

Educational Booklet



The
Grand Traverse
“Flight of a Lifetime”



AIR SAFARIS

Description

The GRAND TRAVERSE flight with AIR SAFARIS takes you over a stunningly diverse landscape. You'll experience the golden tussock lands and vivid turquoise glacial lakes of the Mackenzie Basin, the lush green plains and forests of Westland, isolated sheep stations nestled in glacier-carved valleys, New Zealand's largest glaciers, and its highest peaks.

The GRAND TRAVERSE showcases the alpine majesty of New Zealand's South Island. The Southern Alps, or Main Divide, stand across the prevailing westerly weather patterns. These mountains, uplifted by tectonic plate collisions, were once part of the ancient supercontinent Gondwana. Millions of years ago, New Zealand drifted away from Gondwana's Australian section, and tectonic processes continue to uplift and fault the region. Longitudinal movement along the great alpine fault has been measured at 500 km (300 miles), with erosion and weathering maintaining the mountains' heights.

Typically, as weather systems approach New Zealand from the Tasman Sea, increasing westerly winds carry moisture toward the Southern Alps. When this moist air meets the mountains, clouds form and often result in heavy rain on the west coast. The westerly winds also create excellent soaring conditions in the Mackenzie Basin, making it a hotspot for gliding competitions.

With heavy rainfalls averaging 25 mm per hour on the West Coast, moisture is lost as the air meets and rises over the Main Divide. The air, descending down the eastern side of the alps, gains temperature on its descent, producing the dry, warm Canterbury 'Nor' Wester ' blowing as a gale across the Mackenzie Basin and East Coast

Snowfall at altitude feeds the glaciers, and as snow compacts into ice, it flows down valleys. On the eastern side of the alps, gentle gradients create leisurely glacier movement terminating in lakes. In contrast, the Franz Josef and Fox glaciers on the western side are fed by massive snowfields, creating dramatic icefalls that descend to low altitudes.

Glaciers are powerful erosional forces, transporting rock debris and silt. They grind the bedrock beneath them, producing fine glacial flour that gives glacial lakes their milky turquoise color. The Aoraki National Park glaciers, for example, release around 400,000 tonnes of rock flour annually into the Tasman Valley and Lake Pukaki.

During the last ice age, glaciers shaped the Mackenzie Basin, leaving behind impressive landforms and moraines. The GRAND TRAVERSE provides a bird's-eye view of these ancient landscapes, including glacial outwash patterns and moraine deposits. Look for erratic rocks, drumlins, and Roucher Moutonnee formations as you fly.

Maori History - Significance of the Mackenzie Basin

Early Exploration and Settlement

The Māori were among the first to explore and settle in New Zealand, including the Lake Tekapo area. Early explorers, likely coming from the northern parts of the South Island or from the North Island, ventured into the region. The rugged terrain and abundant natural resources made the area an attractive location for settlement and seasonal hunting.

Significance of the Mackenzie Basin

The Mackenzie Basin, where Lake Tekapo is situated, was particularly important to the Māori. This high-altitude region, with its diverse landscapes and rich wildlife, provided a valuable food source. The area's seasonal abundance of wildfowl and large moa birds (now extinct) drew Māori hunters from coastal lowlands. The Mackenzie Basin was known for its significant food-gathering potential and producing valuable fine wool.

Traditional Practices

The Māori used a variety of traditional methods to harvest and transport resources. Rafts, known as Mokihi, were commonly used to float large quantities of food across waterways. These rafts were essential for transporting food back to coastal settlements via the Waitaki.

River, located at the southern end of the basin.

Early Māori Settlements

Although detailed archaeological records are scarce, it is believed that the Māori established temporary settlements in the region. These settlements were often situated in areas with access to essential resources such as water, food, and shelter. The Māori would have constructed temporary shelters and used the area’s resources for food, tools, and building materials.

Cultural Practices

The Māori had a deep connection to the land, and their cultural practices were closely tied to the environment. They used spiritual and practical reasons for their choice of settlement areas.

