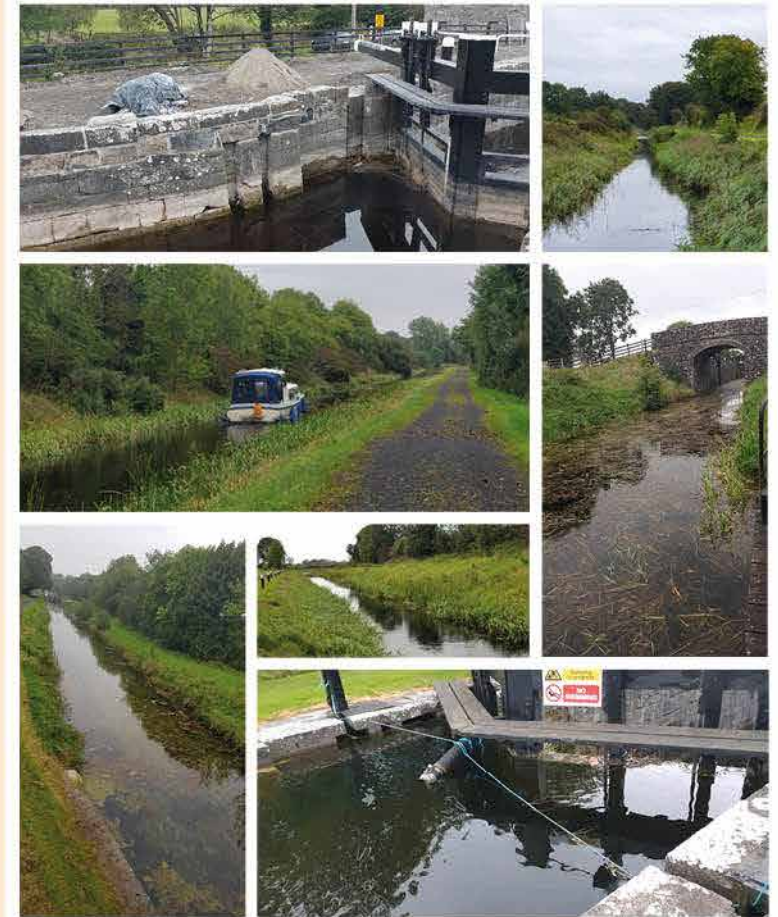


# Nav-Watch Report 2020

## A Condition Survey of the Grand Canal, Royal Canal & River Barrow Navigations

Expert observations and 248 reports of navigational difficulties encountered on the Canals & Barrow navigations

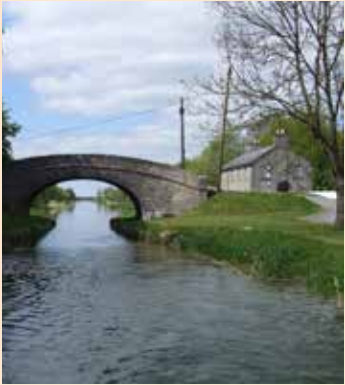


Inland Waterways Association of Ireland



**Nav-Watch**  
Making the Navigation a Priority

# Contents



## Tables of Survey Results

### Executive Summary

#### 1. Introduction

- 1.1 Research Objective
- 1.2 Report Structure
- 1.3 Research Limitations

#### 2. Financial Analysis

- 2.1 Basic Funding
- 2.2 Reduction in Operational Staff
- 2.3 Capital Funding
- 2.4 Vibrant Canals – the Future

#### 3. Canal Conditions Impacting Vessel Progress

- 3.1 Efficient Progress of Vessels
- 3.2 Optimal Condition
- 3.3 Silting
- 3.4 Excessively Large Reed Fringes
- 3.5 Excessive Weed Growth
- 3.6 V Shaped Canal Bed Profile
- 3.7 Greenway Developments
- 3.8 Weed Management Strategy
- 3.9 Threat to Biodiversity in our Canals and Rivers
- 3.10 Summary

#### 4. Survey Research

- 4.1 Methodology for online survey

#### 5. Survey Findings

- 5.1 Grand Canal Circular Line
- 5.2 Grand Canal Shannon Line
- 5.3 Grand Canal Barrow Line
- 5.4 Grand Canal Nass Branch Line
- 5.7 Royal Canal
- 5.8 Barrow Navigation

#### 6. User Case Studies

- 6.1 Private Boater Experiences
- 6.2 Commercial Boating Operator

#### 7. Conclusions

#### 8. Recommendations

#### 9. References

#### 10. Looking Back, to Move Forward

#### *Green & Silver and Barrow Route Map*

1  
2  
6  
6  
6  
6  
7  
7  
7  
8  
8  
8  
9  
9  
10  
10  
11  
12  
12  
14  
15  
16

16  
16  
18  
19  
20  
25  
26  
27  
30  
32  
32  
35  
36  
37  
37  
38  
44

