



## **Report 01-207**

**passenger charter vessel**

***Osprey***

**swamping and manoverboard**

**Uawa River bar, Tolaga Bay**

**14 May 2001**

### **Abstract**

On Monday 14 May 2001, the passenger charter vessel *Osprey*, with the skipper and 6 passengers on board, departed Tolaga Bay for a half-day fishing trip. At about 0830, while crossing the Uawa River bar outbound, the boat encountered 2 waves substantially larger than those already crossed. The first wave heeled the boat significantly to port, causing all on board to lose their footing. One passenger was thrown overboard. The second wave passed over the boat and caused substantial damage to the boat and flooding of the cockpit.

Despite rescue and resuscitation attempts, the passenger who was thrown overboard drowned.

Safety issues identified included:

- the wearing of lifejackets while crossing a river bar
- the swell and wind condition limits placed on the *Osprey*
- the inherent dangers of crossing river bars.

Safety recommendations were made to the owner of Tolaga Bay East Cape Charters to address the safety issues.



The Transport Accident Investigation Commission is an independent Crown entity established to determine the circumstances and causes of accidents and incidents with a view to avoiding similar occurrences in the future. Accordingly it is inappropriate that reports should be used to assign fault or blame or determine liability, since neither the investigation nor the reporting process has been undertaken for that purpose.

The Commission may make recommendations to improve transport safety. The cost of implementing any recommendation must always be balanced against its benefits. Such analysis is a matter for the regulator and the industry.

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*Osprey*

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## Abbreviations

CPR	cardio-pulmonary resuscitation
EFI	electronic fuel injection
GPS	global positioning system
kW	kilowatt(s)
km	kilometre(s)
m	metre(s)
MSA	Maritime Safety Authority
nm	nautical mile(s)
PFD	personal floatation device
UTC	universal time (co-ordinated)

## Glossary

aft	rear of the vessel
bar	sandbank or shoal at the mouth of a harbour or estuary
bilge	space for the collection of surplus liquid
bulwark	solid rail around the deck of a vessel to prevent entry of the sea
checker plate	deck plating with a raised pattern to give non-slip quality
class	category in classification register
conduct	in control of the vessel
flood tide	rising tide
free surface effect	when a liquid that is free to flow within its compartment causes a virtual loss of stability
freeing port	opening in bulwark, allowing accumulated water to flow overboard
heel	angle of tilt caused by external forces
knot	one nautical mile per hour
on its beam ends	said of a vessel when it is on its side; almost capsizing
port	left-hand side when facing forward
restricted limits	operating limits as defined in Maritime Rule Part 20
righting moment	force exerted to return a vessel to the upright
stability	property of a ship by which it maintains a position of equilibrium, or returns to that position when a force that has displaced it ceases to act
starboard	right-hand side when facing forward

## Data Summary

### Boat Particulars:

Name:	<i>Osprey</i>
Type:	passenger charter vessel
Class:	restricted limits passenger ship
Home port:	Tolaga Bay
Limit:	inshore limits – restricted. Restricted to within 12 nm of the coast in areas: between Waipiro Bay 38.00° S and Mahia Peninsula 39.15° S and between Whatatane River mouth 177.00° E to east of Hicks Bay 178.23° E
Allowable passengers:	10
Operating crew:	1
Length (overall):	8.2 m
Construction:	aluminium
Built:	in Palmerston North in 1998
Propulsion:	2 Mariner Offshore EFI 175 two-stroke outboard engines producing a total output of 260 kW
Speed:	up to 35 knots
Owner/operator:	Tolaga Bay East Cape Charters

**Location:** Uawa River mouth, Tolaga Bay

**Date and time:** Monday, 14 May 2001 at about 0830<sup>1</sup>

**Persons on board:**  
crew: 1  
passengers: 6

**Injuries:**  
crew: nil  
passengers: 1 fatal  
5 minor

**Nature of damage:** substantial to boat superstructure

**Investigator-in-charge:** Captain John Mockett

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<sup>1</sup> All times in this report are New Zealand Standard Time (UTC + 12 hours) and are expressed in the 24-hour mode.



