are recommended and these are listed below.
- There is a wealth of information about the natural and built environment. The challenge is understanding what the ‘real’ values are of relevance to the eventual development of a conceptual masterplan. We also don’t know clearly what the cumulative impact of human centred infrastructure is having on these values. While we are confident that there is a lot known about the cultural values of the area, this information is still outstanding.
- While considerable information exists about what customers do in Piopiotahi, there is little understood about what aspects are of particular importance/ relevance and at which points in the journey to Piopiotahi are critical to a good experience. No specific work has been done of direct relevance to MOP in relation to predictive modelling of visitor numbers.
- There is a significant body of legislation that applies to Milford Sound/ Piopiotahi however the overall effectiveness of this legislation is not well understood. An evaluation of the effectiveness of existing legislation and legislative change options is recommended.

### Recommendations for Further Research:

The research undertaken as part of this Gap Analysis identified that there are several gaps in knowledge that should be investigated further to aid the development of the conceptual masterplan. The spreadsheet shown in Section 7 provides a long list of the specific gaps in knowledge identified. Each of the long list of gaps in knowledge were then prioritised against a set of considerations and a short list of recommendations developed. The considerations included; usefulness and relevance for the conceptual master planning project and ability to be delivered within the timeframes desired for the Milford Opportunities project. The Opus/Xyst project team then applied professional judgement to determine the projects to be taken forward for further research. The key recommendations for further research that will best inform the development of the conceptual masterplan as a result of this process, are provided in the table below.

<b>Recommendation:</b>	<b>Detail:</b>
Recommendation 1: Infrastructure	Understanding the collective package of infrastructure in Piopiotahi Milford Sound and the Milford Corridor (including Te Anau). What is the capacity of this infrastructure and the constraints? What opportunities exist for new infrastructure or changes to existing infrastructure provision? What impacts might arise from extracting non-essential infrastructure out of Piopiotahi or through relocation to new sites? Where does infrastructure provide cost effective and efficient opportunities for new development?
Recommendation 2: Land Analysis	Design-led work is required to map important landscapes that might be affected by development, identify places where development or visitor facilities (large or small) might be suitable, including infrastructure impacts. Identification of hazards and risks that impact investment.

Recommendation 3: Cultural Values	While we have a base level of knowledge of the cultural values associated with Milford Sound and the Corridor, we require greater resources to fully understand and embed the aspirations of iwi into the conceptual masterplanning.
Recommendation 4: Legislation	Undertake an assessment of Legislative change options to enable the Milford Opportunities project to realise the vision. This could consider options such as a Piopiotahi visitor levy, international visitor levy, district by district taxes etc. There is also a knowledge gap in terms of lower level legislation, how it regulates land use and development in the project area, could inform the master planning exercise and potential for enabling or restrictive plan changes at this level i.e. FNPMP / District Plan.
Recommendation 5: Hazard Analysis	Undertake assessment of hazard risks (natural and human) for the specific purpose of informing the conceptual masterplan. This will include climate change, natural hazards, resilience, human related hazards including oil spill potential, vehicle crashes, sinking vessels etc. This is fundamental to informing the conceptual masterplan development. There are many significant natural hazard risks i.e. avalanche and human related i.e. Homer Tunnel in localised areas.
Recommendation 6: Economic Analysis	Currently there is little known about what visitors to Milford Sound spend; in Milford Sound itself, along the corridor, in the Wider Southland Region. Work is required to better understand what economic value visitors bring to the local and wider area. And whether this is offsetting the costs associated with providing a safe, attractive place for people to visit.
Recommendation 7: Customer Journey Mapping and Typologies	Undertake a Customer Journey Mapping and Typology development exercise to better understand the key values, and points of significance for visitors coming into the project area. Customer Journey Mapping is possible for a range of the Customer types including tourists, recreational users and residents for example.
Recommendation 8: Visitor Monitoring Programme	A multi-agency visitor monitoring <b>programme</b> will be designed utilising existing data sources and proposing new data sources. A quantitative survey will be designed utilising the existing University of Otago survey. The programme delivery will be costed and based on an initial five-year term. The programme <b>implementation</b> will require the acquisition of hardware, software and other resources for delivery and will result in a Milford Visitor Annual Report. It is recommended that the implementation be funded for an initial five-year term.
Recommendation 9: Understanding the Operator	Currently there is very little information available about the tourism operator market for Milford Sound and the wider region, beyond what is anecdotally available (acknowledging that information may be commercially sensitive). There is a desire to better understand the market structure and characteristics of operators. What dictates supply and demand? How does the market know when it is saturated? What are the current trends telling us?
Recommendation 10: Conservation Values	While there is a significant amount of research available regarding conservation values, further research will be required once the broad conceptual masterplan has been formed, to better understand the potential consequences of the proposed approach.

## 2. Introduction

The Milford Opportunities Project is a three-phased project resulting in the development of an eventual masterplan for the project area, capturing the essence of the Guiding Principle and General Objectives.

### 2.1. Project Area

The project area is detailed below and is wider than Piopiotahi and the Milford Road corridor. An explanation is detailed in the table below.

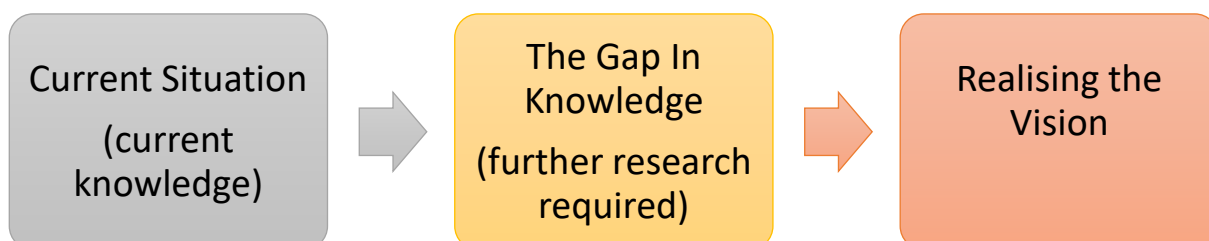
<b>Milford Sound/ Piopiotahi</b>	Includes the Fiord itself, settlement, infrastructure - the natural and physical environment at Milford Sound.
<b>Milford Corridor</b>	State Highway 94 'The Milford Road' from Te Anau to Milford Sound and immediate surrounds from ridgeline to ridgeline up each valley (i.e. includes Eglington Valley and Hollyford Valley).
<b>Milford Regional Context</b>	Wider Southland and Otago areas (Fiordland, Te Anau, Queenstown, Northern Southland Townships, Invercargill, Southern Scenic Route, Catlins, Rakiura, State Highway's 94, 95, 97, 99 and 6.
<b>Milford Piopiotahi National Context</b>	New Zealand Inc

### 2.2. The Gap Analysis

The purpose of this Gap Analysis is to demonstrate where current gaps in knowledge are and recommend further research where required. Further research will inform the eventual development of a conceptual masterplan for Milford Sound/Piopiotahi and wider project area.

To achieve this a phase of information gathering took place to determine what information was already available. It was critical to understand the key attributes of the information; the relevancy of the information, and the level of detail and quality of evidence to validate the information. These factors were considered throughout the analysis. For a detailed overview of how the information above was obtained, refer to Attachment 1.

The diagram below shows the sequence of information gathering and gap analysis.





### *2.2.1. Sequence of Information Sought*

To ensure we captured the right information and asked the right questions pertinent to the project we considered the information gathering process in the following way;

#### **Understanding The Place:**

A robust understanding is required of The Place, how it was historically and how it exists in the present day. We need to be clear about the unique, defining values of the area that make it a place of international significance. The Place includes:

- Natural Environment (terrestrial and marine environment understanding, biodiversity surveys, other assessments);
- Built Environment (asset inventories, asset condition, use, capacity, utilisation, road users, ownership);
- Hazard Management (reports);
- Heritage Values (historic significance);
- Cultural Values (cultural associations, reports);
- Accommodation Providers;
- Access; and
- Activities (what is available).

#### **Understanding The Customer:**

This project is about creating a ‘world class customer experience’. To achieve this, we need to understand The Customer. To assist with this process, it is useful to establish a set of key customer types whose views should be considered to inform the design. For the purpose of this gap analysis we have identified the customer groups listed below;

- Tourist (tourist numbers, type, activities, visit planning, expectations, experiences, packages available, waste volumes, capacity modelling, visitor travel, bookings, market influencers, marketing, future modelling, economic drivers);
- Commercial Operator;
- Recreational User;
- Residents; and
- Government Departments.

A stocktake of organisations associated with the area and based on these five categories, is included as Attachment 5.

#### **Understanding The Interventions:**

An understanding is required of the current interventions in place to protect, maintain and enhance The Place and guide The Customer.

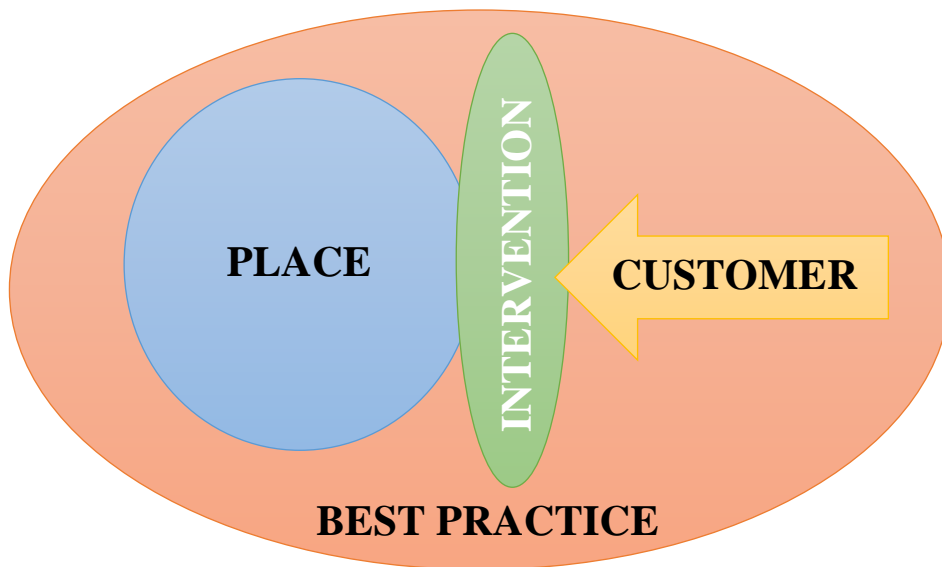
- Legislation (regional and district plans, national policy, concessions, CMP);
- Development proposals;
- Earlier masterplans/ Concept plans; and
- Economic research.

#### **Best Practice:**

With the Guiding Principle in mind, this Gap Analysis considered what information exists pertinent to the general direction this project is going to take and identified potential areas for further research.

- National Parks/ Iconic Features - effectively managing visitor demand while enhancing conservation values (policy/ legislation intervention, innovative visitor experience, effective management)
- Examining visit value
- Visitor Demand and Biodiversity Impacts Research
- Effective frameworks for masterplans - dealing with flux/ change over time

Where information was found to have particular value, these have been highlighted within the full list of information sources contained as Attachment 2.



### 2.3. Project Area

The diagram below shows the project area for the Milford Opportunities Project

# REGIONAL CONTEXT



# TE ANAU AND SURROUNDS



# MILFORD AND THE CORRIDOR



### 3. Information Requirements

The section below provides a broad overview of the types of information required through the gap analysis research and the rationale for requiring the information.

#### 3.1. The Place

Topic	Information Required	Rationale
The Natural Environment	<p>Landform, geomorphology, natural landcover, native biodiversity (abundance, rare species, pests – both past and present), cultivated landscape.</p> <p>What cannot be replicated/does not exist elsewhere?</p> <p>Current management of Piopiotahi (both paid and volunteer).</p> <p>Understanding of the issues and opportunities associated with landscape and visual amenity.</p> <p>Contamination levels.</p>	<p>Allows us to look at the natural earth surface and see how natural processes - such as water and ice, have/will mould the landscape.</p> <p>Allows us to define the protected natural areas, areas of human activity including cultural landscapes, significant species and the habitat protection.</p> <p>Allows us to understand the framework under which the current management of the conservation area occurs.</p> <p>Allows us to understand which features have historically been considered of low and high value in terms of amenity.</p> <p>Allows us to understand where there might be key sites for remediation through the masterplan.</p>
Built Environment	<p>Knowledge of the current assets in Piopiotahi and their ownership, current condition and capacity.</p> <p>Earthquake prone facilities and risks from other natural hazards for example avalanche, landslides and flooding.</p> <p>Understanding of the current road (and associated) assets along the corridor and into Piopiotahi. Understand crash rates and associated analysis resulting in improvements.</p>	<p>Allows us to get a good picture of the state of the built environment to inform future options and the masterplan.</p> <p>Allows us to understand how facilities should be considered during the masterplan process.</p> <p>An understanding of the road asset, the crash rate and resulting improvements gained from analysis will need to be considered through the masterplan development, particularly if features are proposed beyond Piopiotahi itself into the corridor and wider region.</p>
Cultural and Historic Features	<p>Areas of cultural significance including human settlements which should be visible, plus the less visible attributes relating to memory and meaning (e.g. a place where an important event occurred).</p> <p>What cannot be replicated/does not exist elsewhere?</p>	<p>Allows us to plot landscapes and landscape features that have high importance physically and spiritually – either as an area to avoid or an opportunity for storytelling and higher value visitor experiences.</p>
Natural Hazards	<p>A clear understanding of the natural hazard risks associated with the area, areas for caution, and safe areas.</p>	<p>An awareness of the areas for caution and areas with less risk will be important factors when it comes to proposing physical projects through the masterplan process.</p>
How the Place Impacts on the Wider Region	<p>Understanding (current and potential) issues and opportunities that are created for other</p>	<p>Understanding what issues and opportunities exist for the broader community enables us to understand where energy/investment could go to create greater</p>

	communities with Milford Sound in close proximity.	opportunities (greater leverage for wider regional economic/tourism growth) and to resolve issues.
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### 3.2. The Customer

Topic	Information Required	Rationale
Understanding the Customers	Who the customers are, what their drivers are (what they are looking for), their uses of the areas (itinerary), how they currently interact with the area (get to and from the area) and what they find good/bad.	Understanding the customer perspective is important when designing a masterplan that seeks to create a 'world class experience'.  Understanding who the customers are is also useful for informing the consultation and engagement process for later stages in the project.
Future Demand	How many customers are expected in the future (i.e. future demand).	An understanding of the future demand enables the masterplan to be developed in a way that plans for future projections.
Views on the Wider Region Opportunities	Understanding customer views on what other activities/ experiences are on offer in the wider region.  Understanding the role that transport, accommodation, tourism operators have on this movement.	There are numerous other opportunities for tourists (and associated economic growth) in the wider region. It is important to understand visitor views on how these other opportunities can be better understood and accessed by visitors.  Ultimately, how do we spread the load from the 'must do' tourist hotspots (Piopiotahi / Queenstown) to broader regional tourism.
Understanding the Economic Cost/ Potential	Current – understanding the current full economic cost (including externalities) of each visit to Milford based on existing infrastructure delivery.  Potential - Understanding the full economic cost (including externalities) of each visit to Milford based on future 'world class' infrastructure delivery.	Allows us to understand the baseline economic value and potential future economic value.

### 3.3. The Interventions

Topic	Information Required	Rationale
Legislative Framework	RMA, reserve management plans, conservation plans, PNA data, cultural mapping.	Allows us to understand opportunities and constraints for the development of infrastructure to protect place values and improve the visitor experience.
Proposed developments	Anything that is planned and committed that may not yet be on the ground.	Any previous master/concept plans, development proposals, upgrades, LTP budgeted items etc. which will result in an activity in the future.
Previous Master planning/ Concept Plans	An understanding of all previous master planning (or similar) work undertaken in the project area.	Understanding previous work allows us to acknowledge and progress from this work.

### 3.4. Best Practice

Topic	Information Required	Rationale
Managing Visitor Demand and Accessibility	National Parks/ Iconic Features that are effectively managing visitor demand while enhancing conservation values.	Understanding other examples where national parks/ iconic features are being effectively managed may provide an insight into what could be possible for this project. Understanding other examples of less successful management may also be useful.
Examining visit value	Understanding the motivations behind visitors valuing an attraction.	A better understanding of the motivations for valuing place would inform the masterplan priorities and recommendations.
Visitor Demand and Biodiversity Impacts Research	Understanding whether research has been undertaken to understand visitor/ biodiversity thresholds and scope to improve biodiversity values	A better understanding of thresholds would inform the masterplan priorities and recommendations.
Masterplans	Good examples of effective frameworks (masterplans) that deal with flux/ change over time.	Understanding other masterplans that have been effective may provide an insight into what could be possible for this project.

## 4. Information Review and Gap Analysis – The Place

The following section considers what knowledge is available regarding the Place. Commentary is provided on the information available, its relevance to this project and where information is missing. Each sub-section concludes with gaps in information for that topic area.

### 4.1.1. Natural Environment

#### Terrestrial Environment

Piopiotahi/Milford Sound, is located within Fiordland National Park and Te Waipounamu World Heritage Area. It is a unique natural environment combining steep, high mountains covered in native forest surrounding a deep fiord. The Milford Road Corridor from Te Anau to Milford Sound is one of New Zealand's most scenic drives characterised by U-shaped valleys, rugged basins and peaks. It is also an area of very high conservation values. Overall, there is considered to be a good level of knowledge of these areas from a terrestrial environment perspective.

A very comprehensive publication “Conserving Fiordland’s biodiversity 1987-2015: The challenges, the achievements, the knowledge” outlines conservation efforts undertaken to protect biodiversity and is good baseline material for conservation values.

The natural history of the Milford Road and Piopiotahi is succinctly described on the Department of Conservation website which gives a brief overview of endangered species found along the Milford Corridor including mohua/yellowhead, long-tailed bats, kiwi and rock wrens. The Department of Conservation monitor these species in the Eglington Valley and upper Hollyford Valley. A scan has been undertaken of terrestrial ecology research at the species level, with numerous documents identified.

There has been considerable entomological work completed along the Milford Road and at Milford Sound over the past 80 years. Among the groups of insects most studied is the Lepidoptera – butterflies and moths. Several species of significance which are endemic to the area (only found

there) have been found near the Homer Tunnel and at Milford Sound. There are many publications outlining these species, plus unpublished information.<sup>1</sup>

Sinbad Gully, below Mitre Peak was one of the last places the endangered kakapo were found in the wild and this information is well documented. There are rare endemic skinks on the slopes of Sinbad Gully which may be removed to an offshore island for better protection and an endemic skink to the east of the Homer area which has been sighted only once. There is strong support from local tourism operators for specific species programmes but also for localised pest trapping. The high level of endemism around Piopiotahi is also reflected in the invertebrates with a Boulder Butterfly and a leaf vein slug some of the known species. (Pers comm Em Oyston, DOC). *Crassula ruamahanga* is a threatened plant species located at Deepwater Basin. A survey has been undertaken to determine the abundance of the species. A good localised population of this plant was found in December 2008 during a site inspection of vegetation proposed for removal at that time as part of the redevelopment of Deepwater Basin (see Ewans, 2008).

There did not appear to be one repository for the research undertaken, and further work could be undertaken to understand the 'real' conservation values of the area with all current research considered.

Animal pest species management and monitoring appears to be well covered throughout Piopiotahi/ and the Milford Corridor. For example, a published report: "Department of Conservation, Cleddau Biodiversity Management Unit (CBMU), Fiordland National Park - 2016/2017" summarises the animal pest management and species monitoring performed in the CBMU between July 2016 and June 2017.

Of significance is the belief that no resident deer are present at Piopiotahi and the fact that it includes one of eight national security sites for the recovery of whio/blue duck. Likewise, for the DOC are undertaking pest threat management work in the Arthur Valley (Milford Track) and Sinbad Gully, both major catchments that flow into the head of Piopiotahi, with some species monitoring occurring.

Pest plant management research and monitoring is described in the Conserving Fiordland publication in a general nature however the DOC will hold further detail on this. The Fiordland National Park Management Plan includes detail on targeted plant pests and policy on control or eradication.

A number of Assessment of Environmental Effects have been carried out for development work within Piopiotahi/the Corridor and provide quite detailed site-specific identification of biodiversity. While there are various forms of conservation efforts being undertaken both in a paid (through the DOC) and volunteer capacity, the efforts do not appear to be coordinated. Further work could be done to identify a model for the various stakeholders to put back into conservation in a coordinated approach. This is not considered directly relevant to the MOP other than it could inform funding options aimed at efficient and effective pest management and protection of biodiversity values.

## **Marine Environment**

The previously mentioned, Conserving Fiordland's Biodiversity covers the extensive research undertaken within the Fiordland marine area.

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<sup>1</sup> Pers. Comm. Patrick, B. (8 May 2018).



Work completed for Environment Southland was undertaken to help inform the Coastal Management Plan (Sirota, 2006). It covered a raft of research on the marine mammals and other marine flora and fauna, and noted impacts from commercial tourist boats on these and other visitors. Some commentary is given to the question of sustainable tourism at Milford Sound and overall is a useful background report for this project, however, relevant only to the marine area. The bibliography is thorough although somewhat dated now.

Anecdotal through consultation undertaken as part of the gap analysis research, the Fiordland Marine Guardians are considered to be a robust, and well organised organisation charged with driving the sustainability of the Fiordland marine environment. Their vision is “*That the quality of Fiordland's marine environment and fisheries, including the wider fishery experience, be maintained or improved for future generations to use and enjoy*”. Their website provides numerous publications that inform the approach to protecting and enhancing the marine environment. Preventing the introduction and spread of harmful marine pests is a major priority for the Marine Guardians.

“Beneath the Reflections: A User’s Guide to the Fiordland (Te Moana o Atawhenua) Marine Area” for example, is a substantive and informative read directed at commercial operators, recreational users and the fishing industry. It was produced by the Fiordland Marine Guardians with the support of Department of Conservation, Ministry of Primary Industries, Environment Southland and the Ministry of the Environment. The document was first published in 2008 being updated in July 2017. It provides an introduction to the Fiordland marine environment (including physical and biological character), and the fisheries and how they are managed. It contains information on recreational fishing rules and commercial fishing regulations for the area, and further detail on each fiord such as the location of marine reserves and recommended anchorage sites. In summary, it is very useful material as it is current but is considered as being a guide only.

The Piopiotahi (Milford Sound) Marine Reserve was established in 1993 and is situated on the northern side of Milford Sound. Piopiotahi Marine Reserve is one of 10 marine reserves in Fiordland. The DOC website (under Coastal Gems) has a general description of the underwater physical features, the fish, marine mammals and delicate deepwater invertebrates to be found in the reserve. It also covers the rules governing the marine reserve and includes a map. This is brief, general information for the visitor but relevant to the project and given the content, is up to date. Specifically, the bottle-nose dolphin and the Tawaki/Fiordland Crested Penguin have been studied in Milford Sound and may be considered indicator species for the ecological health of the area.

A long-term study of the bottle-nose dolphins in Doubtful Sound has been undertaken. A more recent paper by Lusseau (2005) has found the presence of boats may interfere with dolphins’ normal behaviour and boat strike in areas of high boating activity is always a threat. The DOC has acted upon these findings by placing boating restrictions with regard to dolphin encounters for parts of the Doubtful Sound marine area. The DOC also runs an observer operation for dolphin encounters on tourist boats in both sounds and observations could potentially be obtained to further inform the master planning process.

The Tawaki Project, is undertaking long term research on Tawaki or Fiordland Crested Penguin (one of the world’s rarest penguins) at Milford Sound and at other south-western New Zealand sites. They have found this population to have more breeding success than others. The key person behind the project is Thomas Mattern based at the University of Otago and results of their research can be found on their website ([www.tawaki-project.org](http://www.tawaki-project.org)). The project is a collaboration between University of Otago, Department of Conservation, West Coast Penguin Trust and Global Penguin Society. An article on the tawaki at Milford Sound/Piopiotahi has been published in recent times

(Mattern & Long, 2017) Mattern noted via email "*that these penguins forage inside the fiord and seem surprisingly resilient to boat traffic. However, it is not known if there is a tipping point at which their tolerance might falter.*"

Marine mammal viewing permits at Deepwater Basin are provided by the DOC and while information was not obtained during this gap analysis, further information can be obtained about these permits.

## Landform

A number of books cover the geology and geomorphology of Piopiotahi/the Corridor. Two specific theses are of relevance to this project. "Geomorphology of the deglaciaded Eglinton Valley, Fiordland: new insights into the origin of hummocky terrain" an MSc by G.Walker highlight the significance of these geomorphological features. Also J.Dykstra's 2012 PhD thesis on "The Post-LGM Evolution of Milford Sound" looks at the glacier retreat history, seismic landslides and associated hazards.

We have not identified any obvious gaps in this space that could inform the project.

### **Potential Gaps Natural Environment:**

#### **Terrestrial Environment**

- It is unclear what the 'real' conservation values are for Piopiotahi. i.e. there is a high rate of endemism. However, the priorities and preferred methods for conservation are unclear.
- Piopiotahi / Milford Sound and the Milford Corridor are both recognized as areas of high conservation values. There are numerous rare and endangered terrestrial and marine species and several endemic species. These high conservation values are recognized in the FNPMP which regulates land use and development activities.
- Historic land development at Piopiotahi / Milford Sound has altered the natural environment, enabled establishment of the tourism and fishing industries and provided access for recreational users. The built infrastructure along the Milford Corridor and at Piopiotahi / Milford Sound supports these industries and recreational access and use. The current state of the environment at Piopiotahi / Milford Sound and the Milford Corridor can be characterised as a modified natural environment that still contains very high conservation values.
- We do not understand how the updated Conservation Management Plan will be developed to manage the conservation values.
- What are the ecological values of remaining potential development/ developed areas in Piopiotahi? Equally what could be removed to remedy lost habitat? For example, the presence of rare butterfly at Little Tahiti where development is proposed.
- We don't know how Piopiotahi is managed from day to day, what works well and what doesn't.

#### **Landscape and Visual Amenity**

- There has been no assessment of the visual amenity of the built environment of Piopiotahi and further research could also be undertaken to fill this gap. Assessing and establishing the state of the physical environment could inform the design of new development proposals to ensure they are sympathetic to the natural setting and improve visual amenity.
- For the purposes of MOP there needs to be a recognition that any land development proposals need to be assessed on a case by case basis to determine actual and potential effects on the environment. We see no value or need to be undertaking additional research on specific species or habitats other than on a case by case basis.
- Further research should be undertaken to better understand the point at which conservation can prosper and be enhanced (i.e. improving the conservation value) whilst enabling visitors to access Piopiotahi Milford Sound.

#### 4.1.2. Built Environment

### Large Infrastructure Development

Tourism related development at Piopiotahi Milford Sound began in the 1890's when the Sutherland's established an accommodation house and began servicing the summer tourist trade. Land development associated with tourism and the fishing industries has continued since this time facilitated by the development of the Milford Road and Homer Tunnel. Accommodation facilities, wharfs, roads, vehicle parking areas, storage buildings, cafes and visitor centres, toilet facilities, the Milford Aerodrome, Cleddau Village, flood protection works and water, wastewater and stormwater infrastructure have all been established. Historic land development at Piopiotahi / Milford Sound has resulted in landscape change and new development sites are limited.

There have been two large phases of infrastructure development at Milford Sound over the last 20 years: the terminal/parking area at Freshwater Basin and the Cleddau River Flood Protection Scheme.