## Tables of Survey Results

<b>Table 1 - Grand Canal Circular Line –</b> Reported Infrastructural Issues	19	<b>Table 10 - Grand Canal Barrow Line –</b> Reported Navigational Issues	25
<b>Table 2 - Grand Canal Circular Line –</b> Reported Navigational Issues	19	<b>Table 11 - Grand Canal Naas Line –</b> Reported Infrastructural Issues	26
<b>Table 3 - Grand Canal Shannon Line –</b> Reported Infrastructural Issues, Lock 1 - Lock 20	20	<b>Table 12 - Grand Canal Naas Line –</b> Reported Navigational Issues	26
<b>Table 4 - Grand Canal Shannon Line –</b> Reported Infrastructural Issues, Lock 20 - Lock 30	21	<b>Table 13 - Royal Canal –</b> Reported Infrastructural Issues, Lock 01 - Lock 46	27
<b>Table 5 - Grand Canal Shannon Line –</b> Reported Infrastructural Issues, Lock 31 - Lock 35	21	<b>Table 14 - Royal Canal –</b> Reported Navigational Issues, Spencer Dock – Lock 14	28
<b>Table 6 - Grand Canal Shannon Line –</b> Reported Navigational Issues, Lock 6 - Lock 19	22	<b>Table 15 - Royal Canal –</b> Reported Navigational Issues, Lock 14 - Lock 24	29
<b>Table 7 - Grand Canal Shannon Line –</b> Reported Navigational Issues, Lock 19 - Lock 28	23	<b>Table 16 - Royal Canal –</b> Reported Navigational Issues, Lock 25 - Lock 44	29
<b>Table 8 - Grand Canal Shannon Line –</b> Reported Navigational Issues, Lock 28 - Lock 36	24	<b>Table 17 - Barrow Navigation –</b> Reported Infrastructural Issues	30
<b>Table 9 - Grand Canal Barrow Line –</b> Reported Infrastructural Issues	25	<b>Table 18 - Barrow Navigation –</b> Reported Navigational Issues	31





## Executive Summary



### Overview

In recent years there has been a significant deterioration in the condition of the Grand Canal, Royal Canal and Barrow Navigation. This has been observed by frequent users of the canals who have encountered increasing difficulty as they travel the network by boat. These difficulties include an increase in excessive weed, low water levels, silting and overhanging trees. Individually each of these problems are manageable however, it was not uncommon to encounter these issues cumulatively. Boat skippers have experienced their journeys getting more difficult each year. Vessel damage, accelerated wear and tear and breakdowns can be the result of forcing a vessel through these conditions. While bank side developments of Greenways have been completed to market the canals to wider audiences the navigation has deteriorated, as a result less boats travel the canals. Boating traffic significantly enriches the experience of bank side recreational users as they get to see the canals as functional waterways and as part of our Irish heritage. Boat tourists are themselves strong contributors to the local economy, especially in rural areas.

In late 2018, representatives of the Canals and Barrow branches of the Inland Waterways Association of Ireland (IWAI) met to discuss how to implement an improvement plan for the Grand Canal, Royal Canal and Barrow navigation. The Nav-Watch project team was established with the aim of gathering data, for submission to Waterways Ireland (WI) to make them aware of the difficulties facing boats as their skippers travelled these navigations. It was also envisioned that the information gathered might assist WI in scheduling their maintenance and in improving their budget allocations where needed.

Even though it does not present too much good news, the project is hugely positive. IWAI have a long history of working well with WI and compiled this report as a resource for the agency, to draw detailed attention to the current situation with regard to some of the navigation and what needs to be fixed. This has all been undertaken with the view that the waterways involved are some of the best in Ireland, spanning several counties. They have a rich history, of interest to both tourists from Ireland and abroad. They provide an amenity that can be enjoyed by people of all ages. They are the gateways to rural towns, villages and

attractions. Managed properly, they can provide endless fun for all the family in a healthy environment. Therefore, keeping them navigable needs to be a priority.

### Background

To amass this information centrally from many sources, the Nav-Watch team developed an online survey tool so that users of the navigation could report navigational and infrastructural challenges impeding their progress and risking damage to their vessels. The information needs to be consistent, so a range of categories for identifying and reporting the different issues is included in the Nav-Watch survey tool. There are many benefits to gathering this data. Primarily it allows us to establish a baseline of the condition of the navigations. Also, it facilitates the opportunity for WI to perform targeted maintenance of the navigations to improve conditions from a boaters perspective. As the project rolled out it became apparent there was a need for further data to reinforce how poor canal conditions affect efficient progress of boats. The project team established a collaboration with IWAI Charts Special Interest Group (CSIG), using CSIG skills and knowledge to undertake depth and vessel progress surveys. So far half of the Royal canal has been surveyed and it is anticipated surveying of the Grand Canal and Barrow Navigation should be completed by end of 2020.

### Aim of this Report

As a maintenance organisation, WI do not use 60ft maintenance barges on the canals any more, WI's main waterborne activity on the canals is weed cutting. As a result there is a disconnection and a lack of understanding between those managing and maintaining the navigations and the requirements of boating tourists. We are attempting to bridge this knowledge gap for WI staff, local and central politicians. To realise the full potential of this amenity and make it accessible to all, including boating tourists, we are providing a snag list of issues which could be addressed through targeted maintenance, with increased funding, as part of an overall improvement plan.