Impact of European Settlement

The arrival of Europeans had a profound impact on the Māori communities in the Mackenzie Basin. European exploration and settlement introduced new technologies, changes in land use, and shifts in local economies. This transition often led to competition for resources and alterations in traditional Māori ways of life.

Modern Recognition

Today, the Māori heritage of the Tekapo area is recognized and celebrated as part of New Zealand’s cultural history. The local Ngāi Tahu iwi, one of the principal Māori tribes in the South Island, has connections to the area. Efforts are made to preserve and honor the Māori cultural and historical legacy through education, cultural projects, and collaboration with local communities. Understanding the Māori history and cultural significance of the Tekapo region enriches the appreciation of this beautiful and historically rich area.

Early European Times

James Mackenzie, an early European figure, is notorious for stealing sheep from lowland farmers and driving them up through an alpine pass, now known as the Mackenzie Pass, to the then remote Mackenzie Basin. The term ‘The snowline is their boundary’ refers to the practice of bringing sheep down to lower areas before winter snowfalls , then releasing them back to the alpine valleys once a defined snowline is established keeping them down in safer winter areas.

Modern Farming

The high country farms, called stations, around Lake Tekapo are best known for their Merino sheep and produce some of the best quality fine wool in the world. During summer the sheep graze high up in the alpine valleys , and in April shepherds guide them down to safer lower areas before winter snows. Small cabins on valley floors offer shelter for musterers working with the sheep. As the flight ascends to the high mountain areas near the Main Divide, glaciers and icebergs become prominent. The glaciers on the eastern side of the Main Divide in their lower reaches are covered with rock and shingle moraine debris which, also imbedded in the glacier ice, grinds bedrock beneath to a fine rock flour , creating the distinctive milky blue appearance of lakes like Tekapo and Pukaki. Glacial flour from these glaciers contributes to the colour of these lakes and rivers.

Snow Raking

Once snow has settled, sheep are released into the valleys, where the snowline acts as a natural barrier. However, if heavy snowfall traps sheep, extensive efforts are required to clear paths in the snow to ensure their safety. This challenging task is known as snow raking.

Jet Boats and Conservation

The wide glacial valleys with their many shallow braided streams inspired the invention and development of the jet boat by local inventor C W F Hamilton. With no rudder or propeller protruding below the hull, but simply a nozzle propelling water out the back for propulsion and steering, the jet boat can navigate up the river channels in only a few centimeters of water. Braided riverbeds provide nesting grounds for birds and are home to the endangered Black Stilt, Kakī. Conservation efforts have helped increase Kakī numbers, with recent estimates showing at least 143 adults in the wild.

Head of the Tasman Glacier

The mighty Tasman is the longest glacier in New Zealand, starting at Hochstetter Dome and flowing 26 km down the Tasman Valley past Mt Cook. With 50 metres of annual snow fall covering a base of ice up to 800 metres deep, vast snowfields with strategically located mountain huts ensure the upper reaches of the glacier are popular for skiing and climbing. Since the last ice-age, the Tasman Glacier has had advances and retreats, evidenced by Mackenzie Basin landforms, over a period of approximately 18000 years and in recent times has been retreating steadily. The Tasman Glacier is thought to be over 18,000 years old but unfortunately unlikely to get much older. Since the 1990s, increased temperatures have caused the glacier to melt rapidly. This is New Zealand's largest glacier and flows from the Southern Alps southeast to the Mackenzie Basin.



Franz Josef Glacier

After crossing the Southern Alps (Main Divide), you will see the Westland National Park spread out below, and on a clear day, 300 km of coastline. At the head of the Franz Josef glacier is the beautiful Geike Snowfield, popular for high altitude cross country skiing. The snowfields feed the magnificent 'river of ice' plummeting steeply westward and descending almost to sea level, at a recorded rate of up to 4 metres per day.

The Franz Josef Glacier is approximately 7,000 years old and what is left of an older and larger glacier which originally extended right to the sea.

It is named after Emperor Franz Josef 1 of Austria explorer Julius Von Haast in 1865.

Maori call the Glacier Ka Roimata o Hine Hukatere, meaning the tears of Hine Hukatere.