The Cleddau River Flood Protection Scheme was constructed in 2011 to protect the residents, Deepwater Basin infrastructure, the staff accommodation area and the airport. The DOC contract prepared by URS provides much detail on the extent of the work undertaken. The drawings within the contract may provide some useful background for this project.

The Blakely Wallace Associates Report (2010): "Cleddau Village Design Guidelines" aimed to guide the architectural and landscape character of the Accommodation Activity Area between the airport and Deepwater Basin. It worked within the bounds of the Fiordland National Park Management Plan with the intention being to complement the natural setting but also reflect the special nature of the area. It may require review once the Management Plan review is complete but remains a useful guiding document for new infrastructure in Piopiotahi.

Venture Southland commissioned GHD Ltd to "*assess the current situation of Southland's transport network and provide an integrated transport study for the region*". This formed the Southland Integrated Transport Study Final Report Dec 2005.

The Cleddau River Flood Protection Scheme (CRFPS) Management Plan was prepared by Aecom for the Department of Conservation in 2016. The document was commissioned to guide future management of the flood protection works. It was also part of the process of the DOC relinquishing control of the Scheme to Environment Southland who became responsible for the ongoing management and maintenance, and responsible for ensuring continued compliance with resource consent conditions. This report is relevant to the Milford Opportunities Project as it has flood level data pertinent to the village and provides an indication of the flooding hazard for Piopiotahi.

As a result of these two phases of infrastructure development in Piopiotahi there is good information of what has happened historically and what is in-situ to date (although no data yet on condition assessment of assets).

### Private Development

To date information has not been gathered from private companies for development at Piopiotahi (and an accommodation lodge closer to Te Anau). Development is severely constrained at Milford by land ownership, Fiordland National Park Management Plan, hazards and topography / land cover. This has resulted in mostly incremental development to cope with the increased tourism pressure.

## **DOC Asset Inventory**

In 2017, Bonisch Consultants prepared a series of plans showing the lease areas for land between the airport and Deepwater Basin for the Department of Conservation (the leasee). They were based off Downer as-built information once flood protection works were completed and the village ground level was raised. They include leasee name, building footprints and utility locations and are a current accurate reference for infrastructure in this area.

There is an information gap in terms of understanding details of lease and concession arrangements and associated rights of renewal. These arrangements may have implications for new development and master planning.

The Department of Conservation have an asset management database (AMIS) and a list of the current Milford Road and Piopiotahi visitor sites has been downloaded from it. The list covers all sites maintained and managed to different levels of service dependent on the dominant visitor category for each site (e.g. short stop traveller, day visitor and backcountry user). The Memo to the Governance Group by MBIE provided in the early stages of this project has further detail on the DOC visitor sites along the Milford Road with levels of service for each.

## **Milford Sound Tourism Infrastructure**

A list of infrastructure managed by Milford Sound Tourism has been supplied by the General Manager and includes all the visitor facilities at Freshwater Basin (wharves, terminal, public toilets, coach park, carparks, and walkways), the wastewater and rubbish/recycling systems in the road, and the Knob's Flat public toilets on the Milford Road. While we expect that this information is available, to date we have not obtained detailed information on power generation availability, capacity of sewerage system and capacity of buildings.

The recent pressure on capacity at Piopiotahi gave rise to the Transport Infrastructure Review: Traffic Management Strategy by TDG completed in 2017. The strategy endeavoured to enhance safety and efficiency of existing parking areas, reduce peak travel demands, develop new parking facilities and create opportunities to enhance the Milford Sound experience. This is one of the key documents to inform the master planning process.

The architectural company Warren and Mahoney prepared a master plan for the Milford Sound Passenger Terminal where spatial planning and site amenities were reconsidered in response to tourism pressure. This is a current proposal (2017) and picks up on customer type requirements making it very relevant for the Milford Opportunities Project.

## **Public Boat Ramp**

There appears to be an information gap in terms of the capacity of the public boat ramp at Piopiotahi and congestion issues in peak times. Feedback from the public consultation undertaken indicates that there may be congestion and boat trailer parking and conflict between recreational users and concession holder's issues at peak times.

## **Current Resource Consents/ Building Consents**

Environment Southland run a GIS mapping system called Beacon which shows the location of consented activities and which can be accessed from their website. This gives a snapshot of current consents and what type they are.

Site specific Assessments of Environmental Effects (AEE) occur where development is proposed through resource consent and concession processes. AEE's may include ecological assessments where development or activities are proposed in sensitive locations. There is a considerable number of AEEs prepared each year in the study area and this information does provide a high level of baseline data. With this said, there is no collective analysis of the information contained in these assessments.

We have not sourced any specific reports or assessments in relation to earthquake prone buildings and implications of new building standards for existing buildings in Piopiotahi.

## **State Highway 94**

The Milford Road or State Highway 94 Te Anau to Piopiotahi, is managed by NZ Transport Agency (NZTA) with the day-to-day operations run by the Milford Road Alliance (Downers and NZTA). The Corridor Management Plan, Frankton to Milford Sound (2018-2028), recently produced by NZTA outlines the importance of the road for tourism. Primarily the plan covers management of the assets, the investment in them and the levels of service to be provided such as safety, resilience and reliability. Planned projects including safety improvements to the Homer Tunnel and the Visiting Drivers Project are advanced. The plan sets the scene for management of the Milford Road infrastructure over the next 10 years therefore it is considered a key document for this project.

NZTA undertake a national State Highway Satisfaction Survey which is an annual quantitative survey. Data can be cut to the Milford Contract region. The limitation with this data is that the sample size for that region is so small (in some cases fewer than 25 people) that the information is of limited value.

As part of their operational management of the Milford Road and reflecting the rugged terrain traversed, the Milford Road Alliance run an avalanche programme each winter and a GIS system with rockfall, treefall and avalanche risks monitored. The treefall issue is a particularly large hazard as they monitor over 1000 trees. There is also NZTA official crash data in GIS which will show crash statistics and locations for recorded events on the Milford Road. The High Risk Rural Roads Guide produced by NZTA (2011) classifies the highway from Mossburn to Milford Sound as a high-risk road.

NZTA operates traffic counters at Retford Stream (between Te Anau Downs and the entrance to the national park) and at Homer Tunnel. These have a high rate of accuracy detailing road use: the figures can also separate out heavy and light traffic, show the seasonality and time of day use that will likely prove useful to this project.

## **Boat Travel**

Milford Sound Tourism Ltd (MSTL) hold the master licence for Milford Sound and sublicense to the 7 companies operating from the Freshwater Basin wharves. The operators report passenger numbers to MSTL who collate them and then pay DOC the passenger levy. It is a very accurate reflection of the number of visitors to Piopiotahi who take a boat tour.

Milford Sound harbour in Fiordland is one of the busiest harbours in New Zealand, with over 130 vessel movements per day this season<sup>2</sup>. The harbour facilities were upgraded in 2013, including a new breakwater and additional wharves, to deal with congestion during peak cruising periods. Eighteen commercial vessels operate out of the harbour at Freshwater Basin, with the majority offering tourist cruises. The wharf at Deepwater Basin permanently berths 16 commercial fishing vessels<sup>3</sup>.

A good level of information exists about numbers of boats occupying the marine environment, especially given that Piopiotahi is one of the only readily accessible permanent berths in the area. There appears to be information gaps in terms of the capacity of wharves at Piopiotahi and congestion issues in peak times. Cruise ship information is also readily available for both day cruises and for larger sea going cruise ships that use the Sound more sporadically. There is a low level of understanding of the implications of the boat movements (commercial, recreational and cruise liners) on the tourist experience (i.e. noise/ smoke/ disruption to setting etc.).

Cruise liner ship data shows a trend of increasing numbers of ships, tonnage and passenger numbers. The data is provided by Environment Southland and is collected for the purposes of a levy that contributes to implementing the Regional Coastal Plan. Although the figures do not include cancellations it is considered a reasonable indicator of this market.

## **Air Traffic**

Queenstown is a large source of visitors to Piopiotahi with many undertaking the visit as a daytrip. The Queenstown Airport passenger numbers provide an overview of visitors to Queenstown although only those that have flown into or out of the resort town. The figures also show domestic vs. international numbers, a monthly breakdown and growth.

Airways NZ provide an Aeronautical Flight Information Service at Piopiotahi and have released air traffic movements for Milford Airport over a 10-year time span. It is fairly basic data (number of flights in/out per month and number of over-flights), however, is very accurate. Further detail is being sought on the proportion of flights from the airport which are scenic. The Milford Airport, managed by Ministry of Transport is a component of the Piopiotahi infrastructure and needs to be factored in to the overall visitor opportunities available.

Passenger numbers and recorded aircraft movements from the Te Anau Airport supplied by SDC show a small but steady trend upwards with more tour groups using the airport to access the region and serves to provide wider context for this study.

There is some understanding of the implications of the airport/ air traffic on the tourist experience (Effect of Air Traffic Associated with Milford Aerodrome on Visitors to Fiordland National Park (2008-2010)). The monitoring aims to assess the effects of fixed wing and helicopter aircraft overflights on visitors in Fiordland National Park. An update of this DOC monitoring programme covering the last few years is due soon.

Feedback from the initial MOP public consultation process included comment on Milford Aerodrome and noted issues associated with a lack of infrastructure at the airport. This included an absence of suitable pick up / drop off areas, no pedestrian links to the wider area and no public toilets for passenger use.

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<sup>2</sup> Milford Sound Tourism

<sup>3</sup> Environment Southland

## **Potential Gaps Built Environment:**

### **Built Environment**

- It would be useful to understand what development proposals the various commercial operators have for infrastructure for Piopiotahi. The information gathered from the NZTA, the DOC, and Milford Sound Tourism outline their capital projects for the next 2-3 years. Any further information on forward planning (5-10 years would be ideal) that could be gathered, would inform this masterplan project.
- There is no knowledge of the capacity of current public infrastructure.
- There is no comprehensive list of facilities and their associated New Building Standard (i.e. we do not have a clear understanding of earthquake prone facilities).

### **Boat Movement**

- There is a low level of understanding of the implications of the boat movements (commercial, recreational and cruise liners) on the tourist experience (i.e. noise/ smoke/ disruption to setting etc.).

### **Air Traffic**

- While there is some understanding of the implications of the airport/ air traffic on the tourist experience, this information is somewhat dated. An updated assessment is required (i.e. aircraft noise/ disruption to setting etc.).

### **Assessment of Environmental Effects (AEE's)**

- There is no collective understanding/ analysis of the AEEs for Piopiotahi. Each Assessment is distinct from the next.
- A gap in terms of understanding the impacts visitors have on the values of Piopiotahi and potential effects of visitor related development. Will increasing numbers of visitors give rise to cumulative effects?

### **Road Corridor**

- What is the full cost of vehicle accidents / incidents?
- How can the high social / economic cost of accidents on the road be used to inform the Master Plan? (i.e. How can changes be implemented to avoid accidents?)
- While a lot of government work has gone into visitor driver safety improvements nationally, we are unsure whether anything specific has been developed for the Milford Rd and wider transport corridor back to Queenstown / QT Airport.

### *4.1.3. Heritage Values*

## **European History**

A comprehensive understanding of the European history can be gained from two John Hall-Jones books (2000 & 2004). These books outline the European 'discovery' of Milford Sound, visits by sealing and whaling parties, the dawn of tourism in Fiordland, the development of a guided walk on the Milford Track, and the road and tunnel building period during the Depression. Once the road was finally completed in 1954, it opened the 'floodgate' for increasing tourist use, and other industries such as fishing and venison recovery. Hall-Jones is considered an authority on Fiordland history and has published many books on the region.

More recently an archaeologist, Paul Petchey completed "Milford Flood Protection Scheme Archaeological Assessment for URS New Zealand & the Department of Conservation" (2010) to look at effects on heritage values from proposed Cleddau flood protection works. His report highlighted early road construction camps and tracks along the lower Cleddau River but noted overall there is limited physical evidence remaining of early Maori or Pakeha occupation at Milford Sound. The closest protected historic sites are the Cleddau Pack Horse Bridge, Anita Bay Stone House and the chimney remnants from a 1920's hut in the lower Arthur Valley, Milford Track. There are no known pre-1900 sites. The sources for this report included a site visit to the proposed work area, review of published histories, historic photos, NZ Archaeological Association (NZAA) Site Record Scheme and examination of historic Land Information maps.

A number of Conservation Plans have been completed by DOC for their protected historic sites on the Milford Road such as the Marian Hill Cutting, Hollyford baker's oven, the Marian Corner Camp site, Tutoko suspension bridge and the abovementioned three sites. The Conservation Plans were completed in the 1990's however historic values and background remain very much relevant today. An historic assessment of the Falls Creek Bridge by Rachael Egerton (2002) highlighted the significance of protecting remnants of the original Milford Road infrastructure. The hardship of the roadbuilding enterprise, the iconic tourism status of road journey, and Milford Sound itself appear to be key heritage themes.

The Fiordland Marine Guardians' booklet (*Beneath the Reflections*) recounts the early days of: cruise-ship visits, tourist boat trips, recreational users and the formation of a fishing industry out of Milford. The information is sourced from existing publications.

## **Maori History**

Further research is required to understand the Maori History of the Milford Sound/ Piopiotahi area. To date, it is understood that there is a strong historical cultural association with the area, however we are yet to receive detailed information to inform the study. The Ngāi Tahu Claims Settlement Act 1998 implements settlement provisions recognising cultural, spiritual, historical and traditional associations of Ngāi Tahu with sites and areas relevant to the Milford Opportunities Project. These provisions include statutory acknowledgements with the purpose of improving the effectiveness of Ngāi Tahu participation in resource management. A Statutory Acknowledgement is an instrument created as part of the Treaty of Waitangi settlement between Ngāi Tahu and the Government (Ngāi Tahu Claims Settlement Act 1998). A statutory acknowledgement applies to the mountain known as Tūtoko lying between the lower Hollyford Valley and Piopiotahi, to the Lake known as Te Ana-au (Lake Te Anau) and to Te Mimi O Tu Te Rakiwhanoa (Fiordland Coastal Marine Area).

### *4.1.4. Cultural and Heritage Values*

Further research is required to understand the cultural values of the Milford Sound/ Piopiotahi area. To date, it is understood that there is a strong cultural association with the area, however we are yet to receive information to inform the study.

#### **Potential Gaps Heritage/ Cultural Values:**

- A gap may exist around understanding of Maori cultural associations with Piopiotahi, the Milford Corridor and the wider Milford context. Please note information is pending from Ngai Tahu and this information gap may subsequently be addressed.

### *4.1.5. Hazard Management*

Being so close to the Alpine Fault means information on the level of risk and potential outcome for Piopiotahi of a large earthquake needs to be assessed. Geological and Nuclear Sciences (GNS) have done some work in earthquake forecasting and hazard modelling and should be included as part of the baseline information for this project.

More specific studies or reports into natural hazards at Milford Sound include the Dykstra PhD thesis which highlighted the heightened risk (particularly to residents) from a landslide generated tsunami. This particular risk was again assessed within a 2015 GNS report: Milford Sound risk



from landslide generated tsunami. Recommendations from both these documents should be considered carefully during the master planning exercise.

An overview of natural hazards has been provided in “Cleddau Village Development: Natural Hazards Risk Assessment” prepared by Opus in 2007. The Milford Road natural hazards appear to be covered within the monitoring systems operated by the Milford Alliance but we note this is focused on the road and wouldn’t cover the majority of DOC campsites.

The current AF8 (Alpine Fault Magnitude 8) project is a three year programme of scientific modelling, response planning and community engagement for when a major rupture occurs along the Alpine Fault. This work may further refine the hazard risk level for Piopiotahi and any mitigation measures required. Other known natural hazards risks include those associated with geology in glacial valleys, avalanche, treefall, debris flow, flooding, slips, wind, tsunami.

#### **Potential Gaps Hazard Management:**

- Milford Sound is in a potentially vulnerable position being so close to the Alpine Fault, there are emergency response plans in place however specific hazard modelling from earthquake and tsunami risk may be important for future-proofing any new development.
- It is expected that New Zealand universities will have a valuable contribution to make to this study and further work is required to tap into this wealth of research.

#### *4.1.6. How the Place Impacts on the Wider Region*

There is no specific known research showing how Piopiotahi impacts on the wider region.

#### **Potential Gaps Impacts on the Wider Environment:**

- There is very little understanding of issues and opportunities that are created for other communities as a result of Milford Sound being in close proximity.
- Further research could be undertaken to examine where Piopiotahi Milford Sound and the Southland Region sit in the national tourism ecosystem and how well they are doing relative to other iconic offerings. What is driving the current performance and how might that be affected by projected growth, assuming only known additional investments?

## **5. Information Review and Gap Analysis – The Customer**

The following section considers what knowledge is available regarding The Customer in all forms; tourist, commercial operator, recreational user, resident and government department. Commentary is provided on the information available, its relevance to this project and where information is missing. Each sub-section concludes with gaps in information for that topic area.

### *5.1.1. Tourist/ Visitor*

#### **Quantitative & Qualitative Data on Historic/ Current Visitors**

There is a wealth of quantitative data on visitors to Te Anau and Milford Sound from a diverse range of sources such as passenger numbers for tour boat operators, the Department of Statistics’ Commercial Accommodation Monitor (noting that this does not pick up alternative accommodation providers such as AirBnB and Bookabach etc.), NZTA traffic count data, cellphone tower trigger counts (for regional context), and airport traffic movements. There is less up to date qualitative information on visitors with this information usually in the form of visitor surveys.

The Memo to the MOP Governance Group prepared by MBIE Tourism Unit (2017) is a comprehensive overview of the Piopiotahi current situation gathering relevant information from all agencies involved.

A large and useful dataset can be gained by analysing cellphone tower use within the wider Milford Regional context area of interest. The DOC commissioned a report “Visitors at Milford Sound March 2015-February 2017” (Qrious, 2017) shows visits and visitors by day/month/season, percentage of visitors by country of origin and New Zealand region, and separates out day/overnight visits. There is also a comparison of Milford visits to the wider Southland region. This is a rich dataset but there are some limitations including: only records from smartphones using the Spark and Skinny mobile network are included, smartphones are around 80% of all phone users, and only “counts” when a call, text or data is transmitted within the coverage area. Despite this the resulting data could be useful as a large, representative sample of visitors and it can depict traveller’s behaviour (e.g. around 80% of overnight visits in report were one night stays). We do have a question of the relevance of this data to Piopiotahi given absence of cell phone coverage. Mobile phone coverage only extends to the start of the Milford Rd so some perhaps tenuous assumptions are made for this data and this needs to be verified.

### **Visitor Accommodation**

A report, “Commercial Accommodation Monitor, Fiordland” can be downloaded from the Statistics NZ website, presents information on short-term commercial accommodation for the Fiordland Regional Tourism Organisation (RTO). Data for the full New Zealand wide survey is sourced from the accommodation providers via postal form – this particular report has an 83% response rate. A breakdown is given for type of accommodation, international vs. domestic guest nights and average length of stay. Guest nights within Fiordland RTO rose 8.2% to 691,677 YE January 2018 with the largest increase to holiday park stays. This localised survey is pertinent to the study, relatively robust and up to date. The one key weakness is that it does not include AirBnB and Bookabach customers which is anecdotally increasing.

The Department of Conservation has provided camper numbers for their Milford Road campsites showing a marked increase over the last two to three years, particularly at the camp closest to Milford. The figures are derived from campsite tickets collected daily by rangers and is estimated as 98% accurate (Grant Tremain, pers comm).

There are bed night figures available from the three Great Walk tracks in Fiordland for the DOC managed huts on the Routeburn, Kepler and Milford tracks. Trampers must book to go on these tracks and the numbers reflect the increasing popularity of this type of walking opportunity with good facilities available. Both the guided and independent walkers on the Milford Track finish their walk at Milford Sound therefore these numbers are particularly pertinent to this study.

### **Visitor Surveys**

The International Visitor Survey (IVS) is accessed from the MBIE website for commentary and monthly updates but the full survey is within Department of Statistics. It includes a large amount of data gathered from a sample size of approx. 8900 international visitors each year. The datasets can provide transport used, type of accommodation, money spent, visitor destination and activities undertaken either at national, Regional Tourism Organisation (RTO) or Territorial Local Authority (TLA) level. This provides some very useful context for the tourism scenario at a national level, RTO and TLA level, and is considered fairly representative given the sample size.

The Tourism New Zealand website provides further detailed reports utilising the available data and includes Backpacker Research – July 2015 (understanding the backpacker mindset and its impact on travel to NZ). The Mood of the Nation was commissioned by Tourism NZ and the Tourism Industry Association, to look at the perceptions of New Zealanders on tourism.

The IVS also queries the overall satisfaction of visitors: whether expectations are met or exceeded, whether they would promote New Zealand to others, what factor encouraged them to come to NZ and use of technology/social media (Available at: <http://www.tourismnewzealand.com/markets-stats/research/infographics/visitor-experience/>). This is very useful qualitative tourism experience data albeit at a national level and if reproduced at a local level for Piopiotahi Milford Sound, could be very informative if compared against the national results (particularly with regard to visitor satisfaction and whether expectations were met). This may have been included in the survey undertaken by University of Otago in 2017 for Milford Sound Tourism but is yet to be received to assess content.

By analysing the IVS data, the DOC was able to highlight the importance of national parks in attracting visitors and that visitors who went to national parks contributed disproportionately more to the overall expenditure. This was supplied as a separate report “New International Visitor’s Survey opens opportunities” alongside the DOC 2015/16 Annual Report to the government. It serves to build a picture of the significance of protected natural areas within the itinerary of international visitors.

Destination Queenstown, the local RTO for Queenstown, has undertaken a survey of visitors to Queenstown and sought to find out activities they participate in whilst there (Angus & Associates, ##) (“Experiences in Region, Angus & Associates). Within the list of activities “A visit to Fiordland/Milford Sound” has been included and percentage responses are shown each quarter period. Survey sample sizes are low (less than 100) but give some indication of trends such as around a third to a half of Australian and other international visitors to Queenstown will make a trip to Fiordland and/or Milford Sound.

There was a Domestic Travel Survey undertaken also but this finished in 2012 and the collated data would be too out of date now to be applicable. This highlights a considerable gap in knowledge when assessing New Zealand visitors and their preferences.

The report “Tourism in Queenstown and Milford Sound: Trends and Patterns” by Chris Goble and Dr Caroline Orchiston, University of Otago (2016) establishes drivers of change using secondary tourism data. It provides a good overview of visitor trends across Queenstown and Milford Sound and is a reference key document for MOP.

A visitor survey commissioned by MST (“The Milford Sound Experience”) was undertaken in early 2017 to look at visitor perceptions (in particular with regard to overcrowding), travel behaviour and experience satisfaction levels. The sample size was 365 with surveys undertaken in Te Anau and Milford Sound giving a reasonably good representation of users although it is noted that it was undertaken end of March – not the peak period. However, the survey results indicating high satisfaction levels and a limited sense of overcrowding, albeit the Milford Road car driver experience shows less positive response, are highly informative to this project.

## **Wider Southland View on Visitor Activity**

Taking a wider Southland view of visitor activity in the region, a Southland Open Space Priority Setting report (for SDC) was completed (Xyst, 2017), and took stock of current visitor opportunities and where further facilities could be provided to meet demand. Particular pressure points such as the freedom camping at Lumsden, and stopping points along the Queenstown to Te Anau route were highlighted.

## **Journey Planning**

For destination planning in relation to Milford Sound, visitors who search the key words “Milford Sound” on-line will be directed to several commercial operators offering trips or activities and the Destination Fiordland website and the [www.milford-sound.co.nz](http://www.milford-sound.co.nz) website. The latter two strongly promote Piopiotahi and gives an overview of the special nature of the place, suggested activities for an itinerary and a list of commercial operators providing services. It appears there is a lack of research on visitor preferences for destination/trip planning and at what stage and where decisions are made for itinerary planning – this would warrant further research.

For localised itinerary planning (such as places to stay, where to eat, toilet facilities and activities) many Free Independent Travellers (FITs) will use the Campermate app. Campermate is New Zealand's most popular camping app with over 40,000 users per day, and is run by Geozone, a tech company based in Christchurch. There is the ability to post notifications to reinforce certain information or to give up to date info such as road conditions. The app also collects user reviews which then builds on the popularity of certain sites or not, similar to Trip Advisor. As well as information to the user, Geozone are able to analyse the use of the app to show where visitors are travelling, segmentation of tourists by language, growth and trends. This information was used for the Open Space Priority Setting Southland wide review and should be further analysed for this study.

The DOC have a couple of surveys which provide qualitative research on visitors and are relevant to the study area: Key Summit day visitor survey 2011 and 2007, and Effects of air traffic associated with Milford Aerodrome on visitors to Fiordland National Park: Summer 2007/08, 2008/09 & 2009/10. These will be useful as historical qualitative visitor information but could be very pertinent to this project if the surveys were repeated.

### *5.1.2. Commercial Operator*

## **Tourist Operators**

While there is some understanding of the tourist operators currently providing a service into Milford Sound, there is no coordinated approach to managing/ coordinating these services. The list of current major known tourist operators with a presence in Piopiotahi is as follows; Go Orange, Fiordland Discovery, Skyline Enterprises, Southern Discoveries, Mitre Peak Cruises, Cruise Milford Sound NZ, Real Journeys, Milford Select, AirMilford, Air Wakatipu, Glacier, and Southern Lakes.

Several tourist operators were contacted during the research phase of the gap analysis and shared their views on Piopiotahi. All showed a willingness and interest in the master planning project and recognise the importance of reconsidering how Piopiotahi is managed into the future in a more sustainable manner. While no visitor statistics or surveys were provided by the time this gap analysis was complete, it appears there is quantitative data available from these operators should it be required through the further research. One of our recommendations is that a predictive visitor modelling exercise is undertaken based on both quantitative and qualitative visitor data sets.

## Commercial Fisheries

The Fiordland Marine Guardians vision is *“That the quality of Fiordland's marine environment and fisheries, including the wider fishery experience, be maintained or improved for future generations to use and enjoy”*. As mentioned previously this organisation provides commercial fishing regulations.

The commercial fishing fleet was originally based in Freshwater Basin but as the number of tourist vessels increased to cater for the increase in tourist numbers, it was recognised that there was insufficient room for both industries. Consequently, the industry representatives and the then Marine Department agreed that the fishing fleet would move to Deepwater Basin where facilities were built for them.

It is unlikely that any documentation still exists that formalises this arrangement but it was recognised in the development of the Southland Regional Coastal Plan where a provision was inserted that the commercial fishing fleet had precedence of access and utilisation of Deep Water Basin and the Fiordland Commercial Fishermen's Association had to be consulted over any application by other businesses regarding access or utilisation of Deep Water Basin.

The Fiordland Commercial Fishermen's Association no longer exists and the CRA8 Rock Lobster Industry Association Inc. has taken over the role.

SH94 provides the only road access into the Fiordland Marine Area and along with Deep Water Basin form vitally important transport links for the fishing industry in Fiordland. The fishing industry also relies on helicopter transport to get product to certain export markets.

The CRA8 quota management area encompasses South Westland, Fiordland, Stewart Island, the Catlins, Foveaux Strait and adjacent Islands. The Total Allowable Commercial Catch for CRA8 is 1070.7 tonnes. This represents about 36% of the rock lobster production of New Zealand. It is the most productive quota management area in NZ. The Fiordland coast is the most productive area within CRA8 with approximately 80% of the CRA8 Total Allowable Commercial Catch coming from this area. This makes the Fiordland Marine Area the most valuable (economically) piece of coast across all inshore species in New Zealand.

