MCIB
Marine Casualty Investigation Board

Leeson Lane, Dublin 2.
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REPORT OF THE INVESTIGATION INTO THE INCHAVORE RIVER KAYAKING INCIDENT CO. WICKLOW ON 13th NOVEMBER 2014

The Marine Casualty Investigation Board was established on the 25th March, 2003 under the Merchant Shipping (Investigation of Marine Casualties) Act, 2000.

REPORT NO. MCIB/241
(No.9 OF 2015)

Report MCIB/241 published by The Marine Casualty Investigation Board.
Printed 28th August 2015.

CONTENTS

1. SUMMARY

On the 13th November 2014 a group of kayakers attempted to make a descent of the Inchavore River in Co. Wicklow. They began their descent in two groups. One of the kayakers in the first group got into difficulty and separated from the rest of the group. He was subsequently found unconscious and could not be revived.

2. FACTUAL INFORMATION

2.1 Boat details

Type:	Pyranha Burn III.
Length:	2.50 metres (m).
Beam:	0.65 m.
Volume:	268 litres (l).
External Cockpit length:	0.935 m.
External Cockpit width:	0.50 m.
Displacement:	19.6 kg.
Hull Material:	Polyurethane.

2.2 General overview of the Kayak and Equipment

- The Pyranha Burn III is a polyurethane kayak designed and built for fast flowing and white water descents.
- The other members of the group had similar type kayaks with all members carrying a comprehensive list of specialist safety equipment.

2.3 Standard Safety Equipment

- Helmet
- Buoyancy aid
- Dry suit
- Thermal suits
- Spray deck
- River boots

2.4 Specialist Safety Equipment

The following list details the kind of specialist equipment the kayaker groups were carrying. Different individual members had slightly different items, however both teams had at least one of the following and in many cases, multiples of the items:

- 15 m throw ropes in specially designed throw bags, typically 1 per kayaker
- Carabiner clips, typically 3 to 4 per kayaker
- Rope Slings, typically 2 per kayaker
- First Aid Kit, 1 per kayaker
- Pulley blocks or other double purchasing methods, typically 2 per kayaker
- Glow Sticks and/or battery powered waterproof torches, 1 per kayaker
- Knifes, typically 1 per kayaker
- Whistle, 1 per kayaker
- Survival Bags and or thermal blankets
- Prusik anchor
- Emergency Paddles, at least 2 per group
- Mobile Phone in waterproof cover, at least 1 per group
- Fold up Wood-saw

2.5 Kayaking and canoeing terms

- A stopper – sometimes referred to as a hydraulic jump or a hole in an area on a river where the water flows back on itself. These usually only occur in fast flowing or white water and primarily occur at the base of drops or partially submerged boulders.
- Grade of a river – Rivers and waterways that are frequented by kayakers are graded from 1 to 6:

  Grade 1 = easy

  Grade 2 = novice

  Grade 3 = intermediate

  Grade 4 = advanced

Grade 5 = expert

Grade 6 = extreme

- Carabiner clips – lightweight gate type snap shackles used for fixing ropes.
- Prusik anchor – a rope tackle arrangement that allows the user to ascend and descend ropes, often one handed and are used to set up Z drags or pig rigs to assist in the extraction of equipment that may be stuck in the river.

2.6 The Inchavore River

The Inchavore River is graded between four and five, depending on the amount of water passing through it. The river is only passable when rainfall in the previous six hours has been heavy enough to bring the river level up. In periods of low rainfall, the river does not have enough water to make a descent. The surrounding countryside drains quickly, so conditions on the river change hourly, depending on the rainfall in the previous four to six hour period (See Appendix 7.1 Map of Inchavore River). The weather at the time of the incident was not abnormal and other than the volume of water from recent rain had no bearing on the incident (See Appendix 7.2 Met Éireann Weather Report).

3. NARRATIVE

3.1 On the morning of the 13th November 2014 at around 11.00 hrs, a group of kayakers met and surveyed the Inchavore River. The kayakers were highly experienced, some of whom had previously kayaked the Inchavore River in full flood.

3.2 At 14.00 hrs, the kayakers returned to the Inchavore River entrance point and began another inspection of the river. Agreeing that the river was passable and that its level was medium to high, it was decided that two smaller groups would be more manageable. At approximately 14.15 hrs, the first group of four started their descent leaving three kayakers behind. (See Appendix 7.1 Point A).

