

Waitaki Whitestone Geopark

environment | science | culture
education | sustainable development



Waitaki Whitestone
Aspiring Global
Geopark

Strategic Plan 2021–2025



"Ka titiro ake ki te tihi o
Aoraki,

Heke atu ki te awa
tapu o Waitaki,

Huri ki te Moana
o Araiteuru,

Tēnā koutou katoa"

"Look up to the top of Aoraki,
and back down the
Waitaki River,

to the Coast of the
ancient canoe of the Gods,
Araiteuru,

Greetings to you all"

This mihi is kindly given to the
people of and visitors to Waitaki
by Ngāi Tahu Whānui, the original
peoples of Te Waipounamu

Waitaki Whitestone Geopark



Strategic Plan 2021

Welcome to the Waitaki – a window into the world of Zealandia, the world's eighth continent – formed under an ancient sea and built on the remains of prehistoric creatures from a vanished world. Shaped by volcanoes and glaciers, our district is bordered by the mighty Waitaki River, an early super-highway for New Zealand's first people who left traces of their lives along its banks. Written in the stone and in our land is the story of the Waitaki – a geological wonderland, steeped in culture and history and waiting to be explored.

Nau mai, haere mai tauati mai rā ki te rohe o Te Rūnanga o Moeraki

Our people the Ngāi Tahu iwi (tribe) of this area tell of a time before Te Waipounamu (the South Island) and Te Ika o Māui (the North Island) were formed. This was a time of the Atua Māori (the Māori Gods). During that time, the sons of Raki (the god of the skies) and his first wife Pokoharua-Te-Pō descended from the sky kingdoms to the Great Oceans of Kiwa in the oldest son's waka (canoe). These sons were Aoraki, the oldest, and his younger brothers Raraki, Rakinui and Rarakinui.

When the time came for them to arise back to the heavens, mistakes were made in the karakia (ritual incantations) which were intended to lift them back up to their father's realm. Instead, a powerful and freezing gale sprang up and drove the Waka of Aoraki up onto a reef where it was swamped and left leaning on its side. Aoraki and his brothers scrambled to the highest side of the stranded waka and there, under the influence of the magical gale, turned to the mountains that stand at the highest peak of the Southern Alps.

Aoraki wept and his tears formed Lake Pukaki, and then flowed down the Waitaki (the crying waters) to the tides of Araiteuru. Over the eons that followed supernatural beings prepared the Waka of Aoraki to become a place fit for people to inhabit. Eventually, legendary Polynesian explorers arrived, and the ongoing history of Māori occupation commenced. These stories are written in our landscapes and we invite you to touch these histories and begin to interact with our understanding of the creation of our lands.

Ross McRobie

Chair – Waitaki Whitestone Geopark Trust

David Higgins

Upoko Rūnanga, o Te Rūnanga o Moeraki

**Ko tōku taunahanahataka,
Ko tōku tōpuni ki te whenua.**

**Our place names are the treasured
cloak which adorns the lands.**

Contents

Summary	5	Visitor /	
Purpose of this Plan	5	Manuhiri	22
Plan on a Page	6	Visitor hubs	22
Putting it Simply	7	Visibility	22
About Geoparks	8	Cultural Interpretation	22
What is a Geopark?	8	Waitaki Destination	
UNESCO Global Geoparks	9	Management Strategy	23
UNESCO Aspiration	9	Economy /	
Long term benefits for		Ōhanga	24
Waitaki and New Zealand	10	Enablers	25
Description of the		People	25
Waitaki Whitestone		Platforms	25
Geopark	10	Processes	26
Strategic Direction	11	Values	26
External review and		Governance	
recommendations	11	and Management	27
Vision	12	Patrons	27
Purpose	12	The Waitaki Whitestone	
Mission	12	Geopark Trust	27
Strategic Goals	13	The Advisory Group	28
Work Programmes	14	Management and staff	29
Lenses	14	Budget	29
Environment / Taiao	15	Audit	29
Protection	16	APPENDIX 1	
Access and facilities		Description of our Geopark	30
improvements	17	APPENDIX 2	
Cultural Interpretation		Our Story	49
and mahinga kai sites	19	APPENDIX 3	
Community / Hapori	20	Our Logo	51
Education	20		
Community Engagement	20		
Intepretation	21		

Summary

The Waitaki Whitestone Geopark Trust ("the Trust") has been set up to establish and govern a UNESCO-accredited Global Geopark within the Waitaki District. Geoparks are not just the preserve of geologists and rock-hounds. They are about telling the stories of how the land (and sea) have supported our existence, and shaped our lives.

In essence, the Trust will educate people and amplify the stories connected with the land. This will be mainly achieved through interpretive signage, targeted education programmes, and community participation in informative experiences and meaningful local projects. The Trust will also signpost people to stories which are better told by others – for example, iwi stories, the agricultural industry, built heritage, electricity generation, irrigation, mining, sustainable land management.

The establishment of the Waitaki Whitestone Geopark ("the Geopark") has been a collaborative endeavour between many individuals and organisations, both within the Waitaki district and beyond. The desire to create a Geopark in the Waitaki, Te Waipounamu, Aotearoa, started with the establishment of the Vanished World Geology and Fossil Trail and Centre in Duntroon, and would not have been possible without the enormous contribution that the volunteer members (present and past) of the Vanished World Incorporated Society have made to the knowledge and enjoyment of the current Vanished World Centre and Trail.

The local Ngāi Tahu Whānui representatives, Te Rūnanga o Moeraki, as mana whenua – holders of traditional authority over the Waitaki district, are members of the Trust with the Upoko Rūnanga (cultural leader) being a founding Trustee. The Rūnanga representatives have brought an indigenous history and lens to the creation of the lands and landmarks that form the Geopark. This sweeping creation story and cultural histories form a dynamic and human depth to the story of the Geopark. Giving this history authenticity and recognising the value of this contribution is also at the heart of the work the Trust is undertaking.

Purpose of this Plan

This Plan sets out the Mission, Vision, strategic direction, development roadmap and operating philosophy of the Geopark. It provides a description of the Trust's workstreams and provides a timeline for the key projects within each workstream up until 2025. An Annual Plan outlining the year's workplan and budget will be approved by the Trust for each financial year.

The Geopark has applied for designation as a UNESCO Global Geopark. Once successful, the Geopark will be inspected every four years to renew the designation. The Plan has a four year timeframe to align with the periods between inspections. At the time of adopting this Plan, the date of the initial designation inspection is uncertain as a result of the COVID-19 pandemic.

Enquiries

Enquiries about this Plan can be directed to:

Lisa Heinz, Geopark Manager

Telephone:

+64 3 433 1609 (day)

+64 22 581 5657 (mobile and A/H)

Email:

manager@whitestonegeopark.nz

Postal Address:

Private Bag 50058,

Ōamaru, New Zealand, 9444

www.whitestonegeopark.nz

Plan on a Page

Where we all come together as kaitiaki of the land and its stories

Enable people to care for and connect to our land and our people

Educate our communities to appreciate our land, its heritage and its stories

ENVIRONMENT TIAKI TAIAO

**Protect and enhance
Waitaki's natural and
cultural assets**

Our key geological, natural, cultural, heritage sites and assets are well curated, accessible and protected.

Appropriate protection and interpretation for Geopark Sites
Sustainable access and facilities at hero Geosites

Enhancement of cultural interpretation and mahinga kai sites

COMMUNITY HAPORI TIAKI TANGATA

**Drive social identity,
community pride
and encourage local
champions for the
Geopark**

The Geopark provides a unifying platform showcasing Waitaki's cultural and geological diversity, enabling people, communities and businesses to actively participate at all levels.

Education programme partnerships
Community engagement programmes
Increased community knowledge and engagement with Ngāi Tahu Whānui history

VISITOR TIAKI MANUHIRI

**Drive awareness,
engagement and
advocacy**

Locals are welcoming, and visitors actively choose to spend time learning, discovering and connecting with people, sites and experiences across Waitaki.

Visitor Hubs/Centres of Learning
Visibility – Touring Routes/Signage/Collateral
Cultural interpretation of major sites of Ngāi Tahu Whānui histories

ECONOMY ŌHANGA

Current businesses benefit from an economically sustainable Geopark and new businesses and residents are attracted to come and invest here.

PEOPLE

Manawhenua cultural engagement
Community Supporter programme
Partnerships
UNESCO networking

PLATFORMS

Digital assets/WWG websites and app
Social media
Tourism Waitaki and relevant websites/social media promotion

PROCESSES

Trust financial viability/funding
Brand identity/Comms guidelines
Year round communication linked to initiatives
Programme measurement and evaluation

Kaitiakitanga

We are guardians and protect our natural, built and cultural resources for the benefit of current and future generations.

Manaakitanga

We care for our manuhiri and we care for each other, are hospitable and generous.

Whanaungatanga

Whanau are at the core in everything we do. We build relationships through shared experiences and working together to create a sense of belonging.

Whakaute

Respect for each other, and respect for all.

Putting it Simply

What is a Geopark?

- A geopark is a defined area with geological significance that advances the protection and use of geological heritage in a sustainable way, and promotes the economic well-being of the people who live there
- It's about telling the stories of how the land (and sea) have supported our existence, and shaped our lives
- Geoparks actively involve and support local and indigenous peoples, preserving and celebrating their culture
- Uses the past to make people want to look to a better future

Why do we want to be one?

- Our place is facing earth-based and societal challenges – so we need to take better care of it and each other
- The Geopark will better connect everybody to our land and to the various communities which exist because of it
- If people understand the land, they will appreciate it and protect it

What will we do about it?

- Seek the most suitable level of protection for our geological features
- Educate locals and visitors about our unique land by providing a unifying platform to tell the stories of our land and its impact on our people
- Support Te Rūnanga o Moeraki to protect their cultural landscapes
- Provide ways to explore, experience and engage with the geology and related stories of our place
- Provide events and activities to bring people together to celebrate our land and each other

How will we do this ? – We will focus on:

- Geo-conservation (protection of and access to geosites)
- Education – informing our generations about our place and the need to protect it
- Sharing and sign-posting to local and indigenous knowledge

Outcome:

- Protection of and access to our geological heritage
- Informed and engaged residents, school children and visitors
- Authentic and engaging experiences for locals and visitors
- Kaitiaki of our place
- District and Community identity
- Greater knowledge of the Ngāi Tahu Whānui cultural histories and sites
- An environmentally friendly visitor economy endorsed by locals



About Geoparks

What is a Geopark?

A geopark is a defined area that advances the protection and use of geological heritage in a sustainable way, and promotes the economic well-being of the people who live there (McKeever & Zouros: Geoparks .Celebrating earth heritage, sustaining local communities, EPISODES, Dec 2007, pp 274-78).

Geoparks use that heritage to promote awareness of key issues facing society in the context of our dynamic planet. Geoparks are not just the preserve of geologists and rock-hounds. They are about telling the stories of how the land (and sea) have and will continue to support our existence, and shape our lives. Geoparks are a unifying platform for the stories of our lives – from how the land has sustained our need for food and shaped the cuisine of our places, to the development of built form and architecture, and (in our case) to the development of irrigation, electricity generation and social support systems for our people.

Geoparks sustain, and even enhance, the geographical character of a place by promoting a respectful and sustainable tourism model which is welcomed by locals. This is consistent with work being undertaken in 2021 to produce a Waitaki Destination Management Strategy (DMS).

The Global Geopark concept was developed and internationalised by a group of geoparks which formed the Global Geopark Network (GGN) in 2004. The GGN aims to enhance the value of geoparks while at the same time creating employment and promoting regional economic development.

Many geoparks promote awareness of geological hazards, help prepare disaster mitigation strategies with local communities, educate on climate change issues, inform people about the sustainable use and need for natural resources (whether they are mined, quarried or harnessed from the surrounding environment), as well as demonstrating a "best practice" approach to using renewable energy and employing the best standards of "green tourism". In New Zealand, many of these functions are delivered at a national or regional government organisation level. The Geopark will amplify this work. The Waitaki Whitestone Geopark will focus on educating our locals and visitors about the need to care for our place, while at the same time promoting respect for the environment and the integrity of the landscape.

Geoparks are not a legislative designation so have no legislated power, although the key heritage sites within a geopark are often protected under local, regional or national legislation.

UNESCO Global Geoparks

The Global Geopark Network (GGN) received ad hoc support from UNESCO from 2001 until 2015, when the relationship and designation was formalised. The geopark concept was adopted by UNESCO in November 2015 as its first new designation since the naming of World Heritage sites in 1972.

This expressed governmental recognition of the importance of managing outstanding geological sites and landscapes in a holistic manner. The GGN works in synergy with UNESCO's World Heritage Centre and Man and the Biosphere World Network of Biosphere Reserves, which focus predominantly on the protection of natural and/or cultural values largely through statutory land definitions and regulations. They represent a much more specifically inclusive relationship between communities and the lands they live in and work with. Reflecting this distinction, 'Geoparks' are defined by UNESCO as follows:

"UNESCO Global Geoparks are single, unified geographical areas where sites and landscapes of international geological significance are managed with a holistic concept of protection, education and sustainable development."

According to the Statutes and Operational Guidelines of the UNESCO Global Geoparks, for a geopark to apply to be included in the GGN, it needs to:

- have a management plan designed to foster socio-economic development that is sustainable based on geotourism
- have joint proposals submitted by public authorities, local communities and private interests acting together, which demonstrate the best practices with respect to Earth heritage conservation and its integration into sustainable development strategies
- demonstrate methods for conserving and enhancing geological heritage and provide means for teaching geoscientific disciplines and broader environmental issues

A successful Waitaki Whitestone Geopark aligns with the blueprint of the New Zealand Government which aims, amongst other objectives, to support thriving regions; transition to a clean, green and carbon-neutral New Zealand; ensure everyone is earning, learning, caring or sharing; and builds on our partnership with the local Māori Iwi Ngāi Tahu Whānui.

UNESCO Aspiration

The New Zealand National Commission for UNESCO is establishing a UNESCO Global Geoparks programme in New Zealand. Through its Expert Advisory Panel in June 2018 it endorsed the 'Waitaki Whitestone Aspiring Geopark' application, led by Waitaki District Council, as New Zealand's first bid for an area to be formally granted the international UNESCO Global Geopark status.

The Waitaki Whitestone Geopark Trust ("the Trust") has been set up to establish and govern a UNESCO-accredited Global Geopark within the Waitaki District. The Waitaki Whitestone Geopark is now an aspiring UNESCO Global Geopark (aUGGp), having applied to UNESCO for the designation in November 2019. Our desire to become a UNESCO Global Geopark is rooted in our strong commitment to build a generation of people who are more resilient and who will care for the planet and its people by addressing the societal challenges related to our geology and our geography. In doing so we offer coming generations a more assured future, and we will increase the social and cultural capital of our district. A key benefit of the Geopark will be the creation of innovative local enterprises, new jobs and visitor revenue.

Our quest to become a UNESCO Global Geopark

- provides the framework of values and goals to guide our actions
- provides the unifying framework which weaves together our stories
- creates worldwide brand profile for Waitaki and New Zealand – a reason for people to visit
- creates a fundraising platform to fund our protection, education and sustainable development goals
- increases the number and spend of visitors to our district
- provides access to a network of Geoparks to learn from.



Long term benefits for Waitaki and New Zealand

New Zealanders, from as far back as the first Māori settlement, have always been dependent upon and intimately connected to the land. The process of establishing, and then maintaining, the Waitaki Whitestone Geopark will produce benefits for our local communities, our district, the region and New Zealand overall.

As a result of the recognition afforded by UNESCO Global Geopark accreditation, we will:

- Be better able to protect the wonderful geology present within the Geopark. We will preserve the Geopark's social licence to operate by being a responsible steward and custodian of the geological, cultural and heritage sites within the Geopark. The Trust will ensure that the Geopark operates in accordance with the values described above. UNESCO status will provide greater incentive for Government agencies to support the work of the Geopark.
- Partner with Te Rūnanga o Moeraki to provide an authentic representation of the creation stories and lifestyles of the Māori iwi who were the people in these landscapes. This will encourage local people to better understand and embrace these histories and will inspire visitors with its sweeping vision and connectivity with the lands they are visiting.
- Develop a heightened sense of local pride and strengthening of our identity as people of Waitaki, people of New Zealand and citizens of the world. The Geopark will be a beacon to attract researchers and visitors to our district. We will be able pass on the knowledge and values of our Geopark to them all.
- Enhance the relationship between the peoples within our district, our country and with visitors to our place. We will better integrate the stories of the land, Māori, and colonial settlers so that we holistically understand and appreciate the value of our land and what we must do together to care for it.
- Diversify our economy so that we reduce our long-standing reliance on primary production. We will create a platform which encourages the growth of tourism and other industry sectors such as agriculture, geogastronomy, research and education, and heritage support in a sustainable way that advances the economic wellbeing of our residents and showcases these values to our visitors.
- Contribute to the achievement of UNESCO's Sustainable Development Goals, and share our learnings with the members of the Global Geopark Network.