**We also show how a fall in basic income and therefore staff, has directly affected the maintenance of the actual water course of the canals and River Barrow. Austerity measures introduced in 2011, have significantly reduced the 85/15 funding with the result that current income is near 2002 levels.**

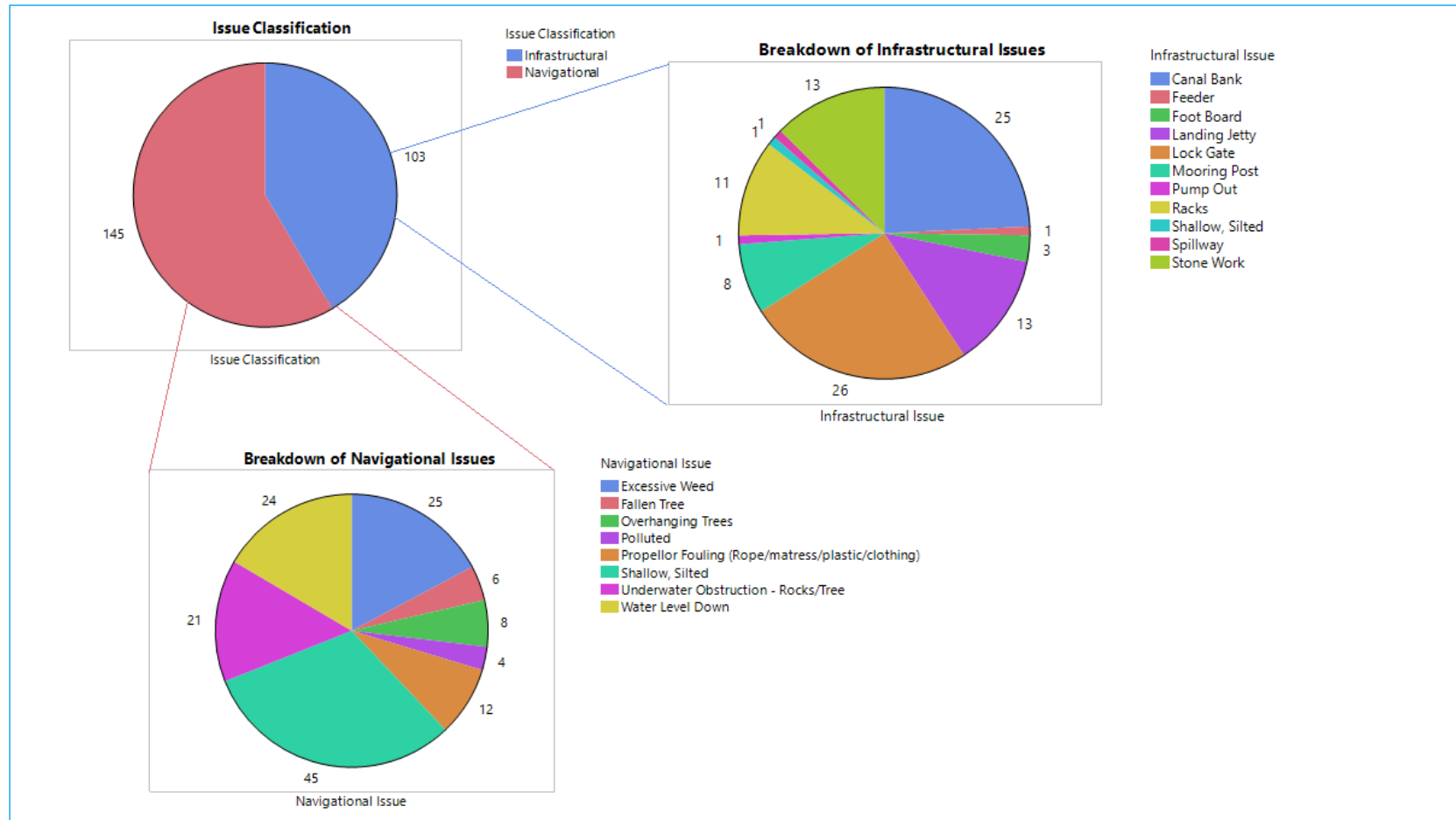
This report aims to convey the difficulties encountered by Irish boat tourists, hire boat tourists and liveaboards and makes representation on behalf of the commercial operators on the canals network. All are affected by the reduced maintenance practices of WI.

When Irish boat tourists choose not to travel on the canals to reduce the risk of damage to their vessels, they are a loss to the local communities. In addition to encountering the same problems as other boaters while they are touring, Liveaboards need to make short hops from base all-year round, to access water and pump-out facilities. The livelihood of commercial operators and the quality of the canal experience they provide to tourists is severely affected by reduced maintenance practices.

## Report Findings

This report presents the 248 issues reported throughout the navigations in 2019, the figure below shows classification and sub categories. In section 5, each issue is presented according to the navigation (Grand Canal, Royal Canal, Barrow Navigation) and between lock sections. The project also undertook water depth, silt depth and speed surveys.

Following the money, detailed in the annual reports of WI over the past eight years, gives an insight into the difficulties they have encountered. In the corporate world, WI would be deemed an asset rich, cash poor organisation, having huge assets but insufficient cash flow to maintain those assets. Their portfolio has been valued in excess of €1.4bn.





Unfortunately, the basic income provided to pay staff, some of which were employed to maintain a clear canal and Barrow navigation, has decreased each year. Although various authorities have provided money for capital projects, mainly on the Shannon and the Erne systems, the on-going maintenance of the canals and Barrow has suffered badly. Total staff numbers have had to be decreased, from 341 to 277, the majority of which were operational staff.