3.3 At approximately 14.30 hrs, the first group stopped at the start of a more challenging section of rapids (See Appendix 7.1 Point B) and got out of their kayaks and walked down the riverbank to survey the conditions. They agreed on the next stopping point, which was to be a set of eddies at the end of the surveyed section (See Appendix 7.1 Point C).

3.4 At approximately 14.42 hrs, the first group got back into their kayaks and started the descent of the section. The first two members of the group, members A and B made the decent without incident. The third (C) and fourth member (D) followed just after. C passed the majority of the section without incident. However he became temporarily trapped in a stopper at the end of the section. D arrived at the stopper just as C got free.

3.5 At approximately 14.44 hrs, C paddled towards the first two group members to stop up in one of the eddies, however he failed to stop and slipped out of the back of the eddy.

3.6 Realising that C failed to stop, B exited the river to throw a rope to C as B could see that C was going to exit the kayak into the water. C swept past B, obviously unconscious, B then followed C on foot but was not able to catch up. D, having just freed himself from the stopper, followed B and C down the river. As A was still in the eddy, he decided to get out of his kayak and follow the others on foot.

At about 14.46 hrs, B noted that C had capsized and recognised that he was in trouble. While B was on the bank C swept past him out of his kayak and face down in the water.

3.7 A short time after this, D paddled past B and asked him to monitor the situation. D paddled after C, while B returned to get the mobile phone from A, who was walking towards them down the riverbank.

3.8 B took a short cut on the riverbank and passed upriver of A without making contact with him. Both kayakers were on the same side of the riverbank, but the noise of the river was making communication difficult. At approximately 14.55 hrs, B found the mobile phone in A's kayak and attempted to make an emergency call, but there was no phone signal.

3.9 At 15.00 hrs, A and B met up on the riverbank and A attempted another emergency call but there was still no phone signal. After several attempts to make an emergency phone call, A and B from the first group began to ascend the riverbank on foot.

3.10 At approximately 15.00 hrs the second group began their descent of the river and at 15.15 hrs they arrived at the start of the more challenging section (See Appendix 7.1 Point B) of the rapids and got out of the kayaks to survey the river. The second group completed the first part of the section (See Appendix 7.1 Point B) at approximately 15.30 hrs and got out of the water again to survey the next section. A and B met them and after a brief discussion, it was decided that A and B would continue up the riverbank to find a phone signal and raise the alarm, while the second team would start a search of the riverbank.

3.11 At 15.45 hrs A and B got to the road, but still couldn't get a phone signal. A passing driver brought them to the top of a nearby hill and at 15.50 hrs, they were able to alert the emergency services. At 15.58 hrs A and B called the emergency services again, to inform them that they were returning back to the river to re-join the search.

3.12 At approximately 16.30 hrs, A and B got back to the river where the river level had dropped sufficiently to allow the two to continue the search from their kayaks. At approximately 16.32 hrs, after descending two sets of rapids, B found C pinned to some branches in fast flowing water (See Appendix 7.1 Point D). A and B managed to free C and bring him to the riverbank where they tried to revive him.

3.13 The Irish Coast Guard helicopter R116, arrived on the scene at 16.17 hrs, and at 16.37 hrs spotted D from the first group and one of the three men from the second group. The winch man descended and airlifted both men from the scene. At about 16.48 hrs the Irish Coast Guard helicopter located A and B, who were continuing to try to revive the casualty, and airlifted the casualty to Tallaght Hospital where he was pronounced dead. Cause of death was later recorded as drowning.

4. ANALYSIS

4.1 On Tuesday the 18th November 2014 the river and riverbank were surveyed. The river level had dropped, exposing rocks and various other obstacles. During the survey of the bank, several large trees and branches were noted as well as several areas where the flora was disturbed as a result of the search. The land on either side of the bank was not easy terrain to negotiate and no mobile phone signal was available (See Appendix 7.3 - Photographs).

4.2 From the interviews with the kayakers it appears that the casualty attempted to enter a back eddy but missed the ingress point and was swept down river. The casualty was capsizing and righting himself a number of times. B went ashore to get downstream of C to attempt assistance. At this time B noted that C was out of his kayak and floating face down.