Description of the Waitaki Whitestone Geopark

A full description of the WWG can be found in the Application to become a UNESCO Global Geopark (2019), which can be found on the Geopark website www.whitestonegeopark.nz. Some material within these documents has changed due to the natural course of development of the Geopark project, and particularly as a result of the COVID-19 pandemic of 2020/21.

Appendix 1 provides a summary description of the Geopark and a list of geosites (places of geological significance) within the Geopark.



Strategic Direction

The initial Geopark Management Plan (2019-20) was largely shaped by the self evaluation process carried out during the application process for UGGP designation. This Strategic Plan pivots the emphasis of the Geopark from its limestone ("Whitestone") origins to the essence of the Geopark being defined as a Window into Zealandia, the 8th continent.

The Strategy pivots the primary driving focus of the Geopark from serving visitors to delivering community-based outcomes, and as such it will be further developed through community participation and input from the Advisory Group.

This change in direction was exacerbated by COVID-19 closing borders and causing a reimagining of what the future visitor economy will look like. It is not anticipated that significant numbers of international visitors will return to Waitaki until at least 2024. However, a valuable learning from this has been that Geoparks really do need to be built 'bottom-up', and that community and Council support is critical.

A commitment has also been made that, when the Trust has acquired sufficient funding, it will take over the operation of Vanished World Discovery Centre and Trail at Duntroon. The Centre lies at the heart of the Geopark, displaying many marine-based fossils. The Trust's Executive Manager is working with University of Otago to formalise the copyrights and terms of loan associated with a number of the artefacts on display at Vanished World.



External review and recommendations

The Trust first applied to UNESCO for designation as a UNESCO Global Geopark in 2018. In 2019, the Trust engaged Prof. Patrick McKeever to undertake a review of the state of the Geopark in relation to the criteria for Global Geopark designation.

The review said that the Waitaki Whitestone Geopark had all the elements of a UGGP, but that the elements needed to be woven together more cohesively and in a way which led people from one element to another. The review also highlighted some work that needed to be done to solidify engagement with community groups and iwi.

Significant progress has been made in not just engaging with iwi, but in having them as co-designers at the heart of the Geopark. A collaborative project with Ngāi Tahu cultural advisors and artists has resulted in the development of a new brand, logo, imagery and interpretation material which more strongly reflects te ao Māori principles.



The Trust's educator has made great connection into the primary school sector, delivering School of Rocks at Duntroon in 2019, and intending to expand this across the district in 2021/2022. Sasha has organised public talks across a range of geological, biodiversity and cultural topics, often attracting large crowds. Her connections to Otago Museum have resulted in the Museum offering to loan the Women in Science exhibition to Ōamaru.

The following sections present the Vision, Purpose, Mission, key result areas and major workstreams of the Geopark. An Annual Plan which includes the work programme, schedules and budget is approved each year.



Vision

Where we all come together as kaitiaki of the land and its stories

The Vision held by the Trustees, on behalf of all the residents, visitors, supporters and promoters of the Geopark, is that the presence of the Geopark will encourage everybody to cherish, care for and protect our land and sea (and sky).

The Vision acknowledges the importance of story-telling as the way in which people can relate, at multiple levels to the lessons we have learned and have yet to learn from understanding our land and the impact that we, as humans, are having on it.

Within this Strategic Plan, we will often use the term "land" to generically mean the earth, sea, sky, and flora and fauna which constitute "our place".

Purpose

Enable people to care for and connect to our land and our people

Our purpose answers the question of "What will we have to achieve to bring our vision to life"? The Trust believes that people will not care for our land if we are not connected to it.

With such a large and encompassing Vision, and like most agencies being constrained by resources, the Trust has chosen as its purpose to be the agency which increases our people's connection to the land and to other people.

The Trust's purpose is increase peoples' knowledge, understanding and heartfelt connection to our place in a way which ensures their commitment to becoming kaitiaki. People will be knowledgeable and informed and engaged enough with it to be motivated to make a difference – either by what they do or what they choose not to do.

Mission

Educate our communities to appreciate our land, its heritage and its stories

Many individuals and agencies subscribe to the Vision of the Geopark, each playing a specific role in communication, funding or delivering what needs to be done to make the Vision a reality. The Trust's Mission reflects what the Trust can do, given the existence of other agencies, the level of resources available, and the likelihood of making a real difference.

The Trust is not resourced nor has the expertise to do everything. In essence, the Trust will educate people and amplify the stories connected with the land. This will be mainly achieved through interpretive signage, targeted education programmes, and community participation in informative experiences and meaningful local projects.

The Trust will also signpost people to stories which are better told by others – for example, the agricultural industry, built heritage, electricity generation, irrigation, sustainable land management and iwi stories.

Strategic Goals

There are four 'key result areas' which align with the intent of the Trust and where the Trust can realistically make a difference. These areas are the focal points for Trust activity – and reflect the Mission of the Trust to better connect people to the land.

A Strategic goal and description of what a successful outcome will be has been developed for each result area.

The areas in which the Trust can deliver, facilitate or promote significant outcomes are:

- The Environment / Taiao
- Our Community / Hapori
- Visitors / Manuhiri
- The Economy / Ōhanga

The Trust has determined what their goal is for each result area. The Goal is related to what the Trust's determined purpose is, and what it can achieve given both its level of resources and the fact that other agencies are contributing to the Vision in differing ways.

The Table below describes the Trust's Goals in each of these result areas, and the outcomes which would indicate that we are making progress towards each Goal.

The Goals start with the Environment / Taiao, which is at the heart and Raison d'être of the Geopark. The regard for the Environment is expressed through our interactions with community, visitors and with relevant landowners.

The Economy / Ōhanga goal is largely a result of us achieving the goals in the first three areas.

ENVIRONMENT TIAKI TIAO

**Protect and enhance
Waitaki's natural and
cultural assets**

Our key geological, natural, cultural, heritage sites and assets are well curated, accessible and protected.

COMMUNITY HAPORI TIAKI TANGATA

**Drive social identity,
community pride
and encourage local
champions for the
Geopark**

The Geopark provides a unifying platform showcasing Waitaki's cultural and geological diversity, enabling people, communities and businesses to actively participate at all levels.

VISITOR TIAKI MANUHIRI

**Drive awareness,
engagement and
advocacy**

Locals are welcoming, and visitors actively choose to spend time learning, discovering and connecting with people, sites and experiences across Waitaki.

ECONOMY ŌHANGA

Current businesses benefit from an economically sustainable Geopark and new businesses and residents are attracted to come and invest here.

Work Programmes

A series of work programmes are required to deliver on the Trust's Strategic Goals.

The work programmes listed below are those that are relevant to this phase of the Geopark's development, and may change over time, although these programme areas may well have an ongoing relevance to the work of the Trust. The projects to be undertaken within each work programme will be decided upon each year, in accordance with Trust priorities, capabilities and funding available.

Lenses

There are two sets of lenses which Geopark staff and participants look through when designing and delivering projects.

Major Themes

The major themes are the ways in which an objective observer would naturally 'see' the Waitaki. These themes are :

- **Geology** – the geosites and physical vistas and landscape of the district, and how our geology has been used in built heritage and shaped the urban form of many towns.
- **Iwi cultural histories** – these histories are embedded in the names, forms and essence of the landscape.
- **Food and Fibre** – the way in which the land and sea is expressed through primary sector activity – mahinga kai, farming, horticulture, fishing, forestry etc., and the ways in which the products of these are prepared, consumed and celebrated.
- **Water** – the lakes, rivers, wetlands of the district, and how they have been used for purposes such as recreation, irrigation and hydraulic and electric power generation.

Locations and Community

Many communities have been built around geosites or geophysical features. At these locations, a number of the major themes may come together to create the history of that community. For example, the Te Kaihinaki / Moeraki Boulders is a geosite around which the geological explanation for the Boulders is accompanied by the iwi story of the arrival of Ārai-te-uru, a large sailing waka. Alongside this, the development of a fishing industry in Moeraki is its own story, as is the concentration of three food outlets in the small community.

Waihemo, the Southern gateway to the Geopark contains 20% of the Geopark's geosites. The district has much volcanic history, a Plesiosaur fossil, mining of coal at Matakaea/ Shag Point and gold at Macraes, building the social history of towns like Dunback on the trail to Central Otago, and Palmerston, the Geoparks' second largest town.

Looking through multiple lenses and choosing the appropriate one(s) allows the design and development of projects and initiatives which most effectively reach varying target audiences.

Environment / Taiao

- Appropriate protection and interpretation for Geopark Sites
- Sustainable access and facilities at hero Geosites
- Enhancement of cultural interpretation and mahinga kai sites



Geology is at the core of the Geopark. The geosites and vistas within the district are the physical reminders to people of why the Geopark exists and why they should care.

The entire territory of the Geopark is managed/ administered under the legal protection of the Resource Management Act (RMA) 1991, the purpose of which is to promote the sustainable management of natural and physical resources (Note that the RMA is under national review in 2021). Many sites within the Geopark are also protected by a range of additional legal mechanisms more specifically focused on their geological, cultural, heritage and landscape values.

The Geopark also includes sites that are managed and protected under the Reserves Act 1977, the Conservation Act 1987, the Heritage New Zealand Pouhere Taonga Act 2014 and through legal covenants with the Queen Elizabeth II National Trust. Alongside these statutory controls, there are other local by-laws which offer further protection for sites such as avoiding nuisance effects on reserves land, freedom camping, vegetation removal and the keeping of animals and stock. There are also sites that have remained under traditional Māori ownership.



Protection

Various levels of protection can be applied to geosites. The hierarchy of protection levels is:

1. QEII (covenant arrangement)	This is a site-specific relationship in perpetuity between the landowners and the QEII Trust. Site specific protection, access, safety measurements etc. are negotiated between them.
2. Waitaki District Plan (operative): Increased levels of protection for all Geopark sites is currently being considered as part of the Waitaki District Plan Review.	<p>This protects sites from inappropriate development, certain land uses, earthworks and subdivision rather than incidental damage such as carving out the rock. Seven basic categories:</p> <ul style="list-style-type: none"> a. Outstanding Natural Landscapes (national importance) b. Outstanding Natural Features (national importance) c. Significant Coastal Landscapes (national importance) d. Significant Natural Areas (national importance) e. Significant Natural Features (regional importance) f. Geopreservation sites (identification of sites of district importance) g. Rural scenic zone (district importance)
3. Other protection levels:	<ul style="list-style-type: none"> a. Heritage New Zealand protection b. Department of Conservation – Scientific reserves c. Regional Policy Statements (published by Regional Councils)

UNESCO accreditation requires that measures be put in place to protect environmental, cultural and geological significant sites before UNESCO Global Geopark status is awarded. Every geosite will differ in its protection needs. While some will stay unavailable to the public, some might be able to receive more visitors, which means measures need to be put in place to protect the site and its value. The Waitaki Whitestone Geopark's philosophy is to work together with the landowners and support them in what they want to do, while advocating for an appropriate and meaningful protection level.

The key for the following table is:

NSR	National Scenic Reserve
SCL	Significant Coastal Landscape
SNF	Significant Natural Feature
ONF	Outstanding Natural Feature
ONL	Outstanding Natural Landscape
RSZ	Rural Scenic Zone
RGZ	Rural General Zone
HNZ	Heritage New Zealand Pouhere Taonga Act 2014

Current protection levels for geosites:

Geosite	Protection
Paritea (Clay Cliffs)	QEII covenant and ONL
Takiroa shelter rock drawings	SNF, Archaeological item (5653)
Elephant Rocks	SNF
Anatini	QEII, SNF
Te Kaikōnaki (Moeraki Boulders) and Scenic Reserve	Scenic Reserve, ONF, Geopreservation site, scientific site
Matakāea (Shag Point)	SCL, Recreation reserve
Ahuriri	ONL and Conservation Park
Ōrore (All Day Bay)	SCL
Te Awa Kōkōmuka (Awamoa Creek Fossils)	Archaeological item (5688)
Beach Road Erosion	SCL
Boatman's Harbour	SCL
Brewery Hole	HNZ
Bridge Point	SCL
Campbells Bay	SCL
Devils Bridge Wetland	QEII covenant, SNF
Waipata (Earthquakes)	SNF
Enfield dikes	Under investigation
Golden Point Battery	Historic Reserve, Heritage Item (129)
Hutchesons Quarry	Scientific Reserve
Huttons Bridge, Otago Schist	Under investigation
Kākaunui River (Kakanui) Mouth	SCL
Kātiki	SCL, site of natural significance, archaeological items (5697, 5696, 5695, 5698), traditional Māori ownership
Maerewhenua rock art site, Duntroon Escarpment	ONF, Archaeological items (5655, 5657), partial historic reserve
Moeraki Peninsula	SCL, Geopreservation site, recreation reserve
Nenthorn Goldfield	Referenced for conservation purposes s62(1) Conservation Act 1987
Ōamaru limestone dike	Under investigation
Ōhau Moraines	ONL and Conservation Park
Makotukutuku (Old Rifle Butts)	SCL, Geopreservation site
Puketapu	SNL, Heritage Item Cat B (108), Archaeological items (5703, 5705)
Rakis Table	RGZ
Tokarahi Sill	Under investigation
Trotters Gorge	Scenic Reserve
Valley of the Whales	SNF
Wai o Tōura Reserve	NSR
Waitaki River	Waitaki Catchment Water Allocation Regional Plan, Mahinga kai easements/reserves, nohoanga
Prydes Gully Road Quarry	Under investigation
Ostler Fault zone, 'The Knot'	RSZ
Landon Creek bank	RGZ
Otepopo (Mt Dasher) slate	HNZ
Te Awa Whakamau (Awahokomo) karst pinnacles	QEII covenant
Jackson's Paddock	RGZ
Te Kōakaumu (Kokoamu) Bluff	SNF, Geopreservation site

The Geopark recognises that a small number of sites within the Geopark do not currently benefit from specific protection for their geological interest through existing statutory mechanisms (these being sites 04, 17, 18, 20, 21, 24 29, and 31). In such cases, the Geopark will work closely with Council, agencies and landowners to discuss protection of the site through private covenant agreements, for example, with the Queen Elizabeth II National Trust, or through the creation of a Memorandum of Understanding between the landowner and the Geopark Trust. Increased levels of protection for all Geopark sites is currently being considered as part of the Waitaki District Plan Review.

The Trust's strategic intention is to:

- submit to relevant organisations on national, regional, and local policy statements and plans regarding the preservation of geological heritage
- have all 42 geosites identified and afforded appropriate protection under the Waitaki District Plan Review.
- working with individual landowners, achieve the most appropriate level of protection for each geosite

Stronger legal protection under the provisions of the Resource Management Act 1991 (RMA) is being sought for each Geopark site through the Waitaki District Plan Review process. Naturally formed Geopark sites will be considered as Outstanding Natural Features (ONF) or Significant Natural Features (SNF). GNS Science have worked with Waitaki District Council to provide advice on the identification of the Geopark sites as ONF. ONF status will ensure that the protection of each Geopark site becomes a matter of national importance. It is anticipated that the District Plan Review will become a statutory document by the end of 2022 with naturally formed Geopark sites protected as either an ONF or an SNF.

The first steps in enhancing geosite protection is for the Trust to engage with the landowners and seek to have them help determine the appropriate level voluntarily of protection.

Access and facilities improvements

It is acknowledged that increasing pressures from tourism and recreation will also need to be considered as the Geopark develops. Visitor pressures include potential physical damage to geological features and increased demand for visitor facilities and amenities such as footpaths, public toilets, visitor centres, signage, car parking etc.

Hero Sites

Priority for improving access and interpretation will be given to the following sites which are identified as 'hero geosites' (those that tell a crucial geological or cultural story, are visually striking and easily accessible for locals and visitors. These sites are ideal for educational purposes). Hero sites should have sufficient facilities and infrastructure such as carparks, walkways, toilets and interpretation.

HERO GEOSITE	Carpark	Toilet	Walkway	Signage
Paritea (Clay Cliffs)	NI	NI	NI	✓
Takiroa shelter rock drawings	✓	X	✓	✓
Elephant Rocks	NI	NI	X	✓
Anatini	NI	X	NI	✓
Te Kaikānaki (Moeraki Boulders) and	✓	NI	✓	✓
Matakaea (Shag Point)	✓	✓	✓	✓
✓	= Satisfactory condition			
X	= Not existent, but no need in the short/medium term			
NI	= Needs improvement			
n/a	= Not applicable			

Together with the landowners and other related organisations, the Waitaki Whitestone Geopark aims to reach appropriate protection and sustainable access, facilities and interpretation at all hero sites. The range of potential improvements depends on the site, and could include any of the following:

- Improved Carparking,
- Improved Interpretation at site and near roadways
- Viewing areas
- Rubbish management,
- Toilet facilities
- Bike racks
- Walkways/boardwalks with disability access
- Tracks and footbridges
- Seating
- Vegetation management

The Trust has recently secured Tourism Infrastructure Fund and Council investment to develop facilities at Elephant Rocks. Negotiations with the landowners are in progress.

