



Franz Josef Glacier

Kā Roimata o Hine Hukatere

Westland *Tai Poutini* National Park

A Glacier in your Back Yard

Franz Josef is the Northern Gateway to *Te Wāpounamu* South-West New Zealand World Heritage Area

WHOSE ROHE?

Ngāi Tahu is the iwi, Kāti Mahaki are the hapū.
Contact Makāwhio Rūnaka for further information.

The Franz Josef Glacier plunges from 3000m at the top of the Southern Alps to 300m above sea-level. It has advanced and retreated many times since the last glaciation when it swept right out to sea. It is now one of the most popular tourist destinations on the West Coast.



- Protect plants and animals*
- Remove rubbish*
- Bury toilet waste*
- Keep streams and lakes clean*
- Take care with fires*
- Camp carefully*
- Keep to the track*
- Consider others*
- Respect our cultural heritage*
- Enjoy your visit*
- Toitu te whenua
(Leave the land undisturbed)*

WHAT'S IN A NAME?

The glacier has two names. *Kā Roimata o Hine Hukatere* is one name which means, in Māori, the tears of the avalanche girl. Julius von Haast later named the glacier Franz Josef, after the Emperor of Austria-Hungary.

SPECIAL FEATURES TO LOOK OUT FOR

- **Glacial Rock Flour** – Look at the milky colour of the Waiho River! It is caused by boulders grinding against each other below the glacier and producing very fine suspended rock sediment.
- **Trimlines** – Cast your eyes around the valley sides. These “lines” of vegetation with bare rock, or younger vegetation, below show where the glacier used to be.



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- Roche moutonnees (Rock Sheep) - You can see good examples of these enormous rocks at the start of the Glacier Valley walk. They are an asymmetrical shape. The up valley side is very steep and rough and the down valley side is gentle and smooth.
- Scoured Rock - Look at the large rocks all around the Glacier Valley. Many of them will have long scratches, or striae. This shows you the direction of ice flow.
- Peter's Pool - Take a short walk to this kettle lake. It was formed when a lump of ice melted.
- Rata blaze - If you are lucky, you will see the rata flowering after Christmas.
- Bird life - Keep your eyes and ears open for all sorts of birds.

SHORT WALKS

Lake Wombat

(Easy, 1.5 hours return)

Starts 3.5 kms along the Glacier Valley access road. Easy forest walk to a kettle lake.

Douglas Loop

(Easy, 1 hour round trip)

A round trip over glacial moraines. Visit Peter's Pool (see below) and the historic Douglas suspension bridge. You can start this walk by leaving your vehicle part way up the Glacier Valley road or from a small parking area near the Glacier Valley carpark. To make a round trip you will need to walk back up or down the road for 500m. See Activity 1.

Peters Pool

(Easy, 5 mins)

This kettle lake was formed around 200 years ago as a lump of ice melted. You can already see how rushes and other plants are starting to take over the pool. In another 100 years it may have disappeared completely. This lake features in our activity.

Sentinel Rock

(Easy, but uphill, 30 mins return from the carpark)

Sentinel Rock is a feature known as a *roche moutonnee* (rock sheep) that has been carved out by the ice. The walk begins from the Glacier Valley carpark. After climbing through a scrub forest of tree daisy (*Olearia*), you reach a point with a fantastic view of the riverbed, the glacier and the mountains above. There are a number of interpretative panels at the viewpoint covering the story of Kā Roimata o Hine Hukatere, the geography of the glacier and the previous positions of the glacier. This walk features in our activities.

Glacier Valley Walk

(Moderate, but conditions can make this walk dangerous, 1.5 hours return)

Think carefully before deciding to take your group on this walk. Although it is a wonderful experience to approach the glacier, the walk is not suitable for young children or those inexperienced in mountain environments. We encourage you to contact the Visitor Centre for the latest conditions. The walk starts at the Glacier Valley carpark. After an easy 20-minute stroll through the bush, you will reach the riverbed.

At this point, you need to make a decision about the suitability of weather and river conditions. It may not be appropriate to continue. If you decide to continue, then follow the limited markers across the valley bottom to the terminal face of the glacier. Keep regular head counts. Walks on the glacier can be organised through one of the local guiding companies.