Deep Water Basin is also used as a base for fishing vessels that are used to catch other species including but not limited to: paua, blue cod, ling, groper, bluenose, school shark, flat fish, and tuna.

While up to 20 vessels are domiciled in Deep Water Basin this number increases at various times of the year as fishing operators target species on a seasonal basis.

Rationalisation of the fishing industry following the introduction of the Quota Management System resulted in a significant decrease in the number of vessels in the CRA8 industry but that number has been steady and slowly increasing again since 2007.

Overall the number of commercial fishing vessels that utilise Deep Water Basin targeting the full range of species is increasing.

From conversations with commercial operators, there are increasing concerns about the conflicts between recreational, tourist and commercial operators at Deep Water Basin that need to be addressed.

### 5.1.3. Recreational User

#### Recreational Boat Use

Recreational use consists mostly of boat users from Southland who will tow their boats over for a daytrip and launch at Deepwater Basin to usually undertake fishing or diving in the fiord. It is a very small proportion of total users but important nonetheless as only two fiords have road access and Piopiotahi is by far the easiest.

#### Kayaking

There is some recreational kayaking. Commercial kayaking it is currently limited to two operators providing guided tourist activity. Kayak numbers can be obtained from the operators, however there are no known surveys undertaken to understand kayak value in Piopiotahi.

#### Tramping

There are many studies that have been undertaken for the purpose of better understanding visitor experiences on the major hikes in the study area, namely Milford Track and the Hollyford Track. A reference document related to the area is Exploring Visitor Experiences, Crowding Perceptions and Coping Strategies on the Milford Track, New Zealand which was undertaken in 2011. This is of limited use given it is focussed on the Milford Track walker, not visitors to Milford Sound/ the Corridor. The abstract below, describes a succinct assessment of this report.

*“This study investigated the factors that influence visitors’ experiences and, in particular, how visitors cope in response to social impacts such as crowding. ... The study set out to identify the factors that influenced walkers’ recreation experiences and the relative importance of these; what mechanisms walkers used to cope with negative impacts; and what opportunities are available to managers to influence these factors and, hence, the walkers’ experiences.*

*The study identified six primary dimensions associated with ‘the Milford Track experience’: national identity, scenery appreciation, iconic status, uniqueness, social bonds and personal challenge.*

*The factors that influenced the experience that walkers obtained included management regulations (uni-directional track, booking system, one-night stays, no camping), track/facility standard and design, the weather, and the social interactions within and between groups. Walkers’ prior experience exerted a strong influence upon their visit evaluations.*

*Walkers gave high overall ratings to their Milford Track experience, despite also reporting some negative aspects, most of which were related to behaviour around huts and disturbance in the bunkrooms. Walkers demonstrated a very high degree of coping behaviour, and employed a variety of strategies. Most people utilised emotional/cognitive strategies, with a very small number employing direct (behavioural) strategies. Implications for park management and recommendations for further research are presented.”*

Despite being seven years old, this research is considered to be a key reference document for the master planning process. A re-survey of visitors to the track could provide up to date information, and provide an insight into any changes over time. While the Hollyford Track Survey also provides some useful content, it is much older (2006/07) and a re-survey would be required to inform the master planning research. No known targeted research into visitor experiences of the Routeburn Track were sourced.

## **Broader Recreational Research**

There are a number of national level studies that provide commentary of visitors to public conservation areas; trends, surveys, values assessments (these were largely undertaken prior to 2011).

In 2011, the DOC produced a GIS study on public participation. It involved a survey of 268 individuals (of which 60% were Southlanders) via an online mapping interface and questionnaire. Respondents mapped their preferences, visits and how they rated the conservation values. Piopiotahi was a well visited site but scored low for impacts of crowding. The methodology for this study may be of real use for a further study of recreational use however the results are dated.

It should be noted that a visitor segmentation project is currently being undertaken by the DOC and might provide further useful up to date information in this regard. Further the Great Walks Visitor Survey has been undertaken, however, is currently not finalised. This could be made available for the MOP purposes, noting its draft status.

### *5.1.4. Residents*

Very little information is known about current residents of Milford Sound/Piopiotahi. From consultation with stakeholders it appears that the majority of people who live in Milford Sound/Piopiotahi do so for work purposes (10 days on and 4 days off) and move to Te Anau for their days off. Further research is required to understand the perspectives of residents.

### *5.1.5. Government Departments*

Government departments with interests in the area are;

- Ministry of Conservation – conservation values
- Ministry for the Environment – resource management
- Ministry of Transport – road and airport
- Ministry of Business Innovation and Employment – economic development
- Department of Conservation – oversee conservation estate
- Ministry for Primary Industries – pest management and fisheries
- NZ Transport Agency – State highway
- Southland Regional Council – regulatory, economic
- Southland District Council – regulatory/ planning, economic

### **Potential Gaps in Knowledge of the Customer:**

- We do not understand what visitors to Piopiotahi expect and whether their visit really met their expectations.
- We do not understand where and how trip planning takes place and the influencing factors when decision-making occurs.
- There is very little qualitative information on visitors usually in the form of visitor surveys, except track surveys that have become dated.
- To what level does Tourism NZ leverage off the iconic sites such as Milford Sound and Rotorua? How important are they as ‘visual capital’ for our reputation? If we go past the tipping point for Milford and the image is tarnished will it affect NZ as a destination? Does this require an extra level of protection for the national tourism reputation?
- Since MBIE ceased the Domestic Traveller Survey in 2012 there is now very little quantitative and qualitative data on New Zealanders travel habits within New Zealand.
- We do not understand the levels of recreational use and activities undertaken, and the quality of experience of these users; recreational fishers and hunters, day visitors, National Park users, AND Milford as access to Fiords.
- We do not understand how visitors value their visits to Piopiotahi. Price points – are they right?
- We do not understand how visitors impact on the values of Piopiotahi and potential effects of visitor related development.
- We do not understand the perspectives of residents in Piopiotahi and how they value the area.

#### *5.1.6. Future Demand*

International Visitor Forecasts are produced by the Ministry of Business, Innovation and Employment looking ahead five years. They predict there will be 4.9 million international visitors by 2023 and further breakdown is given showing the proportion of nationalities and spend by nationality. This appears to be the key modelling of future visitor growth so these statistics although at a national level are valuable to this study. MST also monitor visitor numbers and have forecast information.

Queenstown Lakes District Council have undertaken a growth projection exercise for both residents and visitors and is presented in the factsheet: Queenstown Lakes District Regional Growth Projections (average day). This is informative for the Milford Opportunities Project as Queenstown is a dominant source of visitors however direct relevance would be gained and prove insightful if a similar exercise was to be undertaken for Milford Sound itself.

Stats NZ provide the NZ Tourism Satellite Account each year which outlines the economic and employment contribution that tourism makes to the NZ economy.

### **Potential Gaps in Knowledge of the Future Demand:**

- The preferences of domestic travellers (as done for the IVS) is unknown; further information could be gained as to the link or influence that visitors sourced from Queenstown have.
- Destination/itinerary planning by visitors.
- Growth projections particularly for Piopiotahi itself.
- What is the percentage of domestic tourism?
- If domestic visitors have high value experiences does this also mean that international visitors will generally have similar high value experiences?

#### *5.1.7. Views on the Wider Region Opportunities*

There is no specific known research showing how Piopiotahi visitors view opportunities in the wider region.



### **Potential Gaps in Knowledge of the Wider Region Opportunities:**

- There is very little understanding of the views of visitors to Piopiotahi, on the wider regional opportunities.
- There is very little understood about the role that transport, accommodation, tourism operators have on this movement.
- Limited understanding of the impact of marketing in terms of informing itineraries and influencing where visitors go and how they get there.

#### *5.1.1. The Economic Cost/ Potential*

No project area wide economic modelling was made available during the gap analysis research phase. This would allow us to understand the baseline economic value and potential future economic value.

### **Potential Gaps in Knowledge – The Economic Cost/ Potential:**

- We do not understand the full economic cost (including externalities) of each visit to Milford based on existing and projected 'world class' infrastructure delivery

## **6. Information Review and Gap Analysis – The Interventions**

The following section considers what knowledge is available regarding the Interventions. Commentary is provided on the information available, its relevance to this project and where information is missing. Each sub-section concludes with gaps in information for that topic area.

#### *6.1.1. Legislative Framework*

A broad approach has been taken to developing an understanding of the statutory context for the Milford Opportunities Project yet the scope is limited to the geographic area of Southland. We note here that there will be legislation that sits outside the immediate Southland context that may be relevant to the project. For example, the QLDC Freedom Camping Bylaw, which may have an influence on the movement of visitors into Southland and Piopiotahi. We have excluded legislation that applies nationally (for example the Building Act) or that we don't consider directly relevant to the Project (for example food licensing under the Health Act). We consider the wider legislative context for the Milford Opportunities Project to cover the legislation detailed in Attachment 6. A summary of the key pieces of legislation that we consider most relevant within the wider statutory context is provided in the discussion below.

### **Fiordland National Park Management Plan**

The Fiordland National Park Management Plan 2007 (FNPMP) is a statutory document and provides for the management of Fiordland National Park in accordance with the General Policy for National Parks 2005 and the Conservation Act 1987. The management plan contains detailed objectives and policies for the effective management of the park. The purpose of this plan is to express the Department of Conservation's overall management intentions for Fiordland National Park for the next 10 years (2007-2017). The FNPMP is used as a guide for Fiordland National Park managers, commercial operators and the public when considering the future uses of Fiordland National Park. The FNPMP informs the DOC's concession processes for activities within the Park.

The FNPMP is due for a review and this could provide an opportunity for changes to this document. In the context of the Milford Opportunities Project changes could be made to the Plan to provide for tourism related developments or new infrastructure development or upgrades. Alternatively,

specific changes could also be made as a means of addressing the adverse effects of activities within the Park.

### **Southland Murihiku Conservation Management Strategy (CMS)**

The Southland Murihiku CMS describes the conservation values present in mainland Southland, and provides guidance for the DOC's work in the form of a vision, objectives, outcomes for Places, policies, and milestones; translating the Department's strategic outcomes to Southland. The CMS is relevant to those areas of conservation estate the Milford Corridor and the wider Milford Regional Context that sit outside FNP.

### **Regional Policy Statement for Southland**

The Southland Regional Policy Statement 2017 (RPS) provides an overview of the resource management challenges for Southland and outlines objectives, policies and methods to achieve them. The RPS has the highest rank of any RMA planning document in Southland but does not contain rules. The district plans of Southland's three Territorial Authorities (including the Southland District Plan) and Environment Southland's regional plans must give effect to the provisions in the RPS. The RPS became fully operative in 2017 and is not likely to be reviewed for at least 10 years.

### **Regional Coastal Plan for Southland**

The Regional Coastal Plan (RCP) forms the environmental management framework for Southland's coastal marine area and coastal environment. Under the RMA, Environment Southland is responsible for the development and implementation of the RCP and for ongoing management of the CMA under both the RMA and RCP. The planned future review of the Regional Coastal Plan for Southland provides an opportunity for changes to this document through the submission and hearing processes. In the context of the Milford Opportunities Project, changes could be made to the Coastal Plan to provide for future tourism related developments or new infrastructure development or upgrades. Alternatively, specific changes could also be made to the Coastal Plan aimed at addressing the adverse effects of tourism.

### **Regional Water Plans**

The Regional Water Plan provides the environmental management framework for use and development of freshwater. It regulates water related activities, such as discharges to water, taking and using water, and structures and bed disturbance activities in river beds and some land use activities that can have effects on water. The Regional Water Plan is currently being reviewed and has been through the public consultation and hearings stage. A decisions version on the proposed Water and Land Plan for Southland is due out in early April 2017.

### **Southland District Plan**

The Southland District Plan sets a framework for development and the management of natural and physical resources in the Southland District. It establishes objectives, policies and rules for managing the environmental effects of land use, subdivision and development. The District Plan is representative of both the Council and the community's aspirations for the Southland District.

The Southland District Plan has only recently become operative and as such any changes to this Plan would need to be progressed through a private plan change or alternatively a council driven Plan Change or Variation to the District Plan.

### **Southland District Council Freedom Camping Bylaw 2015**

The Freedom Camping Bylaw details the areas within the Southland District Council where people can freedom camp and those areas where it is prohibited. The QLDC Freedom Camping Bylaw has the same function.

We do not understand the influence of QLDC and SDC Freedom Camping Bylaws in terms of patterns of travel (i.e. movement of free independent travellers (FIT's) into and out of Piopiotahi and Otago / Southland).

### **Environment Southland Cruise Ship Marine Fee**

Under the Deed of Agreement between the New Zealand Cruise Ship Industry and Environment Southland, each cruise ship operator pays a fee to Environment Southland for each cruise ship operating in or through the Internal Waters. The purpose of the fee is to assist Environment Southland to manage the coastal marine area of Southland. The fees are calculated based on the total gross registered tonnage of each cruise ship. The term of the existing agreement ends 1 October 2018.

### **Southland Regional Council Navigation Safety Bylaws**

Environment Southland has the statutory function to promote navigation safety and administers the Navigation Safety Bylaws for the Southland Region. The Bylaw includes specific safety rule provisions for Milford Sound including speed restrictions.

### **The Ngāi Tahu Claims Settlement Act 1998**

The Ngāi Tahu Claims Settlement Act 1998 implements a number of settlement provisions recognising the cultural, spiritual, historical and traditional associations of Ngāi Tahu with particular sites, areas and species. These provisions include the identification of taonga species and the establishment of tōpuni, statutory acknowledgements and nohoanga sites, with the purpose of improving the effectiveness of Ngāi Tahu participation in resource management.

### **Statutory Acknowledgements**

A Statutory Acknowledgement is an instrument created as part of the Treaty of Waitangi settlement between Ngāi Tahu and the Government (Ngāi Tahu Claims Settlement Act 1998). A Statutory Acknowledgement is a means by which the Crown has formally acknowledged the statements made by Te Rūnanga O Ngāi Tahu of the particular cultural, spiritual, historic and traditional association of Ngāi Tahu with the statutory areas. Statutory Acknowledgments recognise Ngāi Tahu's mana in relation to a range of sites and areas in the South Island and provide for this to be reflected in the management of those areas. Statutory Acknowledgments impact upon Resource Management Act 1991 processes concerning these areas.

#### Tūtoko

A statutory acknowledgement applies to the mountain known as Tūtoko lying between the lower Hollyford Valley and Piopiotahi. Mount Tūtoko is the highest peak in Fiordland National Park. It lies between the Hollyford Valley and Milford Sound, 15 kilometres due north of the Homer Tunnel, and rises to a height of 2,723 metres. The Crown acknowledges Te Runanga o Ngai Tahu's statement of Ngai Tahu's cultural, spiritual, historic, and traditional association to Tūtoko in the Ngai Tahu Claims Settlement Act 1998.

#### Te Ana-au (Lake Te Anau)

The statutory acknowledgement applies to the Lake known as Te Ana-au (Lake Te Anau). Lake Te Ana-au is located within Fiordland National Park and within the focus area of the Milford Opportunities Project. The Crown acknowledges Te Rūnanga o Ngāi Tahu's statement of Ngāi Tahu's cultural, spiritual, historic and traditional association to Te Ana-au in the Ngai Tahu Claims Settlement Act 1998.

#### Te Mimi O Tu Te Rakiwhanoa (Fiordland Coastal Marine Area)

The statutory area to which this statutory acknowledgement applies is Te Mimi o Tu Te Rakiwhanoa (Fiordland Coastal Marine Area), the Coastal Marine Area of the Te Anau

constituency of the Southland region. The Fiordland Coastal Marine Area is within the focus area of the Milford Opportunities Project. The Crown acknowledges Te Rūnanga o Ngāi Tahu's statement of Ngāi Tahu's cultural, spiritual, historic and traditional association to Te Ana-au in the Ngai Tahu Claims Settlement Act 1998.

### **Land Transport Management Act 2003**

The Land Transport Management Act 2003 (LTMA) provides the legal framework for managing and funding land transport activities. The purpose of the LTMA is to contribute to the aim of achieving an affordable, integrated, safe, responsive and sustainable land transport system.

### **Public Transport Management Act 2008**

Public Transport Management Act 2008 allows regional councils to: require all or any services to be provided under contract to the council, impose controls on commercial public transport services (e.g. for quality and performance standards), and regulate the registration of public transport services.

### **National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health 2011**

All territorial authorities (district and city councils) are required to observe and enforce the requirements of the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health 2011 (the NES) which sets a nationally consistent framework for managing contaminants in soil. The NES applies to any "piece of land" on which an activity or industry described in the current edition of the Hazardous Activities and Industries List (HAIL) is being undertaken, has been undertaken or is more likely than not to have been undertaken (see regulation 5(7)). Land-use history is the trigger for determining whether land is covered by the NES. Environment Southland maintain a database of HAIL sites in Southland known as the Selected Land Use Sites (SLUS) Register. This database details information about land in the Southland region that is, or has been, associated with the use, storage or disposal of hazardous substances. The SLUS database includes sites in Piopiotahi and Milford corridor and there may be other unknown HAIL sites in the project area. The HAIL status of any land within the project focus area can be an important consideration should new development be proposed in these locations.

#### **Potential Gaps in Knowledge - Legislation:**

Further research is required to determine how effective these policies and plans have been in terms of:

- 1) Regulating activities to avoid adverse environmental effects / protection of conservations values?
- 2) Enabling appropriate tourism related infrastructure and tourism activities that service visitors?
  - Further research is also required to determine how effective they will be in relation to the vision / guiding principle for the Milford Opportunities project.
  - There is a lack of integrated planning in relation to Piopiotahi. This is not a criticism of the various regulatory agencies who are all undertaking their respective duties but in doing this there is not an integrated management approach (i.e. everyone doing their own thing). There is an information gap in terms of options for integrated planning / management.
  - Need to understand legislative change options available that might help the masterplan to be fully realised.
  - While good information exists about land ownership, it would be useful to understand the land status/ ownership across the entire Piopiotahi area (and associated land ownership complexities - I.e. State highway boundaries, national park boundaries etc.).
  - We do not understand the influence of QLDC and SDC Freedom Camping Bylaws in terms of patterns of travel (i.e. movement of FIT's into and out of Piopiotahi and Otago / Southland).

### 6.1.2. Proposed Developments

Bonisch Consultants were engaged by the Department in 2017 to review the development options for the Little Tahiti site, situated 3km east of Piopiotahi alongside the Cleddau River, and considered one of the last pieces of flat land for development. Development was potentially for parking, a camping site and accommodation to support future tourist growth. Two options were detailed in the report and looked at the costs, benefits, risks/hazards and consent implications. A detailed topographical survey was undertaken as part of the work.

In 2017 MST (Milford Sound Tourism) commissioned a report on transport infrastructure issues at Piopiotahi – TDG Transport Infrastructure Review. This is a key piece of information for that will inform MOP.

Milford Sound Tourism’s future development proposals include covered waiting space outside the terminal, and plans for the recently acquired Knob’s Flat accommodation (Tim Holland, pers comm via email).

The Department of Conservation has capital planning bids for 2018/19 which include upgrades to the Divide (car parking and shelter). Other development proposals are upgrades associated with the following visitor sites: Gertrude Valley, Lake Marian and the Chasm (MBIE, 2017).

NZTA have a number of planned improvements on the Milford Rd (MBIE, 2017).

The Milford Community Trust has recently announced plans for a walking track between Deepwater Basin and Freshwater Basin to allow safe access plus a possible regular medical clinic. Fire and Emergency New Zealand now provides fulltime emergency response support.

Visitor attractions linked to Fiordland have been proposed for Te Anau in the past. The Discover Fiordland project is one example and it was originally proposed on a site on the corner of SH 94 and SH 95 in Te Anau. Subsequently a smaller scale project was mooted for central Te Anau. Development proposals such as this in Te Anau could provide further activities for visitors to spend more time in the town. Development in Te Anau could also allow for efficient and effective use of existing infrastructure.

Air Milford provided graphic concepts of their vision to address visitation congestion and improve the overall experience of customers. The images are shown below.

Explanation of images as described by AirMilford:

*“First image, the accommodation, which is considered would alleviate pressure on Milford Lodge. This concept shows the hotel etched into the hillside and blended into the native colour scheme.*

*The second and third images show a monorail concept. With two in operation, they could run at opposite ends i.e. one at the boat terminal while the other is at the lodge. This could be coordinated to have accurate pick up drop off times at each location. Future scope could be planned to have the rail line up to the tunnel, which would ease pressure on the road and make for an outstanding journey. Similar to such as in Europe.”*

Image 1: Accommodation Concept – Courtesy of AirMilford



Image 2: Monorail Concept, courtesy of AirMilford



Image 3: Monorail Concept, courtesy of AirMilford



#### **Potential Gaps in Knowledge – Proposed Developments:**

- While there is some good knowledge of proposed developments, these are largely the developments of public assets. There is very little knowledge of what, if any development proposals are planned by private interests.

#### *6.1.3. Previous Masterplans/ Concept Plans*

Several efforts have been made over the years to consider Milford Sound/ Piopiotahi holistically. While largely outdated, it is important to acknowledge this work, and ensure that future development proposals are mindful of any previous associated work. The specific documents are referenced in the master list provided as Attachment 2.

#### **Potential Gaps in Knowledge – Previous Masterplans/ Concept Plans:**

- It could be useful to understand the effectiveness of more recent plans produced, including key things learnt.

## **7. Information Review and Gap Analysis – Best Practice**

The best practice review aims to examine national and international literature and initiatives. The primary aim is to examine:

*Best practice around national parks that are effectively managing visitor demand while enhancing conservation values, including successful case studies to learn from or gaps in understanding.*

Other elements of the review include:

- Examining trip value and how visitors value their trips
- Balancing visitor demand against biodiversity impacts
- Integrated governance of conservation areas and effective planning to deal with change

Commentary is provided on the information available, its relevance to this project and where information is missing. Each sub-section concludes with gaps in information for that topic area.

### *7.1.1. National park demand management strategies*

Leung & Marion (1999) outline four key spatial strategies for managing visitor impacts in national parks, which can be used individually or in combination within the same park or region, including:

- 1) **Spatial segregation:** Including closure (with no access) or zoning, where access is allowed taking into consideration the type of visitor activity (e.g. zones where there are camping restrictions).
- 2) **Spatial containment strategy:** Confines use to limited designated or established locations. Appears to be the most widely applied strategy.
- 3) **Spatial dispersion strategy:** Aims to spread visitor use, to avoid crowded visitor experiences, and negative impacts on natural resources from peak visitor demand. This appears to be most used in relation to visitor experience, rather than a real drive to limit negative environmental impacts.
- 4) **Spatial configuration strategy:** Which seeks to intelligently locate facilities and visitor attractions spatially to naturally encourage visitor dispersal.

In addition to spatial strategies, Tourist Transport Management (TTM) strategies are available, which are simply existing techniques around traditional Travel Demand Management (TDM) applied to the tourist sector. For example, the Victoria Transport Policy Institute (VTPI) provide an online resource explaining management strategies (<http://vtpi.org/tm/tm46.htm>). Ideally, effective TDM for visitors should include provision of choice, incentives for efficient travel options, and equity, which also allows for a reasonable cost of travel for local residents (Litmann, 2011). TDM strategies are especially effective where visitor travel behaviour patterns are relatively predictable, as they are in the Milford setting.

These strategies have parking strategies, which range in effectiveness in reducing parking demand by between 10-30%. With the interesting remark captured:

*“If every place worth visiting had enough parking for all the people who wanted to visit, there would be no places left worth visiting.”*

A few of the more relevant examples include:

- **Parking regulations:** To favour higher-value users, deliveries, and people with special requirements.
- **Parking maximums:** Limiting numbers and locations of parks.
- **Cost-based parking:** Which covers only the costs of parking facilities, and can reduce parking demand by about 10-30% relative to free parking.
- **Performance-based parking pricing:** With higher rates for peak times and better locations (closer to facilities), and can be set to allow for 10-15% of spaces being unoccupied at peak times, and generate income for wider improvements (such as improved facilities for walking or other travel modes).
- **Parking valets:** Which can increase parking capacity by as much as 20-40% compared with self-park, and be viewed as a premium service by higher end visitors.



- **Remote park and rides:** For remote parking locations this provides a shuttle service, typically utilising busses and vans, often used as free services in specific circumstances (see a good example below under the Accessibility section).

Parks Canada initiatives provides some valuable insights across a range of TDM options they are implementing (the following is based on a personal communication with Greg Danchuk, Visitor Experience Manager, Banff Field Unit, Parks Canada, 2018).

Banff National Park (BNP) in Canada receive 4.2 million visitors each year and have experienced a 30% increase in growth in the last five years, with 10% of arrivals by coach (even with a local culture of private car use in Alberta). There is an entry fee to enter the national park at \$20 per family for a day. Parks Canada admit they have been slow in demand management, but is now implementing several demand management methods.

- **Park and Ride:** Park and Ride has been difficult to gain initial ridership. Until you turn people away (i.e. in the most extreme case, simply block the road) there will be limited uptake. Lake Louise is the highest use site with 2 million trips per annum, running a continual shuttle every 15 min. There is a 1.5–2 hour wait for bus in que (currently free but this will be charged next year). Also, 400 parks for private cars but with no guarantee there will be a park available. They are looking to introduce a bus from Banff in 2018 directly, rather than park and ride.
- **Park Transit:** Banff say's – “We don't have a people problem, we have a car problem”. The concept is if you are camping or staying in a hotel you already have a car park. The transit system is a local authority funded transit system to transport visitors from town to visitor sites. Free shuttles are there currently, but looking to move to a pay system.
- **Parking restrictions:** Implementing restrictions on road-side parking. At some sites there is a 2km long (in either direction) wall of vehicles parked alongside the road. They are removing this and providing better information to update visitors that the car park is full in advance.
- **Quotas:** Only used at one site, Lake O'Hara (Yoho National Park) where 60 people per day can visit (three buses per day).
- **Paid parking:** Introducing paid parking to limit use. Some policy issues given the existing park entrance fee, but this does provide a means to discourage parking. Premium parking is also in place at Sunshine Ski Resort, where there is a higher fee closer to the base facilities.
- **Reserved parking:** A 4-hour rotation (used in 2017 at Bruce Peninsula at the Grotto). First cars in can be there from 9am-12pm and next set come in for the afternoon. There is provision for online reservation for parking <https://www.pc.gc.ca/en/pn-np/on/bruce/activ/experiences/grotto/parking>.
- **Other options:** Being considered include preferential parking for carpooling, charging per vehicle rather than person.

The key message is providing visitors with realistic expectations, with real-time information on car parking capacity and numbers, and providing people with alternative options based on time of day, season and location.

At the more extreme end of TDM, the VTPI site also provides case studies where initiatives aimed towards “car-free” tourism have been investigated. For example, Bad Hofgastein, in Austria, where project components examined included the typical public transit improvements, but also went beyond this to include:

- **Mobility management:** The development of a mobility management centre, with the goal of delivering an integrated travel information system and mobility service.

- Street design: Heavy speed limit zones (that of walking speeds in areas), strong focus on providing space for cycling, and unimpeded walking.

This initiative may not be directly relevant to the Milford Journey given the but concepts are worth outlining as TDM initiatives. However, there is limited empirical information around the success of these types of programs.

#### **Potential Gaps in Knowledge – National Park Demand Management:**

- There is limited empirical information around success of the various travel demand management strategies.