Key Sites

Key sites tell a specific part of the overarching geological, cultural or natural story, and are accessible to the public. Key sites might appeal only to a specific target group or might be off the beaten track. Together with the landowners and other related organisations, the Waitaki Whitestone Geopark aims to reach appropriate protection for all key sites and to develop sustainable access, facilities and interpretation at selected key sites.

Key to Key Geosite table (right)

✓	= Satisfactory condition
x	= Not existent, but no need in the short/medium term
NI	= Needs improvement
n/a	= Not applicable

Other Geosites

Other Geosites are on private land with no access for the public. The story that they tell can be heard and seen at museums, other locations or through online material. Together with the landowners and other related organisations, the Waitaki Whitestone Geopark aims to reach appropriate protection for these sites, however, access and facilities are not being developed.

OTHER GEOSITE	Carpark	Toilet	Walkway	Signage
Ostler Fault zone, 'The Knot'	n/a	n/a	n/a	n/a
Landon Creek bank	n/a	n/a	n/a	n/a
Otepopo (Mt Dasher) slate	n/a	n/a	n/a	n/a
Te Awa Whakamau (Awahokomo) karst pinnacles	n/a	n/a	n/a	n/a
Jackson's Paddock	n/a	n/a	n/a	n/a
Te Kōakaumu (Kokoamu) Bluff	n/a	n/a	n/a	n/a

The Trust's strategic intention is to:

- develop hero geosites as per the improvement opportunities listed in the above table.
- Working with the landowners, use Tourism Infrastructure Fund and Council investment to improve the facilities at Elephant Rocks
- Select the most easily developed key sites to become hero sites
- Provide education and develop display collateral about other geosites

KEY GEOSITE	Carpark	Toilet	Walkway	Signage
Ahuriri	✓	x	n/a	NI
Ōrore (All Day Bay)	✓	✓	n/a	NI
Te Awa Kōkōmuka (Awamoa Creek)	✓	x	n/a	x
Beach Road Erosion	✓	x	x	x
Boatman's Harbour	✓	x	✓	✓
Brewery Hole	✓	✓	n/a	✓
Bridge Point	NI	x	x	NI
Campbells Bay	✓	✓	✓	NI
Devils Bridge Wetland	NI	x	✓	✓
Waipata (Earthquakes)	✓	x	NI	NI
Enfield dikes	NI	x	n/a	NI
Golden Point Battery	✓	x	NI	✓
Hutchesons Quarry	✓	x	NI	NI
Huttons Bridge, Otago Schist	✓	x	x	x
Kākaunui River (Kakanui) Mouth	✓	x	n/a	NI
Kātiki	✓	NI	✓	NI
Maerewhenua rock art site, Duntroon Escarpment	NI	x	✓	✓
Moeraki Peninsula	✓	✓	✓	✓
Nenthorn Goldfield	✓	✓	n/a	✓
Oamaru limestone dike	✓	✓	n/a	NI
Ōhau Moraines	✓	NI	✓	NI
Makotukutuku (Old Rifle Butts)	NI	x	n/a	NI
Puketapu	NI	x	✓	NI
Rakis Table At Tunnel / At Viewing Site	✓	x	✓	NI
	NI	x	n/a	NI
Tokarahi Sill	NI	x	n/a	NI
Trotters Gorge	✓	✓	✓	NI
Valley of the Whales	NI	x	n/a	NI
Wai o Toura Reserve	NI	x	NI	NI
Waitaki River	✓	x	n/a	NI
Prydes Gully Road Quarry	NI	x	x	NI

Interpretation

The Trust recognises that to have people engage with the Geopark it must be visible to them on a number of levels.

The prime mechanism for this is interpretation signage, which outlines the geological, cultural and/or social significance and stories at each site. The Trusts' signage projects will have a secondary benefit of protecting the Geopark sites by creating awareness around the unique and special geological and cultural heritage.

Signage projects involve partnerships with Waitaki Whitestone Geopark Trust (WWGT), Ngāi Tahu and specifically Te Rūnanga o Moeraki, Department of Conservation (DOC), University of Otago, Waitaki District Council, and will work towards enhancing the relevance and relationship of the WWGT to central government, while furthering our UNESCO status eligibility.

The new signage will:

- tell the geological and authentic cultural history of each location
- connect each site to the greater Geopark concept
- visibly connect all stakeholders including the local community, iwi and visitors
- create an awareness around the significance of each site and ensure information is available for further study (for example, QR codes to website on each location, consistent branding and infrastructure, indigenous representation, adequate information and links at each site for school groups to participate)
- access historical information
- The new signage will have the ability to be updated with little to no infrastructure costs -i.e. economical replacement signs/stickers available for all signs, digital updates of QR codes to updated information.

The Trust's strategic intention is to:

- Install signage at hero sites
- Install signage at key sites where possible
- Refresh signage at sites on the Vanished World Trail
- Co-design signage with iwi where there are sights of cultural value to them

The first sites where signage will be installed are :

1. Ahuriri Valley
2. Ohau Moraines
3. Hutchesons Quarry
4. Kakanui Breccia
5. Campbells Bay
6. All Day Bay
7. Puketapu

As well, all Vanished World Trail signs will be refreshed.

Cultural Interpretation and mahinga kai sites

Of critical importance to the Ngāi Tahu Whānui pre-colonial economy was the gathering of wild foods.

In the Southern half of the South Island the horticultural practices brought from Polynesia by Māori were unable to be used as the temperatures were too cold. This led to a culture of collecting and preserving wild foods for consumption during the year. These were the 'mahinga kai' practices of Māori. Mahinga kai practices have been handed down from the ancestors to current day Māori who continue to gather this food in the traditional ways. The Waitaki River is both a place where such practices are maintained and where, in previous times, preserved food was carried down to the coast from the vast inland food gathering areas of the South Island. Mahinga kai practices are seen as a "taonga tuku iho", as treasures handed down from our ancestors, and as such, they form a large part of our identity. Today Māori continue to strive to ensure access to these practices can be maintained.

The Trust's strategic intention is that:

- Te Rūnaka o Moeraki will lead the work within the geopark to advance protection and interpretation of mahinga kai sites.



Community / Hapori

- Education programme partnerships
- Community engagement programmes
- Increased community knowledge and engagement with Ngāi Tahu Whānui history



It really is true that geoparks are community-led and built from the bottom up. Increasing the knowledge of people, especially in the formative school-age years, makes people feel more connected to their place and more equipped to discuss and address the societal challenges we are facing.



Education

Education is the prime tool in the Geopark's kitbag to influence the attitudes and behaviours of both residents and visitors alike.

Expanding on the School of Rocks programme delivery to Duntroon Primary School in 2019, we aim to offer this programme to primary schools throughout the Waitaki District. This will allow students and teachers to learn about our land through the geological treasures and landscapes found within our Geopark. We hope by engaging with this programme, our school communities understanding and appreciation of earth science will be increased through using local and often familiar examples. Knowledge through education adds to our appreciation of our rich geological heritage, and our understanding of earth processes occurring today.

With the localisation of the curriculum in secondary schools in the near future, we aim to work with teachers – offering support in the development of new content.

Community Engagement

Another way of disseminating knowledge, and also increasing everybody's awareness of the Geopark, are the various forms of community engagement undertaken by the Trust and its partners. Key amongst these programmes are the Public Speaker series, newsletters, communications channels and geosite interpretation signage.

It is through these channels we aim to engage with and increase our communities understanding and appreciation of our land. We aim to bring to our communities attention sites they may already be very familiar with – but adding to their knowledge and understanding of processes behind their formation, their special characteristics and the significant stories behind them.

We also hope that by hosting multi-disciplinary experts as our public speakers in our monthly talks that our communities will be able to engage with such specialists and their area of knowledge and research and by so doing add to our further understanding of our land, whether that be biodiversity, ecology or other areas of interest.



Photo credit: Steve Ting

Our newsletter and other communication channels are forms we use to regularly connect and raise awareness to our community about events, projects and news items relating to our geopark.

Interpretation

Geosite interpretation signage is a medium through which we aim to communicate site specific stories. We aim to cover a range of topics depending on the location. These may include geology and other earth science, social, historical, biodiversity, and iwi stories. Iwi are an equal partner in the development of the Geopark.



The Trust's strategic intention is to:

- Deliver educational programmes into schools
- Support teaching staff at Waitaki schools to enhance earth science modules
- Collaborate with Otago University's Science and Communication department to develop engaging projects for students as input to their degrees
- Engage local communities via monthly public talks, media, events, activities and competitions
- Attract displays and exhibitions to the district
- Install activities such as trails in parks
- Set up a volunteer scheme for people to be able to participate in the Geopark



Visitor / Manuhiri

- Visitor Hubs/Centres of Learning
- Visibility - Touring Routes/ Signage/Collateral
- Cultural interpretation of major sites of Ngāi Tahu Whānui histories



Visitors are important to the Geopark because they spread the messaging of the Geopark to other audiences around the country and the world. They also bring diversity and money into the district.

Visitor Hubs

The Vanished World Centre at Duntroon and Vanished World Trail are centres of learning and experiences at the core of the Geopark. Driven by volunteers, the Trust has committed to assuming responsibility for Vanished World as soon as funding and resources allow. The Trust has also committed resources to the Vanished World redevelopment project.

As resources permit, a Visitor Centre in Ōamaru will be created as a taster location which signposts the Geopark's sites and attractions to visitors. It will also be a welcoming space where locals can learn about their own place.

Visibility

The Trust has a current project under way to install or update interpretation signage at key geosites which have public access (refer section above on Access and Facilities) and on the Vanished World Trail.

The sales of Geopark merchandise has commenced.

The Waitaki Whitestone Geopark Touring App was launched in 2019 and is one in which travel itineraries are shared throughout the Geopark with locals and visitors.

Cultural Interpretation

Te Rūnanga o Moeraki will lead the work within the Geopark to advance cultural interpretation of sites of significance to Ngāi Tahu Whānui heritage and history.

Other cultural stories – for example, the history of Chinese gold mining and the build heritage of the Victorian Precinct, will be told by other organisations. The Geopark will share and amplify these histories.





Waitaki Destination Management Strategy

The tourism industry in NZ has been severely impacted by Covid 19 and as a result tourism organisations are being asked by the NZ government to re-imagine their offering with a view to ensuring visitors give back more than they take.

Destination Management plans are being developed to ensure more co-ordinated management of all aspects of a destination that contribute to a visitor's experience. The overall aim is to ensure sustainable growth and resilience for the benefit of the local community with outcomes aligned to the four wellbeings. Kaitiakitanga/ environmental stewardship is a key commitment and as such is closely aligned to the Geopark Vision, Purpose and Mission.

Waitaki's deep roots provide multiple story telling opportunities and Hero experiences across the district will bring these stories to life. Hero Geosites (eg Te Kahinaki/Moeraki Boulders) are key visitor destinations today and ensuring these are protected and enhanced for our children's children is at the core of the Geopark's mission. Working together with Iwi as partners and key stakeholders, the Geopark team will support and amplify this work via interpretative signage and educational programmes. Voluntourism (a form of tourism in which travellers participate in voluntary work) and giving back programmes are likely to be key components of Destination Waitaki to ensure we move beyond sustainable to a more regenerative visitor economy model.

Effective knowledge sharing will also promote local pride and in tandem localising of the school curriculum provides an excellent opportunity for the Geopark to begin this work with our rangatahi.

The Trust's strategic intention is to:

- Refresh Vanished World Centre and develop a long term plan for new Centres of Learning
- Develop themed Touring Routes around key Geosites heroing the land, people and their stories
- Develop wayfinding/signage for key sites in the Geopark and near the Alps2Ocean Cycle Trail
- Engage visitors via monthly public talks, media events, activities and competitions
- Develop fit for purpose collateral and assets
- Attract displays and exhibitions to the district
- Provide a platform or iwi interpretation of their culture and histories which can be promoted and woven into the Geopark narrative

Economy / Ōhanga

- Current businesses benefit from an economically sustainable Geopark
- New businesses and residents are attracted to come and invest here.



Encouraging sustainable economic development is an objective of all geoparks. While the Trust will endeavour to promote and assist local enterprise, economic growth is, in most respects, a product of the Geopark's other activities.

The modern-day Māori economy is growing with the Iwi Authority, Te Rūnanga o Ngāi Tahu, being one of the largest businesses in the South Island. Locally, Te Rūnanga o Moeraki aspires to create opportunities for their extended families to be engaged in businesses and to find employment in the Waitaki.

In partnering with the Waitaki Whitestone Geopark Te Rūnanga o Moeraki seeks to ensure the cultural authenticity of any interpretation of the landscapes which were formed and travelled over by their ancestors and to develop potential business opportunities for those who descend from those ancestors.

The Trust's strategic intention is to:

- Work with Tourism Waitaki to promote the Geopark to visitors and businesses
- Assist operators to start Geopark-related businesses
- Develop merchandising strategy and plan to drive visibility for the Geopark
- Investigate the Geofood and slow food movement opportunities available



Enablers

The Trust will endeavour to provide a range of enablers which underpin the work programmes undertaken by the Trust itself and partner organisations.

People

Manawhenua cultural engagement
Community Supporter programme
Partnerships
UNESCO networking

The establishment of the Geopark has provided a real and meaningful project in which engagement with local iwi is critical. Iwi are represented on the Trust, and are co-designing the feel, experiences and brand of the Geopark.

The Trust has commenced to recruit, train and develop a volunteer group of people who will not only participate in community-driven projects, but become roving ambassadors for the Geopark and its Mission.

Partners

Geoparks are built through partnerships. The Trust has the support of a wide range of partners in each key result area. Key partners include:

- The Waitaki District Council
- Te Rūnanga o Moeraki
- OceanaGold
- Vanished World Inc.
- Heritage NZ
- Adair Craik Accounting
- Otago Museum
- Waitaki Museum and Archives
- Tourism Waitaki
- The National Commission for UNESCO for NZ
- Department of Conservation
- Geological and Nuclear Sciences
- Otago University
- Lincoln University
- Waitaki District Libraries

The Trust actively searches for partner organisations with which to undertake projects to implement this strategy.

Prior to COVID-19, the New Zealand National Commission for UNESCO supported key geopark partners to attend geopark training courses and conferences as part of the learning process and to fulfil UNESCO requirements that geoparks network with each other to share learnings and advance the objectives of the Global Geopark Network around the globe.

Landowner engagement

23 of the 42 geosites are located on privately-owned land. Engagement with landowners is vital to ensure that the maximum levels of protection suitable for each site are obtained.

The Crown is also an owner of land on which geosites are located. Crown land is usually administered by Government departments such as the Department of Conservation.

Platforms

Digital assets/WWG websites and app
Social media
Tourism Waitaki and relevant websites/social media promotion

Much of the work of the Geopark involves telling stories. We use a range of methods and media to communicate and engage with various audiences.

The Geopark website www.whitestonegeopark.nz provides a repository for information about the Geopark and the Trust.

We use Facebook @waitakiwhitestonegeopark primarily to connect with, educate and inform our local community.

We use Instagram @whitestonegeopark primarily to inspire our followers and promote our Geopark domestically and internationally. People are encouraged to find and post imagery which appeals to viewers and increases their emotional connection to our place.

The Geopark app, available on both iOS and Android systems, is a GPS-enabled tool to self-guide visitors around the Geopark.

Our educator produces weekly radio and podcast articles to tell local communities about what is happening in their Geopark. She also arranges monthly public lectures on a range of relevant topics – from geology to biodiversity and ecosystems, to social history, to climate change and iwi story telling.

The Geopark Coordinator publishes a regular newsletter.



Tourism Waitaki is a committed partner of the Geopark. It recognises the Geopark as a key differentiator for the district and promotes key visitor experiences within it. Prior to COVID-19 Tourism Waitaki promoted the Geopark to inbound tour operators at international events. Now its focus is on domestic campaigns. Between Tourism Waitaki, the Council's communications team and the Geopark Coordinator, numerous media articles have been published about the Geopark.

Processes

Trust financial viability/funding

Brand identity/Communications guidelines

Year round communication linked to initiatives

Programme measurement and evaluation

For the Geopark to succeed, the Trust must play a leadership role. To do so, it must be financially viable so that it can have a continuous and enduring presence and impact in the key result areas.

It is a challenge to raise funds for an ultimate outcome of which the benefits are sometimes less tangible (e.g. community pride) and are very widespread. The key potential sources of funding are:

- Local Council – where immediate social, economic activity and employment benefits are most likely to fall
- Central Government (particularly departments responsible for regional economic development and tourism)
- Grants / Funding for specific projects
- Philanthropic sources – especially those which align with the environmental and community
- Merchandising

A geosite interpretation manual has been developed in conjunction with the Waitaki Museum and Archive / Te whare Taoka o Waitaki.