Tatare Tunnels Walk

(Moderate and up hill, 1 hour 20 minutes return)

This walk allows you to explore old tunnels, wooden flumes and an escape race. You will need a torch and sturdy shoes to explore the tunnels. You will get wet feet!

BE PREPARED: RISK ASSESSMENT

See our activity “Be Prepared” in "Using this Resource". In addition to the general hazards outlined, you need to consider:

- traffic round the Visitor Centre, the Glacier Valley carpark and when walking on the road;
- the water hazard at Peter’s Pool; and
- going beyond the barriers at Sentinel Rock Viewpoint.

If you take your group on the Valley Walk to the terminal face of the glacier, you need to consider the danger of:

- falling in the Waiho River;
- falling rocks when crossing the steep slip;
- falling ice hitting people if they go unsupervised beyond the ropes at the terminal face;
- slipping on ice if people venture onto the glacier;
- heavy rain raising side streams while people are at the Glacier Terminal making return dangerous;
- students getting separated from the group (do regular head counts); and
- changing weather in the mountains lowering visibility and increasing the chances of losing the markers.

You will avoid most of these hazards if you seek and heed local advice, maintain small groups, and keep regular head counts.



ATTRACTIONS AND FACILITIES

- Audio Visual Programme
- Guided Walks

OTHER EXCITING THINGS TO SEE AND DO

- Have a picnic at Lake Mapourika 10 km north of Franz Josef.
- See glow worms on the Terrace Walk at night.
- Basic camping at McDonalds Creek and Ottos Corner just north of Franz Josef.
- Go kayaking on Okarito Lagoon.
- Visit the White Heron Sanctuary at Okarito (summer months only).

ACCOMMODATION

There is a wide range of accommodation in Franz Josef. Please phone the Visitor Centre for information.

RESOURCE MATERIAL

- DOC Fact Sheet: Jan 2001 Glaciers - How do they work?
- DOC Walks and Tracks Information
- The Franz Josef Resource Box available for borrowing from the Visitor Centre or the Teacher Resource Centre in Greymouth. This contains photos of trees species, a tree identification guide, and information about the glacier and the tracks.
- Visitor Centre videos: Kea video (20 minutes), Biodiversity video (15 minutes) and "Edge of the Wilderness" video (20 minutes about the South Westland World Heritage Area). Please phone to check availability.
- Te Kakano Video #3 prepared by Waikato University and the Ministry of Education which shows Māori clothing for the mountains.

More Information:

Franz Josef Glacier

Visitor Centre

Department of

Conservation

PO Box 14

Franz Josef Waiata

Pb: 03 752 0796

Fax: 03 752 0797

HOW TO GET THERE

Franz Josef Township is located on State Highway 6, about 2.5 hours drive, or 180 km south of Greymouth. The Glacier Valley carpark is another 5 km from the township. The turn off for the Glacier Valley, and most of the walks, is at the south side of the Waiho River bridge. The Glacier Valley road is unsealed but well maintained and suitable for buses. Minibuses can be hired in the village but you need to book in advance.

The Visitor Centre

The Visitor Centre is open from 8.30 am until 6 pm October to April and 8.30 am until 12 pm and 1 pm until 5 pm in winter. As well as selling a range of souvenirs, the centre has several cultural and natural displays and several audiovisual presentations. See the resources section above. You can also visit Defiance Hut, a historic mountain hut, behind the Visitor Centre.

Department of

Conservation

Te Papa Atawhai

West Coast Conservancy

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EDUCATIONAL ACTIVITIES AT FRANZ JOSEF

THE CURRICULUM

The tracks and environmental issues at Franz Josef present a range of learning experiences for Ss to achieve curriculum objectives. By using and adapting our suggested activities and incorporating the curriculum objectives below, you could develop a trip around the following general aim:

Aim: Ss will have an understanding and appreciation of the uniqueness of the Franz Josef Area

Social Studies

- The essential skills of inquiry, values exploration and social decision making can be developed by focusing your trip on one or more of the environmental issues at Franz Josef Glacier. It is also in the aims of environmental education to develop these skills. For example, Ss could focus on the pressures of tourism including, identifying the reasons why tourists visit Franz Josef; the effects of tourists on the Franz Josef environment, and the management decisions made to control the effects of tourists. For more examples of environmental issues see below.
- Under SO L2:1 & L3:1, Ss can explore how participation in groups, e.g. “being a tourist” involves rights and responsibilities and how and why people make and implement rules and laws for managing tourists. In P&E at all levels, Ss could examine:
 - how people’s activities influence the Franz Josef Glacier environment and vice versa;
 - how different groups e.g. tourists, residents, DOC, tangata whenua, and recreational groups currently view and use this area; and
 - how it has been used in the past.
- Ss could also look at the different ways people describe Franz Josef Glacier and why there are two names.