Water tourism is big business in other countries, attracting those who avoid tours and like to experience other cultures through adventure and outdoor activities. In Ireland we have yet to exploit the potential of this type of tourism and provide additional income to local communities on our canals and Barrow network.

Using the data acquired from the user survey data and consultations with commercial operators, the authors present critical success factors in our conclusions, which if consistently satisfied would ensure a significant improvement to the user experience of not just boaters but all stakeholders.

- Stable water level management - integrated with transparent communications of marine notices if levels are low or are scheduled to be low.
- Effective and strategic weed management of all the navigation - not just sections travelled by interested and concerned groups and organisations.
- Sympathetic understanding of the heritage value of the asset as a navigation - any development impacting on the canal should not detract or reduce the scope of the original intended use of the navigation.

WI annual reports outline the ambition to develop a 'vibrant future' for the canals. We recommend immediate attention to the following:

- Adopt a new approach to weed management for the removal of Milfoil Turion. Carry out a current full weed density survey to develop a targeted cost effective approach.
- Increase annual funding and increase operational headcount needed to maintain clear navigations. Supply additional capital funding beginning in 2021 to upgrade the navigation by dredging, where it has been neglected and allowed to silt up in recent years.

- Create destination cruising on the canals in line with recent studies, thereby further increasing the value cruising boats bring to the national and local economy.
- Include the canals and the Barrow in an all-Ireland navigational marketing strategy.

The canal system has huge potential for indigenous tourists – private boat owners who tour the waterways throughout the year. Especially as the *Green & Silver*, Ireland's circular cruising route, incorporates both canals through Dublin and a section of the Shannon. Circular cruising routes are very popular on the canals in the UK. The combination of landscapes, infrastructure and different types of navigation on Ireland's circular route, is unique and would have wide appeal to visitors, if marketed as such.

IWAI Dublin encourage boaters to partake in the *Green & Silver Route* experience (see map page 5). Many boaters who have undertaken this tour have seen it as a bucket list challenge through an obstacle course rather than a slow paced tranquil experience which could take many months to complete.

As the canals meander through bogs and untouched landscapes there are ample places where the slow tourist encounters natural tranquil sites. Areas of sparse population, between towns where the tourist can become immersed in a tranquil experience. The physical and psychological benefits of Tranquillity are well documented (Pheasant *et al.* 2010, Han 2019). Tranquillity is defined as a place of peace and quiet where a person feels safe and can get away from the demands of everyday life (Herzog *et al.* 2013, TSIG and IWAI 2019).

However, under use and reduced maintenance practices contribute to weed growth. This in turn further discourages use, which again contributes to weed growth. These substandard conditions diminish the tranquil experience of canal touring by boat.

We hope the reader is sympathetic to the approach of this report and its view of the Canals and Barrow, these fabulous features of Irish Heritage which should be retained in a navigable condition. We may be at a turning point now; this is why Nav-Watch was established and our report is intended to be an informative way to influence change.



**Our prime objective in making a case for improvements to the canal and Barrow navigations, is to secure ring-fenced funding for resources to restore and maintain the actual waterway (navigation).**

## Acknowledgements

- The IWAI Nav-Watch project would not have been possible without the support and collaboration of the various IWAI branches involved. These are IWAI Dublin, IWAI Kildare, IWAI Offaly, IWAI Shannon Harbour, IWAI Barrow, IWAI North Barrow and IWAI Royal Canal.
- The nominees from those branches to the Nav-Watch project team have been an invaluable resource for the range of Nav-Watch activity undertaken.
- The project held several meetings at various locations where venues were provided free of charge.
- The project received the support of the IWAI Executive from its inception through to conclusion.
- The IWAI web team assisted greatly with the hosting of the survey for data collection on iwai.ie.
- The IWAI Charts Special Interest Group CSIG have heavily supported the project through the loan of survey equipment and lending their expertise in analysing the depth and speed progress surveys.
- The online survey relied on the active input of reports from a wide range of users and the project strongly acknowledges the significance of that data.
- The case study and business operator experiences are highly valuable in amplifying the survey data reports; and are very gratefully received for inclusion.
- We would like to thank Dr. Joe Caffrey for his discussions and contribution of research journal material.
- We would also like to thank Alan Booth (Botanist) for his contribution on waterways biodiversity.
- Denis M-Baker at [www.tudco.ie](http://www.tudco.ie) provided the boat graphics and Report design.
- The most senior management in WI have been advised on several

