

SOPHORA NOTES 1. *S. MICROPHYLLA* IN SOUTHWEST NELSON, WESTLAND, AND SOUTHWEST SOUTHLAND

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In his list of the vascular plants of Westland National Park and the neighbouring coastal and lowland areas Wardle (1975) notes that the kowhai (*Sophora microphylla*) is found “on the shores of tidal creeks and lagoons” and adds “seed dispersal by coastal currents”.¹ This coastal distribution was also clearly shown by Wilson (1991) whose map of *S. microphylla* in Westland extends from near Punakaiki in the north (between Westport and Greymouth), to near Haast in the south.

The following note gives more detail about several kowhai localities in Westland and extends the story northward to the Heaphy and Buller catchments in southwest Nelson and southward to catchments draining into Foveaux Strait. It is hoped that this note will lead others to extend these observations.

Flowering times of kowhai in Nelson and Westland are given by Godley (2005).

1. The Heaphy River (40° 59'S)

On 16 Jan. 1962 I walked with friends from Scott’s camp just north of Karamea to the hut at the mouth of the Heaphy River. During this coastal walk of some 30 km I did not see any kowhai. Nor did I see any that afternoon or next morning in the vicinity of the hut. But next afternoon (17 Jan.), when we started up the Heaphy Track my notebook records that “Kowhai grow on banks of Heaphy about 1 mile up from mouth.” Supporting specimens are CHR 185865–66. Unfortunately I did not record the number of trees seen.

2. The Buller catchment

This is a true kowhai catchment with kowhai scattered along the main river and its main tributaries (Lake Rotoroa and the Gowan, the Matakītaki, Maruia and the Inangahua).

The Buller River itself arises from Lake Rotoiti in the Nelson Lakes National Park and flows for some 168 km to the Tasman Sea at Westport.

¹ The buoyancy of kowhai seed in fresh and seawater is probably assisted by the less dense tissue which surrounds the cotyledons (Godley 2006a,b).

The only kowhai that I have seen around Lake Rotoiti are several in a picnic area at the foot of the lake; but according to Mr George Lyons, an early Ranger, these were planted. As for the infant Buller, the following observations were made on 29 Jan. 1974 during a 6 km walk along its banks with John Gibb of Ecology Division, DSIR. Kowhai were not seen between the outlet from Lake Rotoiti and where the river crosses State Highway 63. But c. 400 m downstream from the road bridge the first kowhai appears, a quite tall tree on the left bank. From here to the Teetotal Hut (c. 3.5 km) there are scattered kowhai on one or both sides of the river. Trees with pendulous branches were common as were kanuka (*Kunzea ericoides*), matagouri (*Discaria toumatou*), and *Myrsine divaricata*. Just upstream from the hut there is a grove of kowhai and kanuka on a low island in the river. On the margin of the Teetotal Creek, near the hut, were mature kowhai in good leaf and fruit.

On 29 Mar. 1972 I made a day trip south of Nelson with John Dugdale and Willy Kuschel of Entomology Division, DSIR. From Lake Rotoiti we drove westwards along SH 63 to join SH 6 at Kawatiri. At first I did not see any kowhai although there were extensive river flats between the road and the Buller. Matagouri was common. But after the junction with the Howard River, when SH 63 and the Buller become confined between hills I noted: "Kowhai first seen on steep cliffs just above river on south (opposite) side. Later there are many on river bank forming almost a single line at margin of beech forest and river. A group of large trees was also seen on the road (north) side of the river. Here is a good example of the way kowhai occurred in untouched beech forest. One can look across the Buller and see a steep slope of beech forest rising from the river and see the line of kowhai just at the river edge."

On 27 Sept. 1975, when driving from Nelson to Christchurch, the first kowhai I saw on the Buller were 1 km beyond Kawatiri. About 2 km further on they were abundant on the road side of the river. At Gowanbridge they could be seen on the flat on the other side of the river. Just before the Owen River Hotel "there is a gap, but just after, where forest closes in, are kowhai."

The Gowan River and Lake Rotoroa: on 30 Jan. 1974 with road and lake transport provided by Park Ranger, George Lyons, I saw kowhai all up the Gowan River from its junction with the Buller near Gowanbridge to its source in Lake Rotoroa. Kowhai were also seen along the eastern shore of the lake. There were single trees every now and then, in green fruit, many with pendulous branching. They were often "almost pushed out" by the beech, whether *N. solandri* or *N. fusca*. At the head of the lake kowhai grew at the back of a gravel beach, in sand or gravel. I have no notes about the western shore.

The Matakītaki River: this flows northward to join the Buller just west of Murchison and just after crossing SH 6. About 1 km to the west of the road bridge over the river is a group of kowhai on the south side of SH 6. On 4 Nov. 1972 I drove up the Matakītaki from Murchison and over the Maruia saddle to join SH 65. Kowhai grow at least as far up as the bridge leading to the saddle. They are confined to the margin of the beech forest just by the river or at the backs of the river beaches.