#### *7.1.2. Accessibility*

Accessibility management options have been well established. For example, Cole, Petersen and Lucas (1987) outline eight different recreation management strategies (including 37 different tactics), which is also represented in an online matrix ([www.wilderness.net/recreationmatrix](http://www.wilderness.net/recreationmatrix)). Some of the more effective strategies here indicate that reducing access by controlling the type and quality of entry points into a location is a low cost, effective strategy for reducing impacts on natural wildlife (particularly when access conditions are made available to visitors when they are planning their trip).

The recognition that the Milford Road transport corridor into Milford Sound is a key part of the visitor experience, and that this also needs progressively better control over how this is used in terms of safe, efficient visitor flow is not new:

*“The beauty of the Milford Road corridor itself is considered a major part of the Milford Sound experience, and needs to be maintained to a high standard of safety. Currently, on average, 800 vehicles travel along this route per day, 25% of which are buses. At peak times during the day, the high quantity and combination of vehicles generates congestion at viewing areas and certain sections along the Milford Road. It appears that a progressive move to control traffic flows needs to occur over time.”*  
(GHD, 2005, p.3)

The uncontrolled access to Piopiotahi is concern that is continuously raised (this was a common discussion point during consultation undertaken as part of the gap analysis research) and will continue to be raised until there is a better understanding of the different accessibility options, and the impacts of these options (cultural, social, economic and environmental).

For example, multiple modes of transport have already been pitched to the community by developers for the express purpose of improving travel time for visitors (Lowe, 2012). This included a multi-modal visitor experience that utilised a catamaran trip across Lake Wakatipu from Queenstown, an all-terrain bus, and a 43km monorail to finally connect to the main road just north of Te Anau. However, this was all done under the assumption that the ultimate goal was getting to Milford and back in one day (due to visitors being time poor), that bypassing Te Anau was desirable, and that the multi-modal choices would enhance the area. Similar issues were raised, with local opposition to a proposal around the Routeburn-Hollyford tunnel proposal to link the Routeburn and Hollyford valleys, that was deemed to have negative environmental and social impacts, and went contrary to the Fiordland National Park’s management plan (Fraser, 2012).

These plans did not go ahead, but the innovation around a multi-modal experience for visitors could be worth investigating, especially if it were to complement the main existing access route. Overall, it would be valuable to understand the willingness of visitors to travel differently, especially those that currently self-drive. Also, understanding the desire to have a slower, but more in-depth experience of the region (moving away from the day trip) to experience new locations or simply engage in a more multi-modal experience to gain a different perspective on the same location and

provide visitors with more choice (walk, cycle, horse, low-powered electric mobility device, golf cart, coach, cruise boat, kayak, flying). The impacts of different modes at different parts of the journey could be more systematically evaluated, to ensure future mobility solutions are appropriately considered.

The Niagara Falls Heritage Area (NFHA) have just completed a two-year pilot project for their Discover Niagara Shuttle, where an economic impact study has indicated that this has injected \$35 million into the Niagara County economy during 2016, which is projected to double over the next 3 years (Higgins, 2014; Niagara Frontier Publications, 2017; [www.discoverniagara.org](http://www.discoverniagara.org)).

*"The Discover Niagara Shuttle has taken the hassle of planning out of the equation. It has tied together all that the Greater Niagara Region has on display with one convenient route, and has stimulated an economic boom for our area's economy. The ease and comfort that the Discover Niagara Shuttle provides allows visitors to extend their stay in Niagara Falls and the Greater Niagara Region and experience the vast amount of culture and history in our part of the state. The easier we can assist our guests in finding what makes Niagara County so special, the better the result for all of the parties involved."* (New York State Sen. Robert Ortt; Niagara Frontier Publications).



This project allowed people to park their cars (including free parking locations) by making available a free hop-on/hop-off shuttle that connected residents and visitors with 14 cultural attractions along the Niagara river corridor from the “Falls to the Fort”. The service also made available the Discover Niagara app that connected visitors with information on the places, culture, communities and stories to experience during the visit, including complementary wi-fi on each service. Wider complementary services were also provided, including a National Heritage Area Junior Ranger program, targeted at teaching youth about the history of the area, and rewarding participants as they progress through the activity program. This provides an example of how the journey to an Iconic National Heritage attraction can be leveraged to raise benefit for a wider area. Arcadia National Park provides a similar example of a successful mobility solution ([www.exploreacadia.com/](http://www.exploreacadia.com/)).

### Route upgrades and access

The Kolob Canyon Scenic Drive in Zion National Park has had several drainage and road failure challenges, being cut into the side of steep walled canyons. The Federal Lands Transportation Program in partnership with Zion management officials are taking the opportunity to upgrade the route (Zion National Park, 2018). As part of this program they are taking the opportunity to upgrade targeted locations, including rest stops and 17 lookout locations. During this process they will also either remove or restrict access depending on the upgrade, including making some hikes drop-off and pick-up access only. This raises the concept of soft trialling restricted access during a reconstruction/repair phase during an off-peak season and monitoring the impacts and innovation around access that could stem from this.

### Innovation, adaptation and access

Lessons around innovative approaches to maintaining visitor experience and successful visitor management strategies in the face of challenges like climate change can be borrowed from other South Island tourism locations, especially ones like Fox and Franz Josef glaciers. In these locations infrastructure solutions (such as cantilevered bridge structures attached high on rock walls), as well as transport mode solutions where guides use row boats to cross proglacial lakes, park and ride or increased use of aerial approach via helicopter (Orchiston & Espiner, 2017). This also indicates the use of less traditional approaches to access could become increasingly viable, so consideration of transport options to improve resilience, create new visitor experiences (e.g. new scenic perspectives), and capture economic value should be examined in advance of the need.

#### **Potential Gaps in Knowledge – Accessibility:**

- Understanding the combination of relevant access improvements and demand management techniques that would be effective in this setting to better manage visitor demand (for high, medium, and low demand increase scenarios).
- What multi-modal trip options should be investigated for the journey into Milford (i.e. assessing the best modes for each part of the journey based on overall impacts to really test how we could be travelling)? How adaptive are these mobility solutions to alter (including over time) to consider known natural challenges and opportunities (such as changes in sea level, flood risk, and avalanche)? Assessing and understanding the risks associated with the effects of climate change and sea level rise should inform infrastructure investment decisions.
- Understanding visitor motivations, destinations currently travelled to, desire to travel slower or more widely, and willingness and ease of mode shift, especially in those that currently self-drive.

#### *7.1.3. Examining visit value*

#### **Valuing visitation - Iconic Parks and impact management**

Iconic parks with unique wildlife have large economic value. Visitors coming to see mountain gorillas in Rwanda's iconic Volcanoes National Park is now the country's largest source of foreign exchange, bringing in US\$200 million annually (Watson, 2014). However, even within protected parks this is not always clearly reinvested. Only 20-50% of protected areas are assessed as being effectively managed, with the consequence in some situations of serious ecological degradation, such as Australia's Great Barrier Reef Marine Park (Watson, 2014). Under-resourcing of protected area management is the primary reason for poor performance, with only 6% of the countries reporting to the Convention of Biological Diversity (CBD) indicating that resources were adequate (as at 2003).

A critical element is understanding the value of Piopiotahi and understanding the level of reinvestment required. For example, the Great Barrier Reef Marine Park Authority budget was about Aus\$50 million in 2012/13, where the value of tourism was worth Aus\$5.2 billion. Zeng (2013; in Mustika, et al., 2014) found that 55% of visitors to Taibai, China, would not have visited if the nature reserve did not exist. Understanding visitation to New Zealand or the South Island without this attraction would be one way to understand the value.

#### **Visitor willingness to pay to mitigate impacts**

When visitors have a good understanding of the environmental impacts of visitation, and also are motivated by concern for the natural environment, such as those visiting the Great Barrier Reef, they are willing to pay more to ensure the area is preserved. Mustika, Stoeckl and Farr (2014) found

that visitors respond much more negatively to a degradation in environmental quality than to a 20% increase in trip costs. There are a range of environmental trade-off scenarios that can be tested with visitors that can then be translated into economic impacts (for example, see the figure below). Similar realistic scenarios (i.e. based on actual impact scenarios) could be developed for Piopiotahi and Fiordland to gain a better appreciation of value. This could then help inform visitor price-thresholds (for local, wider New Zealand, and overseas visitors), as well as the proportion of environmental reinvestment that may be appropriate.

**Figure: Contingent behaviour scenarios examining the relationships between visitation, cost, and environmental impact (Source: Mustika et al., 2014).**

	I may have stayed longer	This would not have affected my decision at all	I would have still visited but reduced the length of my stay by about			I would not have come here at all	I do not know
			25%	50%	75%		
If local prices rose by 20% (compared to other places in Australia)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If there was twice as much rubbish (bottles, plastic) on the beaches and islands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If there was half as much chance of catching fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If there were half as many fish and less variety to look at	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If there was half as much live coral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If there were twice as many tourists	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If the ocean water changed from clear to murky	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If there were twice as many oil spills, ship groundings and waste spills from the ports	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

There is a known visitor paradox around "last chance" tourism, where seeing an area before negative visitor impacts alter or destroy it actually increases visitor demand. Psychologically, people are loss averse, so understanding and clearly communicating the risks to the area can highlight a last chance to see it at its most untouched, but also provides an opportunity to improve pro-environmental behaviours.

There may be an opportunity to move from "last chance" tourism to "protective tourism" where visitors see how their trip has contributed to improvements, and when they return visitors can be provided with new updates based on transparent intervention programmes aimed at improved resilience.

**Potential Gaps in Knowledge – Examining Visit Value:**

- How much value do visitors place on mitigating negative environmental impacts?
- Understanding the motivations of visitors with nature-related preferences (i.e. what other experiences are they looking for in their visit), so any investment strategy for the corridor and Milford surrounds maximises value by aligning with existing visitor motivations.
- Understanding the types and value of expenditure for this nature-related preference segment (relative to other visitors).
- Understanding the proportion of people visiting who would not have visited 1) New Zealand, and 2) the Southland region at all if Milford and the national park was no longer accessible

#### 7.1.4. Relationship between visitor demand and biodiversity impacts

Setting thresholds or quotas is a common demand management technique. However, it is important to ensure quotas are informed, including via ensuring any impacts relating to visitor demand are understood. Also important is to examine not only pure numbers, but also how visitor behaviours can be monitored and influenced. For example, examining non-compliance rates of visitors (e.g. path departures, or taking dogs in dog-free zones). Currently the Fiordland National Park Management Plan sets a limit at Milford at 4,000/ day [to be confirmed] however it is unclear how this figure is derived.

Barros (2015) reviewed 47 recreation ecology studies that examine the relationship between tourism and ecosystem damage, specifically looking at mountainous terrain in the Andes. These studies demonstrate different methodologies for monitoring the effects of damage including 1) experimental research designs, 2) inventory assessments and interviews as part of management frameworks, and 3) acknowledged but non-assessed impacts. Where there is good detail, including examination of spatial and temporal influences on impacts, it was typically only examined in relation to specific impacts only (e.g. water quality, bird/marine life or native vegetation).

These studies show several different methods for examining impacts and revealing key findings, including some examples below:

- **Experimental trampling of vegetation:** Revealed that repeated trampling at low rates (even 20 passes) resulted in reduced species density and limited recovery of many species even after 1 year (Hoffman & Alliende, 1982).
- **Repeated photography:** To examine changes in land cover over time, revealing changes based on trails, but also due to climate change, natural hazards and grazing (Byers, 2000).
- **Peak vs off-peak visitor demand:** Examined bird tolerance of visitors from peak (1700 visitors per day during Summer) through to no visitors and found no difference in bird diversity or abundance.
- **Experimental vs Control sites:** Examined high and low use trails (ranging from 3000 to 12000 visitors per year) and revealed that bird diversity and abundance was lower on trails that had higher visitation (including for birds of high conservation value; Heil et al., 2007).
- **Event specific visitor effects:** During breeding season measures like the distance of visitors to roost sites can influence roost departures (e.g. when visitors come within 200m).
- **Tolerance thresholds:** The threshold at which guanaco's start to be seen less frequently (and can also influence feeding behaviour), based on different intensities of visitors, was found to be at around 250 visitors per day (Malo et al., 2011; Fuentes Allende, 2011).

In a New Zealand context, Lusseau and Higham (2004) examined the impacts of increasing demand for marine tourism in Doubtful Sound on the bottlenose dolphin population. They indicate the benefit of collecting objective evidence and spatial-ecological analysis to inform tourism management techniques, such as multi-levelled marine sanctuaries, as they revealed that boats did have an impact, but to a lesser extent when the dolphins were socialising (as opposed to resting).

In a review of New Zealand research done for the DOC, Booth (2006) found several gaps in terms of visitor impact research, including very little continuous monitoring (most monitoring is done reactively after there is damage), and a limited number of research approaches that had been applied in a New Zealand context. Overall, the relationship between baseline conditions, the type and level of visitor use, the type and degree of impact, and the effectiveness of any intervention response to these is lacking.

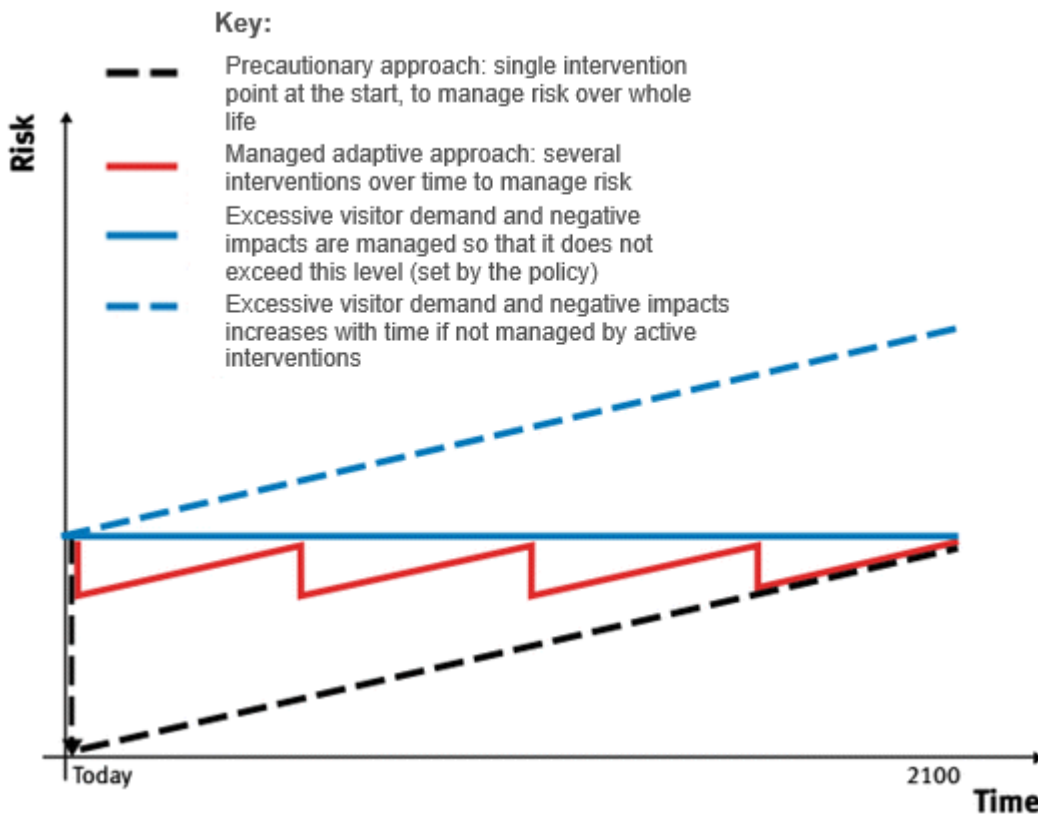
### **Potential Gaps in Knowledge – Visitor Demand and Biodiversity Impacts Relationship:**

- The impacts of visitor numbers of native wildlife and environmental quality needs to be examined more holistically to better inform targeted demand management strategies.
- Ideally this also includes examination of visitor behaviours, including the type of visitor activity (tramping, camping, mountain biking etc), and the rates of undesirable or non-compliant behaviour (e.g. moving off the formal track, taking dogs, or littering).
- Understanding the motivations of those visitors engaging in positive and negative environmental behaviours, to help inform behaviour change interventions.

#### ***7.1.5. Master plans that deal with flux or change over time***

Because projections around the future environment within Milford are uncertain, either because of visitor impacts that may alter biodiversity, or changes in sea level, flood, avalanche and weather-related events, allowing for some adaptivity within planning is useful. For example, choosing a critical intervention path has the benefit of setting long-term actions now to manage the risk, but it can be costly and vulnerable to surprises as it is all premised on the information available now.

Following a managed adaptive approach commits to a short-term action plan, reducing risk iteratively as new information becomes available, and providing the framework and roadmap for future actions to ensure flexibility (Walker, Rahman & Cave, 2013). This innovative adaptive approach has been utilised for identifying key decision points in the area of climate change, as sea level risk rises to a certain level, this triggers a decision-point around appropriate intervention (allowing for lead-time around appropriate infrastructure; Ranger, Reeder & Lowe, 2013). The figure below visually outlines these different pathways for managing demand (directly adapted from the Thames Estuary 2100 Plan; Environmental Agency, 2012; Ranger et al., 2013).



**Figure: Illustration of different risk management approaches (adapted from Thames Estuary 2100 Plan; Environmental Agency, 2012)**

Another element to consider that is relevant to Piopiotahi and Fiordland, is ensuring the context and values raised by experts and key stakeholders (including community) in previous decision processes is captured within the master plan. For example, the master plan for Machu Pichu, the Plan Maestro (2005), has succeeded in representing diverse interests in a complex political environment by ensuring that it has taken captured the historical and cultural actions, interests and conflicts involved to ensure a deep prior understanding of the site (Zan, 2011). The vision, goals, and strategies all come from this understanding, with a focus on integrating the professional knowledge provided by experts, including archaeologists. Of note is that the Plan Maestro is widely used as the framework and strong reference by which organisations coordinate their activities and contribute to organised action (as evidenced by many of them bringing a copy along to critical meetings). In the context of Piopiotahi, the process by which relevant decision actions, for example, the proposed interventions that did not go ahead (such as the proposed monorail), provide a resource for informing the master plan.

**Potential Gaps in Knowledge – Masterplans that deal with flux/ change over time:**

- Understanding the threshold of tolerance around risk from visitor demand impacts.
- Developing a framework to guide and assess future interventions to ensure they are timely and cost-effective at reducing negative impacts around increased visitor demand.



## 8. Table of Knowledge Gaps, Further Research Options and Priorities

The following section provides a synopsis of what we know from the information available, the gaps in knowledge and further research options and an assessment of priorities.

Topic	What we know	What we don't know (gaps in information)	Further Research Options	Prioritisation Assessment
<b>The Place:</b>				
<i>The Natural Environment</i>	<p><b>Terrestrial Environment</b></p> <p>Sufficient detailed information from a range of sources exists about the natural terrestrial environment (both past, present and trends over time). This applies to both Piopiotahi and along the Corridor.</p> <p>There is a high rate of endemism in Piopiotahi, particularly invertebrates and lizards. For example, the Milford boulder butterfly – only two known populations (Little Tahiti, Deepwater Basin Road).</p> <p><b>Marine Environment</b></p> <p>In the context of this project we consider that the marine environment is generally well understood except for some specific species.</p> <p><b>Pest Management</b></p> <p>Pest management is well covered by ES policy and regulations and Marine Guardians non-regulatory information. Generally, a high level of existing knowledge and current workstreams. No specific gaps or direct relevance to the project identified at this stage. It is acknowledged that we may not have a full understanding of all likely threats.</p> <p><b>Landform</b></p> <p>There is existing knowledge on landform, geomorphological aspects of the area. We have not identified any obvious gaps in this space that could inform the project.</p>	<p><b>Terrestrial Environment</b></p> <p>It is unclear what the 'real' conservation values are for Piopiotahi. There is a high rate of endemism, however the priorities and preferred methods for conservation are unclear.</p> <p>We do not understand how the review of the FNPMP will impact on management of conservation values.</p> <p>What the ecological values of remaining potential development/ developed areas in Piopiotahi? Equally what built infrastructure could be removed to remedy lost habitat. For example, the Milford Boulder Butterfly which is endemic to Milford Sound and has survived in small margins of habitat as land development has occurred over the decades. This marginalised habitat includes the former rubbish tip at Little Tahiti which is identified as a potential development site being one of the few flat and vacant areas available. Threatened plant species <i>crassula ruamahanga</i> occurs around the Deepwater Basin area. Habitat could be damaged or lost through future development yet the extent of potential damage is unknown. Many other native species Kiwi for example are present at Piopiotahi and through the wider project area.</p> <p>We don't know how Piopiotahi is managed from day to day, what works well and what doesn't from a conservation management perspective. This applies to both paid and volunteer conservation management.</p> <p><b>Marine Environment</b></p> <p>Some marine species are not well understood. For example, there has been no recent research on the resident bottle nosed dolphin found within the Milford Sound fiord particularly regarding boat activity given that it is known they are susceptible to disturbance.</p>	<p><b>Terrestrial Environment</b></p> <p>Literature review and analysis of key species and habitats for prioritised focus within the masterplan with a focus on endemic species.</p> <p>Close association between the Fiordland National Park Management Plan Update and the Milford Opportunities Project to ensure approach is complementary.</p> <p>Ecological assessment<sup>4</sup> – initially desktop review and then potentially field based assessment to understand the ecological value of potential development/ developed areas of Piopiotahi, especially given the high rate of endemism in the area. It would be envisaged that a 'heat map' would be produced identifying hot spots for endemic species habitat/ presence.</p> <p>Specific studies of specific species may be required as a result of the Ecological assessment above. This might include a specific study on, but not limited to: the Milford Boulder Butterfly in the form of a Conservation Plan, the Bottle Nose Dolphin and endemic species located in Sinbad Gully and near the Milford Tunnel.</p> <p>Undertake targeted research to understand how the area is managed on the ground with regard to conservation values, what works well and what doesn't with a view to recommending a coordinated approach to conservation by both paid and volunteer roles through the masterplan development.</p>	<p><b>Relevance to Conceptual Masterplan Development:</b> 10/10</p> <p><b>Is it being done already:</b> Likely</p> <p><b>Can it be done within the timeframes of the conceptual masterplan process:</b> Could be scoped to fit within timeframes allowed</p> <p><b>Discussion:</b> Further analysis needs to be undertaken to understand the 'real' conservation values of the project area.</p> <p>This should be included as a recommendation. With this said, the review of the Fiordland National Park Management Plan will likely provide a significant amount of information. A close relationships should be formed to ensure close synergy between this process and the management plan process.</p> <p>More value may be gained by undertaking this work once the initial conceptual masterplan 'ideas' generation process is underway.</p>
<b>NOTE: This study has not examined and analysed species level information except where immediately available. This is primarily due to the significant extent of species level research undertaken.</b>				
<i>Built Environment</i>	<p><b>Contamination</b></p> <p>Potentially contaminated sites in the project study area are listed in the Selected Land Use Sites (SLUS) Register maintained by Environment Southland. The information will have a bearing on new development proposals potentially long history of HAIL activities plus numerous fuel storage sites etc. Little Tahiti (former dump) is likely to be a HAIL site for example.</p>	<p>Information known and likely to be adequate at a high level. Has been requested from ES but not received at the writing of this report.</p>	<p>Information Adequate.</p> <p>Scope for more specific assessments at more localised level as new development proposed.</p>	<p><b>Relevance to Conceptual Masterplan Development:</b> 6/10</p> <p><b>Is it being done already:</b> Unlikely</p> <p><b>Can it be done within the timeframes of the conceptual masterplan process:</b> Could be scoped to fit within timeframes allowed</p> <p><b>Discussion:</b> Further consideration of contaminated sites could be undertaken once the conceptual masterplan ideas have been established. A review of potentially contaminated sites at this stage is not recommendation however.</p>
<i>The Natural Environment</i>	<p><b>Landscape/ Visual Amenity</b></p> <p>The landscape of Piopiotahi and wider project study area is unique and nationally and internationally valued as a world class tourist destination.</p> <p>The landscape values of the wider area have long been recognized via National Park status and World Heritage status as part of Te Wāhipounamu - South West New Zealand World Heritage Area.</p>	<p>There has been no assessment of the visual amenity of the built environment of Piopiotahi.</p> <p>Landscape capacity issues are another consideration i.e. how much development capacity is there at Piopiotahi?</p> <p>Piopiotahi / Milford Sound and the Milford Corridor are both recognized as areas of high conservation values. There are numerous rare and endangered terrestrial and marine species and several endemic species. These high conservation values are recognized in the FNPMP which regulates land use and development activities.</p> <p>Historic land development at Piopiotahi / Milford Sound has altered the natural environment, enabled establishment of the tourism and fishing industries and provided access for recreational users. The built infrastructure along the Milford Corridor and at Piopiotahi / Milford Sound supports these industries and recreational access and use. The current state of the environment at Piopiotahi / Milford Sound and the Milford Corridor can be characterised as a modified natural environment that still contains very high conservation values.</p>	<p>Undertake a landscape and visual amenity assessment of the built environment in Piopiotahi. This could identify 'issues and opportunities pertinent to the eventual masterplan.</p> <p>This study potentially could include a landscape capacity assessment for Piopiotahi. Potentially this could be linked to the ecological 'heat map' work outlined above.</p> <p>Further research should be undertaken to better understand the point at which conservation can prosper and be enhanced (i.e. improving the conservation value) whilst enabling visitors to access Piopiotahi Milford Sound.</p> <p>There has been no assessment of the visual amenity of the built environment of Piopiotahi and further research could also be undertaken to fill this gap. Assessing and establishing the state of the physical environment could inform the design of new development proposals to ensure they are sympathetic to the natural setting and improve visual amenity.</p>	<p><b>Relevance to Conceptual Masterplan Development:</b> 9/10</p> <p><b>Is it being done already:</b> Unlikely</p> <p><b>Can it be done within the timeframes of the conceptual masterplan process:</b> Yes</p> <p><b>Discussion:</b> A detailed landscape and visual assessment has not been included within the scope of the masterplan development. As the conceptual masterplan progresses it will become apparent whether more work is required in this regard. Further work is not recommended at this time.</p>

<sup>4</sup> Given the 'natural environment' is a very broad topic area for the purposes of the Milford Opportunities Project we have thoroughly considered available information at a macro scale however where detailed assessments at the species level are concerned, we have only considered presence/ absence of studies. Further research would be required to confirm whether all species level assessments available are robust.