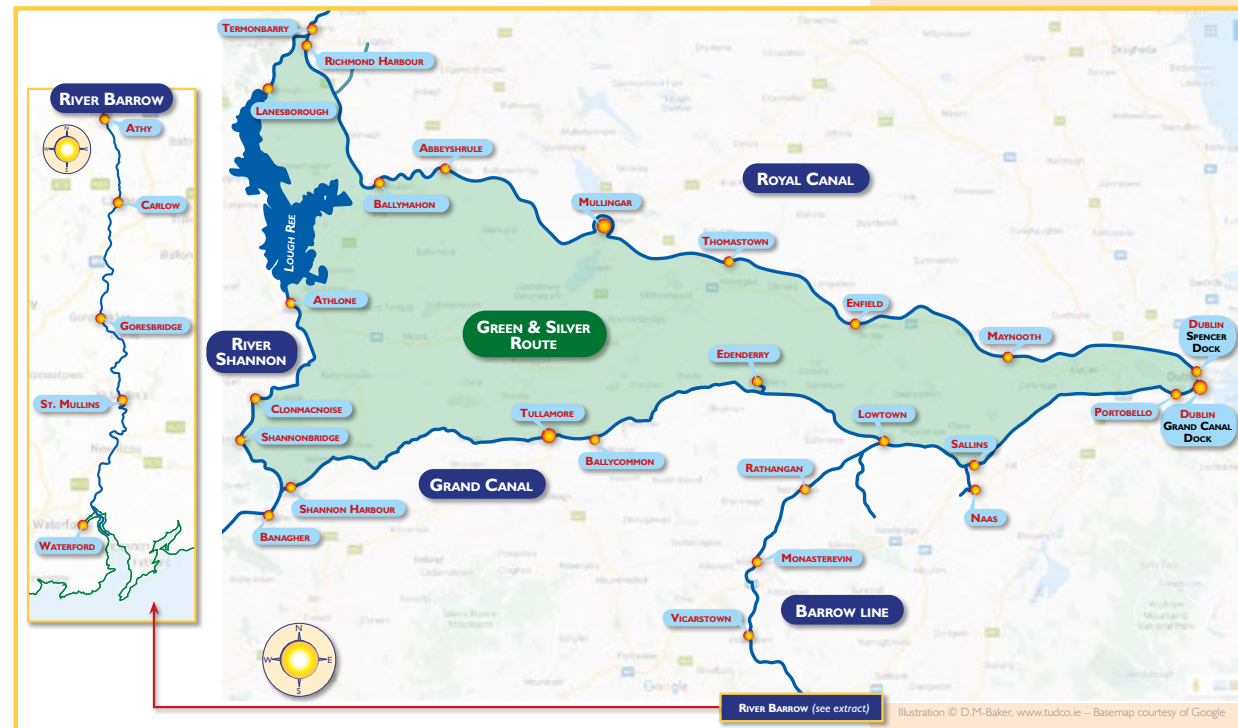
occasions during the duration of this project as to how it has been progressing and have been supportive of this volunteer work which will hopefully assist them in making the case for resources for improvement as necessary.

- As can be the way of good timing, during the latter stages of preparing the Nav-Watch Project Report, WI have been planning the development of a ten year strategy for the waterways, the consultation phase of which is due to commence in the near future. Nav-Watch acknowledges all the good work that WI undertake, and hope this report can feed in to that strategy for the short, medium and long term future of the reviewed waterways.

On behalf of the project's coordinators/authors (listed below), we thank our supporters and contributors, especially the Nav-Watch branch reps who represent the seven IWAI branches on the canals and Barrow, without whom this Nav-Watch Report would not have been possible.

D. M-Baker, C. Clinton, C. Hilliard, T. Meehan, E. O'Loughlin.

September 2020



# I. Introduction



The Inland Waterways Association of Ireland (IWAI) was established in 1954. It has 23 branches across the island of Ireland. It has 3500 members and represents a wide range of member interests regarding inland waterways use and activities, community interests, navigation issues, tourism development, all in relation to the socio and economic benefits of the waterways.

IWAI has a long history of campaigning for the preservation and maintenance of the inland waterways of Ireland. This has been achieved by lobbying and engaging with statutory agencies, funding groups, and increasing community interests with regards to promoting access to the waterways. In recent years this has taken the form of working with Waterways Ireland (WI), the navigation authority; Government Departments in relation to legislative reform regarding byelaws on boating use on the canals and Barrow sections of the waterways, and undertaking large infrastructural refurbishment projects such as the regeneration of the Boyne Navigation. IWAI also supports the Charts Special Interest Group (CSIG) which has undertaken a national mapping and charting project of the Shannon and Erne Rivers, the canals and River Barrow. They have published these digital charts for navigational use by IWAI members and waterway related agencies – see <https://chartssig.iwai.ie/>

In 2018, as a response to the severe difficulties encountered in recent years by boating users of the Grand Canal and Royal Canal, which collectively along with a partial route on the River Shannon and the River Liffey form elements of the *Green & Silver* route, the Nav-Watch project team was established within the Canal branches of IWAI. The Barrow Line of the Grand Canal was also of concern.

## 1.1 Research Objective

The project objective was to find a way to collate information and pool expert boater knowledge about the state of the navigations into a report. This could be utilised by WI to recognise where navigational problems exist which could be addressed by improved resource allocation (eg money or staff), better weed and dredging maintenance planning and operation, and for requests for capital or operational funding increases where necessary. The report is highly successful in the establishment of some of the baseline conditions of the River Barrow and canal navigations by identifying issues and conditions which impede the progress of vessels.

## 1.2 Report Structure

The report follows a cause and effect methodology.

Following Section 1, to understand the reasons behind the perceived deterioration in the navigations the project team reviewed WI Financial Reports from 2011 to 2017; analysis and observations of these are presented in Section 2.

Observations of canal conditions are made in Section 3, explaining how poor canal conditions can cause damage to vessels. A discussion on the benefits of implementing strategic weed management practices concludes the section.