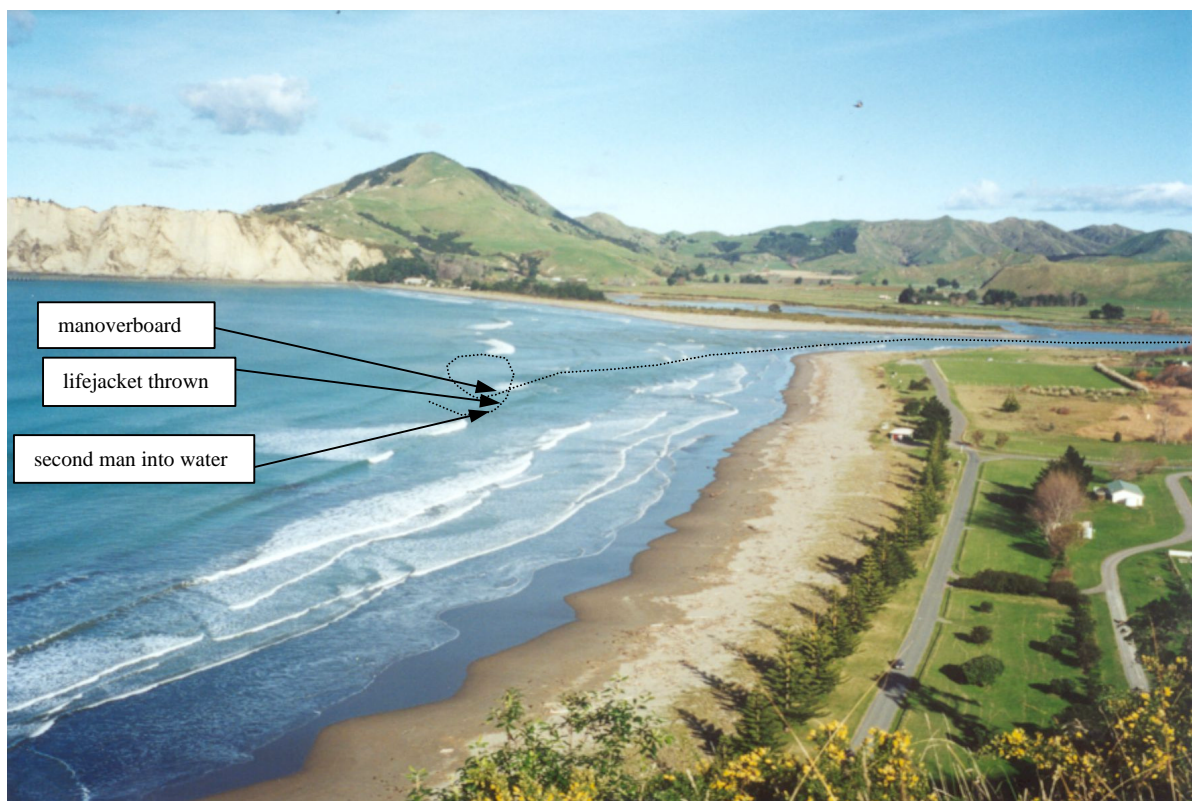


# 1. Factual Information

## 1.1 History of the trip

- 1.1.1 On Monday 14 May 2001 at about 0810, a group of 6 friends arrived at Tolaga Bay, from where they were to embark on a half-day fishing trip on the charter vessel *Osprey*.
- 1.1.2 The group were regular customers on the *Osprey* and had arranged the trip about 3 weeks beforehand, asking the owner to organise the trip on the first available suitable day.
- 1.1.3 The owner had observed the conditions at the river mouth the evening before and although they were marginal for a bar crossing at that time, the forecast was for a reduction in the significant swell height and a fine day on the Monday. He had telephoned one of the group and told him that the trip would go ahead as long as the conditions were as per the forecast.
- 1.1.4 Early on Monday morning the owner again went to the river mouth to observe the conditions. He saw that there had been a significant reduction of the bar swell and considered that the trip could go ahead as planned. He later estimated that the breakers on the bar were about one metre high.
- 1.1.5 The group met the skipper at the boat ramp on the Uawa River where he had launched the *Osprey* ready for the trip. Once they and their personal gear and fishing equipment were loaded on board, the skipper set off down the Uawa River.
- 1.1.6 Because most of the group had been out with the skipper before, he did not give a formal safety briefing but indicated that nothing had changed on the boat. One of the group pointed out some of the safety features to one who had not been out before.
- 1.1.7 The skipper explained that the recent rains had scoured a lot of sand from the river and built up a sand bar in the centre of the entrance and that he would have to go out to one side of it. He said he would go out to the left as that side was likely to be deeper.
- 1.1.8 The trip downriver was made in calm conditions at about 5 knots. As the *Osprey* approached the river mouth the first of the bar waves began to affect the boat.
- 1.1.9 As the boat entered the breaking waves at the bar the skipper increased speed to between 8 and 10 knots. Four of the passengers were standing inside the cabin with the skipper and 2 were standing on the open aft deck.
- 1.1.10 The skipper took the *Osprey* over to the left of the river mouth and out to go past the central sand bar. He was navigating by eye but also had the depth sounder on and the global positioning system (GPS) running and plotting a track on the screen. One of the passengers remembered that the depth sounder showed about 1.5 m up to the time of reaching the river mouth.
- 1.1.11 The boat passed over several breakers, which resulted in a small amount of water accumulating on the open aft deck. The skipper turned the boat more to port to give the central sand bar a wider berth.
- 1.1.12 While the *Osprey* was taking the breakers on the starboard bow of the boat a wave much larger than those previously encountered struck the boat. The wave pushed the bow to port and violently heeled the boat over to port. The skipper later estimated that the wave was about 3 m high.
- 1.1.13 The boat was nearly on its beam ends when the skipper applied full power on the engines in an attempt to drive out and over the wave.