Communication with the community and stakeholders will be achieved through interactions with key stakeholders and the Advisory Group, and through the media and mechanisms described in the Platforms section above. A Stakeholder Engagement Plan has been prepared for the Geopark by Allen & Clarke consultants.

It is difficult, sometimes, to quantitatively measure intangibles such as social capital and community pride. Many of the larger outcomes – for example, increased economic prosperity – may be impacted by many factors outside the scope of the Geopark. Therefore, to measure its success the Trust largely relies on the successful implementation of projects of which the Trust is highly confident will lead to the higher level outcomes. Each project will have its own quantitative and/or qualitative measures associated with it.

Values

The values of the Geopark Trust are in complete alignment with the values of Te Rūnanga o Moeraki, who hold a Trustee role within the Trust.

Of prime significance to Māori is the concept of kaitiakitanga – stewardship of the land, its culture and its heritage, for future generations. Building from this, the Trust has instilled these four values as being the most critical for its success :

Kaitiakitanga

We are guardians and protect our natural, built and cultural resources for the benefit of current and future generations.

Manaakitanga

We care for our manuhiri and we care for each other, are hospitable and generous.

Whanaungatanga

Whanau are at the core in everything we do. We build relationships through shared experiences and working together to create a sense of belonging.

Whakaute

Respect for each other, and respect for all

The Trust commits not only to act by these values, but to look for partners who also subscribe to the same values.

Governance and Management

Patrons

The Patrons of our Geopark are the Right Honourable Helen Clark, ONZ (Order of New Zealand) and Emeritus Professor Richard Sibson.

Helen Clark is a woman with strong ties to the district who can provide the Geopark with invaluable international connections, profile and energy. Ms Clark is a former Prime Minister of New Zealand (1999–2008), and former Administrator of the United Nations Development Programme (2009–2017). In 2006 Ms Clark was named as the world's 20th most powerful woman by Forbes Magazine. Also patron of Vanished World Inc., Ms Clark has enthusiastically extended her patronage to the Waitaki Whitestone Geopark as the Geopark commences its journey towards accreditation as a UNESCO Global Geopark.

Richard (Rick) Sibson is a celebrated structural geologist who has made numerous distinguished contributions to the field of structural geology and tectonics throughout his career, both in New Zealand and abroad. His research focuses on the structure of crustal faults zones and shallow crustal earthquakes, and he has authored or co-authored over 100 research papers. Rick is a Fellow of the Royal Society of London, the Royal Society of New Zealand, and the Geological Society of London. In 2010 he was awarded the Wollaston Medal of the Geological Society of London and in 2011 he received the Structural Geology and Tectonics Career Contribution Award from the Geological Society of America.

The Waitaki Whitestone Geopark Trust

The Geopark is governed by The Waitaki Whitestone Geopark Trust ("the Trust"). The Trust is responsible for setting the Mission and objectives of the Geopark, ensuring that it meets UNESCO requirements, and enabling the raising of funds to achieve the Park's objectives.

The Trust owns the brand of the Geopark, and could be a partner in any future facility development plans. The Trust approves the Strategic and Annual Plans for the Geopark.

It receives advice from an independent Advisory Group which includes key stakeholders and relevant experts. The Trust is supported by a wide range of local, regional and national partners who provide financial and in-kind contributions to the Geopark.

The Trust is a charitable organisation registered on 31 August 2018. Its purposes, as defined in the Trust Deed, are to:

- a. Preserve geological heritage within the Waitaki Whitestone Geopark for present and future generations;
- b. Inform the public about issues in the geological sciences and their relationship to the environment;
- c. Encourage and monitor sustainable development within the local community;
- d. Foster multi-cultural bridges for heritage and conservation and the maintenance of geological and cultural diversity;
- e. Stimulate research;
- f. Promotion of education in relation to geosciences;
- g. Contribute actively within the UNESCO Global Geoparks Network through joint initiatives (e.g. communications, publications, exchange of information, participation in meetings, and common projects);
- h. Contribute local articles to the UNESCO Global Geoparks Network Newsletters, books and other publications;
- i. Contribute to and actively participate in International Geoparks Conferences as recommended by the Global Geoparks Network, with the support of UNESCO;
- j. Follow the principles of the UNESCO Geopark Network and such amendments, additions and/or variations as may be determined from time to time.

Accordingly, the Trust may, at any stage:

- k. Implement projects to mobilise and coordinate bottom up and top down initiative for the promotion, protection, maintenance and growth of the Waitaki Whitestone Geopark;
- l. Fund raise and seek resources to be made available to the Trust and its projects;
- m. Distribute funds and enter into arrangements, contracts and other agreement, on such terms and conditions that the Trustees deem suitable, for the purpose of furthering the objects and purposes of the Trust;
- n. Carry out such other lawful activities which are incidental or conducive to attaining the objects and purposes of the Trust;
- o. Coordinate and network with (not duplicate) existing geoscience, conservation and biodiversity projects;
- p. Share information and raise awareness within the community;
- q. Support developments and use of effective technological advances in geoscience and geopark education;
- r. Support research that contributes to the preservation and protection of fossils.

Trustees

The Trust may have up to nine Trustees, and may co-opt Advisory Trustees as required. Two of the Trustees are appointed by the Waitaki District Council, and one by Te Rūnaka o Moeraki. The current Trustees are:



ROSS McROBIE
(Chair)



DAVID HIGGINS
(upoko of te rūnaka o
Moeraki)



TREVOR McGLINCHEY



MELANIE JONES



HELEN JANSEN



GERALD CARTER



BRETT HUDSON



ALBERT BRANTLEY
(Advisory)



MIKE GRAY
(Advisory)

The Advisory Group

When preparing the initial submission to UNESCO, an Advisory group of senior Advisors from Government departments, universities and geological agencies was brought together to shape the Geopark project.

Now that the Geopark is functioning, the Advisory Group is made up of more operationally-focused members who are respected practitioners across all the domains relevant to the Geopark – Māori cultural and spiritual matters, education, geology, archaeology, geohazards, conservation, regulation and preservation, cultural and natural heritage, tourism and business.

The multi stakeholder group have a common interest to work together to design, fund and deliver geopark projects. Group membership may fluctuate as projects are undertaken and completed. New members, which are added or co-opted to advise on specific

development plan activities. Observers are invited to attend Advisory Group meetings where relevant – for example, corporate supporters with interests ranging from geology to hydro- electricity generation attend so that their knowledge can be included in the Geopark offering.

Renowned New Zealand geoscientists Dr Ian Graham (author of “When Continents Collide”) and Prof Ewan Fordyce of Otago University are geoscience advisors to the Geopark.

Management and staff

The Trust engages an Executive Manager to manage the operational side of the Geopark, to ensure that legislative and UNESCO requirements are met on a day to day basis, and to support the Trust's staff.

The Trust employs:

- a full time Community Coordinator to undertake public engagement, coordinate the members of the Advisory Group and fundraise.
- a part time educator, who is a qualified geologist. The educator communicates information on the geology of the Geopark, develops and delivers educational programmes into schools, and organises a public talk series and other forms of public engagement.

The total number of staff employed by the Geopark Trust as at September 2021 is 1.5 Full Time Equivalents.

Extensive use is made of secondments and arrangements with partner organisations, who hold both talented and qualified people and also extensive resources to contribute to the achievement of Geopark objectives. A project team which worked on the Geopark establishment and development projects has been in existence since 2018. It is made up of people from the Waitaki District Council, Vanished World Inc. Society, Waitaki Museum, Tourism Waitaki, and Trustees. Additional project team members from organisations such as the University of Otago, Ōamaru Blue Penguin Colony and GNS Science are brought on for specific projects.

Budget

The underlying costs of the Geopark Trust, including project expenditure is around \$125,000 annually.

Core funding for the Geopark of \$399,000 over the period 2021-27 has been provided by Waitaki District Council in its Long Term Plan 2021-31.

At August 2021, additional funding from Otago Community Trust for signage projects has been confirmed. Other funding applications have been submitted and are awaiting decisions.

An annual workplan and budgets is approved prior to 30 June each year.

Our commercial sponsor, Oceana Gold, has confirmed its second year of sponsorship.

Audit

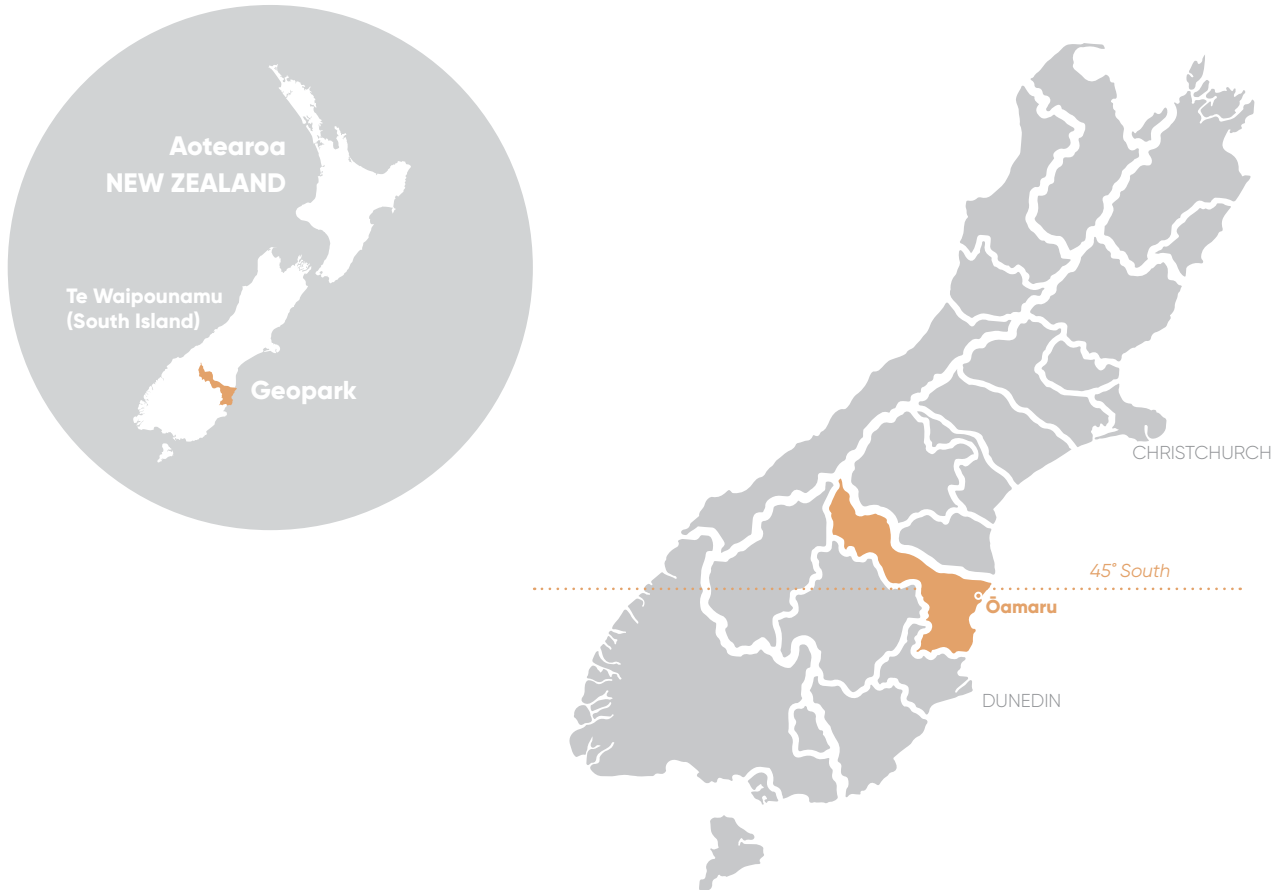
The Trust engages a financial services provider to administer the Trust's accounts, which are examined each year by a reputed Chartered Accountancy firm.

The Trust's Annual Report and Accounts are published to the Geopark website each year.



APPENDIX 1 – Description of our Geopark

Location



The Geopark Offering

The Waitaki District was formed under an ancient sea and built on the remains of prehistoric creatures from a now vanished world. The natural landscape of the District is shaped by volcanoes and glaciers, and is bordered by the Waitaki River, an early super-highway for New Zealand's first people who left traces of their lives along its banks. It was during the Victorian times that Ōamaru arose as a bustling town, which was carved out of whitestone and was trading with the world.

It is this karst landscape and whitestone that are integral to the identity of the Waitaki District. The first people who arrived to the district found shelter in limestone caves, leaving behind the now-treasured rock art. Many years ago, the Waitaki River and Valley was a seasonal hunting and fishing ground for Māori who used the caves and overhangs for shelter – making a canvas for charcoal and red ochre drawings.

The Waitaki District covers a vast and unique landscape, from the east coast of the South Island, up the Waitaki Valley to the base of the Southern Alps – covering 7,214km².

As well as being renowned for its Victorian-era limestone architecture, the Geopark offers a home for local wine and food producers, which is reflected in the emerging range of geo- gastronomy offerings available. Waitaki offers a great deal as a Geopark.

The diverse range of sites, visitor activities and experiences are contained within the Geopark making for a compelling range of visitor propositions. These offerings can be categorised into six broad groups:

Wildlife

The coastline of the Waitaki District provides an impeccable vantage point for observing coastal bird species, including kororā (little blue penguins), hoiho (yellow-eyed penguins) and the Otago shag. Furthermore, the marine margin also plays home to kekeno (New Zealand fur seals). In a primal setting, Matakāea showcases the local coastal wildlife, while visitors can also view penguins at the Ōamaru Blue Penguin Colony Visitors' Centre.

The lower Waitaki River is home to New Zealand's largest breeding colony of the nationally endangered tarapiroe (black fronted tern), whilst the river and its tributaries are an important habitat for the nationally vulnerable ngutu pare (wrybill) – the only bird in the world with a bill that is curved to the right.

Plant and Insect Life

The lowland limestone flora of the Geopark area is notable to botanists for sites containing diversity of endemics. The readily accessible Matakāea Shag Point Scientific Reserve features a unique landscape and biological activity. Species that exist in the reserve include the snow tussock grassland and the large alpine daisy. The presence of these typically alpine species so close to the coast is an example of how native flora can respond and adapt to fire and landslip disturbances. The Grand and Otago skinks – two of New Zealand's most distinctive and impressive lizards – thrive in the climate and habitat created.

Leisure Activities

The establishment of New Zealand's longest cycle trail (301km), the Alps 2 Ocean Cycleway, presents the opportunity for tourists to view many aspects and attributes of the Geopark as they wind their way through.

Building on the success and level of visitations attracted through its presence, a number of community events covering arts, music, heritage, culture and food have emerged. Due to the natural features of the area, the Geopark lends itself to walking trails, camping, fishing and boating. Camping and water-based activities along the Waitaki River and Lakes, as well as in the many coastal settlements, has a long history among domestic visitors.

With the Victorian architecture as a backdrop, the Steampunk weekend takes science-fiction imaginings of a different world inspired by combining futuristic technology with aesthetics and ideas from the Victorian era



Geosites

The wondrous geosites located throughout the Geopark provide a unique offering that showcases the natural geological features and landscape of the Waitaki District. These sites include, but are not limited to, the nationally and internationally acclaimed Moeraki Boulders, Clay Cliffs, Anatini and Elephant Rocks.

Educational Activities

To display the impressive and unique geological collection of fossils, rocks and minerals from the district, the Vanished World Centre, situated in Duntroon, preserves its rich history in an educational context. The centre plays a pivotal role supporting learning outcomes for schools and University scientists. The centre is the hub of the Geopark and all Vanished World Trails branch out from the site.



Cultural Heritage

The geosites, and the District in general, are some of the first sites of human occupation in New Zealand – the last major landmass on earth settled by humans. There are many highly significant archaeological sites featuring early Māori rock art in particular. In latter years during the 19th and 20th centuries, significant agricultural development occurred that helped power the regional economy and its development.

Miners from all over the world also descended on parts the Waitaki to mine the primarily alluvial deposits. The riches from farming (frozen meat was a leading commodity) provided the finance for the quarrying of high-quality limestone for the building of the region's infrastructure and opulent estates and town buildings. Many events in the area are derived from the cultural heritage of the area, such as the Heritage Week and Victorian fete.

Potential Offerings

In addition to those offerings already in existence within the Geopark, a number of business proposals have been received to use the resources that the Geopark possesses. These include new 4WD and back country landscape tours, accommodation lodges, walking tours and Geopark bus tours. These potential ventures, amongst others, will be explored and established (as deemed viable and if they add value to the natural features of the area and the objectives of the Trust).



Partnership with mana whenua

The Waitaki District is an area of significance to Mana Whenua/Nga Rūnanga and as such there is a need to encompass and recognise the cultural values.

A high level of protection is expected in order to preserve and maintain those values of the tipuna that rest within the Waitaki District, where sites of significance have or are defined by Mana Whenua and are included as geosites within the Waitaki Whitestone Geopark UNESCO submission.