The research design is presented in Section 4, here the authors outline the method of data acquisition and analysis, they introduce how the three points of reference correlate to identify areas which impede navigation and detract from the user's experience.

Section 5 presents the Report Findings of the user data for the calendar year 2019, broken down according to navigational area and lock level according to reported navigational or infrastructural issues with some further analysis of the results in Section 6. Conclusions in Section 7 lead in to recommendations in Section 8. Section 9 lists reference material while Section 10 looks at the past but with an eye to the future and the potential of these waterways.

## 1.3 Research Limitations

The nature of the survey and report has limitations, while every effort has been made to ensure the reports are accurate and reliable further investigation may be necessary by WI. The online survey provided users with the opportunity to report issues which impeded vessel progress and identify critical infrastructural issues which affected the functioning of the canal system. This strategy aims to bridge the knowledge gap between WI maintenance activities and user requirements and make recommendations for the benefit of users of the amenities. The online reports are by no means a comprehensive civil engineering survey, this is reflected in the lower quantity of reports from navigations less travelled. As the survey progressed in 2019 this subjectivity became apparent, there were also boats which travelled the systems who encountered issues but did not report to the survey. To remove the subjectivity and further validate user difficulties, the acquisition of scientific depth and



vessel progress data commenced. This survey is ongoing, and we hope to have it completed in 2020. We sincerely hope WI view this project as a positive resource to identify where improvements can be made to the navigations in question.

## 2. Financial Analysis

In this section we present the findings of our perusal and analysis of the Annual Reports of WI. We examined the income and expenditure for 2011 to 2017. Our analysis highlights one of the main reasons for the neglect of the Barrow, Grand and Royal; there is not enough operational staff to provide weekly, monthly and yearly maintenance of the actual waterway.

In order to operate within a greatly reduced budget and to deal with an increase in yearly overheads, WI had to reduce their headcount. To date, the funding and the headcount have not recovered, the figures available for 2019 show it is the lowest it has been since 2002. The result is a choked waterway. While Central and Local government continue to provide monies for capital projects along the waterways, the water itself is not getting the upkeep it needs.

The sheer frustration experienced by boaters of trying to navigate the canals and the potential damage to their craft, mean those who love boating and would gladly stay in Ireland for their holidays, visiting the towns, villages, cities, tourist attractions and both rural and urban amenities along the way, are forced to abandon the Irish canals and go elsewhere. The difficulties encountered might be compared to being on holiday, attempting to visit a tourist attraction where the only means of access is a neglected breen with overhanging hedges that scratch your car and a surface that causes damage to the undercarriage and impedes your progress – result, turn around and go elsewhere. With such a situation, it is also well nigh impossible to market the navigation to overseas tourists and to capitalise on the international marketing opportunities of the *Green & Silver* canal route and the River Barrow.

### 2.1 Basic Funding

WI is funded by the Northern Ireland (NI) and the Republic of Ireland (ROI) governments, the split in income and spend is 15% and 85% based

on the waterways in each jurisdiction. Back in 2010, during the recession, WI like all government organisations at the time, was tasked with reducing costs to meet the austerity measures introduced by both governments. The realisation of this goal resulted in an accumulated shortfall from 2012 to 2019 on basic funding/income of approximately €41 million (*Figure 1*). The basic income in 2018 is the lowest received by WI since 2002.

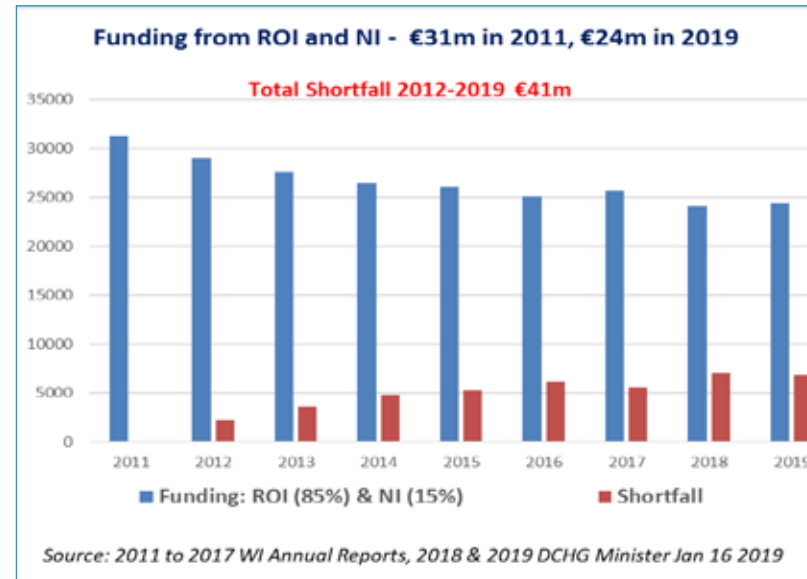


Figure 1 - Shortfall in Waterways Ireland funding 2011 - 2019

### 2.2 Reduction in Operational Staff

WI reduced their staff from 344 in 2010 to 277 in 2017, representing 66 less FTEs (Full Time Equivalents) of which 47 FTEs worked as Operational Staff (*Figure 2*). This has meant a reduction in regular maintenance on the Royal Canal, Grand Canal and Barrow Canal/River. In 2017 out of a total basic income of €24m, €0.9m was spent on 'canal clearing' on the River Barrow, the Grand Canal and the Royal Canal. (Source: DCHG Minister Dáil Nov 6 2019)

We now have canals that are not fit for boats in summer due to rampant weed in the water, and reeds on the sides encroaching in on the navigation, unstable water levels, infrastructure failing in places, together with the increase in silting, which hampers progress year-round.