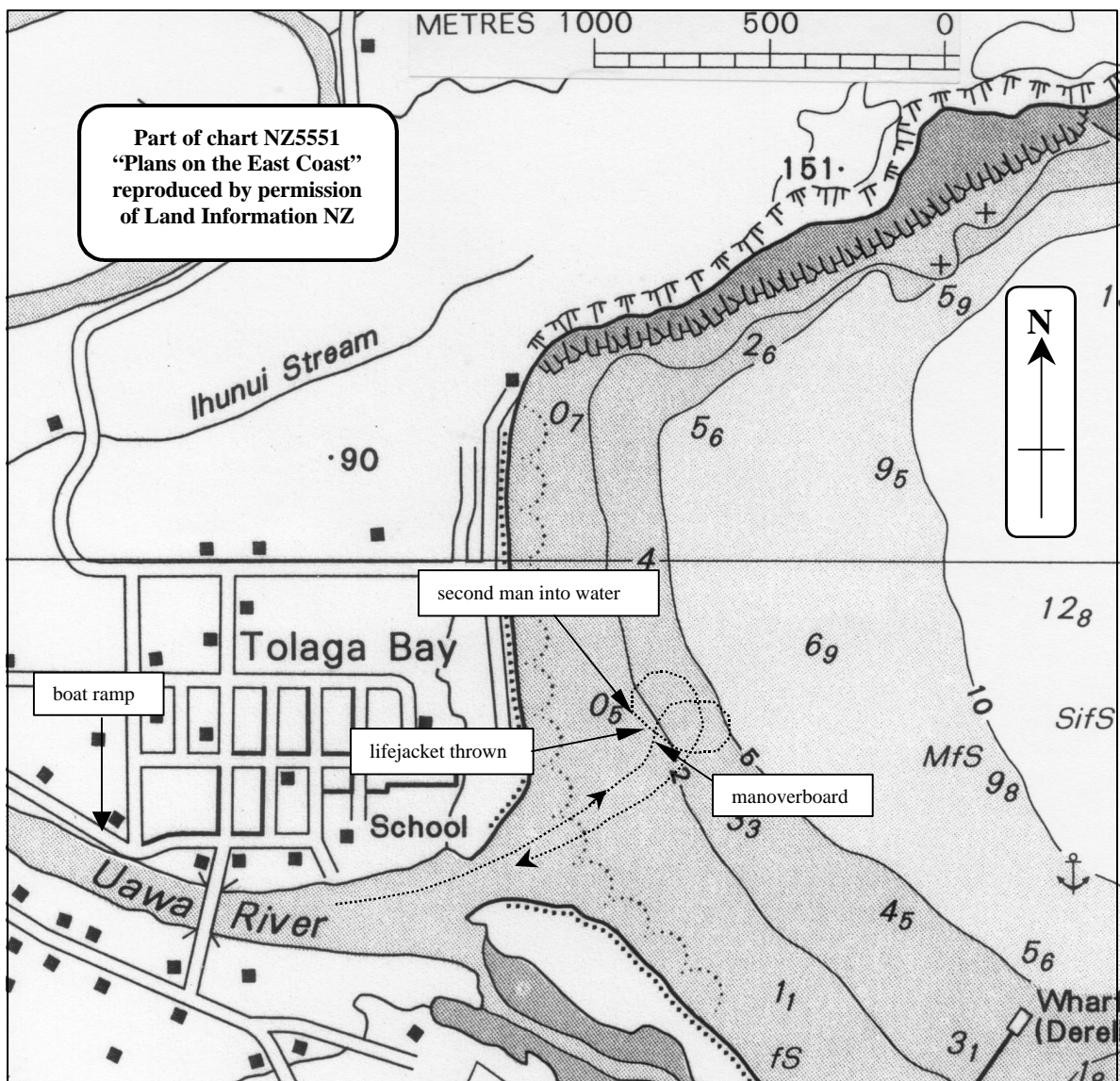
- 1.1.14 When the *Osprey* was heeled over to port, all of the passengers were thrown around in the boat. The skipper managed to hold on to the wheel for some time but at one point lost his footing and let go of the wheel. The wave continued to hold the *Osprey* over to port and the boat travelled along the wave for some considerable distance before the skipper was able to regain the wheel and turn the boat to starboard and over the top of it.
- 1.1.15 No sooner had the *Osprey* crested the wave when it was confronted with another wave that was higher than the one that had just heeled the boat over. This wave hit the boat more or less head on and went right over the top of the boat. The port side windscreen smashed and a large volume of water entered the cabin.
- 1.1.16 The 2 waves had hit the boat in quick succession. As the *Osprey* came through the second wave, the skipper called out to his passengers to check that they were all right. As a result of the check, they realised one of the 2 passengers who had been on the open aft deck was missing.
- 1.1.17 When the passengers looked around they were able to see their colleague in the water astern of the *Osprey*. He initially appeared to be floating but then stood upright in water about chest deep some 100 m off the beach and began to make his way ashore. The skipper told the remaining passengers to watch him carefully and not to lose sight of him.
- 1.1.18 Before turning, the skipper needed to remove the water that had entered the cabin and aft deck, so he ran the *Osprey* out beyond the breakers to allow the water to flow out through the aft freeing ports. Once in the calm waters beyond the breakers, and when most of the water was gone, he turned the *Osprey* around to return to the man in the water (see Figure 1). While the skipper was turning the *Osprey* around, the remaining passengers donned lifejackets.