Health and Physical Education

See our activity “Be Prepared” in "Using this Resource".

Technology

- Ss could look at the impacts of technology (barriers, bridges etc) on the Douglas Walk and the Sentinel Point walk.
- Ss could consider the (positive and negative) effects of helicopter tourism on local residents, wildlife, Ngāi Tahu, other tourists, and recreational groups.
- For textiles, Ss could look at what clothing suits the glacial/high rainfall environment of Franz Josef. Have a look at the Te Kakano #3 video, which has a section on Māori traditional clothing for the mountains.

Science

- Under, LW, Ss can study vegetation succession by comparing the type and structure of the vegetation on an 80-year-old river fan and a moraine that is several hundred years old. See our Douglas Walk activity below.
- There is plenty of scope for studying glacial landscape features and processes as part of PE&B. At L3:1&2, Ss can consider the glacier as part of the water cycle and they can gather and present information about its origins and history. See the Resource Box for more information about glaciers.

Mathematics, English and Art

For Mathematics

- Ss can count, estimate, and calculate percentages of (different types of) tourists, helicopters, vehicles, trees, and plants.
- They can study geometry by looking for natural symmetries and shapes in the environment, e.g. identify and sketch 2 round leaves, 2 square leaves, and two rectangular leaves. The reflection in Peter's pool is a good example of reflective symmetry.

For English

- Ss could work on the story of Kā Roimata o Hine Hukatere.

For Art

- Ss can explore some of the environmental issues below through pictures, posters, dance, drama and music.

Environmental Issues

- The pressure of tourism at Franz Josef – Franz Josef is the second most popular Visitor Centre on the Coast.
- Current and future visitor management – the noise and frequency of helicopter flights and the large number of tourists walking on the

glacier raise the issues of “disturbing the natural quiet” and “social crowding” (too many people) respectively.

- Pests - animal pests like thar, goats, deer, possums and dogs pose a threat to native plants and animals. For example, thar eat tussocks and other alpine and sub-alpine vegetation.
- A further issue is that of natural hazards as Franz Josef is located on a fault line, which could be affected by an earthquake one day. Contact the Regional Council for more information on this topic. Their address is at the back of this document.

TEACHER’S BACKGROUND INFORMATION

More detailed information is available in the Franz Josef Resource Box.

Māori Cultural Heritage

The Māori name for the glacier, Kā Roimata o Hine Hukatere refers to an adventurous Māori woman who loved mountaineering. Her husband, Wawe, did not like climbing but one day she persuaded him to come with her. Tragically, Wawe slipped at the top of the valley and fell to his death. Hine Hukatere was so overcome with grief that she shed a river of tears, frozen by the Gods in perpetual memory of her sorrow.

Tourism Heritage

European visitors started to visit Franz Josef more than a hundred years ago. At that time, there were two wooden hotels in the settlement, one of which was run by the famous guiding family, the Grahams. Local guides like the Grahams, used to operate excursions up on to the ice. A walk on the ice is still a popular option for many tourists today.

Glacial Processes

A glacier is a body of ice that moves slowly downhill. High up in the Southern Alps, layers of snow build up over winter. This part of the glacier is called the neve. These layers of snow compress together, become heavier and move down hill. When the front, or snout, of the glacier moves forward we say that the glacier is advancing. When it shrinks back we say that it is retreating.

Glacial Features

As the glacier advances and retreats it erodes, transports and deposits rock to create a number of features. A typical feature of a glacial valley is the “U” shape created as the ice forces its way downhill. As the glacier travels, it collects rocks, boulders, pebbles and clay and deposits them further down the valley. This material is called moraine. Moraine dumped down the sides of the valley is called lateral moraine. Moraine dumped at the snout of the glacier is called terminal moraine. Moraine is useful because it helps us to trace the path of the glacier. Moraine also provides a fresh surface for vegetation to grow on. See our activity below.