Figure 2 - Employee reduction 2011 - 2017

### 2.3 Capital Funding

In addition to basic funding, capital funding is allocated to WI from various government departments, county councils and the EU. Under the terms of the cross-border agreement, capital is spent in the jurisdiction from whence it came. These capital project funds are in addition to WI's main income. One of the areas that we cannot comment on, because it is not obvious in WI Annual Reports, is how the on-going neglect of the navigation might cause some infrastructure to fail, resulting in a need for higher capital funding to fix the problem.

### 2.4 Vibrant Canals – the Future

Part of the work WI is tasked with is to find alternative ways of creating income. The task of identifying their assets has been going on for many years. In 2017 all property had been identified and costed. Their Asset Register is now complete and is valued at over €1.4 billion.

WI's strategy is to make use of their €1.4 billion in assets, by working with other government departments and private enterprise, to deliver activity tourism for Ireland. The Barrow, Grand and Royal meander through Carlow, Dublin, Kildare, Kilkenny, Longford, Meath, Offaly and Westmeath. The first project on delivering activity tourism on these waterways has been the creation of Greenways; funded by the EU

through the Dept of Transport, Tourism and Sport (DTTAS), local councils and WI. Where possible one side of the canal is being converted to an amenity for walkers and cyclists while still retaining the towpath on the other side for boating activities and emergency access by WI staff. The Greenways have opened up the area to many new visitors who can enjoy holidaying, exercising and relaxing in stress free rural and urban settings.

However, a vibrant Barrow, Grand and Royal, attractive to all kinds of visitors, require clear navigable water, which require operational staff to make it happen, which in turn requires funding. Without sufficient funding and resources to maintain these waterways, they will continue to deteriorate. And in turn, communities along these waterways will lose out on potential income and the vibrancy that water-based activities bring to a community.

## 3. Canal Conditions Impacting Vessel Progress

In this section we outline the physical requirements for vessels to move through water, we present the volume of water necessary for an 'M' type heritage barge to sustain forward motion. M type barges were the first inland waterways vessels designed and built with engines in Ireland; most were originally owned by the Grand Canal Company (GCC), with a few privately owned. They carried goods along the canals from Dublin to Waterford, to Limerick and to Athlone, starting in the 1920s through the 1950s. In Figure 3 below, 41M is fully laden with cargo on the canal in the 1950's.



Figure 3 - 41M fully laden trading barge, circa 1950's. (Courtesy of Heritage Boat Association)

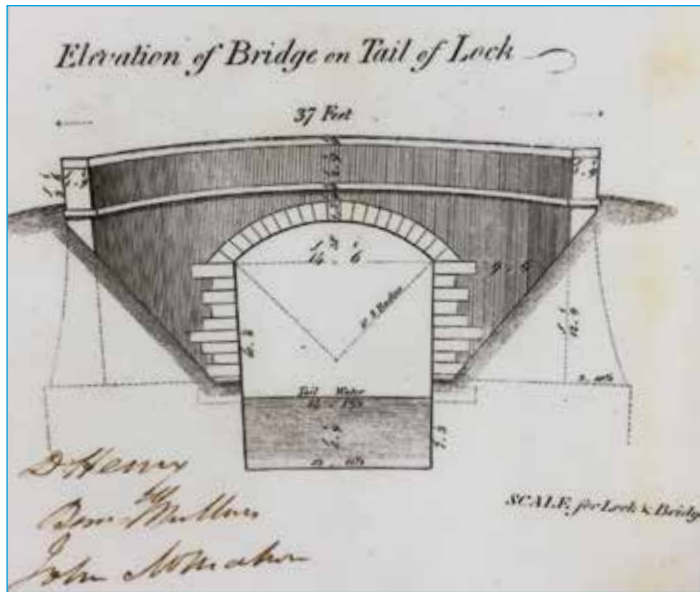


Figure 3A - Original construction drawing of Royal Canal Lock Bridge

Original construction drawings show a canal depth of 5'9". 41M is sitting deep in the water, her deck barely a foot above the surface. This would mean she is drawing up to five feet (her hull bottom is five feet deep in the water). She is still making good headway, which can be determined by the wake she is creating. Many of these M boats are now in private ownership and have been lovingly converted by their owners for recreational use. Without a heavy cargo they sit much higher in the water. They generally draw between three and four feet yet they often struggle to make sufficient progress along the navigation. They are hampered by the build-up of undredged silt on which they run aground.

While the heritage roots of these barges is on the canals, most of the owners have not ventured onto the canals in recent years having experienced significant hardship and damage on previous journeys.