Topic	What we know	What we don't know (gaps in information)	Further Research Options	Prioritisation Assessment
		<p>We do not understand how the updated Conservation Management Plan will be developed to manage the conservation values. What are the ecological values of remaining potential development/ developed areas in Piopiotahi? Equally what could be removed to remedy lost habitat? For example, the presence of rare butterfly at Little Tahiti where development is proposed. We don't know how Piopiotahi is managed from day to day, what works well and what doesn't. This applies to both paid and volunteer roles.</p>	<p>For the purposes of MOP there needs to be a recognition that any land development proposals need to be assessed on a case by case basis to determine actual and potential effects on the environment. We see no value or need to be undertaking additional research on specific species or habitats other than on a case by case basis.</p>	
<i>Built Environment</i>	<p><b>Built Structures</b> There is generally good knowledge of public assets in the Piopiotahi area. For example, there is a comprehensive database of infrastructure located on public land including Department of Conservation managed assets and the State Highway infrastructure (NZTA). Associated resource consents and concession information and documents are available from the various local and regional authorities.</p> <p>There is a good understanding of current use of public infrastructure.</p> <p>Any capacity issues associated with the main Milford Sound Terminal are expected to be known.</p>	<p>We do not understand development proposals that the various commercial operators have for infrastructure for Piopiotahi [with the exception of comment received from Milford Airport]. The information gathered from the NZTA, the DOC, and Milford Sound Tourism outline their capital projects for the next 2-3 years. Any further information on forward planning (5-10 years would be ideal) that could be gathered would inform this masterplan project.</p> <p>There is no knowledge of the capacity of current public infrastructure. Although the Transport Infrastructure Review considers in detail car parking capacity and assorted options for managing. There appears to be an information gaps in terms of the capacity of the boat ramp at Piopiotahi and congestion issues in peak times. Feedback from the public consultation undertaken indicates that there may be congestion, boat trailer parking and conflict between recreational users and concession holder's issues at peak times.</p> <p>There is no comprehensive list of facilities and their associated NBS(i.e. we do not have a clear understanding of earthquake prone facilities).</p> <p>Need full understanding of restrictions that may apply to the built environment for example limitation in FNPMP of 280 staff in Village and limits on overnight camping at Cascade Creek (250?) and other camping spots on Milford Road.</p> <p>What are the expectations of visitors in respect to infrastructure?</p>	<p>Develop schedule of commercial operators and undertake further consultation to better understand development plans (noting that this would be dependent on cooperation of those operators).</p> <p>An assessment of current capacity of public infrastructure in Piopiotahi, Milford Corridor, Te Anau is required What areas can service new development, where is the infrastructure (wastewater, water, stormwater, electricity, internet) capacity? Possibly an issues and options analysis which would include; Where should new development be directed from an engineering perspective? What would be the most effective and efficient approach to servicing (i.e. capacity with Te Anau wastewater / water, / stormwater services in comparison to Milford corridor and Piopiotahi). What is the capacity for further infrastructure servicing at Piopiotahi and on the Milford Corridor?</p> <p>Undertake audit of facilities in Piopiotahi to confirm NBS, or whether assessment is still required.</p>	<p><b>Relevance to Conceptual Masterplan Development: 8/10</b></p> <p><b>Is it being done already: Unlikely</b></p> <p><b>Can it be done within the timeframes of the conceptual masterplan process: Could be scoped to fit within timeframes allowed</b></p> <p><b>Discussion:</b> Further consideration of transportation issues and impacts is a priority for informing the conceptual masterplan exercise. A recommendation for further research has been included.</p> <p>Once the ideas for the conceptual masterplan have been generated further assessment of current infrastructure and potential impacts on this infrastructure may be required.</p>
	<p><b>Resource consents</b> Site specific Assessment of Environmental Effects (AEE's) occur where development is proposed through resource consent and concession processes. AEE's may include ecological assessments where development or activities are proposed in sensitive locations. There are a considerable number of AEE's prepared each year in the study area and this information may provide a high level of baseline data.</p>	<p>There is no collective understanding/ analysis of the AEE's for Piopiotahi. Each Assessment is distinct from the next.</p>	<p><b>Planning Assessments</b> Undertake analysis of resource consents and concessions (associated AEE's). Examine and discuss them, i.e. the extent to which effects on the natural environment are factored into decision processes. What is happening, what are the pressures if any? (concrete evidence rather than general observations). Could include:</p> <ul style="list-style-type: none"> <li>Cruise Ships (noise / visual)</li> <li>Wharfs</li> <li>Boat ramp</li> <li>Fishing fleet</li> <li>All operators</li> </ul>	<p><b>Relevance to Conceptual Masterplan Development: 7/10</b></p> <p><b>Is it being done already: Unlikely</b></p> <p><b>Can it be done within the timeframes of the conceptual masterplan process: Could be scoped to fit within timeframes allowed</b></p> <p><b>Discussion:</b> Not recommended as a priority at this time.</p>
	<p><b>Transport</b></p> <p><b>Road</b> The road asset and associated assets are well understood.</p> <p>The Milford Road Alliance as managers of the Milford Road hold a significant amount of information on the SH94 corridor from Te Anau to Milford Sound. We have not accessed all this information or included it in the list of known information. But we anticipate that there is a significant amount of base data that can be accessed for further research if required.</p> <p>There is government work on visitor driver safety improvements currently occurring nationally.</p> <p><b>Boats</b> A good level of information exists about numbers of boats occupying the marine environment, especially given that Piopiotahi is one of the only readily accessible berths in the area. There appears to be an information gaps in terms of the capacity of wharves at Piopiotahi and congestion issues in peak times.</p> <p>Cruise ship information is also readily available for both day cruises and for larger sea going cruise ships that use the Sound more sporadically.</p> <p><b>Airport/ Aircraft</b> Representatives of Milford Sound Airport were forthcoming with information about the airport at Piopiotahi. Information is readily available about the facility, and flight movements.</p>	<p><b>Highway Traffic</b> What is the full cost of vehicle accidents / incidents? Is this well understood / quantified? Is the rate / number of accidents higher on the Milford Road than the national average? Has the increase in numbers of tourists self-driving vehicles to Piopiotahi correlate to an increase in accidents? How can the high social / economic cost of accidents on the road be used to inform the Master Plan? How can changes be implemented to avoid tourist injury /deaths?</p> <p>While a lot of government work has gone into visitor driver safety improvements nationally, we are unsure whether anything specific has been developed for the Milford Rd and wider transport corridor back to Queenstown / QT Airport. There are a range of safety improvement projects identified in the Milford Corridor Plan (NZTA).</p> <p><b>Boat Movement</b> There is a low level of understanding of the implications of the boat movements (commercial, recreational and cruise liners) on the tourist experience i.e. noise/ smoke/ disruption to setting etc.</p> <p>Cruise liner ship data shows a trend of increasing numbers of ships, increasing tonnage and increasing passenger numbers.</p> <p><b>Air Traffic</b> While there is some understanding of the implications of the airport/ air traffic on the tourist experience (Effect of Air Traffic Associated with Milford Aerodrome on Visitors to Fiordland National Park (2008-2010)) this information is somewhat dated. An updated assessment is required i.e. aircraft noise/ disruption to setting etc.</p> <p><b>Development Proposals</b></p>	<p>Research on the full cost (social economic) of traffic accidents on the Milford SH94 Corridor.</p> <p>Undertake research into the transportation benefits and costs of increasing numbers of tourists travelling to Piopiotahi.</p> <p>Undertake assessment of the impacts of boat movements and air traffic movements in the Piopiotahi environment.</p> <p>Undertake research on capacity of wharves at Piopiotahi and congestion issues in peak times.</p> <p>Undertake issues and opportunities report covering all transportation options.</p> <p>An analysis of emerging transport technologies and implications for Piopiotahi.</p> <p>Analysis of previous transport projects relating to Piopiotahi.</p>	<p><b>Relevance to Conceptual Masterplan Development: 10/10</b></p> <p><b>Is it being done already: Unlikely</b></p> <p><b>Can it be done within the timeframes of the conceptual masterplan process: Could be scoped to fit within timeframes allowed</b></p> <p><b>Discussion:</b> Further consideration of transportation issues and impacts is a priority for informing the conceptual masterplan exercise. A recommendation for further research has been included.</p>

Topic	What we know	What we don't know (gaps in information)	Further Research Options	Prioritisation Assessment
	<p><b>Development Proposals</b> A range of transport related projects have been proposed in the project area that would link to Piopiotahi including monorail, tunnel and new road. There is likely to be a high level of information contained in concession and resource consent applications and related decisions for these projects.</p>	<p>There is a gap in terms of an overview of these projects as a group and analysis of the reasons that they were unsuccessful or did not progress.</p>		
<i>Cultural and Historic Features</i>	<p>There is a good level of understanding of European history of the area. Many historic features are well documented.</p> <p>Anecdotally there are some very interesting events, legends, areas of spiritual and cultural significance in Piopiotahi, through the corridor and in the wider region.</p>	<p>The cultural values need to be articulated so they can be interpreted through the masterplan effectively. Currently there is very little written documentation available.</p> <p>There are likely to be gaps in relation to archaeology (pre-and post-European settlement). As an example, a recent AEE for a MST resource consent application for the Bowen Falls track upgrade identified the presence of early European burials on the Bowen Falls river delta. Public feedback through the consultation phase of the Milford opportunities project also identified the burial place of Donald and Elizabeth Sutherland at Piopiotahi noting that it is not well known / identified.</p>	<p>Cultural Impact Assessment / Cultural Values Assessment (Ngai Tahu or suitable consultancy). Key points of interest;</p> <ul style="list-style-type: none"> <li>• What are the values? Physical and Spiritual</li> <li>• What happened here historically? Pounamu, Battles, Pa, Urupa</li> <li>• Management of values, physical and spiritual?</li> </ul> <p>Recommend a specific considered approach to iwi representatives and a planned approach to working with the various hapu associated with the Piopiotahi area (given there will possibly be different perspectives from each hapu).</p> <p>Archaeological Assessment of Piopiotahi Milford Sound area. This could potentially be done in conjunction with the Cultural Values Assessment identified above.</p>	<p><b>Relevance to Conceptual Masterplan Development:</b> 10/10</p> <p><b>Is it being done already:</b> No</p> <p><b>Can it be done within the timeframes of the conceptual masterplan process:</b> Yes</p> <p><b>Discussion:</b> Having a strong understanding of the Mana Whenua values is important to the success of this project and further research is recommended in this regard. The Ngai Tahu Settlement Act 1998 is a pivotal reference to the importance of recognising these values.</p>
<i>Natural Hazards</i>	<p>Extensive research has been undertaken into natural hazards; especially tsunami mapping and geological hazards with one of the more recent relevant studies being Alpine Fault Magnitude 8 Hazard Scenario (Report) (2016).</p> <p><b>Avalanche management</b> Being an alpine highway, avalanches can seriously affect the road during avalanche season (usually June to October). The avalanche area covers 17km, starting at Falls Creek, above Hollyford Road junction (91km north of Te Anau), and ending at the Chasm on the Milford Sound side of the Homer Tunnel. To keep the road safe and open as much as possible during the avalanche season, the Milford Road Alliance operates an avalanche control programme that predicts and controls avalanches. A specialist avalanche control team employs high tech equipment to manage avalanches. The specialised weather and condition monitoring equipment is based both at road and mountain level, and is monitored around the clock to maximise safety and minimise road closures. Besides predicting avalanches, the programme also controls the avalanche hazard by either not allowing traffic to stop inside the avalanche area or closing the road and using controlled explosives to release avalanches before they occur naturally.</p>	<p>Milford Sound is in a potentially vulnerable position being so close to the Alpine Fault, there are emergency response plans in place however more specific hazard modelling from earthquake and tsunami risk may be important for future-proofing any new development.</p>	<p>It is expected that NZ universities will have a valuable contribution to make to this study and further work is required to tap into this wealth of research. Specific literature review to discover if hazards are covered adequately.</p>	<p><b>Relevance to Conceptual Masterplan Development:</b> 10/10</p> <p><b>Is it being done already:</b> Unlikely</p> <p><b>Can it be done within the timeframes of the conceptual masterplan process:</b> Could be scoped to fit within timeframes allowed</p> <p><b>Discussion:</b> Further research into hazard risk is critical for informing the conceptual masterplan. The proposed ideas need to be able to respond to the natural hazards and cater for the uncertainty that comes with this.</p>
<i>How the Place Impacts on the Wider Region</i>		<p>There is very little understanding of issues and opportunities that are created for other communities as a result of Milford Sound being in close proximity.</p>	<p>Develop project brief to understand the value of Milford Sound to the wider region – and associated issues and opportunities.</p>	<p><b>Relevance to Conceptual Masterplan Development:</b> 8/10</p> <p><b>Is it being done already:</b> Unlikely</p> <p><b>Can it be done within the timeframes of the conceptual masterplan process:</b> Could be scoped to fit within timeframes allowed</p> <p><b>Discussion:</b> Further research could be undertaken into the impacts of Piopiotahi on the wider region. This has not been recommended within the first stage of recommendations however could be considered further once the ideas for the conceptual masterplan have been developed.</p>
<b>The Customer:</b>				
<i>Understanding the Customers</i>	<p>There is good information available about how tourists and commercial operators currently visit and use Piopiotahi/ the corridor. We generally understand the numbers visiting the area.</p> <p>There is generally a good understanding of how the tourists and commercial operators use Piopiotahi/ the corridor.</p> <p>Who the customers are, what their drivers are (what they are looking for), their uses of the areas (itinerary), how they currently interact with the area (get to and from the area) and what they find good/ bad.</p>	<p>We do not understand what visitors to Piopiotahi expect and whether their visit really met their expectations.</p> <p>We do not understand where and how trip planning takes place and the influencing factors when decision-making occurs.</p> <p>There is some qualitative information on visitors usually in the form of visitor surveys except track surveys that have become dated. The Milford Sound Experience commissioned by MST in 2017 has very useful data on Piopiotahi visitor behaviours including road use and perceptions of crowding.</p>	<p>Recommend undertaking Customer Journey Mapping for each customer type. Customer Journey Mapping is a technique increasingly employed to assess and improve the experience for the customer. The Gap Analysis has highlighted a gap in knowledge of the overall visitor experience.</p> <p>Undertake recreation assessment, clarifying and quantifying the recreation values of Piopiotahi/ the corridor for recreation users.</p> <p>Analysis of customer type for example recreational users, tourists.</p> <p>Repeat MS Experience Survey with some fine tuning. Could combine with observational recording of visitor's use of scenic stops along corridor to measure</p>	<p><b>Relevance to Conceptual Masterplan Development:</b> 10/10</p> <p><b>Is it being done already:</b> This has been done by individuals such as tourist operators and for specific tract networks by the Department of Conservation for example. However, no collective analysis has been undertaken.</p> <p><b>Can it be done within the timeframes of the conceptual masterplan process:</b> Could be scoped to fit within timeframes allowed</p> <p><b>Discussion:</b> Further research is recommended in the form of Customer Journey Mapping, to better understand the customers to the project area.</p>

Topic	What we know	What we don't know (gaps in information)	Further Research Options	Prioritisation Assessment
	<p>Most visitors are day visitors. Most visitation is between 11am and 2pm.</p> <p>Very low visitation by New Zealanders.</p>	<p>To what level does Tourism NZ leverage off the iconic sites such as Milford Sound and Rotorua? How important are they as 'visual capital' for our reputation? If we go past the tipping point for Milford and the image is tarnished will it affect NZ as a destination? Does this require an extra level of protection for the national tourism reputation?<sup>5</sup></p> <p>Since MBIE ceased the Domestic Traveller Survey in 2012 there is now very little quantitative and qualitative data on New Zealanders travel habits within New Zealand.</p> <p>We do not understand the levels of recreational use and activities undertaken, and the quality of experience of these users; recreational fishers and hunters, day visitors, National Park users, Milford as access to Fiords.</p> <p>We do not understand how visitors value their visits to Piopiotahi. Price points – are they right?</p> <p>We do not understand how visitors impact on the values of Piopiotahi and potential effects of visitor related development.</p> <p>We do not understand the perspectives of residents in Piopiotahi and how they value the area.</p> <p>How often is MS lodge at capacity? What is the demand for overnight stays at MS? Most visitation is between 11am and 2pm – how do we get better spread?</p> <p>Very low visitation by New Zealanders, why?</p> <p>Views of Te Anau residents of increasing visitor numbers to MS. TIA has undertaken a 'Mood of the Nation' survey but does not identify any responses from Te Anau.</p> <p>There was a sense of frustration in terms of visitor pressure from some who responded through the public consultation phase. This was not anti-visitor but more related to the resulting pressure on infrastructure and a need for change.</p>	<p>congestion. Could also test some future options such as if further accommodation was available in MS would visitors stay, if park and ride available would they use it etc.</p> <p>Research on local (Te Anau) viewpoints on MS issues.</p>	
<i>Future Demand</i>		<p>The preferences of domestic travellers (as done for the IVS) is unknown; further information could be gained as to the link or influence that visitors sourced from Queenstown have.</p> <p>Destination/itinerary planning by visitors</p> <p>Growth projections particularly for Piopiotahi itself. Possibly MST may have undertaken some visitor growth forecasting?</p> <p>Links to infrastructure planning, Demand Vs Capacity.</p>	Develop project brief and undertake a demand modelling exercise for Piopiotahi.	<p><b>Relevance to Conceptual Masterplan Development:</b> 10/10</p> <p><b>Is it being done already:</b> Unlikely. However some work has been done internationally.</p> <p><b>Can it be done within the timeframes of the conceptual masterplan process:</b> Could be scoped to fit within timeframes allowed</p> <p><b>Discussion:</b> Further research is recommended, to better understand this.</p>
<i>Views on the Wider Regional Opportunities</i>		<p>There is very little understanding of the views of visitors to Piopiotahi, on the wider regional opportunities.</p> <p>There is very little understood about the role that transport, accommodation, tourism operators have on this movement.</p>	<p>Develop project brief to understand the views of visitors on opportunities in the wider region – and issues and opportunities associated.</p> <p>Undertake research into the role that transport, accommodation, tourism operators have on this movement.</p>	<p><b>Relevance to Conceptual Masterplan Development:</b> 9/10</p> <p><b>Is it being done already:</b> Unlikely</p> <p><b>Can it be done within the timeframes of the conceptual masterplan process:</b> Could be scoped to fit within timeframes allowed</p> <p><b>Discussion:</b> Further research could be undertaken into the impacts of Piopiotahi on the wider region. This has not been recommended within the first stage of recommendations however could be considered further once the ideas for the conceptual masterplan have been developed.</p>
<i>Economic Cost Value</i>		Understanding the full economic cost (including externalities) of each visit to Milford based on existing and projected "world class" infrastructure delivery	Develop brief and undertake economic analysis of the full economic cost (including externalities) of each visit to Milford based on existing and projected "world class" infrastructure delivery.	<p><b>Relevance to Conceptual Masterplan Development:</b> 10/10</p> <p><b>Is it being done already:</b> Unlikely. However some work has been done internationally.</p> <p><b>Can it be done within the timeframes of the conceptual masterplan process:</b> Could be scoped to fit within timeframes allowed</p> <p><b>Discussion:</b> Further research is recommended, to better understand this.</p>

<sup>5</sup> "The Milford Sound Experience" survey undertaken by University of Otago and commissioned by MS Tourism and answers many of the important questions on current tourism levels such as quality of experience for visitors, did it meet their expectations, their perception of too crowded or not, and would they recommend to others. As discussed above repeating the survey is recommended.

Topic	What we know	What we don't know (gaps in information)	Further Research Options	Prioritisation Assessment
<b>Interventions:</b>				
<i>Legislative Framework</i>	<p><b>Legislation</b></p> <p>There is a good understanding of relevant plans, policies and rules that inform/ guide the masterplan process.</p> <p>There are numerous policy and planning documents that regulate and enable activities in Piopiotahi, the Milford Corridor and the wider Milford context.</p> <p>We are aware that Central Government is progressing work in this area in terms of options for legislative change as a response to increasing tourism pressures.</p>	<p>Further research is required to determine how effective these policies and plans have been in terms of 1) regulating activities to avoid adverse environmental effects / protection of conservations values? and 2) enabling appropriate tourism related infrastructure and tourism activities that service visitors? Further research is also required to determine how effective they will be in relation to the vision / guiding principle for the Milford Opportunities project.</p> <p>There is a lack of integrated planning in relation to Piopiotahi. This is not a criticism of the various regulatory agencies who are all undertaking their respective duties but in doing this there is not an integrated management approach i.e. everyone doing their own thing. There is an information gap in terms of options for integrated planning / management.</p> <p>Need to understand legislative change options available that might help the masterplan to be fully realised.</p> <p>While good information exists about land ownership, it would be useful to understand the land status/ ownership across the entire Piopiotahi area (and associated land ownership complexities) i.e. State highway boundaries, national park boundaries etc.</p> <p>We do not understand the influence of QLDC and SDC Freedom Camping Bylaws in terms of patterns of travel (i.e. movement of FIT's into and out of Piopiotahi and Otago / Southland).</p> <p>Do not have detailed information relating to concession and lease arrangements. We understand that there may be long term concession / lease arrangements and or arrangements that provide rights of renewal. These arrangements may have a bearing on Master Planning for the project.</p>	<p>Assessment of Legislative change options to enable the Milford Opportunities project to realise the vision. This could consider such options as visitor levy, international visitor levy, district by district taxes etc.</p> <p>Assessment of planning framework change options to enable the Milford Opportunities project to realise the vision.</p> <p>Link into upcoming Plan reviews. What opportunities for change do the upcoming reviews of the FNPMP and RCP provide? And over longer timeframes the respective reviews of the RPS, SDP and SCMS? What interventions / enablers could be promoted / utilized?</p> <p>Undertake stocktake and mapping of land ownership and leaseholders.</p> <p>Work with local authorities as Freedom Camping bylaws are developed to understand implications on masterplan process.</p> <p>Need a fuller understanding of concession / lease arrangements for key sites at Piopiotahi and these implications of these for Master Planning / future development options and other possible changes.</p>	<p><b>Relevance to Conceptual Masterplan Development:</b> 8/10</p> <p><b>Is it being done already:</b> No</p> <p><b>Can it be done within the timeframes of the conceptual masterplan process:</b> Could be scoped to fit within timeframes allowed</p> <p><b>Discussion:</b> A recommendation has been made to further consider the legislative framework, particularly once the ideas for the conceptual masterplan have been developed.</p>
<i>Proposed developments</i>	Good knowledge of proposed developments in public areas.	While there is some good knowledge of proposed developments, these are largely the developments of public assets. There is very little knowledge of what, if any development proposals are planned by private interests.	Engage with private sector to understand future development proposals (noting that this would be dependent on cooperation of those operators).	<p><b>Relevance to Conceptual Masterplan Development:</b> 7/10</p> <p><b>Is it being done already:</b> No</p> <p><b>Can it be done within the timeframes of the conceptual masterplan process:</b> Could be scoped to fit within timeframes allowed</p> <p><b>Discussion:</b> No further research is recommended at this time. Further research may become apparent once the ideas for the conceptual masterplan have been developed.</p>
<i>Earlier Master planning/ Concept Plans</i>	Several masterplans/ concept plans have been developed for Piopiotahi in the past. These are useful context, however will not guide future thinking.	We do not understand the effectiveness of more recent plans produced, including key learnings.	Interview those involved in previous implementation of masterplans/ concept plans.	<p><b>Relevance to Conceptual Masterplan Development:</b> 6/10</p> <p><b>Is it being done already:</b> No</p> <p><b>Can it be done within the timeframes of the conceptual masterplan process:</b> Could be scoped to fit within timeframes allowed</p> <p><b>Discussion:</b> No further research is recommended at this time.</p>
<b>Best Practice:</b>				
<i>Managing Visitor Demand and Accessibility</i>	Various travel demand strategies have been employed at national parks world-wide. There is information readily available about the various strategies.	<p>There is limited empirical information around success of the various travel demand management strategies.</p> <p>Further research is required to understand the implications of autonomous mobility, emergence of autonomous vehicles and new transport technologies.</p> <p>Further investigate visitor motivations, destinations currently travelled to, desire to travel slower or more widely, and willingness and ease of mode shift, especially in those that currently self-drive.</p>	<p>Further research is required to understand the combination of relevant access improvements and demand management techniques that would be effective in this setting to better manage visitor demand (for high, medium, and low demand increase scenarios).</p> <p>Investigate which multi-modal trip options should be investigated for the journey into Milford (i.e. assessing the best modes for each part of the journey based on overall impacts to really test how we could be travelling). This would need to link closely to economic modelling. How adaptive are these mobility solutions to alter (including over time) to consider known natural challenges and opportunities (such as changes in sea level, flood risk, and avalanche)?</p> <p>Analysis of previous transport projects relating to Piopiotahi.</p>	<p><b>Relevance to Conceptual Masterplan Development:</b> 10/10</p> <p><b>Is it being done already:</b> Unlikely. However some work has been done internationally.</p> <p><b>Can it be done within the timeframes of the conceptual masterplan process:</b> Could be scoped to fit within timeframes allowed</p> <p><b>Discussion:</b> Further research is recommended, to better understand this.</p>
<i>Examining visit value</i>	The value of Piopiotahi needs to be understood as well as an understanding of the level of reinvestment required to retain the value.	How much value do visitors place on mitigating negative environmental impacts?	Develop brief (including research question) in relation to further examining visit value.	<p><b>Relevance to Conceptual Masterplan Development:</b> 9/10</p> <p><b>Is it being done already:</b> Unlikely. However some work has been done in the past.</p>

Topic	What we know	What we don't know (gaps in information)	Further Research Options	Prioritisation Assessment
	<p>When visitors have a good understanding of the environmental impacts of visitation, and are motivated by concern for the natural environment, they are willing to pay more to ensure the area is preserved.</p> <p>There may be an opportunity to move from “last chance” tourism to “protective tourism” where visitors see how their trip has contributed to improvements, and when they return visitors can be provided with latest updates based on transparent intervention programmes aimed at improved resilience.</p>	<p>Role of conservation partnerships. How can private sector conservation partnerships play in conservation outcomes and how firms market visitor experiences?</p> <p>Understanding the motivations of visitors with nature-related preferences (i.e. what other experiences are they looking for in their visit), so any investment strategy for the corridor and Milford surrounds maximises value by aligning with existing visitor motivations.</p> <p>Understanding the types and value of expenditure for this nature-related preference segment (relative to other visitors).</p> <p>Understanding the proportion of people visiting who would not have visited 1) New Zealand, and 2) the Southland region at all if Milford and the national park was no longer accessible</p>		<p><b>Can it be done within the timeframes of the conceptual masterplan process:</b> Could be scoped to fit within timeframes allowed</p> <p><b>Discussion:</b> Further research is recommended, to better understand this.</p>
<i>Visitor Demand and Biodiversity Impacts Research</i>	<p>If applying a maximum quota of visitation, the number set needs to be based on sound research.</p> <p>Some visitor impact research has been undertaken internationally and nationally.</p>	<p>The current quota of visitation to Piopiotahi is set by the FNPMP however it is unclear how this quota has been derived.</p> <p>The impacts of visitor numbers of native wildlife and environmental quality needs to be examined more holistically to better inform targeted demand management strategies.</p> <p>Ideally this also includes examination of visitor behaviours, including the type of visitor activity (tramping, camping, mountain biking etc), and the rates of undesirable or non-compliant behaviour (e.g. moving off the formal track, taking dogs, or littering).</p> <p>Understanding the motivations of those visitors engaging in positive and negative environmental behaviours, to help inform behaviour change interventions.</p>	<p>An understanding of the relationship between demand (number of visitors), activities (how visitors interact with the natural environment) and biodiversity impact. This could help identify and set key thresholds or tipping points of demand at which bolder interventions could be applied.</p>	<p><b>Relevance to Conceptual Masterplan Development:</b> 9/10</p> <p><b>Is it being done already:</b> Unlikely. However some work has been done in the past.</p> <p><b>Can it be done within the timeframes of the conceptual masterplan process:</b> Could be scoped to fit within timeframes allowed</p> <p><b>Discussion:</b> Further research is recommended, to better understand this.</p>
<i>Masterplans</i>	<p>Various approaches (and associated tools) to developing effective masterplans have been identified.</p> <p>Following a managed adaptive master planning approach commits to a short-term action plan, reducing risk iteratively as new information becomes available, and providing the framework and roadmap for future actions to ensure flexibility.</p> <p>Ensure the context and values raised by experts and key stakeholders (including community) in previous decision processes are captured within the master plan.</p>	<p>Further research is required to determine which tools could be tailored to the masterplan.</p> <p>Understanding the threshold of tolerance around risk from visitor demand impacts.</p> <p>Developing a framework to guide and assess future interventions to ensure they are timely and cost-effective at reducing negative impacts around increased visitor demand.</p>	<p>Consultation process to gauge the appetite of the Milford Opportunities Vision, perhaps ‘Piopiotahi. New Zealand as it was - forever’ - for; locals, New Zealanders and the world.</p> <p>Analysis of changes what's coming/ what may emerge and how this inform the masterplan?</p>	<p><b>Relevance to Conceptual Masterplan Development:</b> 10/10</p> <p><b>Is it being done already:</b> A separate engagement process is being developed in parallel with the conceptual masterplan process.</p> <p><b>Can it be done within the timeframes of the conceptual masterplan process:</b> Yes</p> <p><b>Discussion:</b> The engagement plan needs to be implemented effectively o ensure engagement in the process by key parties.</p>

# **Attachment 1 – Gap Analysis Methodology and Scope**

## Gap Analysis Methodology

To ensure the most appropriate extent of information gathering was considered through this process, a Gap Analysis Scope was prepared and peer reviewed internally and with the Project Working Group. This provided the opportunity for multiple reviews of the approach, ensuring the types of information would best inform the purpose of this project and eventual development of a Masterplan. While the Gap Analysis was updated on several occasions, the team needed to work within a time constraint to obtain information, with the Gap Analysis due by the middle of May 2018.