West Coast Rainforest

The Southern Alps stands like a fortress wall in the path of the moisture-laden westerly airflow rolling in off the Tasman Sea. Within a few kilometers of the ice-world of the glaciers is the temperate rainforest of Westland, sustained by up to 5 meters of rainfall annually. Of the 140 glaciers that make up the Westland National Park, Franz Josef and Fox Glaciers are the only two that penetrate the lower forest zones.



Fox Glacier

Fed by four alpine glaciers, Fox Glacier is longer and faster moving than the Franz Josef Glacier/Ka Roimata o Hine Hukatere. Its terminal face is just five kilometers from the village. Near Fox Glacier is beautiful Lake Matheson - one of New Zealand's most photographed lakes.

Māori understanding of the alpine world was based on great myths to enable generations to commit to memory the unique landforms of the area. The Māori name for Fox Glacier, Te Moeka o Tuawe, was derived from an ancestor, Tu Awe, who fell to his death while exploring the area. The bed of the glacier was his final resting place, and it is said that when his lover Hine Hukatere wept, the bed of the Fox and Franz glaciers filled with her everlasting tears of ice.



Mt Tasman

Known as a classic ice climb, Mt Tasman is New Zealand's second-highest mountain. It was first climbed in January 1895 by Mathias Zurbriggen. The Balfour Icefall and Glacier descend off its western flanks.

Mt Tasman (Te Horokoau) is 3,497 meters high. It is located in the Southern Alps of the South Island, four kilometers to the north of its larger neighbour, Aoraki/Mt Cook.



Aoraki/Mt Cook

‘Aoraki’ – the Cloud-Piercer! New Zealand’s highest mountain stands supreme with its snow and ice fields spilling into the glaciers below. It was first climbed on Christmas Day 1894 by locals Tom Fyfe, George Graham, and 19-year-old Jack Clarke. In 1991, a giant rock avalanche occurred on Mt Cook, lowering the highest peak by 20 meters. An estimated 14 million cubic meters of rock and debris traveled 7.3 km from its source at an approximate speed of 400-600 km/hr. Aoraki Mount Cook in the centre of the South Island as it reaches an altitude of 3,724 metres (12,218 ft). High enough to be permanently covered in snow.



La Perouse

La Perouse is located in the Southern Alps of the South Island. Unlike Aoraki/Mt Cook, La Perouse sits on the South Islands main divide, on the border between Mt Aoraki/Mt Cook National Park and Westland Tai Poutini National Park. On the northern side, the La Perouse Glacier feeds the Cook river that flows into the Tasman Sea. La Perouse has a beautiful peak dominated by its huge southern rock face. In 1948, La Perouse featured in one of the last big ground rescues (before the use of helicopters)—an injured climber was successfully rescued from near the summit in an epic effort over six days!



Tasman Glacier

26 kilometers long with ice up to 2,600 feet (800 meters) deep, the Tasman is easily New Zealand's longest glacier. Moraine (rock and gravel scraped or fallen from the valley walls) covers the ice for much of its length. At its terminus is a glacial lake 150 meters deep and lined with ice, feeding into the huge braided Tasman River and then into Lake Pukaki.



Tasman Glacier Lake

In the early 1970s, there were several small meltwater ponds on the Tasman Glacier. By 1990, these ponds had merged into Tasman Lake. The icebergs, which are clearly visible from the air, have taken about 500 years to travel from the neve at the top of the Tasman Glacier to where they appear today. Underneath this lake, the ice is still over 200 meters thick.

Tasman Lake has quickened the retreat of the Tasman Glacier. Initially it did so by undercutting the cliff at the end of the glacier, causing parts of the cliff to fall into the lake. Since 2006, however, a 50–60 m (160–200 ft) apron of submerged glacial ice projects out from the cliff, and icebergs periodically break off the apron and float away down the lake.



Mackenzie Basin

Approximately 14,000 years ago, the ice that covered this area from the last Ice Age began its retreat—today, golden tussock and grasslands cover the glacial deposits that remain clearly visible from the air. Dramatic ice-carved landscapes, subtle ever-changing hues, and air of exceptional purity—just some of what makes the Mackenzie so special.