The Maruia River: this flows northward from near Springs Junction to join the Buller west of Murchison. It is the tributary of the Buller where kowhai is easiest seen. This is because SH65 on the Nelson–Christchurch route runs from the Buller up the valley and often allows one a good view towards the river. The valley probably supports a larger kowhai population than the other tributaries, not only because some riparian habitats remain unmodified (as in the gorge that skirts the Shenandoah Saddle) but because of the river flats with scattered kowhai above the gorge. The trees are deciduous, often with pendulous branches, and flower as late as November.

The Inangahua River: on 11 Mar. 1972, with Geoff Mew and Trevor Webb of Soil Bureau, DSIR, I visited a farm at Cronadun, lying on the Inangahua river between Reefton and where the river joins the Buller near Inangahua itself. I noted “several large kowhai and some totara on the lowest river terrace, now in pasture”; and that the farmer said that “native pigeons visit these kowhai in abundance in August.” On 25 Sept. 1974 I noted “Kowhai deciduous and in flower above Buller near Inangahua.”

Westport (41° 45'S): on 25 Sept. 1974 I noted “Kowhai deciduous and in flower on lagoon just north of Westport.”

3. Punakaiki (42° 07'S)

On 26 Sept. 1974 I noted kowhai at the mouth of Bullock Creek just north of Punakaiki; and on 16 Jan. 2006 John Knox noted 2 trees just south of the above on the south bank of the Porarari River, 500 m from the beach and 8–9 m tall.

4. The Grey catchment

From 16–19 April, 1974, during a survey of the Upper Grey River no kowhai were seen from its headwaters down to its exit from the Gentle Annie Gorge. Nor have I seen any kowhai along the main Grey River until near its mouth. On 22 Sept. 1974, when approaching Greymouth I noted kowhai at the side of the river just before the road rounds the bluff before the bridge over the Grey, and on the bluff itself. It also grew on the lowest

river terrace on the north side of the river near the junction of the coast road and the road to Blackball. On 6 Oct. 1971 at Paroa, just south of Greymouth, I noted kowhai by the road and on the margin of a lagoon behind dunes.

5. The Taramakau catchment

On 5 Oct. 1975 when driving from Otira to the coast near Kumara Junction the only kowhai that I saw were 4 planted trees in the garden of Mrs Pugh near Kumara.

6. Hokitika to Franz Josef

The Hikimata Lagoon (43° 05'S): in their report on Saltwater Forest, Smith & Burrows (1977) note that "tuis make heavy use of the kowhais along the Hikimata lagoon in spring."

The Waitangitaona River (43° 09'S): on 8 Oct. 1975, I made a second visit to the Waitangiroto River, but this time approached it via the Waitangitaona River which lies just to the north. I was transported and guided by Peter Fletcher, the Westland National Park Ranger. Kowhai were common on the Waitangitaona river flats as we walked towards the coast. Most were still leafless but some had new leaves just appearing. Some had pendulous branches. I estimated that the largest tree I saw was c. 11 m tall with a dbh of 0.5 m. Epiphytes were more diverse here than at the mouth of the Waitangiroto. On a large old tree with a trunk green with moss I noted: *Phymatodes diversifolium*, *Hymenophyllum* sp., *Earina mucronata*, *E. autumnalis*, *Astelia* sp., *Griselinia littoralis*, *Coprosma lucida*, *Pseudopanax crassifolius*, and *Hedycarya arborea* (seedling).

Flowering was past its peak in some trees with petals scattered on the ground. Tui, bellbirds, and native pigeons were visiting the trees. I measured flowers from 2 trees (Table 1, p. 23) for comparison with other regions. One sample was less advanced than the other.

Table 1. Flower size of 2 trees at the Waitangitaona River, Westland. Lengths (mm) from insertion of flower stalk into calyx to tip of standard, wing, or keel (total length).

Flower	Standard	Wing	Total length	Style protrusion
1.1	37	40	50	6
1.2	35	41	50	6
1.3	36	39	48	6
1.4	36	39	45	6
1.5	36	40	48	6
1.6	34	37	45	6
1.7	35	40	47	6
2.1	30	35	40	0
2.2	35	40	47	0
2.3	33	38	43	0
2.4	35	40	45	0
2.5	32	34	42	0
2.6	33	37	43	0
2.7	34	37	43	0
2.8	34	38	44	0
2.9	35	38	40	0
2.10	28	33	38	0

The Waitangiroto River (43° 09'S): on 7 Oct. 1971 I visited the Waitangiroto white-heron colony with Peter Wardle, of Botany Division, DSIR, Brian Aherne, the Westland National Park Ranger, and Dave Tomac, a visiting Canadian. We drove from Franz Josef to the Okarito Lagoon and walked up its seaward margin. At the mouth of the Waitangiroto River kowhai grew close to the sea, 6 m tall, with level or sloping wind-shorn canopy (Fig.1). The prostrate trunk of an old tree turned up for 2 m at the end. Here I saw epiphytes on *Sophora microphylla* for the first time. An upright tree was clothed with *Earina autumnalis*, *Phymatodes diversifolium* (*Microsorium pustulatum*), and *Asplenium flaccidum*. We rowed up the river to beyond the heron colony in a dinghy kept by the hut at the river mouth. The river was lined by flax with kowhai close to the river sometimes hanging over it as shown in Godley (1975). Trees were up to 10 m tall, many with graceful pendulous branches. Most were flowering, some had finished. All were leafless (cf CHR 191446–48). Tui were plentiful. Any young plants seen had divaricating branches.