Expertise was utilised within the Opus/ Xyst team to ensure the most appropriate people were assigned to the Gap Analysis work. Individuals were briefed with the Gap Analysis Scope, the Vision Statement and General Objectives as guiding documents. Overarching Topic Areas were (refer to the Gap Analysis Scope Document further below);

### *The Place:*

- Cultural Aspects (cultural associations, reports)
- Historic (historic significance)
- Conservation Values (biodiversity surveys, CMP, other assessments)
- Accommodation Data
- Stocktake of Organisations Associated with Area
- Natural Hazard Risks (reports)
- Public and Private Infrastructure (asset inventories, asset condition, use, capacity, utilisation, road users, ownership)

### *The Customer:*

- Visitor Information Data and Statistics (visitor numbers, type, activities, experiences, packages available, waste volumes, capacity modelling, visitor travel, bookings)
- Public and Private Infrastructure (current and future plans)
- Market Influencers
- Marketing (social media, web sales, other sales)
- Future Modelling (data, visitor strategies)

### *Legislative Framework:*

- Regional and district plans
- National policy
- Concessions
- CMP
- Economic (reports - local, regional and national level data/ reports, tourism information)

### *Best Practice:*

- National Parks/ Iconic Features - effectively managing visitor demand while enhancing conservation values (policy/ legislation intervention, innovative visitor experience, effective management)
- Leveraging iconic features for wider benefit to region
- Effective frameworks for masterplans - dealing with flux/ change over time

The team undertook the Gap Analysis between 1<sup>st</sup> March and 15<sup>th</sup> May 2018.

To obtain the information, the team used various tools;



- Opus Information Centre Request for information – a brief was provided to the Opus Information Centre on types of information sought.
- Web Searches
- Interview with Visitor Experience Manager, Parks Canada
- Phone calls, emails and meetings with relevant contacts.
- Utilising the resources of the Project Working Group and Governance Group.
- Media release, email address and public survey.

NOTE: An Engagement Plan for phase 1 was developed and is available on request.

## Gap Analysis Milford Opportunities: Phase 1 Gap Analysis Scope

### Purpose of This Document:

The purpose of this document is to set the agreed scope for the Phase 1 Gap Analysis so that the Project Team and Opus/ Xyst understands;

1. understands what is within scope,
2. understands the outputs sought from this Phase

The Opus/ Xyst team will undertake the Gap Analysis with the Guiding Principle, Issues and General Objectives from the RFP, and the Draft Vision Paper (pending) at the forefront of thinking.

### Defining the Study Area for the Purpose of the Project:

The Study Area for the purpose of the overall Project is;

- Milford Sound and the settlement (to be referred to as Piopiotahi)
- Milford Corridor (from Te Anau – Milford Sound, from ridgeline to ridgeline up each valley up SH94, i.e. Eglington Valley and Hollyford Valley)
- Wider Regional Context – Queenstown to Te Anau Road, links into wider Southland (note consideration of wider context needs to be high level)

### Purpose of the Gap Analysis:

1. Assemble and correlate existing information and research reports to understand the level, relevancy and detail of information currently held for Milford
2. Undertake a Gap Analysis of the data needed vs data held and reporting those findings to the Governance Group (including recommendation and rationale on the outstanding data required).

### Scope of the Gap Analysis:

The Gap Analysis is intended to consider three broad areas;

1. The Place.
2. The Customer
3. Interventions/ Proposed Developments
4. The current best practice pertaining to the Guiding Principles and Vision Paper, including International Exemplars.

The following table describes in more detail, the type of information that will be sought through the Gap Analysis process.

<b>Topic Area</b>	<b>Knowledge Sought Through Information Gathering:</b>	<b>Possible Leads for Information (where currently known, <i>specific document references are shown in italics</i>):</b>
The Place	Cultural	<ul style="list-style-type: none"><li>• Relevant information relating to Piopiotahi</li><li>• Ngai Tahu cultural mapping tool</li><li>• Maori historical and cultural associations</li><li>• Pakeha history development of road, tunnel, sealers, whalers etc. Deer recovery / fishing.</li><li>• Landscape assessments</li></ul>

	Conservation Values (Piopiotahi and Milford Corridor)	<ul style="list-style-type: none"> <li>• Department of Conservation Research, biodiversity surveys etc (<i>Fiordland National Park Plan, UNESCO World Heritage Area</i>)</li> </ul>
	Current Public Infrastructure	<ul style="list-style-type: none"> <li>• DoC assets infrastructure excel sheet</li> <li>• NZTA</li> <li>• Ministry of Transport (Milford Airport)</li> <li>• SDC (Te Anau Airport)?</li> <li>• SDC Public toilets on SH6 / SH94?</li> </ul>
	Private Infrastructure	<ul style="list-style-type: none"> <li>• Milford Sound Tourism</li> <li>• Other providers (i.e. water)</li> <li>• Queenstown Airport?</li> <li>• Knobs Flat Facilities</li> </ul>
	Natural Hazard Risks (Piopiotahi and Milford Corridor)	<ul style="list-style-type: none"> <li>• Relevant reports &amp; assessments.</li> </ul>
	Information about the Road Corridor	<ul style="list-style-type: none"> <li>• <i>Corridor Management Plan</i></li> <li>• Current use data</li> <li>• Infrastructure (<i>Transport Infrastructure Review 2017</i>)</li> <li>• Incident statistics</li> <li>• Freedom camping data</li> <li>• Key focal point areas along road – and for what reason are they a focal point</li> <li>• Safe/ unsafe zones</li> <li>• Road maintenance information/ data</li> </ul>
The Customer	Visitor Information Data and Statistics	<ul style="list-style-type: none"> <li>• Total visitors</li> <li>• Visitor type; by ethnicity, age, national/ international etc (this will include a session with MBIE to understand available data)</li> <li>• Information about visit including; reasons for visit, key attractions, overall experience etc (<i>Visitors at Milford Sound Feb 2017, The Milford Sound Experience May 2017</i>)</li> <li>• Growth statistics</li> <li>• Booking data</li> <li>• Visitor nights</li> <li>• DoC Campsite records – Eglington – long history of camping numbers</li> <li>• Other DoC track counters in Eglington</li> <li>• Venture Southland Quirious data and other VS sources</li> <li>• Total number of DoC concessions and capacities issued and pending</li> </ul>

		<ul style="list-style-type: none"> <li>• Flight numbers?</li> <li>• Waste volumes out of Milford?</li> <li>• NZTA road counters</li> <li>• Perceptions of road</li> </ul>
	Queenstown Visitor Market Influencers – (possibly wider Southland/ Otago influencers Southern Scenic Route).	
	Stocktake of organisations associated with Piopiotahi now – and what they do and what they provide	<ul style="list-style-type: none"> <li>• Might be undertaken through discussion with Project Team initially and verified further through community discussion.</li> </ul>
	Understanding the current visitor experience and expectations (Piopiotahi and Milford Corridor)	<ul style="list-style-type: none"> <li>• Relevant surveys TNZ, TIA, RTO's</li> <li>• Can we find any study that has measured visitor satisfaction/perceptions?</li> <li>• What customer research tourist operators do?</li> <li>• What are the current packages on offer?</li> </ul>
	Future Visitor Numbers prediction modelling for 5, 10 and 20 years (Piopiotahi and Milford Corridor)	<ul style="list-style-type: none"> <li>• Does this modelling exist?</li> <li>• Visitor Strategies</li> </ul>
	Economic	<ul style="list-style-type: none"> <li>• Relevant reports &amp; assessments.</li> <li>• Info specific to Piopiotahi</li> <li>• Regional information Otago &amp; Southland</li> <li>• National level information</li> <li>• Tourism Industry information</li> </ul>
Interventions	Legislative Framework	<ul style="list-style-type: none"> <li>• Current legislation guiding use/ development/ enhancement/ protection of Milford Sound and corridor (Detail about <i>Current Concessions &amp; their provisions, CMP, RMA - District and Regional Plans</i>)</li> </ul>
	Proposed Developments	<ul style="list-style-type: none"> <li>•</li> </ul>
	Available Concessions	<ul style="list-style-type: none"> <li>• Total number of DoC concessions pending</li> </ul>

***Understanding Current Best Practice:***

Will contain but not be limited to the following:

NOTE: While we did consider researching cumulative impacts of visitor numbers/ patterns on related sectors, this was considered too broad for the purposes of this Gap Analysis. [can discuss further if concerns with this approach]

**Support from Agencies During Information Gathering & Gap Analysis:**

<b>Knowledge sought through Information Gathering:</b>	<b>Possible Leads for Information (where currently known):</b>
<p>National Parks/ Iconic Features that are effectively managing visitor demand while <b>enhancing</b> conservation values</p>	<ul style="list-style-type: none"> <li>• Innovation (e.g. virtual visits)</li> <li>• Transport solutions (e.g. alternate modes, park and rides, limiting self-drive areas)</li> <li>• Minimalist interventions</li> <li>• Streamlined legislation</li> <li>• Enhancing conservation values</li> </ul> <ul style="list-style-type: none"> <li>• What policy/legislation interventions have been put in place to manage demand?</li> <li>• What sustainable tourism university research has evaluated success of interventions in managing high visitor numbers?</li> <li>• Do any of these successfully manage demand regionally (i.e. don't just shift the high demand issue elsewhere)</li> </ul> <p>Some locations that might be of relevance are:</p> <ul style="list-style-type: none"> <li>• Torres del Paine National Park: Patagonia, Chile</li> <li>• Galapogas Islands</li> <li>• Great Barrier Island</li> </ul>
<p>Leveraging one iconic feature / attraction for the benefit of the wider region</p>	<ul style="list-style-type: none"> <li>• What successfully encourages wider exploration or regional dispersal in visitors coming to see one main attraction?</li> <li>• For example, delivering regional themed trips based on the key attractor (e.g. environmentally themed trips, birds, mountains, under the sea)</li> <li>• What might help people stop to break up the journey or travel in a less common direction?</li> <li>• What encourages multi-day or longer duration stays?</li> </ul>
<p>Good examples of effective frameworks (masterplans) that deal with flux/ change over time</p>	<ul style="list-style-type: none"> <li>• Changeability/ uncertainty of conditions is changing.</li> <li>• Not looking for a static environment. A masterplan that gives consideration to this.</li> </ul>

As a first step, the Project Manager will be seeking information from the Project Team and Governance Group pertaining to the topics above. The Opus/Xyst team will also undertake their own research however, there is an expectation that information from other agencies will be forthcoming in this regard.

Further, we will be undertaking a media release at the outset of the project, seeking any community information of relevance to this project. This will be the initial public information gathering process, where the community will be able to provide information to an email address/ survey.

**Output of Information Gathering & Gap Analysis:**

- Short Summary Report – for Governance Group consideration outlining available information to form the baseline and information gaps. This will also include recommendations for further research/ business case development.
- Information Gathering & Gap Analysis Report
  - List of Information Sources (state age of material, opinion on relevancy to project, brief synopsis of content).
  - A concise description of the baseline information that can be taken forward into later phases of masterplan development – key assumptions that can be made from information available.
  - Further research required to complete the baseline information – further research will aid in developing any remaining key assumptions.

# **Attachment 2 - Master List of Information**

## Updated 15.08.2018 NATURAL ENVIRONMENT

Title	Author	Dates	Relates to
Comments from the DOC on Development Design Review Board	Antonia Croft (DOC)		Landscape
Southland Coastal Landscape Study (Discussion Document)	Boffa Miskell	August 2006	Landscape
Southland Regional Landscape Assessment (Part 1)	Boffa Miskell	August 1997	Landscape
Te Anau Basic Growth Planning (Landscape Capacity Study)	Boffa Miskell	April 2006	Landscape
Te Anau Scenic Zones (Final – Visibility/Visual Landscape Assessment)	Boffa Miskell	June 2012	
The effects of commercial sea-surface activating in Milford Sound: An initial scoping and information gathering report	P. Sirota, Otago University	February 2006	Tourism
Aquaculture zoning in the Southland region – Phase 1: Satellite view of where and what type of aquaculture may be possible	Bonisch Environmental	November 2013	Aquaculture/Commercial
Aquaculture zoning in the Southland region – Phase 2: Helicopter view of where and what type of aquaculture may be possible	Bonisch Environmental	March 2014	Aquaculture/Commercial
Aquaculture zoning in the Southland region – Phase 3A: Site Perspective Ranking Evaluation” of where and what type of aquaculture may be possible	Bonisch Environmental		Aquaculture/Commercial
Beneath the Reflections – A user’s guide to the Fiordland (Te Moana O Atawhenua) Marine Area	Fiordland Marine Guardians, MOE, MPI, DOC, ES		Marine travel & Fisheries
A search for the elusive Fiordland crested penguin/tawaki in Milford Sound/Piopiotahi has revealed the birds to be thriving (DOC Website)	DOC (Dr T. Mattern)	December 2016	
Two reports on the effects of proposed works on the Milford Boulder Butterfly	Brian Patrick – Wildland Consultants Ltd	October 2017	
Cleddau Biodiversity Management Unit, Fiordland National Park	DOC (Bex Jackson and Erina Loe)	2016/2017	
Survey and population size estimate of Fiordland penguin (tawaki; <i>Eudyptes pachyrhynchus</i> ) in Milford Sound/Piopiotahi, New Zealand	Thomas Mattern (University of Otago & Global Penguin Society)		



	Robin Long (West Coast Penguin Trust)		
Coastal deformation and tsunami observations following the July 15 2009, MW 7.8 Dusky Sound Earthquake (report)	SRC	2009	
Geological Hazards – Southland District Council Lifeline Study	SDC	2006	
Regional diversity and biogeography of coastal fishes on the West Coast South Island of New Zealand	Roberts, C, et al.	2005	
Human-mediated pathways of spread for non-indigenous marine species in New Zealand	Dodgshun, T, et al.	2007	
Alpine lizard research in Fiordland National Park: February-March 2007	Bell, T, et al.	2008	
Understanding Local Source Tsunami: 1820s Southland Tsunami (Report)		November 2005	Natural Hazards
Identification of potential tsunami and seiche sources, their size and distribution on Lakes Te Anau and Manapouri	Clark, K; et al. (GNS Science) (For SRC)	2011	
Tsunami and Seiche Study – Stage 2: Evaluation of potential earthquake-induced landslide sites where tsunami waves could be generated on Lake Manapouri and Lake Te Anau	Hancox, G (GNS Science) (For SRC)	2012	
Review of Tsunami Hazard in New Zealand	Power, W (GNS Science) (For SRC)	2013	
Paleotsunami Investigations in the Southland Region	Cochran, U; Strong, D & Clark, K (GNS Science) (For SRC)	2014	
Southland Tsunami Database	SRC		
Our Threats – Southland Water (Part 4)	SRC	2010	
Southland Coastal Hazard Assessment	Bradley, D (SRC)	September 2009	
Alpine Fault Magnitude 8 Hazard Scenario (Report)	Orchiston, C, et al (Prepared for Project AF8 Steering Group)	October 2016	
Conserving Fiordland's biodiversity 1987-2015: The Challenges, the Achievements, the Knowledge  Te Tiaki I te Taiao ki Tu Rua o te moko: Nga wero, nga haumaiui, nga mātauranga	Department of Conservation	August 2017	

Marine protection plan approved (article)	Tracey Roxburgh (Otago Daily Times)	6 April 2017	
Story of the Guardians (website)	Fiordland Marine Guardians		
Ecological Assessment of a Proposed Borrow Site, Cleddau Valley Fiordland	Wildland Consultants (Prepared for OPUS)	September 2009	
Cleddau River Flood Protection Works – Unnamed Cleddau River tributary water quality and fish community survey	Ryder Consulting (Prepared for DOC)	September 2009	
Cleddau Flood Protection Works Upgrade: Borrow Sites (Landscape and Visual Assessment)	OPUS (Prepared for DOC)	January 2010	
Cleddau Village Flood Protection Works: Cleddau River Bulk Fill Extraction – Ecological Assessment	Golder Associated (URS New Zealand)	March 2011	
Assessment of Effects on the Environment: Gravel Extraction, Cleddau River	URS New Zealand (Prepared for DOC)	March 2011	
Milford Sound risk from landslide-generated tsunami	Taig, T & McSaveney, M – GNS Science (Prepared for Environment Southland)	2014 – March 2015	
Proposed Shelter, Deepwater Basin, Milford Sound (Climate change & flood risk) (Email with attachments)	From Gavin Gilder (Environment Southland) to Luke	20 Deember 2017/30 April 2018	
Cleddau River Flood Protection Management Plan	URS (Prepared for DOC)	January 2014	
Milford Sound Marine Ecology Information (Email)	Michele to Anne from Richard Kinsey (DOC Marine Specialist)	30 April 2018	
The Post-LGM Evolution of Milford Sound, Fiordland, New Zealand: Timing of Ice Retreat, the Role of Mass Wasting and Implications for Hazards	Dykstra, J (UC)	2012	
Locality of Milford Road and Avalanche Paths (Map)			Built Environment
Milford Road Avalanche Paths (GIS Print)	Milford Road Alliance (Kevin Thompson)	May 16 2018	Built Environment

Geomorphology of the deglaciated Eglinton Valley, Fiordland: new insights into the origin of hummocky terrain (Thesis)	Walker, G	November 2016	
The Post-LGM Evolution of Milford Sound, Fiordland, New Zealand (Thesis)	Dykstra, J	2012	
Use and Development in the Southland Coastal Marine Area: Discussion Document			

## BUILT ENVIRONMENT

Title	Author	Dates	Relates to
Milford Road News (SH94)	NZ Transport Agency	March 2018	Tourism
Frankton to Milford Sound – Corridor Management Plan	NZ Transport Agency	2018-2028	Tourism
Retford Stream Traffic Counts	NZ Transport Agency	2012 - 2017	Tourism
Southland Integrated Transport Study	GDC, ICC, ES, SDC, South Port NZ, Venture Southland, Kiwirail, NZ Transport Agency	December 2005	
Southland Open Space Priority Settings	Southland District Council	September 2017	Natural Environment, Tourism, Service Levels
Cleddau Village – Design Guidelines	Blakely Wallace Associates (for DOC)	August 2010	Landscape
Milford Sound Lease Areas	Bonish Consultants (for DOC)	March 2017	
Queenstown Airport – Master Plan Options	Queenstown Airport		Tourism,
Cleddau River Flood Protection Management Plan	AECOM New Zealand Limited	March 2016	
Deepwater Basin – Milford Track Shelter (Indicative Business Case)	DOC	October 2017	
Fiordland Response Plan	Emergency Management Southland		Tourism, Level of Service
DOC Sites	DOC		
Te Anau Fordland Concept Plan		2000	

Mobilising the regions: the role of transport infrastructure in achieving economic success across all of New Zealand	Castalia Strategic Advisors (Prepared for LGNZ)	August 2015	
Regional Economic Development Area: Southland (Immediate Priorities and Future Opportunities)	NZ Transport Agency	2018 - 2027	
New multi-million dollar harbour facilities in Milford Sound (Media Release)	Real Journeys	10 May 2013	
Milford Sound Infrastructure (Website)			
DOC investigates site for carpark and campground near Milford Sound (article)	Evan Harding (Stuff)	2 July 2017	
Cleddau River and Delta Assessment (Memorandum)	URS New Zealand	March 2011	
Infrastructure 1938 at Milford Sound (Photograph)		1938	
Slope Failure Hazard Assessment (Milford Sound Lodge)	URS (Prepared for Milford Sound Lodge Limited)	May 2012	
Relocation of Milford Sound Workers Accommodation Village	URS (Prepared for DOC)	October 2007	
SH94 Milford Road (Website)	NZ Transport Agency		
Milford Sound SLUS Register Information (Email and Several Attachments)	Email from Leonie Grace to Luke	May 2018	Natural Environment
Effect of air traffic associated with Milford aerodrome on visitors to Fiordland National Park	DOC	Summer 2008/09 and 2009/10	

## CULTURAL VALUES

Title	Author	Date	Notes
Milford Flood Protection Scheme Archaeological Assessment	P.G. Petchey Southern Archaeology	2010	Built Environment & Natural Hazard
Greenstone: The Prehistoric Exploitation of Bowenite From Anita Bay, Milford Sound	Coutts, P	1971	Archaeology
Cultural Mapping unlocks Ngai Tahu history	Te Runanga o Ngai Tahu (Website)	16 December 2015	
What is a Cultural Impact Assessment (Website Factsheet)	Quality Planning		
The Socio-cultural impacts of tourism (Literature Review)	Simmons, D (New Zealand Tourist and Publicity Department)	July 1986	
Tōpuni of Ngai Tahu	DOC	2006	
Dart Valley Expedition – April 1978	Beck, R,	1978	Document not found
Expedition to Slip Stream Special Area	Beck, R	1980	Document not found
New Zealand Jade. The Story of Greenstone	Beck, R	1970	Document not found
Mana Pounamu	Beck, R	2002	Document not found
Pounamu: The Hade of New Zealand	Beck, R	2010	Document not found
Pounamu Treasures	Beck, R	2012	Document not found

## TOURISM

Title	Author	Date	Relates to
The impact of noise on recreations and wildlife in New Zealand's natural areas (Literature Review)	Harbrow, M; Cessford, G; Kazmierow, B  DOC	2011	Natural Environment
Southland Cruise Ship Visits at a Glance (Factsheet)	SRC	September 2012	
Little Tahiti Development – Phase 1 Development Options Report	Bonisch Consultants (for DOC)		Natural Environment, Service Levels, Built Environment
Queenstown Lakes District Regional Growth Projections (average day) – Factsheet	QLDC		
Approved Commercial Operators	DOC		
Information from Milford Lodged (Customer Feedback Survey, Visitor Nights, Types of Visitors, Length of Stays)	Contact between Michele & Christine Wallace of Milford Lodge		
Milford Road – Campsite Figures	Grant (DOC)		
Queenstown Visitor Snapshot	Queenstown, New Zealand	Year end June 2017	
Queenstown Airport Passenger and Landing Stats	Naomi Lindsay (Queenstown Airport Corporation Ltd)	February 2018	
Milford Sound Aerodrome – Aircraft Movements (10 years) (Excel Spread Sheets with Email)	Andrew Crawford (Airways)		
Commercial Accommodation Monitor (Fiordland)	Stats NZ	January 2018	
Commercial Accommodation Monitor (Fiordland)	Stats NZ	February 2018	
New Zealand Tourism Forecasts	Ministry of Business, Innovation & Employment	2017-2023	
Visitors at Milford Sound	Qrious	2015-2017 (Published June)	
Tourist Number for Milford Sound (1992 – 2016)	Milford Sound Tourism	April 2018	

Experience in Queenstown Region (4 Tables with 2017+2016 comparisons)	Angus and Associate	2017	
Queenstown Airport – Monthly Passenger Traffic	Queenstown Airport	February 2018	
Daily Milford Sounds Visitors (excel)	Venture Southland	1 <sup>st</sup> July 2015 – March 31 <sup>st</sup> 2018	
Number of Cruise Ships Departing(Email)	Sharon Salmons – Destination Fiordland	Feb 2018	
DOC Camper Statistics (Email attachment)	Sharon Salmons – Destination Fiordland	Feb 2018	
Routes Travelled by Free Independent Travellers Visiting Southland Region	Venture Southland	2015/2016	
Milford Sound Gap Analysis	Venture Southland	April 2018	
Assessing the Socio-economic Effects of Concessions-based Tourism in New Zealand's National Parks on Regional Economies and Gateway Communities	Wouters, M	2011	Natural Environment
Exploring factors influencing visitor experiences	Booth, K; et. al.	2011	
The Great Tourism Squeeze: Milford's off the track – but tourism is surging	Phil Taylor for NZ Herald	1 May 2017	
The Milford Sound Experience (Report)	Gnoth, J (University of Otago) (Prepared for Milford Sound Tourism)	May 2017	
Milford Sound Tourism – Transport Infrastructure Review – Traffic Management Strategy	TDG (Prepared for Milford Sound Tourism)	May 2017	Transportation
Feedback from Air Milford (Email)	Anthony Sproull to Milford Opportunities Email	18 April 2018	Transportation & Level of Service
Feedback from University of Otago Department of Tourism	Hazel Tucker to Michele	11 April 2018	
Working group on freedom camping may ease tensions	Maree Baker-Galloway (Published in ODT – Anderson Lloyd)	26 March 2018	Level of Service
Tourism in Queenstown and Milford Sound: Trends and Patterns (Attachment to Email)	Goble, C & Orchiston, Dr. C	Email sent 18 January 2018 to Warrick Low of Venture Southland	

Tourist Summary – All Passengers (Table)	Milford Sound Tourism Ltd	March 2018	
Piopiotaahi Milford Sound – Passenger Terminal (Master Planning)	Warren and Mahoney	February 2017	Built Environment
How to cut numbers and smooth out the bumps (Opinion Article)	Tim Hazledine (Economics Professor - Otago Daily Times)	16 April 2018	
Northern Bruce Peninsula: Sustainable Tourism Management Plan (Phase 2 Report – Updated)	Twenty 31	December 2017	
Milford Opportunities Project (Memo)	Ministry of Business, Innovation & Employment	November 2017	
SDC councillors welcome \$456,000 tourism infrastructure boost (article)	Evan Harding (Stuff)	17 December 2017	
National Tourism Infrastructure and Investment Assessment – Appendices Document	Deloitte (Prepared for Tourism Industry Aotearoa)	April 2017	Infrastructure
Addressing New Zealand’s most pressing local tourism infrastructure needs – Tourism infrastructure Study (executive summary)	Tourism Industry Aotearoa	November 2016	Infrastructure
Review of the Tourism Aspects of the Fiordland Link Experience Project Application	TRC (Prepared for Department of Conservation)	February 2014	Infrastructure
Tourism and tourism infrastructure in New Zealand	Ministry of Business, Innovation and Employment	August 2016	Infrastructure
Increasing tourist pressure (Opinion)	Otago Daily Times	October 2016	
Is a tourist tax the right response to New Zealand’s tourism boom? (article)	Rebecca Macfie (Noted)	28 January 2017	
The Fiordland Link Experience, Creating Transportation Opportunities For Tourism and Recreation by Monorail (Technical Paper)	Will Parker (WSP Opus) Louise Robertson (Mitchell Partnerships Ltd) John Beattie (Riverstone Holdings)	March 2010	Infrastructure
Management of the Environmental Effects Associated with the Tourism Sector	Parliamentary Commissioner for the Environment	November 1997	