4.3 The casualty's kayak was surveyed after the incident. The hull had scuffs and marks, consistent with normal use and there was a small repair in the hull bottom under the seat. The kayak was in good repair and fit for purpose (See Appendix 7.3 Photograph No.5).

4.4 Cause of death was drowning.

5. CONCLUSIONS

5.1 The kayakers involved in the incident were experienced with most of them having completed a high level of formal training.

5.2 The Inchavore River is frequented by kayakers and four of the seven members of the two groups had already made a descent of this river on at least one previous occasion. The river is described in white water guidebooks with recommended river flow conditions similar to the day of the incident. The casualty had not previously kayaked the river but was a highly experienced kayaker.

5.3 The kayakers had in their possession appropriate equipment and safety equipment for a descent of the Inchavore River.

5.4 The noise of the river made verbal communications between the kayakers extremely difficult if not impossible. Where line of sight was possible, the training the kayakers had in hand signals was effective, however when line of sight was not possible, it became difficult to locate the various group members and coordinate the search.

5.5 On this occasion, the delay in contacting the emergency services, due to the lack of mobile phone coverage, did not impact on the casualty's survival.

6. SAFETY RECOMMENDATIONS

6.1 Kayaking groups making descents on remote rivers of Grade 3 and higher should carry registered personal location beacons (PLB's). This will enable early alerting of the rescue services, in the event of an emergency.

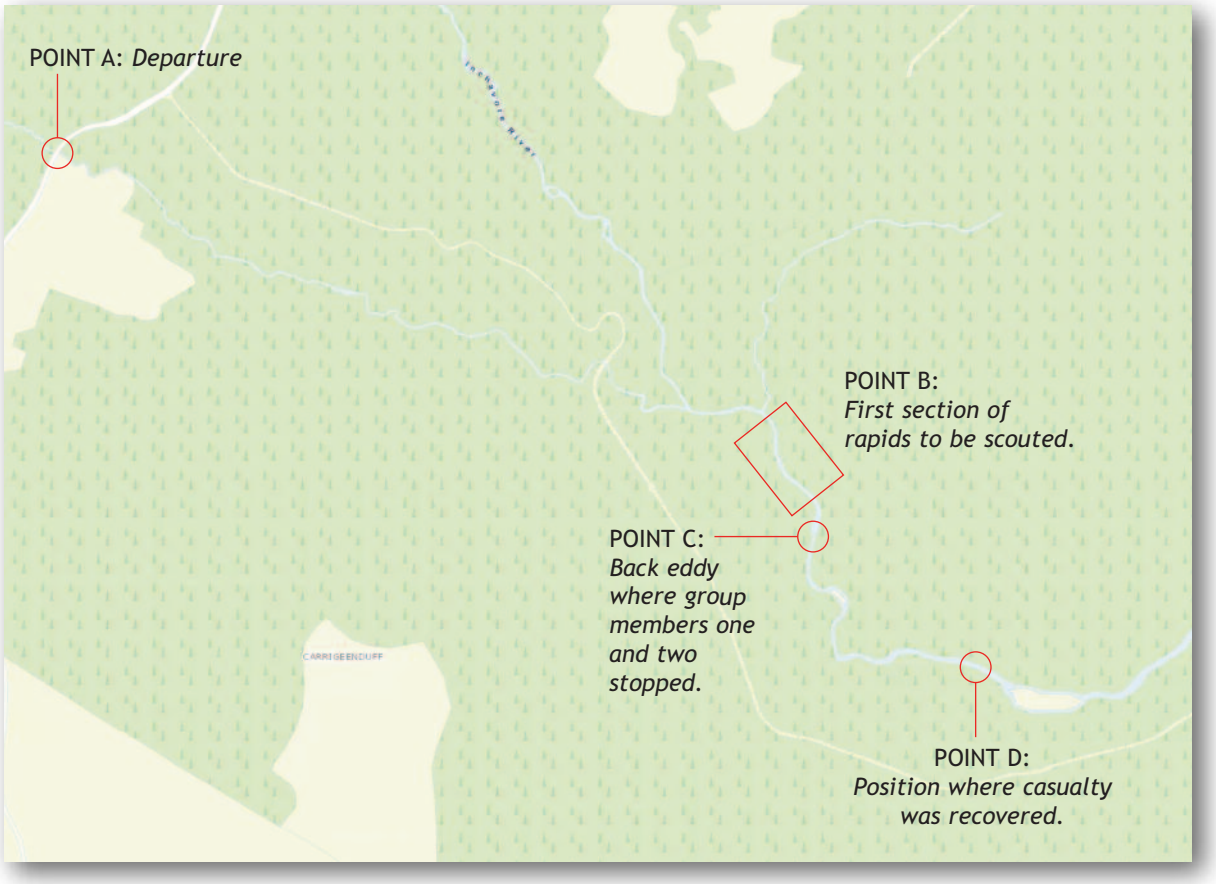
6.2 In rivers of a high flow rate, with extended periods of rapids, Canoeing Ireland should recommend that kayaking groups should consider using waterproof radios to allow communication between group members when line of sight is not possible.