We spent the night at the hut and returned to Franz Josef next day. Wardle (1969) gives further information on the Waitangioto.



Figure 1. Windswept *Sophora microphylla* growing with flax (*Phormium tenax*) at the mouth of the Waitangioto River. Photo: E.J. Godley

7. Haast Village to Big Bay

Haast village (43° 53'S): on 31 Jan. 2000, during a brief visit, I noticed kowhai to the east and south of the township.

The Hapuku estuary (43° 55'S): this lies c. 12 km south of Haast village and 1 km up from the Hapuku River mouth. Dickinson & Mark (1999) describe *S. microphylla* as co-dominant in the Sophora-podocarp Woodland Association and the Tall Sophora-Mixed Shrubland Association.

Jackson Bay (43° 58'/): Mrs Doreen McKinley, who has a cottage near Jackson Bay, about 30 km south of Haast, tells me that kowhai are plentiful on the track from the Bay to Ocean Beach, and on the south bank of the Arawata River at least as far inland as the road bridge.

The Cascade River (44° 02'): Johnson (1992) recorded kowhai as common on the banks of the river near the coast, and on sand dunes.

Big Bay (44° 18'S): kowhai is not mentioned by Wardle (1991) in his account of a pristine lowland wetland at Big Bay. Johnson (1992) in his coastal survey listed it as “rare”.

8. The Hollyford catchment

At Martins Bay (44° 22'S) kowhai are abundant on sand dunes and along the coastal sector of the Hollyford River. They then occur as far inland as the head of Lake McKerrow and further inland to where the upper Hollyford joins the Pyke (P.N. Johnson, pers. comm.).

9. The Sounds

Catseye Bay (44° 50'S) between Bligh and George Sounds: “rare” (Johnson, 1992).

George Sound (44° 50'S) and Caswell Sound (45° 00'S) “very rare” (Poole, 1951).

Secretary Island (45° 14'S) at the mouth of Doubtful Sound: not listed by Wardle & Mark (1970).

Disappointment Cove (45° 35'S): in Breaksea Sound: “rare” (Johnson, 1992).

10. The Waitata catchment

The Waitata River arises from Lake Poteriteri and runs southward for c. 6 km into Foveaux Strait. On 25 Feb. 1976, with Gordon Williams and Peter Beadle of the Wildlife Division, Dept. of Internal Affairs, I walked westwards from the Forestry hut at the mouth of the Wairaurahiri River to the mouth of the Waitata River. This took 4 hours along a good wide level track, which traversed some very good rimu – southern rata forest. We saw no kowhai, nor did we see any when travelling up the river by jet-boat. There were none along the eastern margin of Lake Poteriteri for several kms although there were several suitable beaches, on one of which we landed. None were seen coming back along the western shore.

11. The Wairaurahiri catchment

This, like the Buller and the Hollyford, is a kowhai catchment. The Wairaurahiri River arises from Lake Hauroko and flows southward for c. 16 km into Foveaux Strait. On 1 Mar. 1970 I gathered *S. microphylla* on the eastern shore of the lake, near where the access road reaches the lake (CHR 194440–43). On 23 Feb. 1976, accompanied by Peter Johnson of Botany Division, DSIR, Dunedin, I saw no kowhai at the river mouth. But next day, when we were taken by jet boat up the river to the Wairere Stream, halfway to the lake, I counted 9 kowhai, 3 on the true right bank

and 6 on the true left bank. They were scattered single trees, some with pendulous branching. A large specimen grew on a small alluvial island.

12. Speculations on dispersal

The dispersal of *Sophora microphylla* in and around New Zealand could be considered under 3 heads: coastal; up-river and down-river; and up-slope and down-slope. So far, only the first 2 have been important in the west of South Island.

Up-river dispersal, over a long period, has occurred in the Buller catchment with kowhai colonising the narrow riparian strips and river flats. Lake Rotoroa has been reached but Lake Rotoiti is still without wild kowhai. During this time down-river dispersal would also be occurring, but for most of the time Buller seed would not be able to colonise the coast to the south because of glaciers reaching the sea. Since glacial retreat, however, kowhai has successfully established as far south as Martins Bay, and has started to move up some of the rivers. Indeed at Martins Bay it has moved far inland with the help of a lake near the coast. South of this it will presumably establish more bridgeheads in the future and this could include Stewart Island, which it has yet to colonise successfully.

The Wairaurahiri kowhai could be part of a separate story and have come from the east.

I do not know of any examples of up-slope dispersal in this region, unless it be on the bluff at the mouth of the Grey. Establishment could be difficult because most of the slopes are still forested, unlike many other parts of New Zealand.

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