Fiordland Link Experience: Business Plan Review	Sarah Bagnall & Kirstin Ralph (DOC) & Ian Dickson (Ian Dickson and Associates) (Prepared for DOC)	March 2014	Infrastructure
Tourism infrastructure Funding System 'unfair' – Mayor (article)	RadioNZ	21 January 2018	
Sage views on tourism (article)	Claire Kaplan (Advocate South)	15 March 2018	
Milford Sound set to top 1 million visitors in 2019 (article)	Evan Harding (Southland Times)	28 June 2017	
Harnessing Tourism Opportunities (Media Release)	Venture Southland	13 December 2017	
Milford Opportunities project picking up speed (article)	Dave Nicoll (Stuff)	1 January 2017	
Tough Choice may await Milford governance group down the track	Dave Nicoll (Stuff)	16 November 2017	
Governance to protect 'tourism icon' (article)	Otago Daily Times	17 November 2017	
Milford Sound 'bursting at the seams' (article)	Radio NZ	10 February 2018	
Conservation at heart of tourism and economy (opinion)	DOC (originally in Southland Times)	16 June 2015	
\$12m for tourism infrastructure like a 'damp tea towel on a bonfire' – farmers (article)	Radio NZ (Alexa Cook)	25 January 2017	
New Zealand Cruise Association (He Waka Eke Noa) – Cruise Ship Schedule			
Tourism Data Domain Plan Stakeholder Survey (Summary)	Michael Webster (Contact), Ministry of Business, Innovation & Employment	March 2018	
Tourism Data Stocktake: Background for Tourism Data Domain Plan Workshops	Michael Webster (Contact), Ministry of Business, Innovation & Employment	March 2018	
Tourism 2023 – Four scenarios, a vision and a strategy for U.K. outbound travel and tourism	Forum for the Future Action for a Sustainable World	October 2009	
Cruise Ship Passenger Numbers (email and attachment)	Lyndon Cleaver to Anne (ES)	April 2018	
Mood of the Nation New Zealanders' perceptions of international visitors	Kantar TNS (Tourism Industry Aotearoa)	March 2018	

DOC to reduce helicopter landings to remote Fiordland glacier (Article)	Michael Hayward (Stuff)	24 April 2018	
Southern Scenic Route Brochure 2016		2016	Tourism
Queenstown to Milford Travel Time (Map)	NZTA		
Features of Interest From Te Anau to Milford (Map)	NZTA		
Submission to Southland District Council on Draft Long Term Plan 2018-2028	Tourism Industry Aotearoa	09 April 2018	
Milford Sound Chinese Visitors Online Feedback (Summary)		2012-2015	
Milford Sound Visitors Online Feedback (Summary)		2015-2016	
Milford Sound Visitors Online Feedback (Summary)		2016-2017	
Visitor Trend Analysis – Strategic Plan 2016-2026	Crowe Horwath for Milford Sound Tourism Ltd	December 2016	
Putting a Price on Tourism on Conservation Land (article)	Stuff (Nikki Macdonald)	2 June 2018	
Milford Sound MDA Pax with non-cruisers	-	Updated March 18	
DOC Campsite Stats	Grant Tremain – Sharon Salmons	15 February 2018	
Southland Regional Combined Map - Routes Travelled by Free Independent Travellers Visit Southland Region	Venture Southland	Jan – Dec 2015	
International Visitor Conservation and Tourism Levy – case studies for consultation	Ministry of Business, Innovation & Employment	May 2018	
Southland Regional Combined Map - Routes Travelled by Free Independent Travellers Visit Southland Region	Venture Southland	2015 – 2017	Another document showing just 2015 exists for this information
Milford Sound Analysis	Venture Southland	June 2018	
Social Media Responses (Spreadsheet)	-	-	
Milford Sound MDA Pax with non-cruisers (spreadsheet)		Updated May 2018 (2006-2026)	

## LEGISLATION

Title	Author	Date	Relates to
Fiordland National Park Management Plan	DOC	June 2007	Natural Environment, Built Environment, Tourism
Southland Conservation Management Strategy	DOC	2016	Natural Environment, Built Environment, Tourism
Otago-Southland Regional Land Transport Plans	ORC & SRC	2015-2021	Built Environment, Tourism
Regional Coastal Plan for Southland	SRC	2013	Natural Environment, Built Environment, Tourism
Deed of Agreement Between "The New Zealand Cruise Ship Industry" & "Environment Southland"	SRC	October 2008 (2010 and 2012 Amendments)	Tourism
Proposal for a Fiordland Marine Regional Pathway Management Plan	SRC	March 2016	Natural Environment, Tourism, and Fisheries
Proposal for a Fiordland Marine Regional Pathway Management Plan (Factsheet)	SRC		
Fiordland Marine Regional Pathway Management Plan	SRC	April 2017	Natural Environment, Tourism, Fisheries
Navigation Safety Bylaws	SRC	2009 (Revised 2015)	Tourism, Transportation, Fisheries
Regional Air Plan	SRC	2016	Natural Environment
Regional Pest Management Strategy for Southland	SRC	March 2013	Natural Environment
Southland Regional Policy Statement	SRC	2017	Natural Environment, Built Environment, Tourism, Cultural Values
Fiordland Marine Conservation Strategy (Te Kaupap Atawhai o Te Moana o Atawhenua)	Laurel Teirney Guardians of Fiordland's Fisheries & Marine Environment Inc (Tautiaki Ika O Atawhenua)	June 2003	Natural Environment, Commercial/Fisheries, Cultural Values
Freedom Camping Zones	QLDC		Tourism
Freedom Camping Control Bylaw	QLDC	2012	Tourism
Freedom Camping Bylaw	SDC	2015 - 2018	Tourism

Southland Regional Development Strategy	Southland Mayoral Forum	October 2015	
Ngai Tahu Ki Murihiku Natural Resource and Environmental Iwi Management Plan (Te Tangi a Taurira)	Southland Runanga Papatipu (Awarua, Hokonio, Oraka/Aparima, Waihopai)	2008	Cultural Values
Operative Regional Water Plan for Southland	SRC	2010	Natural Environment
Southland Water and Land Plan	SRC	2018	Natural Environment
Southland District Plan	SDC	2018	Natural Environment, Built Environment, Cultural Values
Civil Defence Emergency Management Group Plan for the Southland Region	Emergency Management Southland	2017	Built Environment
Fiordland (Te Moana o Atawhenua) Marine Management Act	MOE	2005	Natural Environment, Built Environment, Cultural Values
Milford Sound Piopiotahi Aerodrome Emergency Plan	MOT	2015	Built Environment
Fiordland Marine Pathway Plan Rules (Factsheet)	SRC		Natural Environment, Tourism. Fisheries
Clean Boats – Living Seas (Factsheet)	DOC, SRC, Fiordland Marine Guardians, MPI	September 2016	Natural Environment, Tourism. Fisheries
National parks policy review put on hold (article)	Wilderness Magazine	March 2018	
Milford Sound Resource Consent Status (List)	Southland District Council	May 2018	
Milford Sound Resource Consent Status (Map)	Southland Regional Council	May 2018	
Ngai Tahu Claims Settlement Act	MOE	1998	
Statutory Acknowledgment for Tutoko (Part of NTCSA 1998)	MOE	1998	
Milford Sound/Piopiotahi Extract from Fiordland National Management Plan		June 2007	

## BEST PRACTICE

Title	Author	Date	Relates to
Senator Gillibrand's Legislation to Designate Finger Lakes Region As A National Heritage Area Passes Key Committee		2018	
Daines Introduces Bipartisan, Bicameral Legislation to Help Restore and Rebuild National Parks		2018	
NEW REPORT CONFIRMS THE DISCOVER NIAGARA SHUTTLE IS DRIVING ECONOMIC OPPORTUNITY IN THE NIAGARA REGION		2017	
Values in nature conservation, tourism and UNESCO World Heritage Site stewardship	Liburd, J; Becken, S	2017	
Good Neighbors and Lost Cities: Tourism, the Good Neighbour Policy, and the Transformation of Machu Picchu	Rice, M	2017	
Scenario planning for tourism management: a participatory and system dynamics model applied to the Galapagos Islands of Ecuador	Pizzittui, F, et al.	2017	
C&B Puts storytelling at the heart		2017	
New Directions for Understanding the Spatial Resilience of Social-Ecological Systems		2017	
Last chance tourism and the Great Barrier Reef		2017	
Moving beyond sense of place to care of place: the role of Indigenous values and interpretation in promoting transformative change in tourists' place images and personal values	Walker, K & Moscardo, G	2016	
Canada : World Tourism Day spotlights Albertas growing tourism industry		2016	
The potential implications of environmental deterioration on business and non-business visitor expenditures in a natural setting: A case study of Australia's Great Barrier Reef	Mustika, P; Stoeckl, N & Farr, M	2016	
Creating Conditions for Policy Change in National Parks: Contrasting Cases in Yellowstone and Yosemite	Yochim, M & Lowry, W	2016	

Sustainable Tourism Development Frameworks and Best Practices: Implications for the Cuban Tourism Industry	Laitamaki, J, et al.	2016	
Tourism and responsibility considered in academic framework	Zbucnea, A	2015	
Culture-production-place and nature: the landscapes of somewhere	Beilin, R & Bohnet, I	2015	
Is tourism damaging ecosystems in the Andes? Current knowledge and an agenda for future research	Barros, A; Monz, C & Pickering, C	2015	
The significance of environmental values for destination competitiveness and sustainable tourism strategy making: insights from Australia's Great Barrier Reef World Heritage Area	Esparon, M, et al.	2015	
Analysis on the threats and spatiotemporal distribution pattern of security in World Natural Heritage Sites	Wang, Z; Yang, Z; Du, X	2015	
Rapid survey protocol that provides dynamic information on reef condition to managers of the Great Barrier Reef	Breeden, R, et al.	2014	
The performance and potential of protected areas	Watson, J, et al.	2014	
The development of a tourism research framework by South African National Parks to inform management	Biggs, D, et al.	2014	
Assessing biophysical limits to the economic development of remote islands: the case of Isabela in the Galapagos Archipelago	Martines-Iglesias,C, et al.	2014	
Future Scenarios as a Research Tool: Investigating Climate Change Impacts, Adaptation Options and Outcomes for the Great Barrier Reef, Australia	Evans, L et al.	2013	
Who Visits a National Park and What do They Get Out of It?: A Joint Visitor Cluster Analysis and Travel Cost Model for Yellowstone National Park	Benson, C, et al.	2013	
Monorail Proposal Conflicts with NZ Tourism Brand		2013	
Trends and sustainability in the Canadian tourism and hospitality industry	Chandana, J, et al.	2013	
Social Dimensions of 'Nature at Risk' in the Galapagos Islands, Ecuador	Lu, Flora, Valdivia, G, Wolford, W	2013	
Developing sustainable tourism through adaptive resource management: a case study of Machu Picchu, Peru	Larson, L & Poudyal, N	2012	
A Short-Cut to Milford Sound	Lowe, I	2012	

Australian senior adventure travellers to Peru: Maximising older tourists' travel health experience	Bauer, I	2012	
Tourism, Environment, and Development on the Inca Trail	Maxwell, K	2012	
Linking natural resource management to tourist satisfaction: a study of Australia's Great Barrier Reef	Coghlan, A	2012	
Managing Machu Picchu: institutional settings, business model and master plans	Zan, L & Lusiani, M	2011	
SCHUMER CALLS ON NIAGARA FALLS HERITAGE AREA COMMISSION TO CREATE AGGRESSIVE RESTORATION PLAN TO REJUVENATE NIAGARA FALLS STATE PARK		2011	
Roads Less Travelled: Emerging Tourism in Peru	Smith, J & Hurt, D	2011	
The Last Word: How Peru's tourism industry coped when its crown jewel was forced to close	Mapstone, N	2010	
Tourism 2020: Policies to Promote Competitive and Sustainable Tourism		2010	
The role of tourist icons for sustainable tourism	Becken, S	2005	
Norway slashes tourism adverts as it is overwhelmed thanks to 'Frozen effect' (article)	The Telegraph	16 September 2016	
Realising the potential of driverless vehicles: Recommendations for law reform	Michael Cameron (The Law Foundation)	2018	
High-risk rural roads guide	NZ Transport Agency	September 2011	
Enabling the Safe System Approach to Road Safety	NZ Transport Agency	June 2012	
New Zealand's Road Safety Strategy 2010 – 2020 (Safer Journeys)	Ministry of Transport	2010 - 2020	
Identifying and evaluation adaptation strategies for cruise tourism in Arctic Canada	Dawson, J, et al.	2016	
Coping with Success: Managing overcrowding in tourism destinations	McKinsey & Company (World Travel and Tourism Council)		
Effects of Changed Aircraft Noise Exposure on Experiential Qualities of Outdoor Recreational Areas	Hjertager Krog, N; Engdahl, B; Tambs, K	2010	

**TBC**

Title	Author	Date	Relates to
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Comments from the DOC on Development Design Review Board	Antonia Croft (DOC)		Landscape/ Natural Environment?
Southland Regional Development Strategy (Te Iwi Me Oranga Rauemi)	“		
MDA Operations HSE Plan – Significant Hazards	?	2016	?
Analysis of Te Anau residents' impacts, awareness and preparedness following the 2003 Fiordland earthquake	SRC	2004	
National Seismic Hazard Model for New Zealand	Stirling, M; et. al.	2010	
Surface effects and geological observations following the 1988 Te Anau and 1989 Doubtful Sound earthquakes		2006	
Milford Sound – Piopiotahi	Steve Ruru (As part of The Great Southern Tourism Opportunities Presentation)		
Milford Sound, Fiordland National Park: development options report	Murray-North Ltd (Prepared for DOC)	1988	
Milford Sound development: commentaries on discussion paper	Mr C.J.McFarlane (Chairman of Southland National Parks & Reserves Board)	1986	
Milford Sound Development Stage 1: Investigations and Design	Austin, R; McGowan, A & Anthony, N (Milford Sound Development Steering Committee – Department of Lands and Survey, Invercargill)	1986	
Milford Sound Development Stage 1: Environmental Impact Assessment	Austin, R; McGowan, A & Anthony, N (Milford Sound Development Steering Committee – Department of Lands and Survey, Invercargill)	1986	
Milford Sound Environmental Planning Report: Policy Consideration and Planning Proposals	Milford Sound Planning Team (Prepared for the National Parks Authority)	1972	
Milford Sound Development – Environmental Impact Assessment: The Milford Sound Development Consortium		1989	
Milford Planning Report	Parks Authority by the Department of Land and Survey	1975	
Milford Sound Redevelopment Study	JASMaD development – John Austin & Peter Hatch	1976	



	(Prepared for Tourist Hotel Corporation)		
Milford Sound Development Plan	Milford Sound Planning Team (Prepared for Milford Sound Consultative Committee)	1980/1981	
Developers targeting Deepwater Basin	Tim Newman (Southland Times)	11 March 2018	
Deepwater Basin Development – Indicative Business Case	DOC	February 2018	
Flood Hazard Map – Milford Sound	OPUS (Prepared for SDC)	August 2003	
Cleddau Village Development – Natural Hazards Risk Assessment	OPUS (Prepared for DOC)	April 2007	
Proposed Milford Sound Village Flood Hazard Assessment	OPUS (Prepared for DOC)	January 2007	
Decision Letter for Joint Hearing for Cleddau River Flood Protection Scheme (To submitters)	From SDC/ES	October 2010	
Milford Sound File Reference (List of Documents)	Southland District Council (Sonya Johnstone)	April 2018	

# **Attachment 3 - Specific Generic Projects**

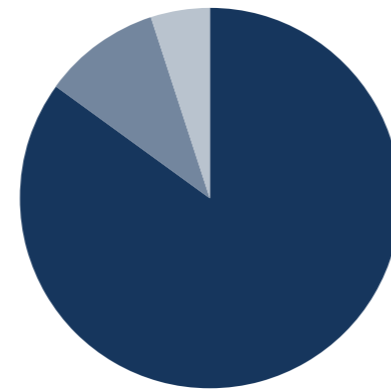
# VISITOR INFORMATION DATA AND STATISTICS

## Overarching statement

Research projects for specific consideration through the Gap Analysis phase were identified by the Governance Group at the commencement of the Milford Opportunities project. The following is a summary of findings under six topics:

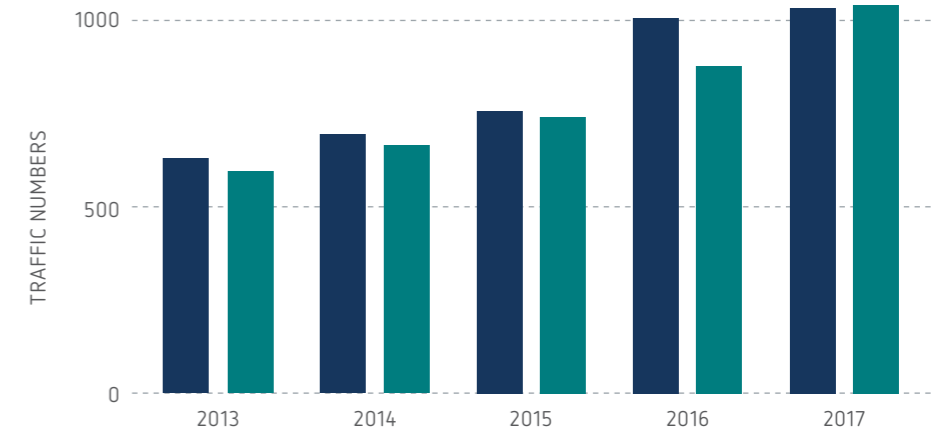
- Visitor Information data and statistics
- Queenstown Visitor Market Influencers
- Conservation Values (Milford and the corridor)
- Stocktake of organisations associated with Milford now – what they do and what they provide
- Understanding the current visitor experience and expectations
- Future visitor numbers prediction modelling for 5, 10 and 20 years

Milford Visitors who took a cruise



- 85% Cruise via Freshwater Basin
- 10% Cruise from Deepwater Basin
- 5% Do not participate in cruise

Average annual daily traffic numbers



- Retford Stream (near Te Anau)
- Homer Tunnel

## Gross visitor numbers to Milford

**1.2 mil** Gross visitor numbers

**5771** Boat passengers  
(Highest recorded peak day 22.02.2018 - Chinese New Year)

**28** Cruise liners made 96 visits 2017/2018

**255,065** Cruise liner passengers  
(Most stay on board)

**946,787** Visitors took a cruise on Milford via Freshwater Basin

## Vehicle numbers

**2586** Largest daily vehicle number at Homer Tunnel  
22nd Feb (Chinese New Year)

**< 10%** Volume of heavy vehicles on Milford Road

## Parking and occupancy

**35%** Vehicles arrive between 10am and 1pm

- Average stay is 3 hours
- Early arrivals still occupy carpark when late arrivals arrive
- Parking demand has exceeded capacity of available parking on 20 - 30 days on last three seasons
- Average car number from TDG report is 4.4

\* Key source: Crowe Horwath for MSTL

\* Key source: NZTA Corridor Management Plan (Jan 2018) (Milford Sound Tourism Transport Infrastructure Review Traffic Management Strategy May 2017)

# VISITOR INFORMATION DATA AND STATISTICS

## Milford Airport

**2421** Landings - movements to and from aerodrome February 2018

**681** Overflights (no landing) February 2018

## Queenstown Airport

**2,054,515** Passenger movements for 2017/18 (Queenstown airport)

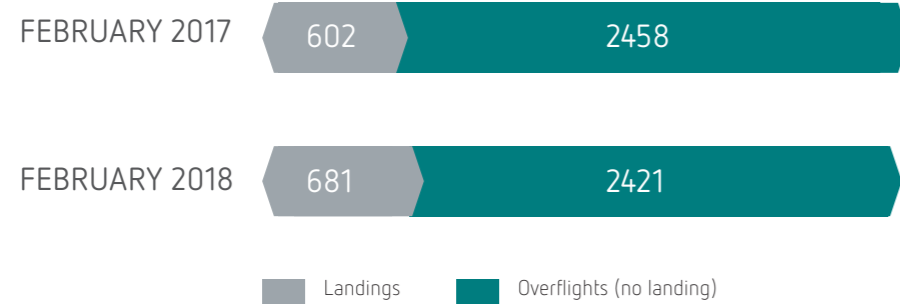
**5.1mil** Queenstown airport has the potential for 5.1 million passenger movements per annum with new terminal option by 2030

## Accommodation

**2,781,329** Queenstown's annual accommodation capacity Bed nights, April 2018

**829,082** Fiordland annual accommodation capacity Bed nights, April 2018

### Movements to and from Milford aerodrome



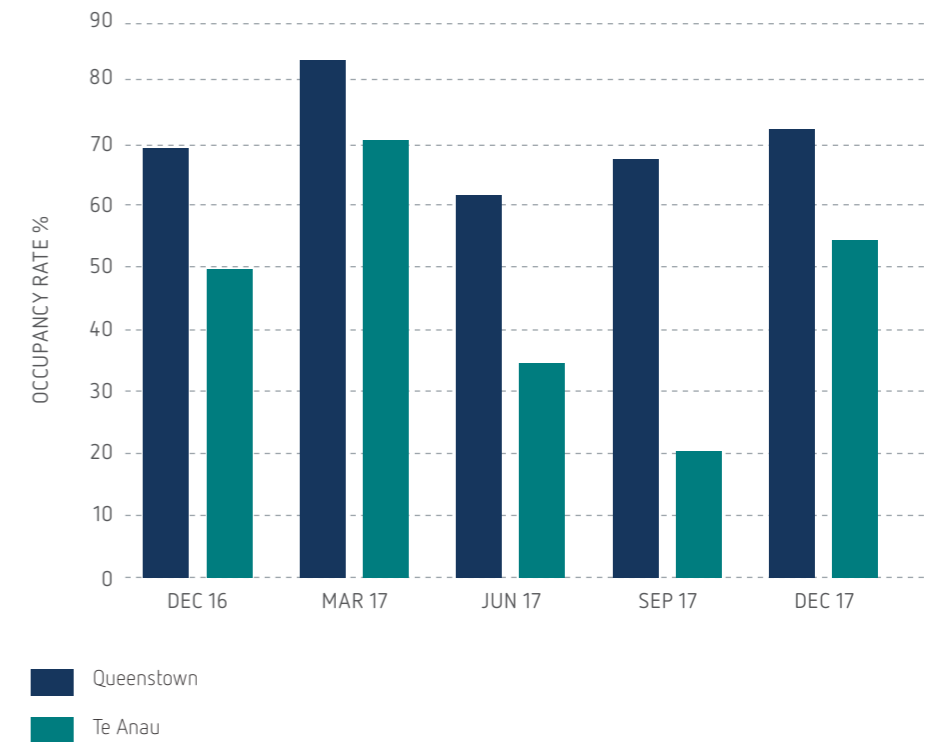
### Arriving from Queenstown / Te Anau

**40-50%** International visitors to Queenstown visit Milford

**20%** Of domestic visitors to Queenstown go to Piopiotahi / Milford

**19%** International visitors to Southland visit Milford

### Accommodation Occupancy



\* Key source: Transport Infrastructure Review May 2017 TDG for Milford Sound Tourism

# FUTURE VISITOR NUMBERS PREDICTION MODELLING - 5,10,20 YEARS

## 2018 New Zealand Tourism forecast

- Most forecasted growth is from holiday makers /those visiting friends/relatives
- Percentage movement in visitor numbers to Milford Sound has varied widely annually

**4.5%** Expected growth rate per annum for visitor arrivals to NZ

**5.1 mil** Projected visitors to New Zealand in 2024 from 3.7mil in 2017

**\$14.8bil** Expected International spend in 2024 (Up 40% from 2017)

Australia is New Zealand's largest visitor market

Australian market will continue to be healthy and set to grow by 23% by 2025



## Visitor numbers to Milford Sound

- Percentage movement in visitor numbers to Milford Sound has varied widely annually with as much as:

**28%** Increase in visitor numbers to Milford in 2017

**-11%** Decrease in visitor numbers to Milford in 2012

**4% p.a** Median annual growth since 1992

Tourism forecasts predict that China will become NZ's largest market in terms of expenditure at the end of the forecast period



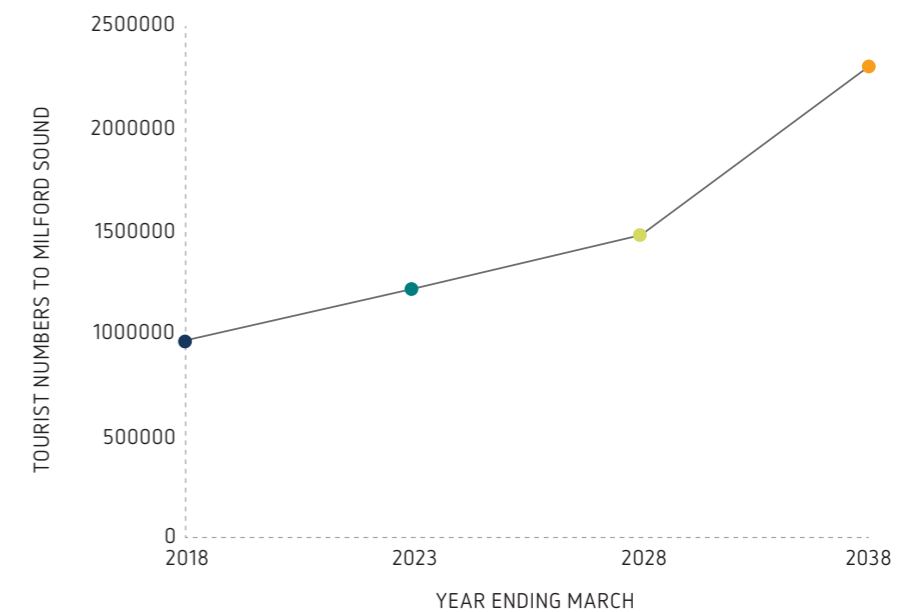
## Visitor growth predictions

- Crowe Harwarth - Visitor Trends, Dec 2016 provides a formula for estimating current numbers of visitors to Milford Sound and applies growth rates of 4% or 10% p.a
- Growth predictions for 2017/2018 have exceeded forecast

**1.2 mil** Projected visitors to Milford in 2023 From 0.95 million to March 2018

**2mil** Visitors to Milford Sound by 2035

### Growth predictions



- 2018 (Current) 946,787 visitors
- 2023 (5 Years) 1,200,000 visitors
- 2028 (10 Years) 1,470,331 visitors
- 2038 (20 Years) 2,283,378 visitors

# QUEENSTOWN VISITOR MARKET INFLUENCERS

## International, national media messages

- Piopiotahi/Milford Sound has always historically been sold as a 'Queenstown Regional Visitor Experience'<sup>1</sup>
- Sold as a 'one day' experience from Queenstown<sup>2</sup>
- Its embedded - its the message sold to the world
- Social media (facebook and TripAdvisor) all have a role to play
- Sold in this way by the whole tourism ecosystem:

## Local media

- Cut price operators - cheap trips to Piopiotahi
- Accommodation providers, Isite and Tourism Agencies all promoting Piopiotahi (can influence un-educated travellers)
- Social media (facebook and trip advisor)

## Signage/local advertising

- Driving the price to the bottom

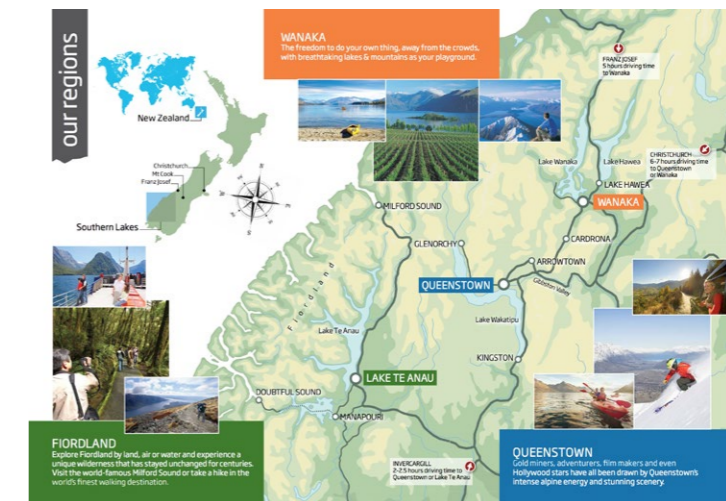
## How to travel to Piopiotahi/Milford Sound

- Flights into Queenstown - frequent, cheaper than other options
- Car rental from Queenstown - more of them and cheaper? better advertised?
- Organised transport - coach etc

## Travel Trade Collective

Southern Lakes New Zealand is a travel trade collective, promoting Wanaka, Queenstown and Fiordland to the world, as a package.