**Figure 1**  
**Approximate track of the *Osprey* to accident site**

- 1.1.19 By the time the *Osprey* reached the man in the water he was about 60 m from the beach and in water just above his waist. One of the other passengers threw him a lifejacket, which he caught and tucked under his arm.

- 1.1.20 The passengers in the boat decided that one of them should get into the water to help the man who had been washed overboard. One of them climbed over the side and started to wade towards him. The skipper had been manoeuvring the *Osprey* to keep the propellers away from the first man and was also keeping a watch on the breakers. By the time that the second man went into the water there was about 50 m between them (see Figure 2).
- 1.1.21 Both men seemed to be coping with the conditions and the skipper decided that his best option was to return to the boat ramp and then come back to assist them from the beach. He left the scene and headed back to the ramp. As they left, they could see that the first man was being pulled towards the river mouth by the flood tide and the second man was making only slow progress towards him.
- 1.1.22 The trip back to the ramp took between 5 and 10 minutes. As soon as the boat arrived at the ramp, 3 of the passengers got into their van and went to the beach. On the way they picked up 2 local residents to give them directions.
- 1.1.23 Meanwhile the skipper and the one remaining passenger secured the *Osprey* before they went in the skipper's van to his home to collect blankets and warm clothing. The skipper then went to the beach, leaving the passenger at his house to prepare hot drinks and some food for when everyone returned from the beach.



**Figure 2**  
Part of chart NZ 5551 showing approximate track of the *Osprey*

- 1.1.24 The first group of passengers arrived at the beach to find that their 2 friends were on the sand at the water's edge. The one who had gone into the water to help was performing cardio-pulmonary resuscitation (CPR) on the man who had been swept overboard.
- 1.1.25 One passenger and one of the residents remained on the beach to help while the others went in their van to get medical assistance. The passengers found the medical centre and alerted the doctor to the emergency. The doctor and 2 nurses went immediately to the beach.
- 1.1.26 At the beach the rescuing passenger was still trying to revive his friend. When he had finally reached him in the water he had found his friend unconscious and floating face down, still with the lifejacket tucked under his arm. He had turned him over and pulled him to the beach, attempting mouth-to-mouth resuscitation as he went. Because his friend was a big man, he had managed to pull him only as far as the water's edge. The CPR was difficult with waves lapping around them and their lifejackets hindered easy movement.
- 1.1.27 With the arrival of help, the unconscious person was pulled further up the beach and CPR continued. Despite his best efforts, the rescuing passenger did not manage to get any response from his friend. When the doctor and nurses arrived, the doctor took over resuscitation efforts but he too was unable to revive the victim.

## **1.2 Injuries and damage**

- 1.2.1 The passenger who was washed overboard died as a result of the accident. A post mortem examination was carried out and among the pathologist's findings were the following observations:
- There were minor lacerations consistent with having been thrown from the boat.
  - The most likely cause of death was drowning.
  - A significant cardiomyopathy could have been a contributing factor.
- 1.2.2 The other passenger who had been standing on the aft deck suffered severe bruising to his back and one foot. The remaining passengers received bruising to some degree.
- 1.2.3 The *Osprey* was substantially damaged during the accident. The visor that protruded forward from the cabin roof fractured away from the windscreen surrounds and peeled back. The upper edge of the windscreen surrounds was distorted and the port side windscreen shattered. The plywood deckhead of the cabin was torn free on the port side and the electric cabling to the radios mounted on the deckhead damaged.

## **1.3 Site information**

- 1.3.1 Tolaga Bay lies on the east coast of the North Island of New Zealand about 50 km north of Gisborne. The New Zealand Pilot holds, in part, the following description:
- Both sides of the bay are formed by cliffs and the head of the bay is a sandy beach backed by fertile flats. Uawa River flows into Tolaga Bay over a bar which breaks heavily in a E swell and is dangerous.
- 1.3.2 The current along Tolaga Bay beach generally runs from south to north. The tidal run tends to build up sand on the south side of the bay, reducing the depth of water on that side.
- 1.3.3 The Uawa River bar generally had breakers across it to some degree. Easterly weather and swell produced the worst conditions. The skipper later estimated that the swells over the bar on the day of the accident were about one metre high. The photograph in Figure 1 was taken the day after the accident and the skipper had thought that the conditions were much the same, or perhaps a little better, than on the day of the accident.