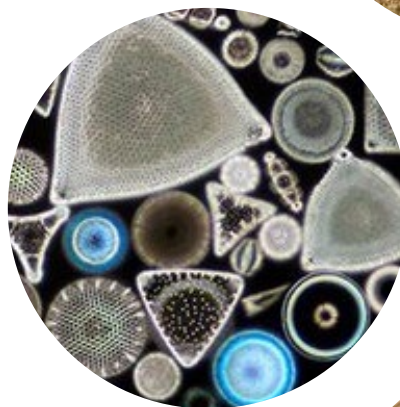


Geological Description

The Geopark reaches from the coast up the Waitaki Valley to the base of the Southern Alps. Built by dynamic tectonic forces and sculpted by fire, ice, and the powerful braided Waitaki River, the Geopark has a land area of 7,214km², in which a population of 23,000 people live in 16 towns and villages.

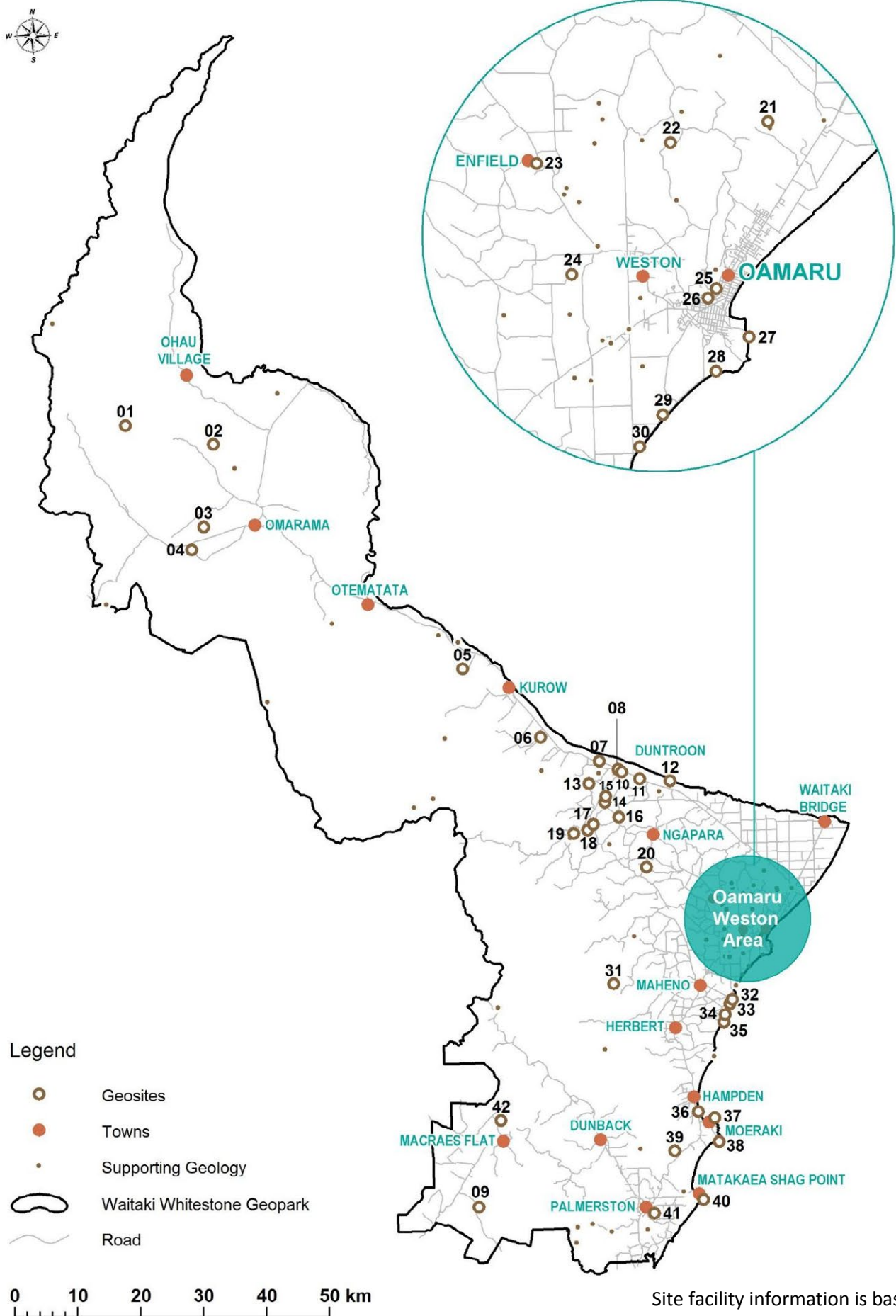
Within the Geopark there are many examples of glacial, tectonic, igneous, fluvial and marine processes producing metamorphic, sedimentary, and igneous geological features, along with Cenozoic fossils dating back to the time when the area was a shallow marine environment. The karst landscape and its 'whitestone' are integral to the identity of the Geopark. The Waitaki is world famous for its diatoms, extracted from rich diatomite deposits that once covered ancient sea floors.

The following table summarises the characteristics of the geosites within the Geopark. A full description of the geology of the geopark can be found in the Application to UNESCO for Global Geopark designation which is available on the Geopark's website [Our UNESCO Story | Waitaki Whitestone Geopark](#).



Waitaki Whitestone Geosite Detail Information

There are 42 Geosites throughout the geopark, each with special qualities to be preserved and appreciated



Site facility information is based on assessments carried out August-September 2018

01 Ahuriri

-44:20:22.263, 169:43:17.024

This geosite refers to the broader Ahuriri area and its special landscape value recognised with wide coverage as an area of outstanding natural beauty in the Waitaki District Plan and also as an outstanding land of regional significance by Environment Canterbury



Geological Period

Jurassic, Triassic, Permian (basement rock), Quaternary (landscape)

Geology

Greywacke, mudstone and schist of the Rakaia terrane/Otago Schist and Quaternary sediments. Headwaters of the Waitaki River.

Geomorphology

Active Fault in lower Ahuriri River
Glacial valleys

Protection

Outstanding Natural Area.

Importance

Scientific Importance: Regional
Cultural Significance: 2 - Minor significance
Public Significance: 4 - Very Interesting

Hazards

Access along metal road which is also A20 track

Biodiversity: Uncommon, at risk, threatened

Extensive biodiversity including threatened plants

Vulnerability to Human Actions

Planning values: 2 - Significant Modification
Recreation values: 3 - Not Vulnerable

Access and Facilities

Open to the Public (Unrestricted Access)
Parking Available (10 Cars)
Wheelchair accessible
Toilet
Walking Track and Cycleway links

Terrain

Roading: Easy/Flat
Site: Easy/Flat

Site Features

Culture - Nature - Geological - Vista - Heritage

Site Associations

Natural Heritage

Site Characteristics

Active Erosion - Landform

Site Interpretation

Science Education - Geotours

02 Ōhau Moraines

-44:22:17.089, 169:53:41.229

This significant wetland complex is one of the largest wetland areas to be protected in recent years. Several rare and threatened plants can be found here such as the small summer green lily and coral broom. [Is this supposed to be somewhere else?]-->The Ohau Moraines are an exceptionally well-preserved set of glacial moraines deposited during the ice-age. These moraines are some of the most sensitive recorders of ice-age climate change in the Southern Hemisphere.



Geological Period

Quaternary

Geology

Quaternary moraine ridges of bouldery till, merging with scree and associated glacial outwash gravels.

Geomorphology

Glacial (Moraine)

Protection

Outstanding Natural Area.

Importance

Scientific Importance: International
Cultural Significance: 2 - Minor significance
Public Significance: 2 - Niche Interest

Hazards

Access along metal road which is also A20 track. Wetland

Biodiversity: Uncommon, at risk, threatened

Wurmbea novae-zelandiae, Carmichaelia crassicaulis subsp. Crassicaulis, Ranunculus, Ranunculus brevis, Carex lachenalii

Vulnerability to Human Actions

Planning values: 1 - Complete destruction

Access and Facilities

Open to the public (Unrestricted Access)
Parking Available (10 Cars)
Cycleway links

Terrain

Roading: Easy/Flat
Site: Easy/Flat Sloped

Site Features

Nature - Geological - Vista

Site Associations

Natural Heritage

Site Characteristics

Sediment - Active Erosion - Landform

Site Interpretation

Science Education

03 Paritea (Clay Cliffs)

-44:29:20.087, 169:52:08.271

This stunning landscape of spectacular "badland" outcrops encourages people to wonder how this landscape was formed. The Clay Cliffs were first formed as glacial gravels, sand and silt, in fresh-waters. The sediments, which were deposited about 4 million years ago, were buried and compacted, then uplifted and eroded. The finer-grained lower strata probably represent lakes, while the upper section includes ancient river gravels. These river gravels probably eroded off the growing Southern Alps. The Clay Cliffs were uplifted and tilted by the recently active nearby Ostler Fault.



Geological Period

Neogene (strata), Quaternary (landscape)

Geology

Lacustrine siltstone, sandstone and conglomerate.

Geomorphology

Badlands, Active Fault

Protection

QEII covenant and Outstanding Natural Area.

Importance

Scientific Importance: Regional
Cultural Significance: 2 - Minor significance
Public Significance: 5 - Can't miss this site

Hazards

Walkways vulnerable to slippage and water damage. Uneven surface. Heavy rain

Vulnerability to Human Actions

Planning values: 2 - Significant Modification

Access and Facilities

Open to the public (Ticketed)
Parking Available (6 Cars)
Walking Track and Cycleway links

Terrain

Roading: Uneven
Site: Easy/Flat Uneven Rough Sloped

Site Features

Geological - Vista

Site Characteristics

Sediment - Active Fault - Active Erosion
Landform

Site Interpretation

Science Education

04 Ostler Fault zone, 'The Knot'

-44:31:14.937, 169:50:36.151

Situated in the Ahuriri River plain 'The Knot' is a major 90 degree bend in an example of reverse fault movement. Terraces have maximum scarp heights of 15 m on surfaces c.20000 years old. This site is monitored for precise strain measurements



Geological Period

Quaternary

Geology

Active reverse fault zone uplifting lacustrine siltstone, sandstone and conglomerate.

Geomorphology

Active reverse fault zone

Protection

Rural Scenic Zone. Additional protection needed.

Importance

Scientific Importance: International
Cultural Significance: 2 - Minor significance
Public Significance: 3 - Broad Interest

Hazards

Active Fault. Traffic when viewing from roadside

Vulnerability to Human Actions

Planning values: 3 - Not Vulnerable
Recreation values: 3 - Not Vulnerable

Access and Facilities

Open to the public (Unrestricted Access)
Parking Available (3 Cars)

Terrain

Roading: Uneven
Site: Uneven

Site Features

Geological - Vista

Site Characteristics

Active Fault - Landform

05 Te Awa Whakamau (Awahokomo) karst pinnacles

-44:42:16.477, 170:22:37.184

Karst pinnacles are the eroded remnants of thick sheets of Otekaike Limestone, which formed about 25 mybp, when the low land was surrounded by wide shallow seas.



Geological Period

Neogene (strata), Quaternary (landscape)

Geology

Otekaike Limestone, approximate limit of marine transgression in area.

Geomorphology

Karst Pinnacles

Fossils

Fossils

Protection

QEII covenant.

Importance

Scientific Importance: National
Cultural Significance: 2 - Minor significance
Public Significance: 4 - Very Interesting

Hazards

Metal road

Vulnerability to Human Actions

Planning values: 2 - Significant Modification

Access and Facilities

Not open to the public (Access by Arrangement)
Parking Available (3 Cars)

Terrain

Roading: Uneven
Site: Sloped

Site Features

Geological - Vista

Site Characteristics

Sediment - Active Fault - Landform

Site Interpretation

Science Education - Interpretive Board

06 Wai O Toura Reserve

-44:48:20.685, 170:31:43.881

Wai O Toura Reserve is home to critically endangered plants such as the native cress *Lepidium sisymbrioides* and critically endangered *Carmichaelia hollowayii* among other threatened species. These are located in a rare limestone ecosystem containing diverse Waitakian molluscan fauna, and a geological holotype. The outcrop has produced significant fossils of bony fish, penguins, and cetaceans. It is an important paleontological site and geological reference location.



Geological Period

Paleogene, Neogene

Geology

Ototara and Otekaike Limestone, grading up to Mt Harris formation

Geomorphology

Escarpment

Fossils

Fossils - Waitakian molluscan fauna and holotype

Protection

National Scenic Reserve.

Importance

Scientific Importance: National
Cultural Significance: 3 - Moderate significance
Public Significance: 2 - Niche Interest

Hazards

Traffic on entrance to parking area

Artefacts

Artefacts exist (University of Otago)

Vulnerability to Human Actions

Planning values: 3 - Not Vulnerable
Recreation values: 2 - Significant Modification

Access and Facilities

Open to the public (Unrestricted Access)
Parking Available

Terrain

Roading: Sloped
Site: Uneven

Site Features

Culture - Nature - Geological - Vista

Site Associations

Cultural Heritage
Natural Heritage

Site Characteristics

Sediment - Landform

Site Interpretation

Science Education

Biodiversity: Uncommon, at risk, threatened

Lepidium sisymbrioides, *Carmichaelia hollowayi*, *Poa spania*, *Geniella calcis* subs. *calcis*

07 Takiroa shelter rock drawings

-44:50:34.321, 170:38:45.258

These limestone overhangs offered early travellers shelter along a seasonal route up the Waitaki Valley. The rock art captured here includes images from abstract forms to bird and animal life and people and is an archaeological treasure.



Geological Period

Neogene (strata). Quaternary (landscape)

Geology

Otekaike Limestone

Geomorphology

Karst erosion, Escarpment

Fossils

Fossils - Invertebrate fossils (corals, molluscs, bivalves and/or gastropods)

Protection

Significant Natural Feature, Archaeological Item (5653).

Importance

Scientific Importance: National
Cultural Significance: 4 - Significant
Public Significance: 5 - Cant miss this site

Hazards

Falling debris from overhang and birds

Vulnerability to Human Actions

Planning values: 1 - Complete destruction
Recreation values: 1 - Complete destruction

Access and Facilities

Open to the public (Unrestricted Access)
Parking Available (12 Cars or 1 Bus)
Walking Track and Cycleway links

Terrain

Roading: Easy/Flat
Site: Sloped

Site Features

Culture - Geological - Heritage

Site Associations

Cultural Heritage

Site Characteristics

Sediment - Active Erosion - Matauranga Maori

Site Interpretation

Science Education - Interpretive Board - Geotours

08 Brewery Hole

-44:51:17.168, 170:40:59.330

This is an excellent example of a karst topography. Dissolution of the limestone has created an underground drainage system with sinkholes and caves. The Maerewhenua river disappears into sink holes and travels 4.5km underground to briefly emerge at this sunken limestone cave known as Brewery Hole. It was known in pre-European times and the water hole was seen as a source of pure, clean water. "Waikoakoa" translates as 'happy waters'.



Geological Period

Neogene. Quaternary (landscape)

Geology

Otekaike Limestone

Geomorphology

Karst erosion (chemical) Sinkholes and Caves

Fossils

Fossils - Invertebrate fossils (corals, molluscs, bivalves and/or gastropods)

Protection

Township Zone, Heritage New Zealand
Pouhere Taonga Act 2014. Additional protection needed.

Importance

Scientific Importance: Regional
Cultural Significance: 3 - Moderate significance
Public Significance: 5 - Cant miss this site

Hazards

Deep hole but well fenced off and good viewing platform

Vulnerability to Human Actions

Recreation values: 3 - Not Vulnerable

Access and Facilities

Open to the public
Parking Available
Wheelchair accessible
Toilet
Cycleway links

Terrain

Roading: Easy/Flat
Site: Easy/Flat Sloped

Site Features

Culture - Geological - Heritage

Site Associations

Cultural Heritage
Natural Heritage

Site Characteristics

Sediment - Active Erosion - Landform - Matauranga Maori

Site Interpretation

Science Education - Interpretive Board

09 Nenthorn Goldfield

-45:28:28.266, 170:22:29.977

You can see barely any trace of what was once a gold boom town. The roadside features an example of a well exposed gold-bearing quartz veins that created this boom.



Geological Period

Permian, Triassic, Jurassic (Otago Schist).

Geology

Otago Schist

Geomorphology

Waipounamu Erosion Surface

Protection

Referenced for Conservation purposes s62(1)
Conservation Act 1987.