The basin was named in the 1850s by and after James Mckenzie, a shepherd and would-be farmer of Scottish origin. Mackenzie was captured for allegedly stealing sheep; he herded his flocks in what was then an area almost totally empty of any human habitation, though Māori previously lived there intermittently. After his capture, the area was soon divided up amongst new sheep pasture stations in 1857. The basin extends approximately 100 kilometres north to south, and 40 kilometres east to west. The Southern Alps constitute its western edge



Lake Tekapo Village

Nestled around the southern shoreline of Lake Tekapo, the village is home to approximately 350 permanent residents. Dominating the skyline to the west is Mt John—a classic example of a Roche Moutonnée (harder bed-rock sculptured by advancing glacial ice). The village itself is built on old glacial terminal moraine and is surrounded by unique glacial features which become obvious from the air.



Mt John Observatory

Lake Tekapo has some of the clearest and darkest night skies in the world and is home to the Mt John Observatory housing the biggest telescope (1.8-meter MOA) in the country. Built in the 1960s, the observatory is now mainly used for research purposes by Canterbury University. In 2012, an area of 1,700 square miles around the observatory was declared as the Aoraki Mackenzie International Dark Sky Reserve.



Lake Tekapo

The lake covers an area of 83 km² and is at an altitude of 710 m (2,330 ft) above sea level. It is fed at its northern end by both the braided Godley River and Macaulay River which have their sources in the Southern Alps to the north.

Glaciers grinding against rock produce a fine 'rock flour' that, when washed into the lake, creates its unique turquoise-blue color. At 120 meters deep and with an average temperature of 7°C, Lake Tekapo is the first in a chain of seven lakes providing hydroelectric power to all of New Zealand. During the summer months, Lake Tekapo is popular for waterskiing and other watersports, as well as trout and salmon fishing.

Motuariki is a small island in the middle of Lake Tekapo. The legends of Ngāi Tahu tell of Motuariki, who was an ancestor of the Āraiteuru waka that capsized near Shag Point on the Otago coastline. After the waka capsized, many of the passengers went ashore to explore the land. Legend states that they needed to be back at the waka before daylight. Many did not make it, including Motuariki, and he was instead transformed into the island of Motuariki



Lake Alexandrina

Famous for Rainbow and Brown trout fishing, this spring-fed lake provides a striking contrast to the turquoise-blue glacial water of Lake Tekapo. The lake is one of New Zealand's Scenic Reserves, with over 40 species of birds within its biologically rich catchment. Rowing boats are the only mode of transport on the lake, as sail and motorboats are prohibited.

It is a shallow lake with distinct indications of glacial origin with an outlet on its eastern shore midway down the lake. The outlet feeds into a smaller lake, Lake MacGregor before feeding into Lake Tekapo described as "Opaque and milky blue" in colour. In the desert terrain of the Mackenzie Plains, Lake Alexandrina is considered as an "oasis of life".