- 1.3.4 The passengers' estimates of the wave heights varied but most thought that generally the waves were about one metre high, although one thought they might have been as much as 2 m. All agreed that the 2 larger waves that the *Osprey* encountered were much bigger, with estimates up to 3 m for the first one and simply an impression that the second was bigger than the first.
- 1.3.5 Two of the passengers stated that the conditions they observed as the *Osprey* reached the river mouth were no worse than they had seen on previous trips and they had no cause for concern.
- 1.3.6 The weather forecast for the area issued at 0300 on Monday 14 May was:  
  
Northwest 15 knots, becoming southwest 10 knots late evening. Sea slight.  
Northwest swell 1 metre. Fair visibility in morning showers north of Tolaga Bay.
- 1.3.7 Tolaga Bay was in the weather forecast area Portland, which ran from Cape Runaway to Cape Turnagain. The forecasts applied to open waters within 60 nm of the coast. The area was large and although the forecast was a good indicator, conditions on the coast or in any of the many bays, inlets and estuaries could differ significantly from the general forecast.
- 1.3.8 In assessing conditions, mariners needed to be aware of the general forecast but make their own observations of local variation. Additionally Taupo Maritime Radio broadcast observations of wind speed and direction, and sea and swell conditions from 40 coastal weather stations. The closest weather station to Tolaga Bay was at Gisborne. The skipper of the *Osprey* stated that the most reliable indicator of conditions at Tolaga Bay was an average of the reported conditions at Hicks Bay and Mahia weather stations.
- 1.3.9 On the day of the accident there had been a low tide at 0449 at a height 0.5 m above chart datum. The high tide was at 1057 at a height of 1.5 m above chart datum. One of the passengers recalled that the depth sounder registered about 1.5 m as the *Osprey* left the river mouth.

#### **1.4 Personnel information**

- 1.4.1 The skipper had worked out of Tolaga Bay for the previous 21 years. For 15 years he fished commercially for crayfish. When he sold his crayfish quota he bought a charter boat and had run fishing trips for about five and a half years. He subsequently sold that boat and bought the *Osprey*, and had been chartering it for about one year.
- 1.4.2 The skipper held a Commercial Launchmaster Certificate that he gained in August 1996. He also held a Restricted Radiotelephone Operator's Certificate, gained in December 1993.
- 1.4.3 The logbook for the *Osprey* showed that the skipper had last chartered the boat on 28 April 2001.
- 1.4.4 The passengers were from Gisborne and were all retired except one. The passenger who was washed overboard was 71 years old and had limited use of one arm owing to a previous injury. The passenger who went into the water to help was 75 years old. The others were aged 72, 70, 66 and 53. The 53-year-old passenger was the one who injured his back and foot.
- 1.4.5 The passengers on the day were part of a larger group of friends who regularly went on fishing trips on the *Osprey*. All but one of the group on the day had been out on the *Osprey* before. Several of the passengers owned their own boats and were used to the local conditions, albeit generally from Gisborne.

## 1.5 Boat information

- 1.5.1 Tolaga Bay East Cape Charters was an owner/operator single vessel company. The *Osprey* was an 8.2 m aluminium boat built in 1998 and purchased by the company about one year before the accident. The boat had a cabin forward and an open aft deck. The deck was constructed of aluminium checker plate. The boat was kept on a trailer at the owner's home.
- 1.5.2 The boat was powered by 2, two-stroke outboard engines which produced a total output of 260 kW and gave a maximum speed of 35 knots.
- 1.5.3 When the skipper purchased the *Osprey*, any water that accumulated in the cockpit drained into a bilge well aft and was pumped overboard from there. The skipper considered this a slow process and fitted 2 freeing ports at deck level in the transom. When travelling forward with a stern trim, any accumulated water ran overboard through those freeing ports. The bilge pump option was still available as well.
- 1.5.4 The *Osprey* was entered into a safe ship management system with Survey Nelson Limited. The certificate had been issued on 2 March 2000 and was valid, subject to periodic inspection and audit, until 28 January 2003. The last inspection and audit was completed on 16 October 2000 with no deficiencies noted. The *Osprey* had also undergone a satisfactory flag state inspection by the Maritime Safety Authority (MSA) on 31 May 2000.
- 1.5.5 The *Osprey* was authorised to operate within 12 nm of the coast in 2 restricted inshore limits, which were:
- between Waipiro Bay 38.00° S and Mahia Peninsular 39.15° S
  - between Whatatane River mouth 177.00° E to east of Hicks Bay 178.23° E.
- Movement between the 2 areas had to be by road.
- 1.5.6 The *Osprey* could carry a maximum of 10 passengers, had a minimum crewing level of one commercial launchmaster and carried life-saving equipment for 13 persons. The skipper said that for fishing and diving charters he normally imposed his own restriction of 6 passengers, although would take 10 on sight seeing trips.
- 1.5.7 Among the life-saving equipment were 14 lifejackets: 6 of the sheltered water type and 8 of the offshore type.
- 1.5.8 Among the special conditions in the ship safety manual was the following entry:
- Osprey* is not to operate with swell being more than one metre and wind more than 15 knots from any direction.
- 1.5.9 When asked about this special condition, Survey Nelson was of the opinion that it pertained to the area of operation for fishing and diving and not specifically for the Uawa River bar which had to be crossed at the beginning and end of any charter.
- 1.5.10 The skipper of the *Osprey* thought that the special condition was in place for both the fishing and diving areas as well as the bar. He said that he believed his decision to embark on a trip or to abort a trip was based on his extensive local experience and his knowledge of his boat, although always tempered by the special condition.