Importance

Scientific Importance: International
Cultural Significance: 3 - Moderate significance
Public Significance: 4 - Very Interesting

Hazards

Old mine shafts

Vulnerability to Human Actions

Planning values: 1 - Complete destruction
Recreation values: 1 - Complete destruction

Access and Facilities

Open to the public (Unrestricted Access)
No Parking Available
Walking Track and Cycleway links

Terrain

Roading: Uneven
Site: Easy/Flat Uneven

Site Features

Culture - Geological - Heritage

Site Associations

Cultural Heritage
Natural Heritage

Site Characteristics

Metamorphic - Minerals - Mining

Site Interpretation

Science Education - Interpretive Board - Geotours

**10 Maerewhenua rock art site,
Duntroon Escarpment**
-44:51:33.255, 170:41:25.254

This escarpment contains multiple rock shelter sites and rock drawings and is an outstanding natural feature



Geological Period

Neogene

Geology

Otekaike Limestone

Geomorphology

Escarpment

Fossils

Fossils - Invertebrate fossils (corals, molluscs, bivalves and/or gastropods)

Protection

Partial Historic Reserve (Maerewhenua Historic Reserve), Outstanding Natural Feature, Archaeological Items (5655, 5657).

Importance

Scientific Importance: National
Cultural Significance: 5 - Very Significant
Public Significance: 4 - Very Interesting

Hazards

Steep uneven steps and falling debris from large overhang

Artefacts

Artefacts exist

Vulnerability to Human Actions

Recreation values: 2 - Significant Modification

Access and Facilities

Open to the public
Parking Available
Cycleway links

Terrain

Roading: Easy/Flat
Site: Steep

Site Features

Culture - Geological

Site Characteristics

Sediment - Active Erosion - Landform

Site Interpretation

Science Education - Interpretive Board

11 Te Kōakaumu (Kokoamu Bluff)
-44:52:10.402, 170:43:32.189

Within 100m west of the road, this scarp has a mid Oligocene unconformity below richly fossil-bearing Kokoamu Greensand and Otekaike Limestone. These strata have produced important fossil vertebrates, some of them reference or type specimens.



Geological Period

Neogene

Geology

Limestone, greensand

Geomorphology

Escarpment

Fossils

Fossils - molluscs, sea urchins, other invertebrates; rare whales and dolphins;

Protection

Significant Natural Feature, Geopreservation site.

Importance

Scientific Importance: International
Cultural Significance: 3 - Moderate significance
Public Significance: 4 - Very Interesting

Hazards

Lack of suitable stopping area. Farming activity

Artefacts

Artefacts exist

Vulnerability to Human Actions

Planning values: 2 - Significant Modification
Recreation values: 2 - Significant Modification

Access and Facilities

Open to the public (Access by Arrangement)
No Parking Available

Terrain

Roading: Uneven
Site: Rough Sloped

Site Features

Culture - Geological - Vista -

Site Characteristics

Sediment - Landform

Site Interpretation

Science Education

12 Waitaki River

-44:52:25.084, 170:47:11.788

Waitaki literally means the waterway of tears, symbolising the tears of Aoraki Mt Cook, the tallest mountain of New Zealand, as they flow along the Tasman River and spill into Lake Pukaki, the headwaters of the Waitaki River. The braided river is characterised by gravel beds, numerous channels and variable flows, which are unique to parts of the world with young, rapidly eroding mountains. The upper part of the Waitaki Basin was formed thousands of years ago when glaciers retreated leaving behind beds of gravel and boulders. Ongoing geological uplift, erosion and alluvial transport continue to maintain the Waitaki braided river and associated wetlands. Only Alaska, Canada and the Himalayas have the same extensive braided river systems that NZ has.



Geological Period

Quaternary

Geology

Gravel, sand and mud of modern and postglacial floodplains.

Geomorphology

Braided River

Protection

Waitaki Catchment Water Allocation Regional Plan.

Importance

Scientific Importance: International
Cultural Significance: 5 - Very Significant
Public Significance: 3 - Broad Interest

Hazards

Swift moving water

Biodiversity: Uncommon, at risk, threatened

Extensive biodiversity including threatened plants

Vulnerability to Human Actions

Planning values: 2 - Significant Modification

Access and Facilities

Open to the public (Unrestricted Access)
Parking Available (10 Cars)

Terrain

Roading: Easy/Flat
Site: Easy/Flat

Site Features

Culture - Nature - Geological - Vista - Heritage

Site Associations

Cultural Heritage
Natural Heritage

Site Characteristics

Sediment - Active Fault - Active Erosion - Landform

Site Interpretation

Science Education

13 Waipata (Earthquakes)

-44:52:27.575, 170:37:24.545

Ototara Limestone, Otekaikē Limestone and Kokoamu Greensand separated by a regional intra-Oligocene unconformity represented the maximum level of marine inundation. Area includes large slumped blocks and fissures produced by mass movement probably on underlying mudstone. Earthquakes has baleen whale bones on display, still partly embedded in rock, as part of Vanished World trail.



Geological Period

Paleogene, Neogene

Geology

Otekaikē Limestone, Kokoamu Greensand, Ototara Limestone in places

Geomorphology

Mass movement - slumping and landslides

Fossils

Fossils - In situ Baleen Whale fossil. Molluscs, sea urchins, other invertebrates; rare whales and dolphins; type location for some species

Protection

Significant Natural Feature.

Importance

Scientific Importance: International
Cultural Significance: 4 - Significant
Public Significance: 5 - Cant miss this site

Hazards

Hidden holes and caves. Uneven slippery surface

Biodiversity: Uncommon, at risk, threatened

Colobanthus brevisepalus, Geranium aff. Brevicaule "Manahune"

Artefacts

Artefacts exist (Otago Museum)

Vulnerability to Human Actions

Recreation values: 2 - Significant Modification

Access and Facilities

Open to the public
Parking Available

Terrain

Roading: Easy/Flat
Site: Uneven Rough Sloped

Site Features

Culture - Nature - Geological -

Site Associations

Cultural Heritage
Natural Heritage

Site Characteristics

Sediment - Active Erosion - Landform

Site Interpretation

Science Education - Interpretive Board - Geotours

14 Anatini

-44:54:05.482, 170:39:15.496

Easily accessible, with a natural limestone arch and curious honeycomb-weathered surfaces, Anatini has baleen whale bones on display nearby as part of a Vanished World trail.



Geological Period

Neogene

Geology

Otekaikē Limestone

Geomorphology

Tafoni (honeycomb) weathering, natural arch, paleo valley

Fossils

Fossils - Baleen Whale Bones; molluscs, sea urchins, other invertebrates

Protection

Significant Natural Feature.

Importance

Scientific Importance: National
Cultural Significance: 3 - Moderate significance
Public Significance: 5 - Cant miss this site

Hazards

Parking on side of blind corner. Pathway to site difficult for some users.

Biodiversity: Uncommon, at risk, threatened

Triglochin palustris, Aciphylla subflabellata, Colobanthus brevisepalus, Chenopodium allanii, Geranium aff. Brevicaule 'Manahune'

Artefacts

Artefacts exist (University of Otago)

Vulnerability to Human Actions

Recreation values: 2 - Significant Modification

Access and Facilities

Open to the public
Parking Available
Cycleway links

Terrain

Roading: Sloped
Site: Uneven Sloped

Site Features

Nature - Geological

Site Associations

Natural Heritage

Site Characteristics

Sediment - Landform

Site Interpretation

Science Education - Interpretive Board - Geotours

15 Elephant Rocks

-44:53:36.131, 170:39:22.355

Many distinctive large hummocky rocks (elephant shaped outcrops) have been formed out of Otekaikē Limestone which originated as a fossil rich marine sand 25 million years ago. The thick and flat-lying limestone is cross cut by joints caused by the uplift of the area. Erosion occurs by water infiltration along these joints, eventually leaving isolated 'elephants'.



Geological Period

Neogene

Geology

Otekaikē Limestone

Geomorphology

Erosion - chemical; wind; heating-cooling

Fossils

Fossils - Invertebrate fossils (corals, molluscs, bivalves and/or gastropods)

Protection

Significant Natural Feature.

Importance

Scientific Importance: Regional
Cultural Significance: 3 - Moderate significance
Public Significance: 5 - Cant miss this site

Hazards

Uneven and slippery surface

Artefacts

Artefacts exist (University of Otago)

Vulnerability to Human Actions

Recreation values: 2 - Significant Modification

Access and Facilities

Open to the public
Parking Available
Toilet
Cycleway links

Terrain

Roading: Easy/Flat
Site: Rough Sloped

Site Features

Culture - Geological - Vista -

Site Characteristics

Sediment - Active Erosion - Landform

Site Interpretation

Science Education - Interpretive Board - Geotours

16 Valley of the Whales

-44:55:24.882, 170:40:55.012

The Valley of Whales earned its name from the exciting discovery of whale and dolphin fossils in the surrounding Otekaike Limestone and in the underlying Kokoamu Greensand. The meandering Awamoko Stream has eroded the limestone in this area to create a spectacular landscape. Moa bones have been found in swampy settings in the valley.



Geological Period

Neogene, Paleogene in places

Geology

Otekaike Limestone, Kokoamu Greensand, Ototara Limestone in places

Geomorphology

Erosion (fluvial) Awamoko stream bed. Linear concretions. Tafoni (honeycomb) weathering

Fossils

Fossils - Molluscs, sea urchins, other invertebrates; rare whales and dolphins; type location for some species

Protection

Significant Natural Feature.

Importance

Scientific Importance: National
Cultural Significance: 5 - Very Significant
Public Significance: 4 - Very Interesting

Hazards

Limited parking on side of road. Flood prone

Biodiversity: Uncommon, at risk, threatened

Simplicia laxa

Vulnerability to Human Actions

Recreation values: 2 - Significant Modification

Access and Facilities

Open to the public
Parking Available
Wheelchair accessible

Terrain

Roading: Easy/Flat
Site: Easy/Flat

Site Features

Culture - Nature - Geological - Vista - Heritage

Site Associations

Cultural Heritage
Natural Heritage

Site Characteristics

Sediment - Landform

Site Interpretation

Science Education - Interpretive Board - Geotours

17 Prydes Gully Road Quarry

-44:55:58.854, 170:37:46.967

Adze marks remain in an old quarry which produced "Waitaki Stone" (Otekaike Limestone) for building. This is a different stone than the more widely known "Oamaru Stone" (Ototara Limestone).



Geological Period

Neogene

Geology

Otekaike Limestone

Fossils

Fossils - Invertebrate fossils (corals, molluscs, bivalves and/or gastropods)

Protection

Rural General Zone, Heritage New Zealand Pouhere Taonga Act 2014.

Importance

Scientific Importance: Regional
Cultural Significance: 3 - Moderate significance
Public Significance: 4 - Very Interesting

Hazards

Vehicle visibility at cross road.

Artefacts

Artefacts exist

Vulnerability to Human Actions

Recreation values: 3 - Not Vulnerable

Access and Facilities

Open to the public
Parking Available

Terrain

Roading: Easy/Flat
Site: Uneven Rough Steep

Site Features

Culture - Geological - Heritage

Site Associations

Cultural Heritage

Site Characteristics

Sediment - Active Erosion - Mining

Site Interpretation

Science Education - Interpretive Board - Geotours

18 Tokarahi Sill

-44:56:25.663, 170:37:06.756

This road cutting cliff exposes a section through a columnar-jointed basaltic sill or lava flow, formed when molten rock ran across the seafloor, about 40 mybp. In places, pillow lavas occur near the sill.



Geological Period

Paleogene

Geology

Waiareka Volcanics

Geomorphology

Volcanic escarpment

Protection

Rural General Zone. Additional protection needed.

Importance

Scientific Importance: Regional
Cultural Significance: 2 - Minor significance
Public Significance: 5 - Cant miss this site

Hazards

No parking or stopping possible at Dip Hill Road Site. Interpretation could be created elsewhere - Sill visible from Duntroon-Livingstone Road

Vulnerability to Human Actions

Recreation values: 3 - Not Vulnerable

Access and Facilities

Open to the public (Access by Arrangement)
No Parking Available

Terrain

Roading: Sloped

Site Features

Geological

Site Characteristics

Volcanic - Plutonic - Landform

Site Interpretation

Science Education - Interpretive Board - Geotours

19 Huttons Bridge, Otago Schist

-44:56:41.918, 170:35:22.614

The Otago Schist that can be seen at Huttons Bridge is one of the oldest local rock types, the basement rock of this region, formed 150-180 Mybp. Sandstone and siltstone were buried deeply and subject to high temperatures and pressures to create light coloured quartz-rich and darker mica-rich layers. Gold bearing quartz veins developed when hydrothermal fluids percolated through these schists. Once eroded, these quartz veins released gold-bearing sediments (e.g. Taratu Formation).



Geological Period

Permian, Triassic, Jurassic (Otago Schist).
Paleocene (gold-bearing sediments).

Geology

Otago Schist. Taratu Formation.

Geomorphology

Fluvial erosion (gorge).

Protection

Rural General Zone. Additional protection needed.

Importance

Scientific Importance: Regional
Cultural Significance: 3 - Moderate significance
Public Significance: 3 - Broad Interest

Hazards

Single lane bridge. River site.

Vulnerability to Human Actions

Recreation values: 3 - Not Vulnerable

Access and Facilities

Open to the public
Parking Available

Terrain

Roading: Easy/Flat
Site: Sloped

Site Features

Geological

Site Characteristics

Sediment - Metamorphic - Active Erosion

Site Interpretation

Science Education - Geotours

20 Rakis Table

-44:59:46.470, 170:44:02.548

The locality of the sedimentary rock, Raki Siltstone from the Eocene epoch. The flat 'table top' of Rakis table is a significant feature in the landscape. It was also the location of rain making efforts in the late 19th century when dynamite was set-off to 'seed' the clouds. At the base of Rakis table a disused rail tunnel is now part of the Alps 2 Ocean cycleway. There is a fantastic spot to view Rakis table at the intersection of Peaks and Conlans Road.



Geological Period

Paleogene, Neogene

Geology

Burnside Formation (Onekaka Group),
Otekaike Limestone

Geomorphology

Mesa hill top of near-horizontal erosion-resistant limestone

Protection

Rural General Zone. Additional protection needed.

Importance

Scientific Importance: Regional
Cultural Significance: 3 - Moderate significance
Public Significance: 4 - Very Interesting

Hazards

Metal road at T intersection.

Vulnerability to Human Actions

Recreation values: 3 - Not Vulnerable

Access and Facilities

Open to the public
Parking Available
Cycleway links

Terrain

Roading: Easy/Flat
Site: Easy/Flat Uneven Rough Sloped

Site Features

Culture - Geological - Heritage

Site Associations

Cultural Heritage

Site Characteristics

Sediment - Active Erosion - Landform

Site Interpretation

Science Education

21 Landon Creek bank

-45:01:51.391, 170:59:44.014

Two small exposures in banks on either side of North Branch of Landon (Boundary) Creek, 50 m upstream of the rifle range at the end of Landon Road. Featuring common Duntroonian brachiopods. Hypostratotype of Duntroonian Stage.



Geological Period

Paleogene, Neogene

Geology

Otekaike Limestone, Kokoamu Greensand,
Otara Limestone in places

Fossils

Fossils - Duntroonian Brachiopods

Protection

Rural General Zone. Additional protection needed.

Importance

Scientific Importance: National
Public Significance: 2 - Niche Interest

Hazards

Farming activity and safety around creek

Access and Facilities

Not open to the public (Access by Arrangement)

Site Features

Geological

22 Devils Bridge Wetland

-45:02:17.152, 170:56:34.684

This wetland is an important habitat for many species and is recognised as an area of Natural Significance in this Karst landscape. There are also caves surrounding the wetland containing solution holes and a shell bed layer.



Geological Period

Paleogene

Geology

Ototara Limestone

Geomorphology

Disappearing stream and wetland (active karst erosion).

Fossils

Fossils - Invertebrate fossils (corals, molluscs, bivalves and/or gastropods)

Protection

QEII covenant, Significant Natural Feature.

Importance

Scientific Importance: Regional
Cultural Significance: 3 - Moderate significance
Public Significance: 4 - Very Interesting

Hazards

Limited Parking off narrow road. Flooding of area in heavy rain

Vulnerability to Human Actions

Recreation values: 3 - Not Vulnerable

Access and Facilities

Open to the public
Parking Available
Walking Track links

Terrain

Roading: Easy/Flat
Site: Easy/Flat Sloped

Site Features

Nature - Geological

Site Associations

Natural Heritage

Site Characteristics

Sediment - Active Erosion - Landform

Site Interpretation

Science Education - Geotours

23 Enfield dikes

-45:02:40.908, 170:52:14.112

This is one of the best inland exposures of igneous dikes in the Oamaru region. The sequence of several near-vertical sheets of basalt formed by multiple injections of lava.



Geological Period

Paleogene

Geology

Waiareka Volcanics

Geomorphology

Quarry excavation.

Protection

Rural General Zone, owned by Waitaki District Council.