Godley Peaks and Glenmore Stations

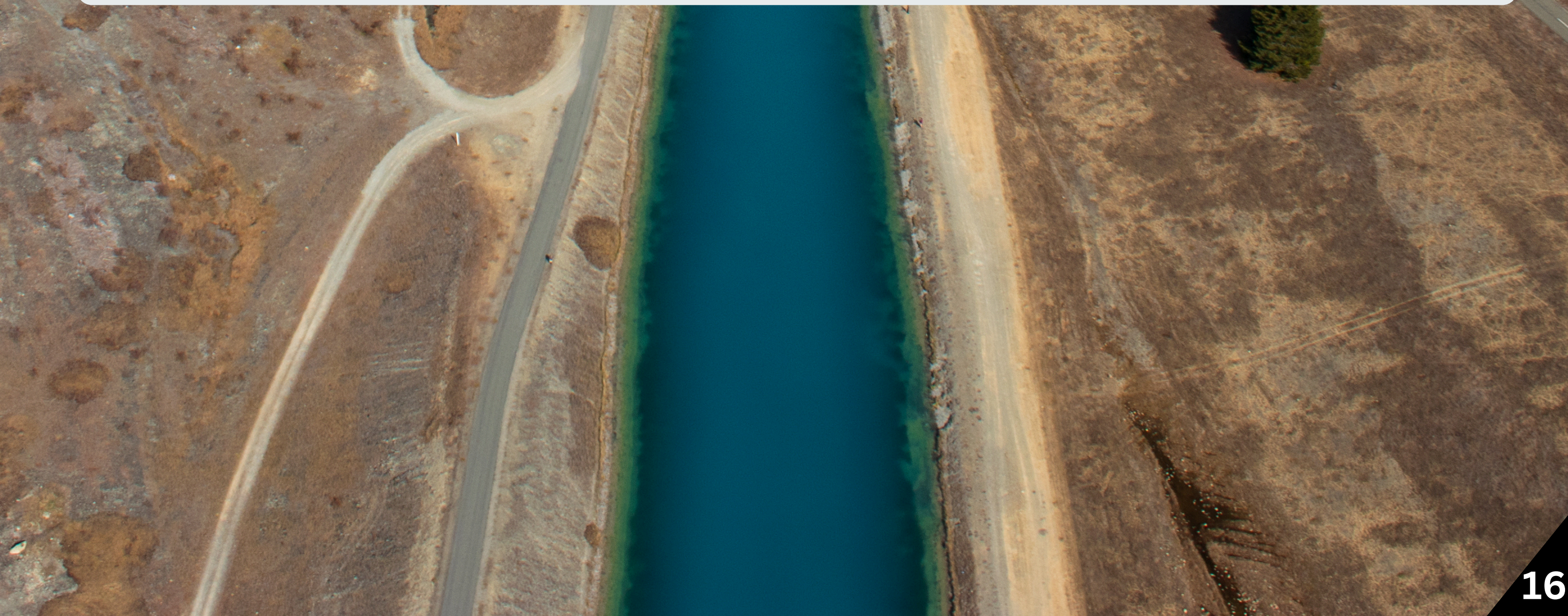
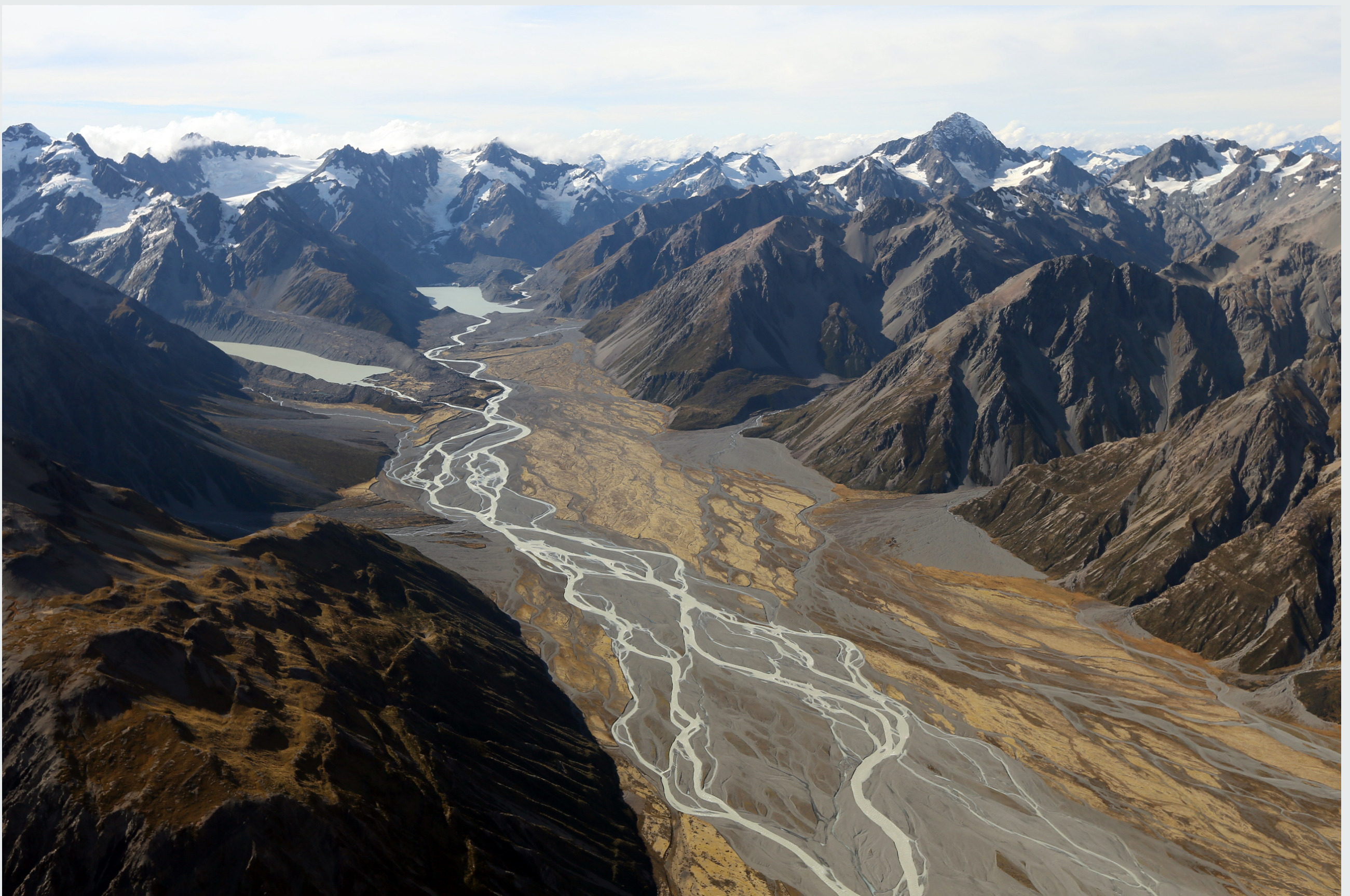
Both these high-country sheep stations are 50,000 acres (20,000 hectares) in size. They each farm approximately 10,000 Merino sheep, a breed famous for its super-fine wool and ability to survive in harsh environments. They graze high on the mountains during summer and are mustered on foot by shepherds and their dogs to the lower country for the winter months, protected from the deep winter snows. The sheep are brought down to lower levels for lambing and shearing. They shear their sheep for not only the merino wool but it helps the sheep feel the cold so they seek shelter with their new born lambs.