## 1.6 Other information

- 1.6.1 The MSA publishes Marine Notices for the advice of mariners. Notice 02/2000, issued in September 2000, read as follows:

### Caution when approaching bar harbours and river entrances

The continuing loss of life as a result of vessels capsizing when attempting to enter bar harbours and rivers causes the Maritime Safety Authority concern. Marine Notice 18/1995 – Caution When Approaching Bar Harbours and River Entrances – has been superseded by the following information.

Extreme caution must be exercised when crossing bars or approaching rivers. Unusually steep seas that have the ability to heel even well found boats to a dangerous angle may be encountered.

The conditions prevailing on a bar or on the approach to a river depend on five factors:-

The size and direction of the swell.

The wind and sea conditions.

The depth of water or the gradient of the sea bottom.

The set or cross current across the entrance or along the shore.

The run in the river.

One of the most important things to remember is that conditions on the bar change quickly and unpredictably.

The following precautions should be strictly observed:

All persons operating to and from bar harbours should obtain relevant up to date information pertinent to the area before crossing the bar, and comply with it.

Stay a safe distance offshore until a report on the bar conditions has been obtained from the Harbourmaster or other reliable person inside the harbour.

Assess the conditions and ensure that your vessel is able to withstand them, prior to any attempt to cross.

Ensure that your vessel has sufficient stability. Mariners should be aware that broken water contains air which reduces the stability of a vessel. In addition, due regard should be taken of free surface and additional weight on deck which also have an adverse effect on the stability of a vessel.

Approach at a moderate speed, with power in hand to help you steer the vessel out of trouble.

Use the echosounder or other sounding device to detect newly formed or shifting sandbanks.

Ensure that all lifesaving equipment is in good order, that lifebuoys are free in their racks and that each person on board is wearing an approved personal flotation device (PFD) [lifejacket]. Children must be fitted with lifejackets of an appropriate size.

All deck openings should be secured and hatches battened down.

- 1.6.2 The MSA, together with a special interest group of harbourmasters consisting of bar harbour harbourmasters and fishing industry representatives formulated a draft national code of practice for bar crossings. At the time of publication of this report, the draft code was ready for industry consultation.
- 1.6.3 The purpose of the code will be to provide clear guidelines to skippers and crews of all vessels regarding safe and prudent practice when attempting to enter or leave any bar harbour or river entrance.
- 1.6.4 The MSA intends that the final code, expected to be introduced by 1 December 2001, will be produced as a Marine Notice - Boats to replace Notice 02/2000 and that it will be included in the safe ship management manuals of all vessels using or likely to use bar harbours.

## 2. Analysis

- 2.1 The passengers who chartered the *Osprey* were regular customers and had requested the trip about 3 weeks beforehand. The skipper had been watching the weather and forecasts to arrange a suitable day to conduct the trip. Although the boat had been available, the skipper had made no trips for 15 days before the accident trip because of unsuitable weather or bar conditions.
- 2.2 From the weather forecast it appeared that Monday 14 May 2001 might be suitable, so the skipper took the opportunity on the Sunday evening to view the conditions from the cliff overlooking the river mouth. The conditions on the bar were marginal but with a forecast improvement it was appropriate that the skipper alert his passengers to the possibility of a trip to go on the Monday morning.
- 2.3 Rather than rely on the forecast, the skipper went to the beach early on Monday morning. He estimated that the breakers over the river mouth bar were about a metre high, but the water further out to sea was relatively calm. Calling on his more than 20 years' experience and local knowledge, he decided that the bar could safely be crossed and the trip could go ahead.
- 2.4 Having made the tentative arrangement with the passengers, the skipper was probably loath to disappoint them but he was also conscious of the fact that the group was mostly elderly and may need better conditions than younger passengers.
- 2.5 Although the conditions on the morning of the accident were close to those imposed as special conditions in the ship safety manual, the skipper's decision to continue with the trip was made with the best intentions and was appropriate. His waiting more than 2 weeks for appropriate conditions suggests that the skipper was not prone to making unwise decisions when assessing weather and bar conditions.
- 2.6 The skipper had not undertaken any trips for 15 days and had had a restful weekend before the accident trip. Fatigue did not contribute to the accident.
- 2.7 Having embarked his passengers the skipper set off without giving them a full safety briefing. Despite the fact that all but one of them had been on the *Osprey* before, it would have been prudent for the skipper to have given a full briefing anyway. Even regular passengers might forget what equipment was available and where it was stowed. In this case the lack of a full briefing did not contribute to the accident.
- 2.8 Despite the advice contained in Marine Notice 02/2000, the skipper did not have a policy of requiring passengers to wear lifejackets. While the jackets might be cumbersome when out at the fishing grounds, it would have been prudent for himself and his passengers to routinely wear them when crossing the bar outbound and inbound, those being the most potentially risky parts of the trip. In this case, with bar conditions close to his limitations, it would have been especially advisable for all persons on board to have been wearing them.
- 2.9 The sand bar that had been formed by recent rains scouring sand from the river was situated centrally in the river mouth. The bar was easily identified by the waves breaking over it. Because of its position the skipper was unable to leave the river and take a straight line out to sea.
- 2.10 The skipper could have passed the sand bar on either side but chose to go to the left because his intended fishing area was in that direction. Neither side was any safer than the other so his decision based on operational need was appropriate.