Another special glacial feature that you will be able to see from Sentinel Point is a trimline. These are lines separating vegetation of different ages along the valley wall. The lines represent a former position of the glacier. The older vegetation is usually above the line, as it has been exposed for longer. The younger vegetation is below, as it has been uncovered from the ice more recently.

Vegetation Succession

As soon as the glacier retreats, or the Waiho river changes its channel, then life begins to grow again. The first colonisers on the moraine or river gravel are tough lichens, algae and mosses. After a few years, these plants are replaced by plants that can fix nitrogen, like tutu and broom. Over the next fifty years, as these plants die and decay, they create a basic layer of humus, which is suitable for larger shrubs like tree daisy (*Olearia*), coprosmas and hebes to grow. These plants are themselves then replaced taller species and after 120 years or so, we may have a rata/kamahi/broadleaf forest. If undisturbed for a 1000 years, we will see giant podocarps, such as matai and tōtara, towering above the undergrowth in some places.



PREVISIT ACTIVITIES

- Try the “Be Prepared” activity in "Using this Resource". Focus on road safety and conduct on the Glacier Valley walk if it is in your itinerary.
- Research glacial processes, features and terms. Use the information in the Resource Box and in the Ts notes above. Prepare Ss to be glacier detectives when they arrive on site!
- Ask the Ss to tell you their expectations of the glacier. Has anyone in your class been there before? Encourage Ss to find out information from friends and family. Write or draw their ideas and repeat the exercise after the visit for comparison.
- Assign different Franz Josef Glacier Valley plants to several Ss. These Ss are responsible for identifying their plant during the trip. You could have a rimu expert, a flax expert and a palm leaf fern expert.

VISIT ACTIVITIES

We have outlined some ideas for a visit to Douglas Walk and Peters Pool and the Sentinel Rock Walk. Please adapt them for your group.

Curriculum Links in a box

Social Studies: SO L2:1 & L3:1, and P&E L2:1, L3:1, & L4:1

Science: LW, all levels and PE&B L2:1 & L3:1&2

Technology: T&S

Health and Physical Education: PH&PD

Activity One Douglas Walk and Peter's Pool

(Allow 1.5 hours)

Examples of Specific Learning Outcomes

- Ss will identify 3 plants.
- Ss will be able to identify the differences between vegetation growing on young and older surfaces.

Equipment & Preparation

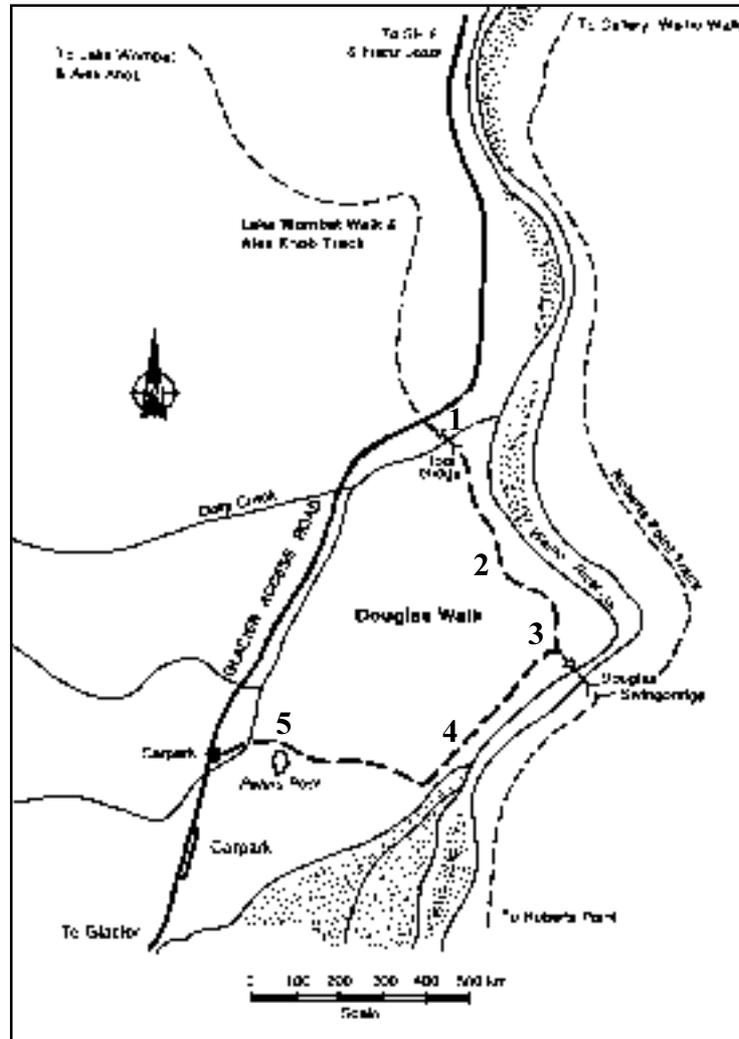
- If you have an older group, you could convert the questions for each stopping place into a worksheet.
- Plant ID cards or books.
- Sheets of plain paper and pencils for sketching plants and Peter's Pool.
- Appoint some Ss to count the number of helicopters you hear on your walk.
- The notes for this activity start at the north end of the track. You could work backwards and start at the south end.