6.3 Canoeing Ireland should issue a Notice to all its members to urge them to comply with the requirements of the Department of Transport, Tourism and Sport Code of Practice for: The Safe Operation of Recreational Craft – In particular Chapter 7 on Canoeing/Kayaking.

7. APPENDICES

Appendix 7.1 Map of Inchavore River.

Appendix 7.1 Map of Inchavore River.



Appendix 7.2 Met Éireann Weather Report.

MET ÉIREANN
The Irish Meteorological Service

Glasnevin Hill, Dublin 9, Ireland. | Cnoc Ghlas Naíon, Baile Átha Cliath 9, Éire. | www.met.ie
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[redacted]
MCIB
Leeson Lane
Dublin 2

Marine Casualty Investigation Board
20 NOV 2014
Bord Imscrúdú Tasimí Muirí

18/11/2014

Our Ref. WS 3018/2_15677
Your Ref. MCIB/12/241

Re: Estimate of weather conditions on Lough Dan, Co Wicklow, on the 13th November 2014, between 6 hours and midnight.

[redacted]

Please find enclosed the above report.

Yours sincerely,

[redacted]

[redacted]
Met Eireann
[redacted]

Appendix 7.2 Met Éireann Weather Report.

MET éireann

MET ÉIREANN
The Irish Meteorological Service

Glasnevin Hill, Dublin 9, Ireland.
Cnoc Ghlas Naíon Baile Átha Cliath 9, Éire.
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18/11/2014

Our Ref. **WS 3018/2_15677**
Your Ref. **MCIB/12/241**

Estimate of weather conditions on Lough Dan, Co Wicklow, on the 13th November 2014, between 6 hours and midnight.

General Situation

The Lake is orientated in a North-west to South-East direction. Moderate to Fresh winds in the early morning were from the south-east. Some funnelling of winds may have occurred over parts of the lake, caused by the higher ground nearby and the direction of the wind. The wind direction would also have caused waves, especially on the north-western part of the lake for a time in the early morning. The winds eased as a band of rain passed over the area between 9 hours and 15 hours, and there were some very heavy falls in the general area. The rain cleared to good dry periods and isolated showers for the afternoon and early evening. Further rain followed overnight.

Details:

6 hours to 12 hours

Winds: Fresh and gusty winds, Force 4 to 6, (15 to 25 knots) gusting 30 to 40 knots, from a south-easterly direction, became Light to Moderate, Force 2 to 4, (5 to 15 knots) about 10 hours but gusty at times.

Weather: generally dry at first, apart from some light drizzle in the area. The rain arrived about 9 hours and was very heavy at times.

Visibility: moderate to poor

Appendix 7.2 Met Éireann Weather Report.

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The Irish Meteorological Service

Glasnevin Hill, Dublin 9, Ireland.
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WS 3018/2_15677 continued...

12 hours to 24 hours

Winds: Light, Force 2 to 3 (5 to 10 knots), and variable in direction, with some stronger gusts at first.

Weather: Rain cleared to isolated showers for the late afternoon and evening with another heavy band of rain arriving from the south after 20 hours

Visibility: Mostly good for the afternoon, became moderate to poor again later.

[redacted]

[redacted]
Met Éireann

Appendix 7.2 Met Éireann Weather Report.

