Rudders, Skegs and Sea Kayaking

by Paul Caffyn – November 2019

During our very first sea kayak expedition around Fiordland during the summer of 1977/78, Max Reynolds and I were paddling Nordkapp kayaks, a British design based on the shape of a West Greenland seal hunting kayak. The mould, imported into New Zealand by Grahame Sisson in 1977, was an HS model, which had a generous amount of rocker, that is the profile of the hull from bow to stern. This was fine for turning on calm water but caused a few issues in following or quartering seas, when the stern wanted to turn upwind. Particularly when surfing in front of following seas, it was difficult to maintain long surfing rides without the stern wanting to turn upwind - desperate rudder strokes were never enough to keep the bow at 90˚ to a breaking wave.

With that in mind, and fully aware of Fiordland's windy reputation with the highest number of gale days in New Zealand, we leaned on Grahame Sisson to design a stern-mounted, retractable skeg that would mitigate that trait of broaching off course in following seas. To avoid cutting off the stern horn of the Nordkapp, Grahame designed a 'shoe' or triangular shaped fibreglass sleeve that slid over the kayak stern. The skeg blade, barely the size of a cigarette packet, was rotated into a vertical position once in deep water by the other paddler. When retracted, it lay above the keel line and thus damage to the blade was avoided when landing on gravel beaches.

The triangular section retractable skeg used for our Fiordland expedition.

The skeg showing the blade rotated down to the vertical position

If there was ever a place to 'road test' a skeg set-up, it was Fiordland. On the afternoon attempt to reach Dagg Sound from the beach at Coal River, we only managed to raft up the kayaks once, to pump out water from breaking seas sneaking through our sprayskirts into the cockpits. Our kayaks were running virtually out of control in front of 25+ knot winds and breaking following seas. The deployed retractable skeg blades were of little use as they were out of the water much of the time. Much longer skeg blades would have helped.

For the rest of the South Island paddle I tried out a bigger skeg blade, more of a shark fin shape, that I could pull into place once clear of a beach. The top of the triangular 'sleeve' had a small fibreglass loop, from which I had a cord to pull it into place when seated in the cockpit, and a short length of bungee cord to the stern horn of the kayak – this was for when I needed to release the skeg (knock it out of position with the paddle) for a surf landing.

Almost ready to launch into a huge surf off Glinks Gully, west coast North Island, 20 January 1979.
The loop of shock cord is visible in front of Lesley's hand, and the line to pull the shark fin shaped skeg into position from the cockpit (when clear of the surf) is trailing in the water by the hull.

The skeg in position when paddling; the shock cord stretched tight to the stern horn of the kayak

This solo paddler retractable skeg did help with steadying the Nordkapp's track in following or quartering seas but this was quite frustrating at time, particularly when the skeg was in place and I was trying to turn the kayak.

1980 Around Britain

For the paddle around England, Scotland and Wales with Nigel Denis, Frank Goodman who had developed the lines of the Nordkapp from a West Greenland hard chined seal hunting kayak, loaned me an HM model, or hull modified. To counter the HS model's tendency to run off course in following or quartering seas, Frank had extended the keel line to almost under the kayak's stern horn, thus significantly reducing the boat's rocker. It was thus slower to turn on flat water, but tracked better than the HS model in following or quartering sea.

This HM stern configuration aided the kayak tracking in light to moderate winds and light swell – even with a wind 'up your chuff' or quartering from the stern. 'But, on a medium to heavy swell or a decent chop when the stern was out of the sea over half the time, it was useless'. Despite my negative diary note, the HM stern seemed to help with boosting our average mileage achieved on paddling days to 33 mpd (miles per day). The all-up daily average for 85 days, including the rest and weather-bounds days (17) was 26 mpd.

The HM Nordkapp stern, showing the keel line extended to almost under the stern horn Dover Harbour 1 July 1980

1982 Around Australia

The mould Grahame Sisson used was for the HS model, so when building the two kevlar Nordkapps for the Aussie trip and since I was convinced that the HM stern was superior to my old retractable skeg set-up, Graham added a thin strip of laminated fibreglass under the stern horn to emulate the HM stern model. Straight line tracking was great but turning, unless on top of a wave crest, was rather tedious and slow.

A quick moving 30 knot southerly front created gnarly breaking seas inside Gabo Island, SE Victoria. The added strip of fibreglass is visible at the stern of my yellow Nordkapp

Escaping from these breaking seas (above) into the lee of Gabo Island, the sea flattened off but the wind maintained its strength. No matter how much we either forward or back paddled, we were unable to turn the kayaks up wind. We had no option but to run north in front of the wind for a sheltered lee landing.

The loss of rocker with that extended keel HM stern was not only a serious hindrance in this situation, it would be far worse when I was paddling solo. So I hacksawed off that added strip of fibreglass in Sydney and went back to using the retractable skeg system I used for the NZ circumnavigations.

About to launch from La Perouse, Sydney, after reverting to the NZ retractable skeg system

But just after crossing the border into Queensland, I forgot to release the shark fin skeg from under the stern and snapped the blade off when surfing to

shore at Currumbin. Ever since leaving Sydney, I had been mulling over the idea of adopting what I had seen in December 1981 during a visit to Hobart where I was shown fibreglass overstern rudders that the Tasmanian paddlers had designed and built. Their deep draft fibreglass rudders could retract 270˚ from when in use, to lying horizontally on the stern deck for landing and launching.