The Godley River

Carved out by the glacier that formed Lake Tekapo, the shingle valley floor is over two kilometers across and criss-crossed with river channels—the famous South Island ‘braided’ river system. The Black Stilt (Kaki in Māori), one of the world’s rarest birds, nests and feeds within the channels, well protected from predators.

The rivers headwaters are in Aoraki/Mount Cook National Park. It flows south for 30 kilometers from the Southern Alps into the top end of the glacial Lake Tekapo, this forming part of the ultimate headwaters of the Waitaki hydroelectric scheme.



Lilybank Station

Passing the Macauley River, we fly over the Godley Valley and one of New Zealand's most isolated high-country sheep stations, Lilybank. It is famous as a safari game and recreation area. Look out for its 4WD track access fording the Macaulay River; there are no bridges, so when the river is high, the station can be isolated for days at a time. property is 2246 hectares, including 500 hectares of gently sloping land.



The Murchison Glacier

16 kilometers long, the Murchison is New Zealand's second-longest glacier. Flowing in parallel valleys, the Tasman and Murchison Glaciers are separated by the Malte Brun range, dominated by Mt Malte Brun at 10,400 feet (3,170 meters).



Mt Sibald and the Sibald Range

The Sibald mountain range with Mt Sibald as the dominant peak at 9,200 feet (2,800 meters). Flanking the eastern edge of the Godley River, this range clearly shows active erosion—typical of the geologically young Southern Alps. Musterers huts, seen in the valleys below, are used for accommodation and shelter during autumn musters on the sheep stations. There are also many sporting animals in this area, including Chamois, Himalayan Tahr, and Red Deer.



The Godley Glaciers

As we enter the Mt Cook National Park, located at the headwaters of the mighty Godley River, you will see the isolated Classen and Godley Glaciers. At their bases are the large terminal lakes—frozen over during the winter months. In summer, you can occasionally see icebergs floating in the lakes that have broken off the glaciers, melting to feed the Godley River.