MET éireann

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The Irish Meteorological Service

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Appendix

Beaufort Scale of Wind

Force	Description	Speed* knots	Speed* km/hr	Specification -sea	Wave height** (metres)
0	Calm	<1	<1	Sea like mirror	
1	Light air	1-3	1-5	Ripples	0.1 (0.1)
2	Light breeze	4-6	6-11	Small wavelets	0.2 (0.3)
3	Gentle breeze	7-10	12-19	Large wavelets, crests begin to break	0.6 (1)
4	Moderate breeze	11-16	20-28	Small waves becoming longer, frequent white horses	1 (1.5)
5	Fresh breeze	17-21	29-38	Moderate waves, many white horses, chance of spray	2 (2.5)
6	Strong breeze	22-27	39-49	Large waves, white foam crests, probably some spray	3 (4)
7	Near gale	28-33	50-61	Sea heaps up, streaks of white foam	4 (5.5)
8	Gale	34-40	62-74	Moderately high waves of greater length	5.5 (7.5)
9	Strong gale	41-47	75-88	High waves, dense streaks of foam, spray may reduce visibility	7 (10)
10	Storm	48-55	89-102	Very high waves, long overhanging crests, visibility affected	9 (12.5)
11	Violent storm	56-63	103-117	Exceptionally high waves, long white foam patches cover sea	11.5 (16)
12	Hurricane	64+	117 & over	Air filled with foam and spray, sea completely white	14 (-)

*Speed = mean speed at a standard height of 10 metres.
**Wave height is only intended as a guide to what may be expected in the open sea. Bracketed figures indicate the probable maximum wave height.

Wave Heights / State of Sea

The wave height is the vertical distance between the crest and the preceding or following trough. The table below gives a description of the wave system associated with a range of significant wave heights. The Significant wave height is defined as the average height of the highest one-third of the waves. (It is very close to the value of wave height given when making visual observations of wave height.)

Sea State (Descriptive)	Significant Wave height in meters
Calm	0 – 0.1
Smooth(Wavelets)	0.1 – 0.5
Slight	0.5 – 1.25
Moderate	1.25 – 2.5
Rough	2.5 – 4
Very rough	4 – 6
High	6 – 9
Very high	9 – 14
Phenomenal	Over 14

Individual waves in the wave train will have heights in excess of the significant height. The highest wave of all will have a height about twice the significant height

Visibility Descriptions of visibility mean the following:

Visibility (Descriptive)	Visibility in nautical miles (kilometres)
Good	More than 5 nm (> 9 km)
Moderate	2 – 5 nm (4 – 9 km)
Poor	0.5 – 2 nm (1 – 4 km)
Fog	Less than 0.5 nm (< 1km)

Note:

If there are no measurements or observations available for an exact location, these estimated conditions are based on all available meteorological measurements and observations which have been correlated on the routine charts prepared by Met Éireann.

Appendix 7.2 Met Éireann Weather Report.

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The Irish Meteorological Service

Glasnevin Hill,
Dublin 9, Ireland.

Cnoc Ghlas Naíon
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Tel: +353-1-806 4200
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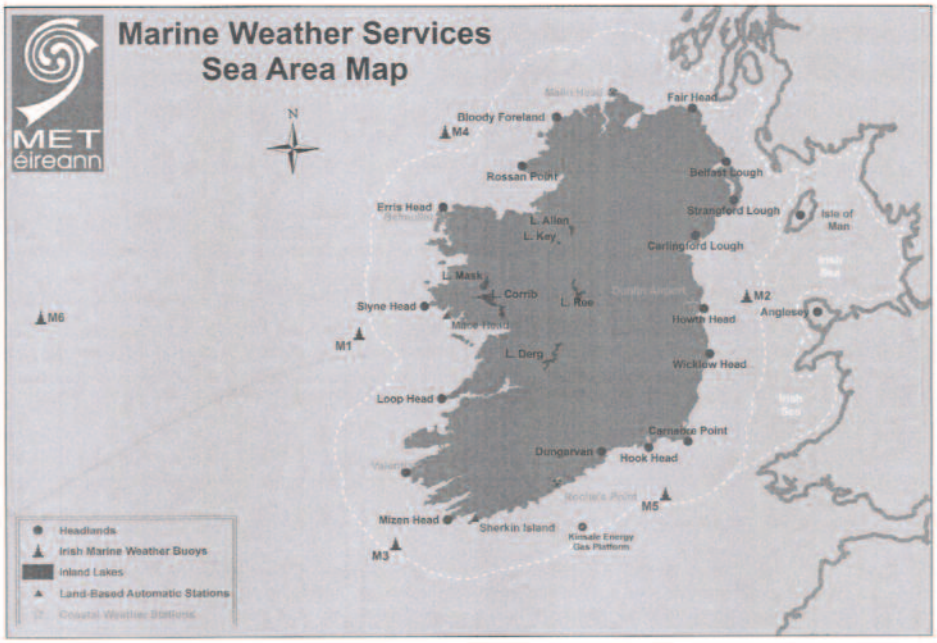


http://www.met.ie/marine/marine_map.asp

Appendix 7.3 Photographs.