The following is from chapter 4 of *The Dreamtime Voyage:*

> Since the skeg was broken, I telephoned Tony Turbett to ask his advice about rudder design and construction. Tony said he would help and asked Lesley and I out to Shorncliff to utilize the facilities of his father's backyard workshop.
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> Stacked alongside and underneath the house was a great collection of home-built sea kayaks, all with stern-mounted, deep draft rudders. Tony was a firm advocate of using rudders on sea kayaks. He'd undertaken many long committing trips, both alone and with his father Tub, on the north coast of Queensland. A near disaster during one of his solo trips, along a 32 mile long surf beach between Noosa Heads and Double Island Point, fair put the wind up me. Tony had landed for the night, but overnight the surf lifted. No matter how hard he tried, he could not affect a breakout through the surf. He tried for several days but ended up with heavy dumpers smashing his boat during a final attempt.
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> Tony's rudder blades, constructed of wood, could only be retracted clear of keel line. For landing and launching on surf beaches, I needed a rudder that would fully retract onto the aft deck. The Tasmanian kayakers used such a system but I was not fussed with their fibreglass blades and rudder assemblies. I figured aluminium would provide not only a sturdy assembly but also a blade that would tolerate bending without breaking. One problem was that I did not want to remove the stern horn of the Nordkapp. I was still uncertain how efficient a rudder would be and hence required a system which could be removed if I didn't like it. Tony had a brilliant knack for improvization and the solution was rather simple.
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> We moulded a fibreglass 'shoe' or sleeve, 12 inches long, which would slip over the stern. The decklines would hold it firmly in place. Below the horn, the shoe dropped vertically for eight inches with sufficient thickness of fibreglass to hold a stainless steel hinge, to which we would attach the rudder assembly.
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> Using scrap pieces of aluminium sheet, we fabricated two sheaves for a rudder assembly and a long slim blade which would project 12 inches below the keel line. The key to retracting the rudder onto the deck was a wheel, grooved to take a cord, which I hacksawed and ground into shape from a sheet of plastic. This was attached to the blade with glue and recessed screws, one of which locked a long length of cord in position. By running the cord along the deck to the cockpit, I could then pull down or retract the rudder. For steering, I made two foot pedals, similar to the system used on a surf ski, which I mounted on a 'T' shaped bracket. On the cockpit floor, I fibreglassed two short bolts into position, so I could adjust the position of the bracket for optimum leg comfort.
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> The final product looked quite professional. Stainless steel steering cables and short rabbit's ears on deck to hold the blade in position when retracted.

Construction of the aluminium overstern rudder assembly at Tony Turbett's workshop in Brisbane. The rudder is attached by a stainless steel hinge glassed into a fibreglass 'shoe or sleeve' that allowed the stern horn of the Nordkapp to remain intact – but I could remove the whole lot if I didn't like the rudder!
The two inverted triangle tabs on top of the shoe had a hold drilled through where the decklines were threaded through, holding the shoe/rudder in place when tensioned.

After the first afternoon north from Wellington Point when I seemed to spend all the time surfing in front of a tailwind, that rudder never was removed from the Aussie boat. I could not believe how it made my paddling and surfing so more efficient!

Well, my purist mind set about not using a rudder disappeared with the first long surfing run north of Brisbane, and the rudder stayed in place for the rest of the trip.

The blade in its retracted position on deck

It saved my life on several occasions, the most crucial being the overnighter along the Baxter Cliffs when I was caught by a savage cold front. When I limped into a beach at the end of that 106 mile drama, my knees and heels were rubbed bare of skin down to the exposed blood vessels, such was the battle to steer clear of being smashed into the vertical cliffs.

The round Aussie statistics speak for themselves in showing the benefit gained from the addition of a rudder:

Melbourne to Sydney: HM stern – 30.6 mpd
Sydney to Brisbane: Skeg – 34.3 mpd
Brisbane to Cape York: Rudder – 39.2 mpd

Not quite an additional 10 miles per day, but near enough!

Contrary to the notion of a rudder being:
'not for steering, but to trim. Sea kayaks are steered with the paddle, like all kayaks and canoes.'
I use my rudder for steering – the paddle being solely used for forward propulsion.
Without an effective rudder, the paddle is necessary for corrective steering strokes, either sweep or paddling on one side, and forward propulsion suffers. The normal paddling cycle is upset.

The design, structure and mounting determine the difference between inefficient and efficient rudders. My rudder blades project 12″ below the keel line. I have never broken a rudder – bent the blade once off North Queensland in a big surf, but straightened it out over my knee on shore and it was good for another 6,000 miles.

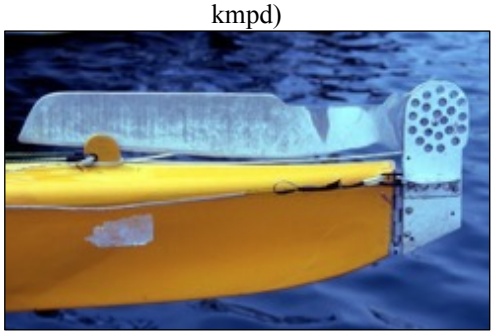
Japan 1985
Thus when it came time to build a really lightweight kayak for the Japan trip, many of the lessons learned from the Aussie trip came into play.

To maximize dry stowage and minimize the amount of water entering the cockpit during an out of boat disaster, Grahame Sisson turned the former slung seat into a bulkhead seat, thus creating a third dry storage compartment accessible from the cockpit.

Adamant that I now was not concerned with the aesthetics of the Nordkapp stern, and that I wanted a rudder as an integral part of the kayak, we cut the stern horn of the Nordkapp off and bogged one half of a stainless steel hinge into the slightly truncated hull.

Was it worth it? You betcha it was! The statistics speak for themselves: 118 days around the four main islands of Japan – 34.1 mpd (54.6 kmpd)

Then for Hokkaido, a distance of 1,191 miles (1,905.6 kms) my all-up average was 41 mpd (65.8 kmpd)



The overstern rudder mounted on Hiya Kaze *– the kayak used for the 4,021 mile paddle around Japan. The holes were to reduce weight*