Importance

Scientific Importance: Regional
Cultural Significance: 2 - Minor significance
Public Significance: 4 - Very Interesting

Hazards

Closed landfill site. Rock fall (cliff face is +30m high)

Vulnerability to Human Actions

Recreation values: 2 - Significant Modification

Access and Facilities

Open to the public
Parking Available
Cycleway links

Terrain

Roading: Easy/Flat
Site: Uneven Sloped

Site Features

Geological

Site Characteristics

Plutonic - Active Erosion - Minerals

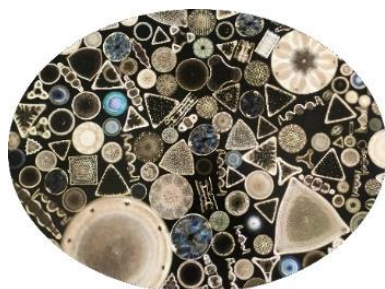
Site Interpretation

Interpretive Board - Geotours

24 Jackson's Paddock

-45:05:14.340, 170:53:17.212

Known as Jackson's Paddock, this site is an internationally important site of Eocene diatomite and Eocene-Oligocene boundary. Classic Oamaru Diatomite locality (upper part of stratigraphic sequence) and overlying Ototara Limestone containing Eocene-Oligocene boundary.



Geological Period

Paleogene

Geology

Ototara Limestone and Oamaru Diatomite

Geomorphology

Escarment

Fossils

Fossils - Oamaru Diatomite

Protection

Rural General Zone. Additional protection needed.

Importance

Scientific Importance: International
Cultural Significance: 3 - Moderate significance
Public Significance: 3 - Broad Interest

Hazards

Narrow metal road.

Artefacts

Artefacts exist

Vulnerability to Human Actions

Planning values: 2 - Significant Modification

Access and Facilities

Not open to the public (Access by Arrangement)
No Parking Available

Terrain

Roading: Sloped
Site: Sloped

Site Features

Geological - Vista

Site Associations

Cultural Heritage

Site Characteristics

Sediment

Site Interpretation

Science Education

25 Hutchesons Quarry

-45:05:38.583, 170:57:56.154

The disused Hutchesons Quarry is one of New Zealand's first geological reserves. Tuffs and Ototara limestone at the base are overlain by a fossil cobble-beach and an important fossil brachiopod location in the Gee Greensand.



Geological Period

Paleogene

Geology

Ototara Limestone, Waiareka-Deborah Volcanics

Fossils

Fossils - Invertebrate fossils (corals, molluscs, bivalves and/or gastropods)

Protection

Scientific Reserve (Hutchinsons Quarry).

Importance

Scientific Importance: National
Cultural Significance: 3 - Moderate significance
Public Significance: 3 - Broad Interest

Hazards

Sloped site, slippery grass track.

Vulnerability to Human Actions

Planning values: 2 - Significant Modification
Recreation values: 2 - Significant Modification

Access and Facilities

Open to the public (Unrestricted Access)
Parking Available (4 Cars)

Terrain

Roading: Sloped
Site: Sloped

Site Features

Culture - Geological - Heritage

Site Associations

Cultural Heritage

Site Characteristics

Sediment - Volcanic - Plutonic

Site Interpretation

Science Education - Interpretive Board - Geotours

26 Oamaru limestone dikes

-45:05:51.531, 170:57:39.913

In the road cutting on the north side of Chelmer Street, at the intersection with Chess St and opposite the botanic park in Oamaru, is one of best examples of limestone dikes crosscutting tuff in New Zealand.



Geological Period

Paleogene

Geology

Ototara Limestone, Waiareka-Deborah Volcanics

Fossils

Fossils - Invertebrate fossils (corals, molluscs, bivalves and/or gastropods)

Protection

Business 2 Zone, owned by Waitaki District Council.

Importance

Scientific Importance: Regional
Cultural Significance: 3 - Moderate significance
Public Significance: 2 - Niche Interest

Hazards

Falling debris including vegetation

Vulnerability to Human Actions

Recreation values: 2 - Significant Modification

Access and Facilities

Parking Available (20 Cars)
Wheelchair accessible
Toilet

Terrain

Roading: Easy/Flat
Site: Easy/Flat

Site Features

Geological - Heritage

Site Associations

Cultural Heritage

Site Characteristics

Sediment - Plutonic

Site Interpretation

Science Education

27 Boatman's Harbour

-45:06:46.369, 170:58:57.291

Located on the east side of Cape Wanbrow, Boatman's Harbour is accessible at low tide via Graves Track from Cape Wanbrow. Spectacular pillow lavas occur here, formed 34-36 Mybp when masses of molten lava solidified on the sea floor. White limestone between the pillows represents original limey sediment. The pillows are overlain by volcanic debris; the sequence includes mud and sand reworked by currents, yellow-brown limestone with occasional fossils, and a thick red-brown sequence which includes large boulders. The eruptive vent was probably close to what is now Cape Wanbrow.



Geological Period

Paleogene

Geology

Pillow Lava of the Waiareka-Deborah Volcanics, with associated bedded tuffs and agglomerate; Ototara Limestone between pillows

Geomorphology

Sea cliff

Fossils

Fossils - Bryozoans, brachiopods

Protection

Significant Coastal Landscape.

Importance

Scientific Importance: International
Cultural Significance: 3 - Moderate significance
Public Significance: 4 - Very Interesting

Hazards

Falling debris. Seals. Dangerous and difficult track. Not accessible at high tide. Beach site

Vulnerability to Human Actions

Planning values: 3 - Not Vulnerable
Recreation values: 3 - Not Vulnerable

Access and Facilities

Parking Available (2 Cars)

Terrain

Roading: Sloped
Site: Uneven Rough Sloped

Site Features

Culture - Geological

Site Associations

Natural Heritage

Site Characteristics

Sediment - Volcanic - Plutonic - Active Erosion

Site Interpretation

Science Education - Interpretive Board - Geotours

28 Makotukutuku (Old Rifle Butts)

-45:07:32.004, 170:57:51.513

To the south of Cape Wanbrow, 100-300m north of the golf course is a section through Eocene pyroclastic volcano, superb and rare rhodolith deposits of the Ototara Limestone. Also Pleistocene penguin and sea bird remains and raised Pleistocene beach. Richly fossiliferous, well exposed sedimentary sequence.



Geological Period

Paleogene, Neogene, Quaternary (raised beach)

Geology

Waiareka-Deborah volcanics, Ototara Limestone, Gee Greensand, Mt Harris Formation.

Geomorphology

Raised Pleistocene beach

Fossils

Fossils - Rhodolith, molluscs, brachiopods

Protection

Significant Coastal Landscape, Geopreservation site.

Importance

Scientific Importance: National
Cultural Significance: 2 - Minor significance
Public Significance: 3 - Broad Interest

Hazards

Cliff face erosion. Not safely accessible at high tide.

Vulnerability to Human Actions

Planning values: 2 - Significant Modification

Access and Facilities

Parking Available (4 Cars)

Terrain

Roading: Easy/Flat

Site Features

Culture - Geological - Heritage

Site Characteristics

Sediment - Volcanic - Plutonic

Site Interpretation

Science Education

29 Te Awa Kōkōmuka (Awamoa Creek fossils)

-45:08:30.327, 170:56:06.324

An archaeological site of middens/ovens recognised in the Waitaki District Plan. This site is also important for diverse early Miocene (Altonian Stage) macrofauna occasionally exposed on the beach



Geological Period

Neogene, Quaternary (archaeology)

Geology

Otekaike Limestone, Mt Harris Formation.

Fossils

Fossils - Invertebrate fossils (corals, molluscs, bivalves and/or gastropods)

Protection

Archaeological item (5688).

Importance

Scientific Importance: National
Cultural Significance: 4 - Significant
Public Significance: 2 - Niche Interest

Hazards

Muddy parking area. Beach site - partially limited at high tide

Artefacts

Artefacts exist (North Otago Museum)

Vulnerability to Human Actions

Planning values: 2 - Significant Modification

Recreation values: 1 - Complete destruction

Access and Facilities

Open to the public (Unrestricted Access)

Parking Available (10 Cars)

Terrain

Roading: Easy/Flat

Site: Easy/Flat

Site Features

Culture - Geological

Site Associations

Cultural Heritage

Natural Heritage

Site Characteristics

Sediment - Active Fault

Site Interpretation

Science Education - Interpretive Board

30 Beach Road Erosion

-45:09:13.109, 170:55:19.954

Today the Waitaki coastline is susceptible to erosion. Layers of high-class volcanic topsoil, loess and gravels with minimal vegetative cover erode easily and there is a lack of sedimentation to replenish the beach front. Sedimentary units underlying the active beach sands and gravels - mainly rocks of the Mount Harris formation - are sometimes visible.



Geological Period

Neogene (sedimentary rocks), Quaternary (erosion)

Geology

Otekaike Limestone, Quaternary sand and loess

Geomorphology

Coastal erosion

Protection

Significant Coastal Landscape.

Importance

Scientific Importance: Regional
Cultural Significance: 2 - Minor significance
Public Significance: 3 - Broad Interest

Hazards

Traffic near roadside pull off area. Coastal erosion (undercutting)

Vulnerability to Human Actions

Planning values: 2 - Significant Modification

Recreation values: 3 - Not Vulnerable

Access and Facilities

Not open to the public

Parking Available (5 Cars)

Terrain

Roading: Easy/Flat

Site: Rough

Site Features

Geological

Site Associations

Cultural Heritage

Natural Heritage

Site Characteristics

Sediment - Active Erosion - Landform

31 Otepopo (Mt Dasher) slate

-45:09:40.892, 170:39:41.573

A disused slate quarry and the only site in NZ where roofing slate has been produced) near Mackerras Creek, tributary of Kauru River, east foothills of Kakanui Range.



Geological Period

Jurassic, Triassic, Permian

Geology

Slate within Otago Schist (Rakaia terrane)

Protection

Rural General Zone, Heritage New Zealand Pouhere Taonga Act 2014.

Importance

Scientific Importance: Regional
Cultural Significance:
Public Significance: 2 - Niche Interest

Hazards

Remote, mountainess terrain

Access and Facilities

Not open to the public (Access by Arrangement)

Site Features

Culture - Geological - Heritage

Site Characteristics

Metamorphic

32 Kākaunui River (Kakanui) Mouth

-45:10:59.404, 170:54:26.974

Either side of the Kakanui River Mouth thin-bedded pyroclastic deposits occur, including mineral breccia. The Kakanui Mineral Breccia contains material erupted from deep in the Earth's mantle and crust 34+ Mybp, including lherzolite, pyroxenite, garnet pyroxenite and granulite as well as megacrysts of garnet, clinopyroxene, kaersutite, and feldspar.



Geological Period

Paleogene

Geology

Waiareka-Deborah Volcanics

Protection

Significant Coastal Landscape.

Importance

Scientific Importance: International
Cultural Significance: 3 - Moderate significance
Public Significance: 4 - Very Interesting

Hazards

Not accesible at high tide. River mouth

Artefacts

Artefacts exist (North Otago Museum)

Vulnerability to Human Actions

Planning values: 2 - Significant Modification
Recreation values: 3 - Not Vulnerable

Access and Facilities

Open to the public (Unrestricted Access)
Parking Available (5 Cars)
Walking Track links

Terrain

Roading: Easy/Flat
Site: Uneven

Site Features

Geological

Site Associations

Cultural Heritage
Natural Heritage

Site Characteristics

Sediment - Volcanic - Plutonic - Minerals

Site Interpretation

Science Education - Geotours

33 Campbells Bay

-45:11:40.546, 170:53:43.488

At this gorgeous beach you can see ancient shrimp burrows in Ototara Limestone. These were enlarged by erosion about 30 Mybp. Younger Otekaike limestone was deposited over the eroded surface about 25 Mybp, and was overlain in turn by Gee Greensand and Mt Harris Formation.



Geological Period

Paleogene, Neogene

Geology

Waiareka-Deborah Volcanics, Ototara Limestone, Otekaike Limestone, Gee Greensand, Mt Harris Formation, Quaternary raised beach

Geomorphology

Coastal erosion

Fossils

Fossils - Foraminifera, bryozoa, corals, other invertebrates

Protection

Significant Coastal Landscape.

Importance

Scientific Importance: National
Cultural Significance: 3 - Moderate significance
Public Significance: 4 - Very Interesting

Hazards

Coastal cliff instability. Beach site limited at high tide. Rough terrain

Vulnerability to Human Actions

Planning values: 2 - Significant Modification
Recreation values: 3 - Not Vulnerable

Access and Facilities

Open to the public (Unrestricted Access)
Parking Available (10 Cars)
Toilet
Walking Track links

Terrain

Roading: Easy/Flat
Site: Uneven

Site Features

Geological

Site Associations

Cultural Heritage
Natural Heritage

Site Characteristics

Sediment - Volcanic - Plutonic

Site Interpretation

Science Education - Geotours

34 Ōrore (All Day Bay)

-45:12:34.430, 170:53:05.929

The rock pools and geology of All Day Bay make it a favourite attraction for school trips and holiday makers. It shows deep-water mudstone of the Mount Harris Formation (Early Miocene, 20 Mybp) with fossil molluscs



Geological Period

Neogene

Geology

Deepwater mudstone Mt Harris formation marks the beginning of the marine regression

Geomorphology

Beach, rockpools and nearby estuary

Fossils

Fossils - Molluscs

Protection

Significant Coastal Landscape.

Importance

Scientific Importance: National
Cultural Significance: 3 - Moderate significance
Public Significance: 5 - Cant miss this site

Hazards

Muddy parking area. Beach site - partially limited at high tide

Vulnerability to Human Actions

Planning values: 2 - Significant Modification

Recreation values: 3 - Not Vulnerable

Access and Facilities

Open to the public (Unrestricted Access)

Parking Available

Toilet

Walking Track links

Terrain

Roading: Easy/Flat

Site: Easy/Flat

Site Features

Geological

Site Associations

Cultural Heritage

Natural Heritage

Site Characteristics

Sediment - Active Erosion

Site Interpretation

Geotours

35 Bridge Point

-45:13:14.051, 170:52:57.026

A coastal outcrop of Waiareka Volcanics and marine sediments. The volcanics erupted in shallow seas in Eocene-Oligocene times 32-36 Mybp, forming pyroclastic debris flows. Organisms lived on and in volcanic debris. In places, abundant fossils accumulated to form the Ototara Limestone.



Geological Period

Paleogene

Geology

Waiareka Volcanics

Geomorphology

Natural bridge

Fossils

Fossils - Foraminifera, bryozoa, molluscs, other invertebrates; type locality for some species

Protection

Significant Coastal Landscape.

Importance

Scientific Importance: International
Cultural Significance: 3 - Moderate significance
Public Significance: 3 - Broad Interest

Hazards

Coastal cliff instability and undercutting

Hazards

Coastal cliff instability and undercutting

Biodiversity: Uncommon, at risk, threatened

Lepidium tenuicaule, Lepidium oleraceum, Eryngium vesiculosum

Vulnerability to Human Actions

Planning values: 2 - Significant Modification

Recreation values: 3 - Not Vulnerable

Access and Facilities

Open to the public (Unrestricted Access)

Parking Available (10 Cars)

Terrain

Roading: Rough

Site: Easy/Flat

Site Features

Nature - Geological

Site Associations

Cultural Heritage

Natural Heritage

Site Characteristics

Sediment - Volcanic - Plutonic - Active Erosion - Landform

Site Interpretation

Geotours

36 Te Kaihīnaki (Moeraki Boulders) and Scenic Reserve

-45:20:50.824, 170:49:33.972

These striking spherical concretions can reach over 1 metre in diameter, and have formed a spectacular backdrop to photographs for over a century. Beyond the immediate visual appeal is an interesting geological story. The boulders at Moeraki (Paleocene) and Shag Point (Cretaceous) formed within mudstone underlying the ancient seafloor between 55 and 35 million Mybp. At the heart of each boulder is a pebble or fossil, which mud and lime slowly became cemented around. Spherical boulders may have formed around a shell while more irregular shapes may have formed around something much more unique.



Geological Period

Paleogene

Geology

Mudstone and sedimentary concretions

Geomorphology

Coastal erosion

Fossils

Fossils - Fish, turtle, bird

Protection

Scenic Reserve (Moeraki Boulders Scenic Reserve), Outstanding Natural Feature, Geopreservation Site.

Importance

Scientific Importance: International
Cultural Significance: 5 - Very Significant
Public Significance: 5 - Cant miss this site

Hazards

Cliff face erosion. Not safely accessible at high tide. Traffic from turn off of SH1 to site

Artefacts

Artefacts exist

Vulnerability to Human Actions

Planning values: 2 - Significant Modification

Access and Facilities

Open to the public (Unrestricted Access)

Parking Available (20 Cars)

Toilet

Walking Track links

Terrain

Roading: Easy/Flat

Site: Easy/Flat

Site Features

Culture - Geological - Vista

Site Associations

Cultural Heritage

Natural Heritage

Site Characteristics

Sediment - Active Erosion - Matauranga Maori

Site Interpretation

Science Education - Interpretive Board - Geotours

37 Moeraki Peninsula

-45:21:24.143, 170:51:32.080

The peninsula, formed substantially of basaltic volcanics, provides views south to Matakaea, and north to White Bluffs. Moeraki volcanic rocks have produced good examples of zeolite (such as erionite and phillipsite), and barite.