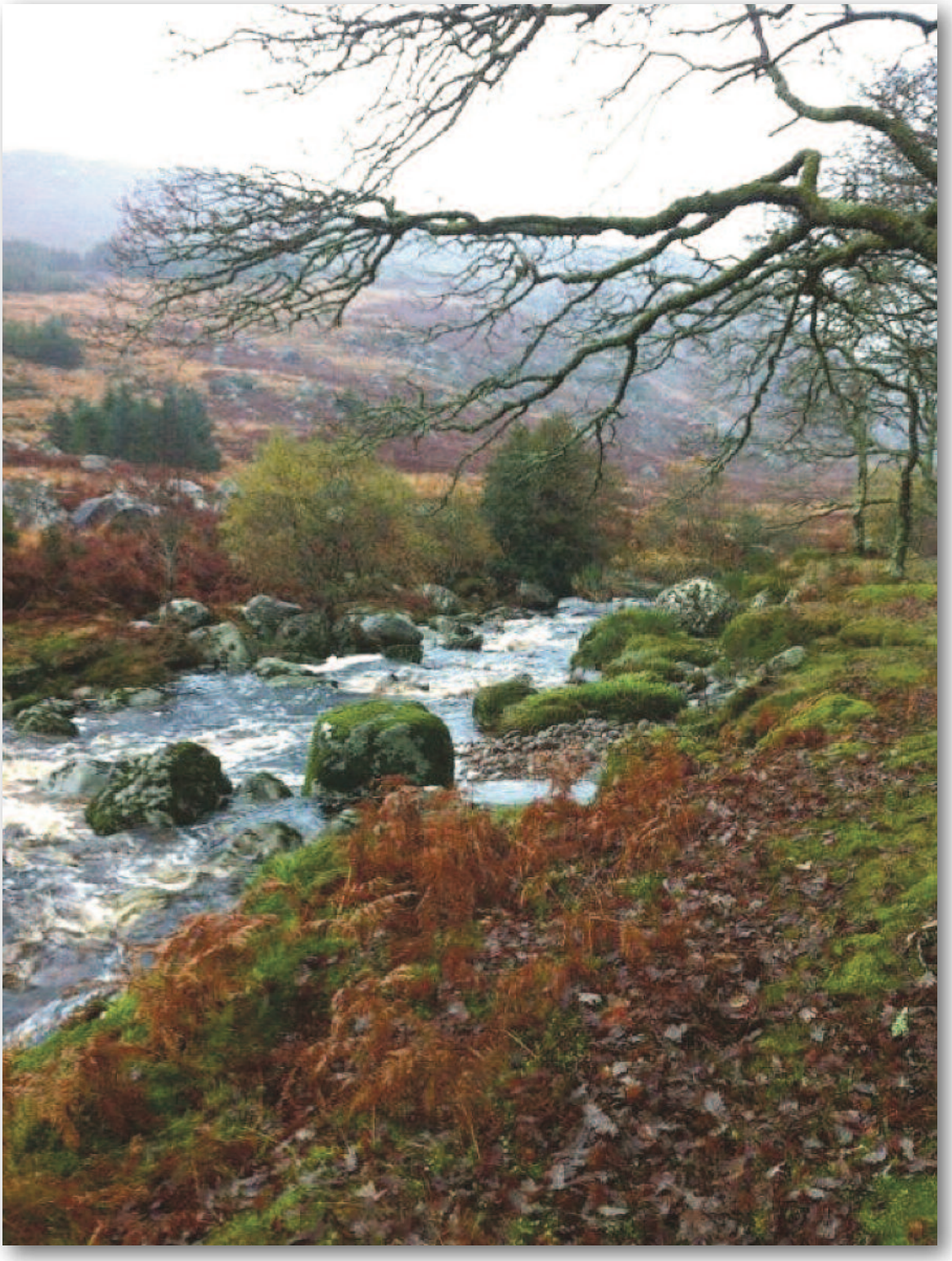
Photograph No.1 - River on the day of the incident

Photograph No.2 - River on the day of survey

Appendix 7.3 Photographs.