- 2.11 As the *Osprey* approached the river mouth the passengers could see the breaking waves at the bar. They later stated that the waves were no bigger than they had crossed before and gave no cause for concern. Some of the passengers were experienced boating people and their confidence in approaching the bar lent credence to the skipper's decision to continue with the trip.
- 2.12 When passing through breaking waves in a small vessel, the safest and most comfortable method is to meet them head on, thus passing over or through them quickly and without causing the boat to roll to either side.
- 2.13 Heading to the left side of the river mouth, caused the *Osprey* to meet the breaking waves on its starboard bow. Initially the angle was small and while both pitching and rolling motions would result, a one-metre wave height would not cause a boat the size of the *Osprey* to move unduly.
- 2.14 As the *Osprey* approached the area of the sand bar, the skipper took the *Osprey* further to port. This action caused the *Osprey* to meet the breakers at a larger angle and thus the boat began to roll more. The rolling action caused a small amount of water to enter the open aft deck.
- 2.15 Up to this time the *Osprey* had crossed several breaking waves without incident and neither the skipper nor the passengers were concerned that they were in any danger.
- 2.16 The skipper was suddenly confronted with a wave larger than those that had already been crossed. Later estimates indicate that it was probably about 3 m high. To pass over such a wave safely, the *Osprey* would ideally need to meet it head on. However, the boat was already angled to port and the wave hit the boat at about 45 degrees on the starboard bow.
- 2.17 The wave heeled the *Osprey* over to port. Later estimates varied from 45 degrees to 120 degrees, but whatever the angle, the movement would have been sudden and violent. Everyone on board lost their footing. Those inside the cabin would have been constrained unlike the 2 on the open aft deck. The passenger on the starboard side would have first fallen to the deck and then slid down and been constrained by the side of the boat. The passenger standing on the port side of the deck would have been thrown directly against the side of the boat.
- 0
- 2.18 The *Osprey* travelled for some distance along the wave, effectively surfing. Despite momentarily losing his footing, the skipper was able to hold the bow up by increasing engine power and trying to steer to starboard. The outboard motors turning to starboard under considerable power would have created a significant righting moment to starboard. Had the skipper not taken that action, the *Osprey* would probably have fallen off to port and capsized.
- 2.19 As the wave passed under the *Osprey* the skipper was able to steer to starboard to bring the boat around and over the wave. As the boat went over and down the back of the wave it entered a steep trough between the first and second larger waves. The second wave went over the top of the *Osprey*, and to have done so must have been at least 3 m high. It was this wave that would have inflicted the damage on the boat.
- 2.20 Swell heights in marine forecasts are given as significant wave height. Significant wave height is defined as the average height of the one-third highest observed wave heights over a given period.
- 2.21 The maximum expected wave height is generally taken to be 1.6 times the significant wave height; however, the statistical relationship is based on a period of 10 minutes. If a period of 3 hours is considered, a maximum wave height of 2 times the significant wave height can be expected, and 2.3 times the significant wave height over a 24-hour period<sup>2</sup>.

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<sup>2</sup> M Darbyshire and L Draper, Forecasting wind-generated sea waves, *Engineering*, April 1963.

- 2.22 Significant wave height refers to the height of waves in deep water. Other phenomena affecting wave height are shoaling, refraction and opposing tide or current. As waves enter shallow water, interaction with the sea bed causes them to slow. This loss in speed causes the waves to increase in height, thus retaining the same amount of energy. Opposing tide or current also causes waves to slow with the same consequences. The period of the waves is not affected by either phenomenon. As the waves approach land, they are refracted which can lead to areas where waves become focused.
- 2.23 In this case the skipper and most of the passengers had estimated that the waves were generally about one metre high as per the forecast. However, it should not have been unexpected to meet such a set of waves as they did on a river bar with a significant swell height of one metre. Mariners crossing bar harbours should be aware of and look for such a phenomenon.
- 2.24 Once through the 2 large waves the sea conditions reverted to an average height of one metre and the skipper regained control of his boat. His first concern was for his passengers and he initiated a check, which revealed that one passenger was missing.
- 2.25 The passenger who had been thrown overboard had been the one standing on the port side of the aft deck. Although no-one on board saw him go overboard, he probably tipped over the side when he was thrown against the bulwark as the *Osprey* was violently heeled over by the first large wave.
- 2.26 The skipper was now confronted with a situation where he had a passenger in the water, a damaged boat and a significant amount of water on board. The man in the water appeared to be uninjured and coping with his situation. In the interests of the safety of those remaining aboard, the skipper needed to get rid of the water in the boat as it would have made manoeuvring difficult and could have resulted in the boat getting caught again. His action in instructing the other passengers not to lose sight of their friend while he drove the *Osprey* beyond the breakers to get rid of the water was appropriate.
- 2.27 The skipper then turned the *Osprey* and brought it back to where the man was in the water. He manoeuvred the boat close to the man but was careful to keep the propellers away from him, at the same time keeping a careful watch for any further large waves approaching. In the area of breaking waves it would have been difficult and even dangerous to manoeuvre the boat too close to the man in the water.
- 2.28 The skipper got the *Osprey* close enough to the man in the water so that a lifejacket could be thrown to him. The man was in an area of breaking waves and donning the lifejacket would have been difficult. He was seen to tuck the jacket under his arm rather than attempt to put it on.
- 2.29 The decision to put another man into the water was taken about this time but by the time he entered the water, the *Osprey* had drifted further away from the first man in the water. The men were about 40 to 50 m apart, both in water between waist and chest high. The first man was closer to the river entrance and was seen to be drifting in that direction, pulled by the flood tide.
- 2.30 Seeing both men apparently coping well, the skipper decided to take the *Osprey* back to the boat ramp so that he and the other passengers could come back to the beach and assist from there. It was not far to the ramp where road transport was available. The skipper's decision was based on getting the greatest amount of help to the men in the shortest possible time while considering the safety of the remaining passengers.
- 2.31 The passenger who went into the water to help was 76 years old but was relatively fit. Even so he had to wade through breaking waves wearing a lifejacket. Movement would have been difficult and he did well to reach his friend.