Stop One – Dolly Creek North End

Find a place to stop before you reach the footbridge. You are standing on rocks that were dumped here by the river about 80 years ago so plants and trees have been growing here for nearly 80 years too!

- Do Ss know anyone who is 80 years old?
- What are the main types of plant that are growing here? Big trees? Small trees? Shrubs? Ferns? Epiphytes? Mosses? Lichen?
- How many different types of tree can you see?
- Find the tallest tree. How many Ss would you need to stand on top of one another to reach the top of the tree?
- How many different types of fern can you see?
- Use a plant guide, or your "experts" and see if you can identify and remember 3 plants or trees.
- Choose one or two plants to sketch and label.
- How much light is there? What percentage of the sky can you see?

- Is it wet or dry?
- Is there any wind?
- Have a look at the leaf litter? Can you see any insects?
- What colour is the water in Dolly Creek?
- At stop two, you will see some plants that have been growing for over 400 years. How do you think they will differ?



Stopping Points for Activity One

Stop Two – 400 year old moraine

Walk over the footbridge and up to the top of the next slope. You are standing on moraine or rocks that were dumped here by the glacier over 400 years ago.

- Which of your predictions about the plants was correct?
- Repeat the questions you answered for stop one.
- What do you think are the three big differences between this stop and stop one?
- Can you see some of the larger rata, kamahi or tōtara trees?

Stop Three – The Douglas Swing Bridge

This bridge was built in 1907 and is named after Charlie Douglas, the famous South Westland explorer.

- Can you explain why the bridge is here and what materials it is made out of? Where do you think the materials came from?
- In groups of no more than five, walk onto the bridge to have a look at the Waiho River.
- Can you guess where this water comes from?
- The water in the river should be a grey/blue colour and different to the water in Dolly Creek. Why is this?
- The Waiho River is a typical (braided) glacial river. Is the water running in one channel, or several?

Stop Four - (Awareness and Sensitivity to the Environment)

Leave the bridge and continue your walk up the hill. This hill is made of moraine dumped by the glacier 250 years ago. Find a good place to rest.

- See if you can keep quiet for 3 or 4 minutes! Ask everyone to hold out their fists in front of them and close their eyes. Every time a S hears a noise they should release a finger or thumb from their fist until they reach 10!
- What noises did you hear? Which noises did you like? Why? Which noises didn't you like? Why?
- What does it smell like in the bush? Do you like it?
- How many different shades of green can you see? Choose one shade and make up a new name for it.
- Without picking any plants, see if you can find something rough, something smooth, something furry, something smelly and something prickly.

Stop Five – Peter's Pool

Continue your walk until you come to Peter's Pool. Peter was a boy who camped here in 1894. If you are lucky, the glacier will be reflected in the pool.