Photograph No.3 - Showing exposed rock when the river is at a low level

Appendix 7.3 Photographs.



Photograph No.4 - Showing over hanging branches

Appendix 7.3 Photographs.

Photograph No.5 - Picture showing the casualty's kayak on day of survey

8. CORRESPONDENCE RECEIVED

Note: The names and contact details of the individual respondents have been obscured for privacy reasons.

Correspondence 8.1 Witness and MCIB response.

[redacted]
Co Wicklow
10th April 2015

F.A.O.: [redacted]
Secretariat
Marine Casuality Investigation Board
Leeson Lane

Dublin 2
Your Ref: MCIB/12/241

Dear [redacted]

Re: Draft Report of the Investigation into the Inchavore River Kayaking Incident, Co. Wicklow, 13th November 2014

In connection with the Draft Report dated 2nd April 2015 regarding the above incident I have no comment or observations to make on the report.

Yours sincerely

[redacted]

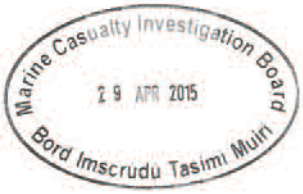
[redacted]

Marine Casualty Investigation Board
14 APR 2015
Bord Imscrúdú Tasimí Muirí

MCIB RESPONSE:
The MCIB notes the contents of this correspondence.

Correspondence 8.2 Witness and MCIB response.

27 April 2015



[redacted]

Secretariat,

Marine Casualty Investigation Board,

Leeson Lane,

Dublin 2.

Dear [redacted]

On the 2nd of April I received a draft report of the investigation into the kayaking incident on the Inchavore River, reference code MCIB/12/241. After reading the report I have noted three minor errors. In section 3.1 it states that at 11:00 a group of kayakers met at the Inchavore River. It should be clarified that no members of the first team to get onto the Inchavore River at 14:15 were part of the group that surveyed the river at 11:00. The two teams had not made any plans to kayak together that day prior to meeting in Laragh at around 13:00 but both teams had previously paddled together on multiple occasions. After a brief discussion the decision was made to run the Inchavore River. Secondly, in section 3.6 it states that when paddler B saw paddler C was in difficulty he paddled to the bank to get ahead of C on foot. This was not the case; B paddled to the river bank and exited his kayak to enable him to throw a rope to C because B felt C was going to exit his kayak while still in the white water. The fast flowing nature of the Inchavore River means that a rope is the most efficient way to get a kayaker out of the water if they have exited their kayak. When C swept past B unconscious, B was unable to throw C a rope so B attempted to catch up with C on foot but the fast current and difficult terrain on the river bank meant that C was swept out of sight downstream. Lastly, in section 5.2 it states that it was not possible to ascertain whether C had previously kayaked the Inchavore River. I can confirm that C had never kayaked the Inchavore River before but had years of experience kayaking similarly graded rivers in the surrounding area. B was the only kayaker from the first team to kayak the Inchavore before and all members of the second team had previous successful descents of the Inchavore.

Other than the observations mentioned above, I am happy with the content of the report and have no further comments.

Yours sincerely,

[redacted]

[redacted]

MCIB RESPONSE:
The MCIB notes the contents of this correspondence and has made amendments where necessary.

Correspondence 8.3 Canoeing Ireland and MCIB response.

Canoeing Ireland
Irish Sport HQ
National Sports Campus
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Marine Casualty Investigation Board
30 APR 2015
Bord Imscrúdú Tasimí Muirí

Reference MCIB/12/241

29 April 2015

[redacted]
Secretariat
Marine Casualty Investigation Board
Leeson Lane
Dublin 2

Report of the investigation into the Inchavore River Kayaking Incident,
Co Wicklow, 13th November 2014

Dear [redacted]

Canoeing Ireland would like to submit the following observations and comments on the above Inchavore River Kayaking Incident Report.