Geological Period

Paleogene

Geology

Waiareka Volcanics, siltstone and mudstone.

Geomorphology

Coastal erosion, volcanic promontory

Protection

Recreation Reserve (Moeraki), Significant Coastal Landscape, Geopreservation site.

Importance

Scientific Importance: Regional
Cultural Significance: 5 - Very Significant
Public Significance: 5 - Cant miss this site

Hazards

The wider area has land stability issues

Artefacts

Artefacts exist (Otago Museum)

Vulnerability to Human Actions

Planning values: 2 - Significant Modification
Recreation values: 3 - Not Vulnerable

Access and Facilities

Open to the public (Unrestricted Access)
Parking Available (8 Cars)
Wheelchair accessible
Walking Track links

Terrain

Roading: Easy/Flat
Site: Easy/Flat

Site Features

Culture - Nature - Geological - Vista - Heritage

Site Associations

Cultural Heritage
Natural Heritage

Site Characteristics

Sediment - Volcanic - Active Erosion - Landform
- Minerals - Matakara Maori

Site Interpretation

Science Education

38 Kātiki

-45:23:28.176, 170:51:57.913

This magical location is the home to many species of wildlife including hoiho (yellow-eyed penguins) and kekeno (fur seals). Kātiki Lighthouse (built in 1878) also stands prominently on the point. A special place of cultural and historical significance to Ngāi Tahu.



Geological Period

Paleogene

Geology

Waiareka Volcanics, siltstone and mudstone.

Geomorphology

Coastal erosion, volcanic promontory/isthmus

Protection

Significant Coastal Landscape, Site of Natural Significance, Archaeological Items (5697, 5696, 5695, 5698).

Importance

Scientific Importance: Regional
Cultural Significance:
Public Significance: 5 - Cant miss this site

Hazards

Coastal cliffs, slippery path if wet. Seals

Biodiversity

Hoiho (Yellow Eyed Penguin) Colony

Access and Facilities

Open to the public (Unrestricted Access)
Parking Available (10 Cars)
Toilet

Terrain

Roading: Easy/Flat
Site: Easy/Flat Sloped

Site Features

Culture - Nature - Geological - Vista - Heritage

Site Associations

Cultural Heritage
Natural Heritage

Site Interpretation

Interpretive Board - Geotours

39 Trotters Gorge

-45:24:10.363, 170:46:32.968

The rocks are a greywacke-breccia conglomerate of Cretaceous age, but the gorges and caves were formed after the last ice age 12 - 15,000 years ago. This is a great place to see and hear many of New Zealand's bush birds. Listen out for NZ falcon/karearea calling overhead. Also, look out for native fish (galaxiids) in the streams.



Geological Period

Cretaceous, Quaternary (erosion)

Geology

Horse Range Formation, Taratu Formation

Geomorphology

Caves

Protection

Scenic Reserve (Trotters Gorge Scenic Reserve).

Importance

Scientific Importance: Regional
Cultural Significance: 3 - Moderate significance
Public Significance: 5 - Cant miss this site

Hazards

Hidden caves, water. Narrow driveway access and road

Biodiversity: Uncommon, at risk, threatened

Pimelea pseudolyalli, Celmisia hookeri, Teucrium parvifolium, Ramalina pollinaria

Vulnerability to Human Actions

Planning values: 2 - Significant Modification
Recreation values: 3 - Not Vulnerable

Access and Facilities

Open to the public (Unrestricted Access)
Parking Available (6 Cars)
Toilet
Walking Track links

Terrain

Roading: Easy/Flat
Site: Easy/Flat

Site Features

Nature - Geological

Site Associations

Natural Heritage

Site Characteristics

Sediment - Landform

Site Interpretation

Science Education - Geotours

40 Matakaea (Shag Point)

-45:28:25.050, 170:49:53.096

There are many diverse features at this site from a history of coal mining to the discovery of a significant plesiosaur fossil. Large round boulders (of Arai Te Uru legend) can be found embedded in the rock shelf. A seven-metre marine reptile, a plesiosaur, was found here and is now part of the University of Otago fossil collection. This area was used by the early moa hunters. Nearby, Shag/Waihemo River Mouth yielded important archaeological evidence of Ngai Tahu lifestyles dating back to the 12th century. Moa skeletons and many artefacts found here are displayed at the Otago Museum. Whalers discovered the first bituminous coal in New Zealand here in the 1830s. By 1862 the exposed coal seams were found to be commercially viable and were successfully mined until 1972, when flooding eventually closed shafts that extended under the coast. Evidence of coal mining is still obvious throughout the reserve



Geological Period

Cretaceous, Paleogene

Geology

Horse Range Formation, Taratu Formation, Onekakara Group

Geomorphology

Coastal erosion

Fossils

Fossils - Fossil marine reptile: the Plesiosaur Kaiwhekea katiki.

Protection

Recreation Reserve (Matakaea Recreation Reserve), Significant Coastal Landscape.

Importance

Scientific Importance: International
Cultural Significance: 5 - Very Significant
Public Significance: 5 - Cant miss this site

Hazards

Seals. Rock falls and cliff edge instability.
Unmarked mining shafts (warning signs visible)

Artefacts

Artefacts exist (North Otago Museum & University of Otago)

Biodiversity: Uncommon, at risk, threatened

Wurmbea novae-zelandiae, Celmisia hookerii

Vulnerability to Human Actions

Planning values: 2 - Significant Modification
Recreation values: 3 - Not Vulnerable

Access and Facilities

Parking Available (20 Cars)
Toilet

Terrain

Roading: Easy/Flat
Site: Easy/Flat Uneven

Site Features

Culture - Nature - Geological - Heritage

Site Associations

Cultural Heritage
Natural Heritage

Site Characteristics

Sediment - Mining - Matauranga Maori

Site Interpretation

Science Education - Interpretive Board

41 Puketapu

-45:29:26.583, 170:43:52.540

Puketapu overlooks the Waihemo area and stands prominently to the east of the town of Palmerston. This volcanic centre is part of the Dunedin Volcanic Group. A monument to Sir John McKenzie, a former Waihemo MP, stands at the top



Geological Period

Neogene

Geology

Dunedin Volcanic Group

Geomorphology

Volcanic peak.

Protection

Significant Natural Feature, Heritage Item Cat B (108), Archaeological Items (5703,5705).

Importance

Scientific Importance: Regional
Cultural Significance: 4 - Significant
Public Significance: 5 - Cant miss this site

Hazards

Active farming area. Steep track

Vulnerability to Human Actions

Planning values: 2 - Significant Modification
Recreation values: 3 - Not Vulnerable

Access and Facilities

Not open to the public (Access by Arrangement)
Parking Available (4 Cars)
Toilet
Walking Track links

Terrain

Roading: Uneven
Site: Sloped

Site Features

Culture - Geological - Vista - Heritage

Site Associations

Cultural Heritage
Natural Heritage

Site Characteristics

Sediment - Volcanic - Plutonic - Active Fault - Landform - Matauranga Maori

Site Interpretation

Science Education

42 Golden Point Battery

-45:21:06.455, 170:25:31.673

Wonderfully preserved stamper battery and the only authentic working example in Otago it will leave you in awe of the determination of early miners. A tunnel and shaft dug into the hillside exposes Otago Schist.



Geological Period

Permian, Triassic, Jurassic (Otago Schist).

Geology

Otago Schist

Protection

Historic Reserve (Golden Point), Heritage Item (129).

Importance

Scientific Importance: National
Cultural Significance: 4 - Significant
Public Significance: 4 - Very Interesting

Hazards

Road crosses mining track. Mining trucks and activity. Prickly vegetation alongside tracks.
Holes in ground

Vulnerability to Human Actions

Planning values: 1 - Complete destruction
Recreation values: 3 - Not Vulnerable

Access and Facilities

Open to the public (Unrestricted Access)
Parking Available (10 Cars)
Walking Track links

Terrain

Roading: Easy/Flat
Site: Easy/Flat Uneven Sloped

Site Features

Culture - Geological - Heritage

Site Associations

Cultural Heritage
Natural Heritage

Site Characteristics

Metamorphic - Minerals - Mining

Site Interpretation

Science Education - Interpretive Board

APPENDIX 2 – Our Story

In November 1985 Prof. Ewan Fordyce of the University of Otago's Geology department excavated the fossilised skull of a shark tooth dolphin from the "Earthquakes" site near Duntroon. Local farmers were excited by the realisation that their land contained important geological and historical artefacts and possessed a fascinating human history predating the arrival of Europeans to New Zealand.

In October 2000, the Vanished World Incorporated Society was formed. A group of landowners and volunteers in the Duntroon area, with assistance from the Geology Department of Otago University, established the Vanished World Fossil Centre in Duntroon and the Vanished World trail with sites throughout the Waitaki District.

Over time Ewan Fordyce saw the UNESCO Geopark concept as one that was a great 'fit' for Vanished World (VW). In June 2013 Ewan wrote to UNESCO in Paris expressing an interest in becoming a UNESCO Geopark. On April 26th 2017, at a VW Committee Meeting, a Geopark Steering Committee was formally established. This group met regularly and carried out an audit of the Trail. They reported back monthly to the VW Committee and Roger Blackburn had several informal meetings with Mayor of Waitaki, Gary Kircher.

On December 14th 2017, Waitaki District Council CE Fergus Power organised a visit to Vanished World by Dave Bamford, a recognised tourism sector consultant), to look at the possibility of achieving UNESCO Geopark for Waitaki and World Heritage Site status for Ōamaru.

By April 30th 2018 the Council-led Geopark team plus partners produced an Expression of Interest document, which was submitted to the New Zealand National Commission for UNESCO. In May the Commission announced that the Waitaki Whitestone Geopark has been accepted to go forwards as a New Zealand nomination for UNESCO Global Geopark status. By August, the Waitaki Whitestone Geopark Trust had been incorporated.

The Application Dossier was submitted to UNESCO



Professor Ewan Fordyce with a fossil discovery from the Waitaki region photo © Otago Daily Times

headquarters in Paris in November 2018. We received extensive help from the University of Otago and GNS Science.

As a matter of good sense the Trust arranged for an independent review of our application and state of readiness by Prof. Patrick McKeever who had been the instigator of the Geopark designation at UNESCO. His findings were that we had all the elements of a Geopark, but needed to link them together in a way which gave it its own identity and visibility.

Since Patrick's visit we have been working hard on his recommendations. Additional skilled and passionate Trustees have been appointed to drive the Geopark forward. This has included the appointment of an additional Te Rūnanga o Moeraki member to further strengthen the partnership with Ngāi Tahu Whānui. As a result in 2020 the Trust embarked on a significant project with Te Rūnanga o Moeraki to better reflect te ao Māori – the Māori world perspective – into the co-design of the Geopark. This has led to a rebranding of the Geopark in 2021.

Prior to COVID-19, Tourism Waitaki had taken the geopark to TRENZ and to inbound tour operators in England and Australia. Post-TRENZ, Tourism Waitaki hosted five famils in the region, these famils have already resulted in media exposure in China and new bookings to the Ōamaru Blue Penguin Colony with visitors staying in Ōamaru.

We have had successful workshops with geogastronomy industry players and published an app to self-guide visitors around the geopark.

In 2019 the Trust, with support from the Waitaki District Council and the Provincial Growth Fund, engaged a consortium of economic and tourism consultants to develop a 'Validation Case' which would quantify the benefits of the Geopark in dollar



terms (including employment created), and proposed a model for how the Geopark could become self-funding. The Case proposed the development of three revenue-generating visitor attractions, managed by a new commercial entity which would have had the Council, central Government, iwi, philanthropic funds and the private sector as cornerstone investors.

A number of factors meant that the timing for such an ambitious investment programme was not right. The proposal necessitated a deeper relationship with iwi, something which is now occurring. The investment appetites of Council and central Government towards visitor-related attractions had diminished since the earlier days of the Provincial Growth Fund. With hindsight, and the unexpected impact of the COVID-19 pandemic, a development path which focused more on community-led engagement and smaller capital investments will be the most suitable way forward for the Geopark. This is reflected in the new strategic direction outlined in this Plan.

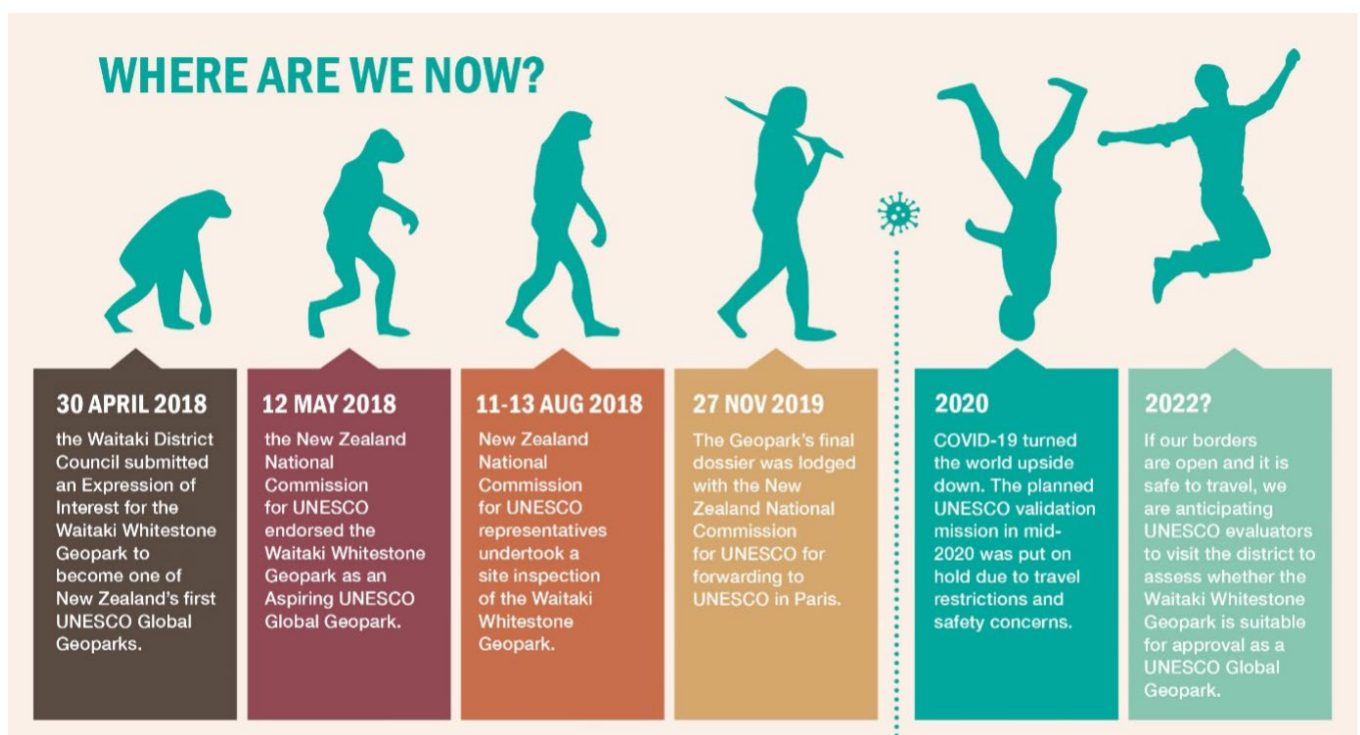
We delivered the School of Rocks primary school education programme in 2019, but had to cancel the 2020 programme due to the pandemic.

We are working on designs to discuss with Council about increasing the Geopark's visibility in the district.

Our first commercial sponsor, OceanaGold, has come on board to fund the Geopark geologist and to help us advance the objectives of the Geopark.

In 2021 we codesigned the activities and project set of the Waitaki Whitestone Geopark with iwi. This included the development of a new logo, the story of which is explained in Appendix 3.

We are still developing the Geopark in line with the UGGp framework, as the overarching values remain core to the purpose of the Geopark and the guidelines will have our Geopark in a ready state when it is assessed by UNESCO for UGGp designation.



APPENDIX 3 – Our Logo



Mauka Āhuru – Sheltering Mountains

This represents the support and sustenance provided by the environment to people and the care and protection people need to give to the environment. Together we will contribute to thriving environments and communities.

Wai – River and Sea

The braided and woven river lines represent the movement of water and the linkages of people and places. It also signifies the ongoing connections that flow from all our ancestors to us – and to those that come after us.

Tangata – People

The tiki figure is an abstract representation of Māori Rock Art, symbolic of a person. Just as the Geopark has hidden elements waiting to be discovered, this too is hidden among the elements, creating a sense of discovery for the viewer.

Whenua – Fossil-rich Limestone

The lines represent eroded rock formations, created by fossil rich limestone. The spiral shape represents fossils beneath the limestone.

Overall, this represents the whenua, the land and landscapes that connect us to the past, the present and the future.



www.whitestonegeopark.nz