- This pool is about 200 years old and was formed by the glacier. See if you can come up with a clever idea to explain how the glacier made this pool.
- Look at the plants around the edge of the Peter's Pool. Do you think the pool is getting larger or smaller? What will it look like in another 200 years?
- Take a plain sheet of paper and draw a horizontal line half way across the page. On the bottom side, draw the reflection of the mountains and glacier in Peter's Pool. It will be upside down! Back in the classroom, try to draw the actual mountains themselves.

Activity Two Sentinel Rock

(Allow 45 mins)

Examples of Specific Learning Outcomes

- Ss will be able to identify 3 positive and 3 negative effects of tourism.

Equipment & Preparation

- If you have an older group you could convert the questions from each stop below into a worksheet.
- Plant ID cards or books.
- Ss will need a basic idea of glacial processes and features. For example, a glacier, a U-shaped valley, a braided river, a roche moutonnee and a trimline.

Stop One – Start of Glacier Valley Track/safe place in carpark

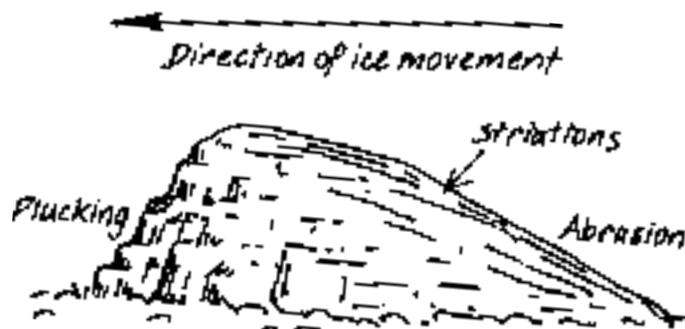
- How many tourists have you seen so far (include the carpark)?
- Where do you think they come from?
- Why are they here?
- Name at least five things DOC has put here for tourists
- How do tourists affect the Franz Josef area? Think about what tourists do and what they need. Try to think of three positive effects and 3 negative effects.
- What does DOC do to protect the area from tourists?
- What do you need to do to be a “good” tourist?

Stop Two – Sentinel View Point -How has this area been made safe for visitors?

- What two jobs do the track and the barrier do?

Be a Glacier Detective!

- Stand somewhere with a good view of the glacier and the valley!
What is a glacier?
- Do you think this landscape has changed or will ever change? How?
- You are standing on a roche moutonnee, or rock sheep, formed by the glacier forcing itself over hard rock. What other glacial features can you see when you look around the valley.



A Roche Moutonnee



POST VISIT STUDY AND ACTION

Tourism Theme

- Using Ss' observations from their trip focus on the Social Studies links at the beginning of this section.
- Charlie Douglas the great NZ explorer said in 1900 “ Let us keep a few spots in Westland, uncontaminated by the ordinary tourist, the picnicker and the photographic fiend, some almost impassable place where what is inside can be left to the imaginations..keep them for those who care to risk their necks.”

For English

- Debate or role play different groups of tourists, some of whom think there should be more scenic helicopter flights and some of whom think that there should not be any!
- How would the Ss manage tourists in the area in the future? Write a letter to DOC with your ideas.

For English and Art

- Create a poster to raise visitor and tourist awareness of either safety issues at Franz Josef Glacier, or how to be a “good” visitor. Ss will need to consider carefully the types of messages they wish to put across. Send a copy to the Franz Josef Visitor Centre for display.
- Design an interpretation panel or a pamphlet for children to read when they visit Franz Josef. Present it to a younger class in your school and send a copy to the Franz Josef Visitor Centre, where it could be used for younger visitors.

Species Management and Pest Control (Biodiversity)

- Investigate the Māori uses of plants and Māori names for the plants you identified. Refer to your Forestry Insights Pack.
- Create a collage or montage using photos and sketches from your visit to show the vegetation of different ages along the Douglas Walk.
- What introduced plant and animal species did the Ss notice on their trip? Why are they there? What problems do they cause?
- For Art, create a “wanted” poster for one of the pest plants or animals you identified. Think of ways to encourage your community to get rid of the pest.

Landform Processes Theme

- Consolidate what the Ss learnt and observed on the trip by discussing which processes resulted in the glacier and the glacial features.
- Think about how people affect these processes.
- For art, use Ss' sketches of the Peter's pool reflection to recreate the landscape above the reflection.