Enticing people to experience Piopiotahi/Milford Sound in a day, whether by coach or flying



<sup>1</sup> Personal Communication: Graeme Budd, Destination Queenstown (June 2018)  
<sup>2</sup> Anecdotal feedback provided during project engagement (March 2018)

# QUEENSTOWN VISITOR MARKET INFLUENCERS

## Most common travel package to Piopiotahi/ Milford once in Queenstown?

**3 nights**

Common length of stay  
Meaning limited time - cutting experience short

- Accommodation pre booked in Queenstown
- Queenstown accommodation is expensive so if pre-booked, its unlikely they will re-book elsewhere on arrival

## Milford experience

- One day package available (coach - boat - coach) and the boat schedule caters for this
- Free independent traveller
- Campervan
- Coach - fly - coach

## Other Queenstown attractions after visiting Piopiotahi/ Milford Sound

- There are other options
- The operators make it easy and attractive to sell more options in addition to the Piopiotahi/ Milford Sound experience.....so they do

## Undersold experience

**\$115**

Kiwi Experience: Milford Explorer from Queenstown  
One Stop Adventures

## Cruise schedule for peak operating days in February

**10:30 - 1:30pm** Daily peak cruise time

**6** Number of day cruise operators  
(Not including stops by large cruise ships and overnight cruises)

*"Journey to New Zealand's  
"eighth wonder of the  
world" Milford Sound, with  
an amazing scenic drive &  
unforgettable 2 hour cruise"*



**MILFORD  
EXPLORER**

Time slot	Number of cruises departing
7 - 8:59 am	3
9 - 9:59 am	5
10 - 10:59 am	6
11 - 11:59 am	6
12 - 12:59 pm	6
13 - 13:59 pm	11
14 - 14:59 pm	4
15 - 15:59 pm	5
16 - 16:59 pm	6 (3 are overnight)
17 - 17:59 pm	2

<https://www.onestopadventures.com.au/tour/kiwi-experience-milford-explorer/>

\*Key source: Milford Opportunities

# CONSERVATION VALUES: PIOPIOTAHU-MILFORD AND CORRIDOR

## Terrestrial Environment - Northern Fiordland Protection site

Piopiota/Milford Sound consists of a large terrestrial and marine environment providing habitat to some of the rarest floral, faunal, marine and invertebrate species of national and international significance. Among the rare species, some of which are endemic to this area are Bottle Nose Dolphin, Tawaki/ Fiordland Crested Penguin, and Boulder Butterfly.

The habitats for rare species extend beyond the Piopiota/ Milford Sound area, into the corridor and wider Fiordland/ Regional setting.

Several organisations are driving the protection and management of the conservation values of this area including;

- Department of Conservation
- Fiordland Marine Guardians
- Fiordland Conservation Trust
- Other locally supported projects and organisations

As the master plan process develops and site specific solutions/ concepts are established further focussed research to understand consequences to conservation values will need to be undertaken.

Piopiota-Milford forms part of Te Wahi Pounamu World Heritage Area

Significant landscape values of this unique landscape contribute to its world ranking:

Biophysical (biotic and abiotic)

Associative (culture and meaning) and

Sensory (visual etc)





# STOCKTAKE OF ORGANISATIONS ASSOCIATED WITH MILFORD NOW

What they do and what they provide

<i>Kaitiakitanga</i>			<i>Regulatory Functions</i>			
<b>Te Rūnanga o Ngāi Tahu</b>			<b>Regulatory Authorities</b>			
Aparima Oraka Runanga	Te Ao Marama Inc	Makaawhio Runanga	Department of Conservation	Southland District Council	NZTA	Environment Southland
<i>National Governance</i>			<i>Local Governance</i>			
<b>New Zealand Government</b>			<b>Local Government</b>			
MBIE	NZTA	Ministry of Transport	Environment Southland		Otago Regional Council	
Department of Conservation	Ministry for the Environment		SDC, ICC, GDC, Venture Southland		QLDC, CODC, CDC, DCC	
<i>Conservation</i>			<i>Provision of infrastructure</i>			
<b>Conservation</b>			<b>Infrastructure</b>			
NZ Conservation Board	Southland Conservation Board	Fiordland Marine Guardians	Milford Sound Tourism Milford Sound Infrastructure NZTA Ministry of Transport			
<i>Recreation</i>			<i>Tourism Marketing / Governance 1</i>			
<b>Recreational Users</b>			<b>Tourism</b>			
Day Visitors	Hikers	Great Walk Walkers	Venture Southland Destination Fiordland Destination Queenstown MBIE			
Recreational Fishers	Recreational Boaters	Recreational Kayakers	Local, Regional, National and International Visitors			
Users of other Fiords (access)	Campers	Hunting / Diving				
<i>Community Interests</i>			<i>Business Interests</i>			
<b>Community</b>			<b>Industry 2</b>			
Residents of Milford	Residents of Fiordland	Te Anau Community Board	Fiordland Fishermen's Association	Fiordland Lobster Company Ltd	Real Journeys	Cruise Milford
Manapouri Community Development Agency	Fiordland Trails Trust	Milford Community Trust	Skyline Enterprises	Southern Discoveries	Mitre Peak Cruises	Queenstown Milford User Group
Te Anau & Manapouri Community	Southland Community	New Zealanders	Ultimate Hikes	Rosco's' Kayaks	Distinction Hotels	Tour Guides
Nth Southland Townships	Queenstown Community	International Community	FIT Vehicle Suppliers	Heli & Plane Operators	Bus Companies	Accommodation Providers

<sup>1</sup> Includes Natural Hazard Management

<sup>2</sup> This represents a 'snapshot' of industry and is not intended to be a comprehensive list.

# UNDERSTANDING CURRENT VISITOR EXPERIENCES AND EXPECTATIONS

## Milford visitor expectations and experience

- From market research undertaken by Tourism New Zealand, The #1 factor influencing consideration of NZ as a visitor destination is; 'Spectacular Landscapes/Natural Scenery'
- From the information available, overall visitor perceptions to Piopiotahi/Milford Sound remain positive

## Customer experience

- Sourced from TripAdvisor, Facebook and Google
- By aggregating over 5000 online reviews for Milford Sound over the last 5 years, it is possible to detect trends and themes in customer perception.
- Because there is more to be learnt from negative feedback, themes from the findings have been presented in the table

Piopiotahi has a major role to play given that the following comes up when you Google 'top things to do in New Zealand':

### Things to do in New Zealand



Milford Sound  
Mitre Peak, waterfalls, seals & penguins



Aoraki / Mount Cook  
Mountain, glacier, lake, hiking, and



Fiordland National Park  
Milford Sound, Mitre Peak & Mirror Lakes



Tongariro National Park  
Tongariro Alpine Crossing & volcanoes

Issue	Approximate percentage of 'negative' responses	Possible solutions
Generally underwhelmed by scenery	~20%	Provide other attractions nearby that cater to a wide variety of tastes
Limited parking space around attractions (Mirror Lakes, The Chasm)	~17%	Allow more parking space near attractions if possible, encourage park 'n' ride
Long drive from Queenstown to Milford Sound (8-10 hours on bus)	~12%	Remind tourists of the unusual driving experience beforehand Improve traffic flow if possible
Road safety	~6%	Remind tourists of driving safety when they pick up rental cars
Milford Sound Visitor Centre car park too far from cruise terminal	~5%	Expand existing car park Build car park closer to cruise terminal if possible
Homer Tunnel - darkness of tunnel, one-lane; long waiting time to get in (Less negative reviews recently compared to previous years)	~3%	Improve traffic management if possible Make visitors aware of the potential waiting time at traffic light. Advise visitors to leave enough travel time.
Bad service by members of staff	~1%	Improve service quality Provide better visitor experience
Other / no comment	~36%	N/A

\* Key source: TripAdvisor, Facebook and Google

# UNDERSTANDING CURRENT VISITOR EXPERIENCES AND EXPECTATIONS

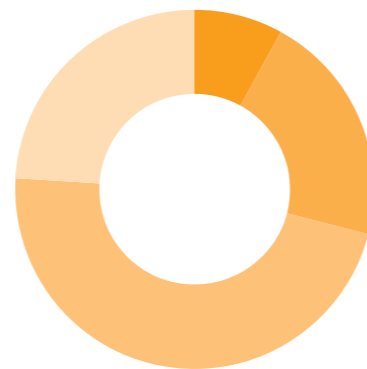
## Otago University study - 'The Milford Sound Experience'

- 'The Milford Sound Experience' undertook a one-off survey of 365 people, from 22 nationalities between the ages of 18 – 90 which was completed at the end of March 2017 (5% margin of error). Some useful results were observed through this study.

The key findings were:

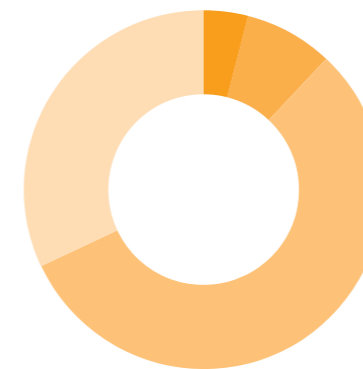
- Number of visitors or aircraft noise did not affect their satisfaction substantively
- Car drivers and passengers most likely to agree with crowding as an issue (along Milford Road)
- Most visitors stopped twice on road journey
- Ongoing monitoring is needed

Seeing and feeling the sound, I felt like I was in another world?



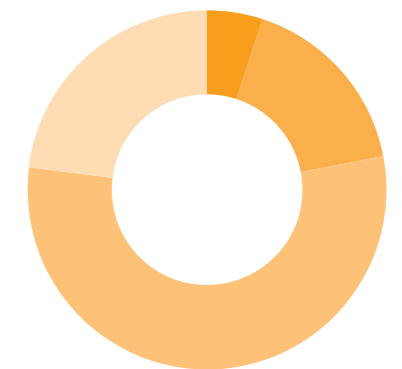
- 7.6% Strongly disagree
- 20.8% Disagree
- 47.3% Agree
- 24.2% Strongly agree

The service on the boat was just perfect?



- 4.1% Strongly disagree
- 7.5% Disagree
- 56.4% Agree
- 32.0% Strongly agree

I truly felt the wilderness and natural quiet?

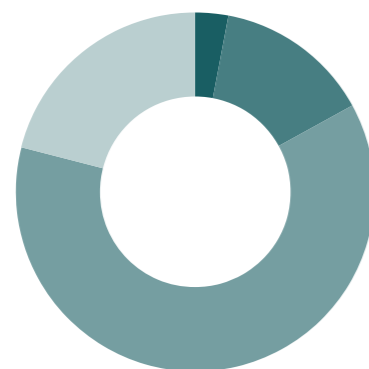


- 5.4% Strongly disagree
- 16.6% Disagree
- 54.9% Agree
- 23.1% Strongly agree

## Results of relevant questions

Otago University Study 'the Milford Experience' March 2017

How was your Milford Experience overall?



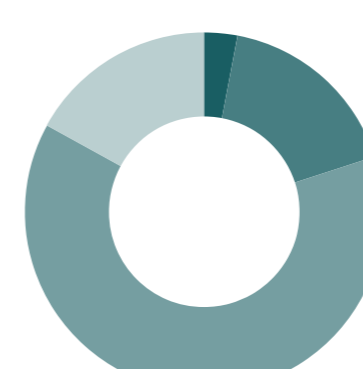
- 2.5% Ordinary
- 13.6% Ok
- 62.5% Outstanding
- 21.4% Beyond expectations

Did you stop on the way to look at scenery?



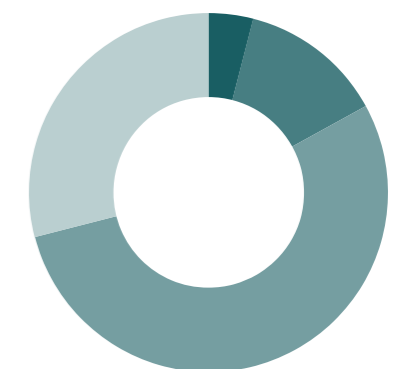
- 9.0% Never stopped
- 11.4% One stop
- 21.4% Two stops
- 58.2% Three stops or more

How was your scenery experience?



- 2.4% Ordinary
- 17.3% Ok
- 62.9% Outstanding
- 17.3% Beyond any expectations

Driving through the trees and the Homer Tunnel got me all excited



- 4.3% Strongly disagree
- 12.4% Disagree
- 53.9% Agree
- 29.4% Strongly agree

# **Attachment 4 – The Milford Opportunities Project**

## **The Milford Opportunities Project**

The Milford Opportunities Project is a three-phased project resulting in the development of an eventual masterplan for the project area, capturing the essence of the Guiding Principle and General Objectives of the project which are;

### ***Guiding Principle***

*Enhancing Milford Sound, its corridor, and Fiordland National Park as key New Zealand visitor 'icons' providing a 'world class' visitor experience that is accessible, upholds the conservation values, reflects the unique nature of the place, and adds value to Southland and New Zealand Inc.*

### ***General Objectives***

- *To develop an understanding of the opportunities for increasing the economic returns from visitors to Milford Sound and Fiordland for those places, for Southland, and for NZ Inc.*
- *To develop a vision, strategy, and master plan for the future development of Milford Sound*
- *To identify opportunities to enhance access to Milford Sound and Fiordland National Park in a sustainable manner.*
- *To develop an approach to support Te Anau, Southland and NZ Inc to build on opportunities created by the Milford icon as a visitor attraction.*

The three phases of the project are;

- Gap Analysis (the subject of this report)
- Further Research
- Masterplan Development

At the time of preparing this Gap Analysis, the Project Team including the Governance Group were in the process of developing and defining a Project Vision. The draft Vision Themes that will increasingly influence the project direction are shown below (shown in no particular order).

## Vision Themes



### Better journeys

Milford journeys are multi-day experiences, where visitors choose to connect with a series of attractions across Southland



### Awe Inspiring

The place the world identifies when they think of Kipling's 8th wonder of the world



### Value

Activities don't undermine the true economic value of the Piopiotahi Milford Sound experience and the opportunity to use it to improve the quality of the environment and supporting infrastructure



### Conservation growth

Milford is an engine for conservation growth providing significant funding for conservation programmes



### The Experience

The journey into Piopiotahi Milford Sound is as much of an experience as the destination



### Continuously Improve

Monitor, understand and create next generation visitor experiences.



### Refresh

A journey of modular experiences – allowing key parts to be refreshed, to maintain its "world class" reputation



### Reveal

The journey is a series of "wow" factor moments and stories, building to the breathtaking Milford reveal



### Integrated

Everyone is working to the same vision



### Innovation

Devise innovative ways to protect the natural environment, manage visitor expectations and continue to provide a world-class experience



### Manage

Manage visitation in an agreed and planned way to protect this ancient natural treasure so that it endures into the future, remains a world class visitor destination



### Resilient

Adaptive and resilient to changes in environment and any escalation in climate-related events, such as avalanche and flood

## Project Context

The Milford Opportunities Project is a response to the increasing pressures that Milford, Fiordland, and the wider tourism sector are experiencing. Increasing visitor numbers and the opportunities for managing them is an issue that affects the environment, communities, and the economy. There is also a chance to create leveraging opportunities for Te Anau, Southland, and New Zealand Inc. The way visitors travel, particularly the trend away from the 'packaged bus tour' and towards greater numbers of Free Independent Travellers (FIT), has the potential to enable spreading the load from 'must do' visitor hotspots to broader regional tourism.

It is important that when looking at Milford opportunities, we consider Milford in its broadest context. The Milford experience is much more than just the activities that visitors can have in Milford Sound because the way people choose to travel creates different opportunities along the

way. Understanding key issues such as the way people travel, how they determine their itineraries, what experience they are looking for, and visitor flows in and out of Milford will enable us to maximise opportunities for tourism and economic growth for the region.

# **Attachment 5 – Stocktake of Customers**



## Stocktake of organisations associated with Piopiotahi

Te Rūnanga o Ngāi Tahu			Regulatory Authorities			
Rūnanga - Aparima Oraka, Hokonui, Awarua & Waihopai	Te Ao Marama Inc	Makaawhio Runanga	Department of Conservation	Southland District Council	Environment Southland	
<i>Kaitiakitanga</i>			<i>Regulatory Functions</i>			
New Zealand Government			Local Government			
MBIE	NZTA	Ministry of Transport	Environment Southland		Otago Regional Council	
Department of Conservation	Ministry for the Environment		SDC, ICC, GDC, Venture Southland		QLDC, CODC, CDC, DCC	
<i>National Governance</i>			<i>Local Governance<sup>6</sup></i>			
Conservation			Infrastructure			
NZ Conservation Board	Southland Conservation Board	Fiordland Marine Guardians	Milford Sound Tourism Milford Sound Infrastructure NZTA Ministry of Transport			
<i>Conservation</i>			<i>Provision of infrastructure</i>			
Recreational Users			Tourism			
Day Visitors	Hikers	Great Walk Walkers	Venture Southland Destination Fiordland Destination Queenstown MBIE  Local, Regional, National and International Visitors			
Recreational Fishers	Recreational Boaters	Recreational Kayakers				
Users of other Fiords (access)	Campers	Hunting / Diving				
<i>Recreation</i>			<i>Tourism Marketing / Governance</i>			
Community			Industry <sup>7</sup>			
Residents of Milford	Residents of Fiordland	Te Anau Community Board	Fiordland Fishermen's Association	Fiordland Lobster Company Ltd	Real Journeys	Cruise Milford
Manapouri Community Development Agency	Fiordland Trails Trust	Milford Community Trust	Skyline Enterprises	Southern Discoveries	Mitre Peak Cruises	Queenstown Milford User Group
Te Anau & Manapouri Community	Southland Community	New Zealanders	Ultimate Hikes	Rosco's' Kayaks	Distinction Hotels	Tour Guides
Nth Southland Townships	Queenstown Community	International Community	FIT Vehicle Suppliers	Heli & Plane Operators	Bus Companies	Accommodation Providers
<i>Community Interests</i>			<i>Business Interests</i>			

<sup>6</sup> Includes Natural Hazard Management

<sup>7</sup> This represents a 'snapshot' of industry and is not intended to be a comprehensive list.

# Attachment 6 - Legislative Context

## Milford Opportunities Project Legislative Framework

<b>Resource Management Act 1991</b>		
Environment Southland	Regional Policy Statement for Southland	2017
	Operative Regional Water Plan	2010
	Proposed Regional Water Plan for Southland	2016
	Regional Coastal Plan	2013
	Regional Air Quality Plan	2016
Southland District Council	Southland District Plan	2018
Te Rūnanga o Ngāi Tahu	Te Tangi a Taurira - The Cry of the People – Iwi Management Plan	2008
National Environmental Standards	National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health 2011	2011
<b>Local Government Act 2002</b>		
Southland District Council	Southland District Council Freedom Camping Bylaw 2015	2018
<b>Conservation Act 1987</b>		
Department of Conservation	Fiordland National Park Management Plan	2007
Department of Conservation	Southland Murihiku Conservation Management Strategy	2016
<b>Biosecurity Act 1993</b>		
Environment Southland	Regional Pest Management Strategy	2013
Environment Southland	Fiordland Marine Regional Pathway Management Plan	2017
<b>Other Legislation / Non-Regulatory</b>		
Central Government	The Ngāi Tahu Claims Settlement Act	1998
Environment Southland	Deed of Agreement between the New Zealand Cruise Ship Industry and Environment Southland	2008
Environment Southland, Southland District Council, Invercargill City Council and Gore District Council.	Southland Regional Development Strategy	2015
Environment Southland	Southland Regional Council Navigation Safety Bylaws	2009 (revised 2015)
Environment Southland & Otago Regional Council	Otago Southland Regional Land Transport Plans	2015
Environment Southland, Southland District Council, Invercargill City Council and Gore District Council.	Civil Defence Emergency Management (CDEM) Group Plan for the Southland Region	2017
Fiordland Marine Guardians (advisory)	Fiordland (Te Moana o Atawhenua) Marine Management Act	2005
Central Government	Land Transport Management Act	2003
Central Government	Public Transport Management Act	2008

# **Attachment 7 – Recommendations for Further Research**

The following table provides a discussion about the possible areas for further research.

<b>Recommendation:</b>	<b>Detail:</b>	<b>Context/ Rationale:</b>
<b>Recommendation 1: Infrastructure</b>	Understanding the collective package of infrastructure in Piopiotahi Milford Sound and the Milford Corridor (including Te Anau). What is the capacity of this infrastructure and the constraints? What opportunities exist for new infrastructure or changes to existing infrastructure provision? What impacts might arise from extracting non-essential infrastructure out of Piopiotahi or through relocation to new sites? Where does infrastructure provide cost effective and efficient opportunities for new development?	Data/ reports are available about the various infrastructure in Piopiotahi. Understanding the infrastructure as a ‘package’ and considering its overall capacity, and impacts of extracting non-essential infrastructure has not been considered before.
<b>Recommendation 2: Land Analysis</b>	Design-led work is required to map important landscapes that might be affected by development, identify places where development or visitor facilities (large or small) might be suitable, including infrastructure impacts. Identification of hazards and risks that impact investment.	Land analysis will enable the project team to better understand areas for potential consideration for development, protection and enhancement.
<b>Recommendation 3: Cultural Values</b>	While we have a base level of knowledge of the cultural values associated with Milford Sound and the Corridor, we require greater resources to fully understand and embed the aspirations of iwi into the conceptual masterplanning.	There are significant cultural values recognised in the project area. While the cultural values have been recorded in various forms over the years, the Gap Analysis (master list) only lists several key documents. We understand from Ngai Tahu representatives that there are more to draw from regarding further site specific values. Importantly the Ngai Tahu Settlement Act 1998 is a guiding piece of legislation that describes the Deeds of Recognition, Dual Place Names and Statutory Acknowledgements for the project area. The project area is specifically referred to as of significance to Ngai Tahu so it will be important that masterplanning work accurately and effectively embraces the values of Mana Whenua in this regard.
<b>Recommendation 4: Legislation</b>	Undertake an assessment of Legislative change options to enable the Milford Opportunities project to realise the vision. This could consider options such as a Piopiotahi visitor levy, international visitor levy, district by district taxes etc. There is also a knowledge gap in terms of lower level legislation, how it regulates land use and development in the project area, could inform the master	A considerable body of legislation exists for the project area, however consideration needs to be given to its effectiveness and whether there is a better solution for the project area in terms of enabling the vision to be realised.

	planning exercise and potential for enabling or restrictive plan changes at this level i.e. FNPMP / District Plan.	
<b>Recommendation 5: Hazard Analysis</b>	Undertake assessment of hazard risks (natural and human) for the specific purpose of informing the conceptual masterplan. This will include climate change, natural hazards, resilience, human related hazards including oil spill potential, vehicle crashes, sinking vessels etc. This is fundamental to informing the conceptual masterplan development. There are many significant natural hazard risks i.e. avalanche and human related i.e. Homer Tunnel in localised areas.	While good information is available about hazard risk, further work is required to understand and interpret the information in a way that will inform the conceptual masterplan. This is vitally important on a range of fronts, with high numbers of visitors there is a continual high risk of avalanche, snow /ice, earthquake prone, tsunami / flooding, tree slide, rainfall implications.  Also the risk to infrastructure at Piopiotahi and the road / tunnel itself. Keeping the road open is a constant challenge.  If (when) a major earthquake hits, what are the alternatives ? How do we plan to spread the visitors out through the region if it is out of action.
<b>Recommendation 6: Economic Analysis</b>	Currently there is little known about what visitors to Milford Sound spend; in Milford Sound itself, along the corridor, in the Wider Southland Region. Work is required to better understand what economic value visitors bring to the local and wider area. And whether this is offsetting the costs associated with providing a safe, attractive place for people to visit.	
<b>Recommendation 7: Customer Journey Mapping and Typologies</b>	Undertake a Customer Journey Mapping and Typology development exercise to better understand the key values, and points of significance for visitors coming into the project area. Customer Journey Mapping is possible for a range of the Customer types including tourists, recreational users and residents for example.	While some good (yet isolated) information exists about the experiences of visitors to the project area, further detailed analysis is required to understand the Customer Journey for a range of customer types. Customer Journey Mapping is one approach for better understanding the perspectives of visitors. Further to this, typologies could be developed to understand the types of customers to this area.
<b>Recommendation 8: Visitor Monitoring Programme</b>	It is proposed that a multi-agency visitor monitoring programme be designed utilising existing data sources and proposing new data sources. A quantitative survey could be designed utilising the existing University of Otago survey. The programme delivery would be costed and based on an initial five-year term. The programme implementation will require the	While significant information exists about the past and current visitor numbers, no detailed research has been undertaken to better understand what Piopiotahi, the corridor and wider region should be expecting with regard to visitor numbers. While a number of assumptions would need to be created to be able to make an assessment, this would be useful for understanding what the Conceptual

	<p>acquisition of hardware, software and other resources for delivery and will result in a Milford Visitor Annual Report. It is recommended that the implementation be funded for an initial five-year term.</p>	<p>Masterplan should be considering as part of its long term vision.</p>
<p><b>Recommendation 9: Understanding the Operator</b></p>	<p>Currently there is very little information available about the tourism operator market for Milford Sound and the wider region, beyond what is anecdotally available (acknowledging that information may be commercially sensitive).</p>	<p>There is a desire to better understand the market structure and characteristics of operators. What dictates supply and demand? How does the market know when it is saturated? What are the current trends telling us?</p>
<p><b>Recommendation 10: Conservation Values</b></p>	<p>While there is a significant amount of research available regarding conservation values, further research will be required once the broad conceptual masterplan has been formed, to better understand the potential consequences of the proposed approach.</p>	<p>A lot of studies have been undertaken into species and environments in the project area. None of the studies consider the project area in its entirety and recommend priorities for preservation, protection, enhancement. This work may be undertaken as part of the Fiordland National Park Management Plan review.</p>

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