1. Page 5 Item 2.5 – Stoppers – Stoppers primarily occur at the base of drops or partially submerged boulders.
2. Page 5 Item 2.5 – Prusik Anchors in canoeing are primarily used to set up Z drags and pig rigs to provide mechanical advantage in the extraction of equipment that may be stuck in the river.
3. Page 6 – The Inchavore River would be Graded between 4 and 5 not between Grade 3 and 5.
4. Page 6 – It is our understanding that a significant rainfall event occurred in the early afternoon on the 13th November 2014, shortly before the accident. This rainfall event caused water levels in the local area to rise significantly over a short period of time and recede quickly. This is consistent with a 'flash flood' which is generally uncharacteristic of Irish weather and rivers. This weather event seems to coincide with the time of the accident and the subsequent search. The heavy rainfall event is referenced in the Met Eireann Weather report from Lough Dan. We would suggest that the weather, the exceptionally heavy rainfall event, and associated abnormal 'flash flood' was a contributing factor to the accident and subsequent challenges in the search.
5. Page 7 Item 3.1 – Just to clarify that the group most probably inspected the start of the river from the road bridge, and did not survey the river in its entirety.
6. Page 7 Item 3.2 – Once again the group most probably inspected the river from the road bridge.
7. Page 7 Item 3.3 – The canoeing term is 'eddy' not 'back eddy'
8. Page 11 Item 5.4 – We would suggest that the noise of the river made communications difficult between group members, but not impossible.

MCIB RESPONSE: The MCIB notes points 1,2 and 3 and has made the necessary amendments.

MCIB RESPONSE: Point 4. Whilst the report from Met Éireann suggests that the rain was very heavy at times between 09.00 hrs and 15.00 hrs there is no evidence that a "flash flood" occurred. If the kayakers believed that "flash flooding" was taking place the MCIB would suggest that the kayakers should have taken sufficient safety precautions to prevent any such incident as happened.

MCIB RESPONSE: Points 5 & 6. The MCIB has no evidence of this. If this is the case then it must have been obvious that the river was in a dangerous spate.

Correspondence 8.3 Canoeing Ireland **(Page 1 repeated)** and MCIB response.

Canoeing Ireland

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web: www.canoe.ie

Marine Casualty Investigation Board
30 APR 2015
Bord Imscrúdú Tasimi Muiri

Reference MCIB/12/241

29 April 2015

[redacted]
Secretariat
Marine Casualty Investigation Board
Leeson Lane
Dublin 2

Report of the investigation into the Inchavore River Kayaking Incident,
Co Wicklow, 13th November 2014

Dear [redacted]

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8. Page 11 Item 5.4 – We would suggest that the noise of the river made communications difficult between group members, but not impossible.

Member of the Olympic Council of Ireland, International Canoe Federation & European Canoe Association

MCIB RESPONSE: Point 7. The MCIB notes point 7 and has made the necessary amendments.

MCIB RESPONSE: Point 8. The evidence received from the kayakers was that verbal communications were impossible due to the noise of the river.

Correspondence 8.3 Canoeing Ireland and MCIB response.

9. Page 12 Item 6.1 – We propose a change of wording: PLB's should be recommended on challenging rivers in remote areas where no mobile phone signal is available.
10. Page 12 Item 6.2 – We propose a change of wording: Waterproof radios should be considered on challenging rivers in remote areas where no mobile phone signal is available and where verbal communication might be difficult.
11. Page 12 Item 6.2 – Canoe Ireland to be changed to Canoeing Ireland (NGB Name)
12. Page 12 Item 6.4 – Canoe Ireland to be changed to Canoeing Ireland (NGB Name)
13. Page 18 Photograph 4 – Although this photograph shows overhanging branches, these particular branches would be of little concern to paddlers as they are so high above water level. The branches in the river in photograph 1 and those on the island and banks in photograph 3 would be the types of overhanging branches that could be hazardous to canoeists.

Yours sincerely

[redacted]

MCIB RESPONSE: Points 9 & 10. The MCIB Recommendations 6.1 and 6.2 stand. Mobile phones are receiver specific only and do not work if immersed in water.

MCIB RESPONSE: Points 11 & 12. The MCIB notes points 11 & 12 and has made the necessary amendments.

MCIB RESPONSE: Point 13. This photograph was taken at the same time as photograph no. 2 but from a slightly different angle.