- 2.32 The passenger who was thrown overboard seemed initially to be coping well with his situation. When he went overboard, it would have been a sudden and traumatic experience during which it was likely that he ingested some water and sustained injuries. However, no injury was severe enough to impair his ability to reach the shore.
- 2.33 He was thrown a lifejacket which would have given him some support, but he tucked it under one arm rather than putting it on. The recollections of the other passengers were that he put the lifejacket under his left arm, which was the one that had limited use.
- 2.34 He was reportedly a big man and would have had to work hard to make progress through the waves, particularly with only one arm free. It was revealed after the accident that he had a heart condition but it was unclear if that affected his ability to reach the shore unassisted.
- 2.35 In an area of breaking waves over a river bar, a sandy sea bed becomes irregularly corrugated and pitted with deep holes. As he tired, he might have slipped on the uneven surface and fallen into the turbulent water. He had been unable to reach the shore unassisted and was not breathing when help arrived. During the period that he was in the water, it is likely that he had ingested water and drowned and experienced a consequential cardiac arrest.
- 2.36 When the second man reached him he was floating face down but still had the lifejacket under his arm. Had he been wearing a lifejacket before going overboard, it might have kept him above the surface of the water when he slipped, and even if he did succumb, the lifejacket was designed to turn him over to float face up and would have significantly increased his chances of survival.
- 2.37 The efforts of the second passenger in the water to save his friend were commendable and carried out without hesitation. However, by the time he was able to start revival attempts, his efforts were probably too late.

### **3. Findings**

Findings and safety recommendations are listed in order of development and not in order of priority.

- 3.1 A passenger on board the charter vessel *Osprey* died, probably due to drowning, as a result of falling overboard without a lifejacket when the boat was almost capsized by a wave while crossing the Uawa River bar.
- 3.2 The *Osprey* was fit for the purpose for which it was being used and held a valid maritime document.
- 3.3 The skipper of the *Osprey* was suitably qualified and experienced to have conducted the trip.
- 3.4 The conditions over the river bar were close to the limits imposed by the special conditions in the *Osprey's* ship safety manual, but were appropriate for the trip to proceed.
- 3.5 The skipper was forced to steer to the left of the river mouth to avoid a sand bar, a not unusual requirement from time to time when crossing river bars. While exposed to waves on its starboard bow, the boat was caught by larger waves and almost capsized.
- 3.6 The waves that caught and swamped the *Osprey* could reasonably be predicted for a deep water swell with a forecast significant height of one metre.
- 3.7 The skipper's actions in recovering the *Osprey* from the situation and rendering assistance to the passenger lost overboard were appropriate.

3.8 Contrary to the advice contained in Marine Notice 02/2000, none of the persons on board the *Osprey* was wearing a lifejacket when the skipper attempted to cross the bar. Had the passenger who was lost overboard been wearing a lifejacket, his chances of survival would have been significantly increased.

3.9 The deceased's pre-existing medical condition may have contributed to his drowning.

#### **4. Safety Recommendations**

4.1 On 31 October 2001 the Commission recommended to the owner of Tolaga Bay East Cape Charters that he:

4.1.1 In conjunction with Survey Nelson Limited, amend the ship safety manual to reflect:

- a policy to ensure that all persons on board wear a lifejacket when crossing the bar outbound and inbound regardless of the prevailing conditions on the bar.
- operating limits set separately for the Uawa River bar and outer fishing grounds, based on observed conditions, the capabilities of the *Osprey* and his own local knowledge and experience. (061/01)

4.2 On 20 November 2001 the owner of Tolaga Bay East Cape Charters replied, in part:

4.2.1 Life jackets are now worn on all trips over the bar and off the beach. I intend to implement the recommendations of the final report as soon as possible.

Approved for publication 31 October 2001

Hon. W P Jeffries  
**Chief Commissioner**