### 3.1 Efficient Progress of Vessels

To understand how a vessel is driven in a body of water, one must understand the concept of displacement. Basically, when a vessel is placed into a body of water, it will displace the volume which the hull occupies. For a sixty-foot heritage barge with an approximate 3-foot

draft (the part below the water line) this equates to roughly 70 tonnes of water or 70,000 litres. When the vessel is under way hydrodynamic principles dictate that the vessel displaces this water around the hull, for example, at 0.7mph the vessel will be progressing at ~60ft/min, it is travelling its own length every minute and displacing 77,000 litres per minute.

The speed limit according the byelaws of the canals is 4mph, however larger heritage vessels will only achieve 3mph in the very best of conditions. At 3mph the vessel is travelling at 264ft/minute it is displacing approximately 338,800 litres per minute. If the vessel was progressing in a body of water with sufficient depth, width and minimal weed to facilitate this displacement of water it can be termed efficient progress. Figure 4 below illustrates a cross section of the canal in optimal condition, there is sufficient depth and clear water around the vessel to achieve efficient progress. Based on average dimensions of a canal cross section there is an average navigable cross section of 14.22m<sup>2</sup>.

### 3.2 Optimal Condition

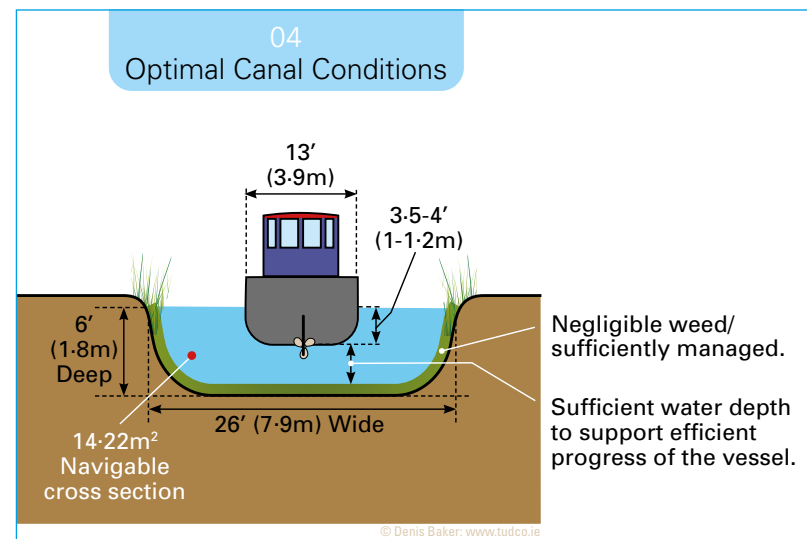


Figure 4 - Optimal conditions for efficient progress







A range of factors can inhibit efficient progress; excessive silting reduces the available depth, some bank and canal bed profiles have been compromised, channel width reduced by weed fringes and weed density not adequately controlled. All of these factors individually reduce efficiency of progress and in situations where they are combined, progress can be significantly reduced. In such situations, the engine of the vessel could be put under considerable strain by having to run at excessively high RPM to compensate for the inability to displace water around the vessel. By subjecting the vessel to such conditions there is an increased risk of damage to the hull, propeller, rudder and engine.

How some of the sub-optimal conditions occur is outlined below.

### 3.3 Silting

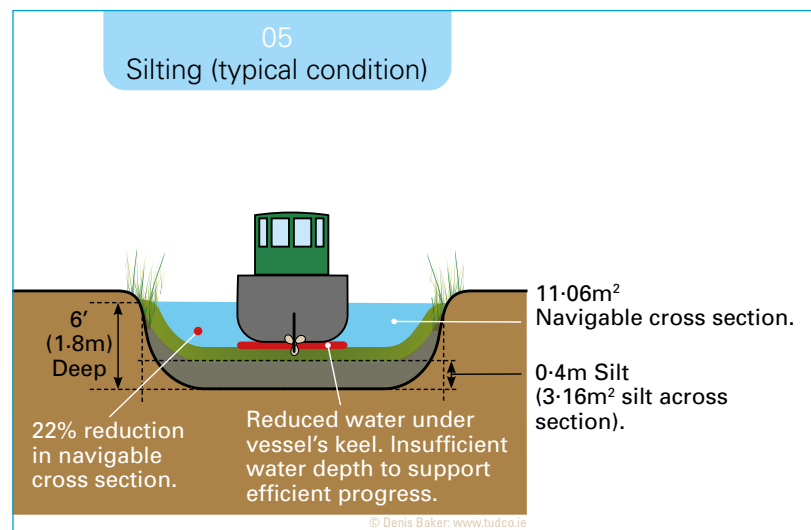


Figure 5 - Excessive silting reduces the depth of water, inhibiting water flow around the vessel.

In situations where the depth of the navigable channel becomes too shallow while a vessel is under way it will experience the 'squat' effect. In this situation, the stern of the vessel will sink lower in the water thus increasing the likelihood of striking the bottom of the channel and increasing the risk of damage. Figure 5 above shows how silting can reduce the navigational cross section by 22%. This was determined with

the use of a measuring stick, gauging the depth of the water to the top of the silt, the stick was then pushed deeper with moderate pressure into the silt until the canal bed could be found by increased resistance by a change in density of the canal bed. At this point a second measurement was taken, the difference in these measurements determined the depth of silting. The average depth was approximately 0.4m.

### 3.4 Excessively Large Reed Fringes

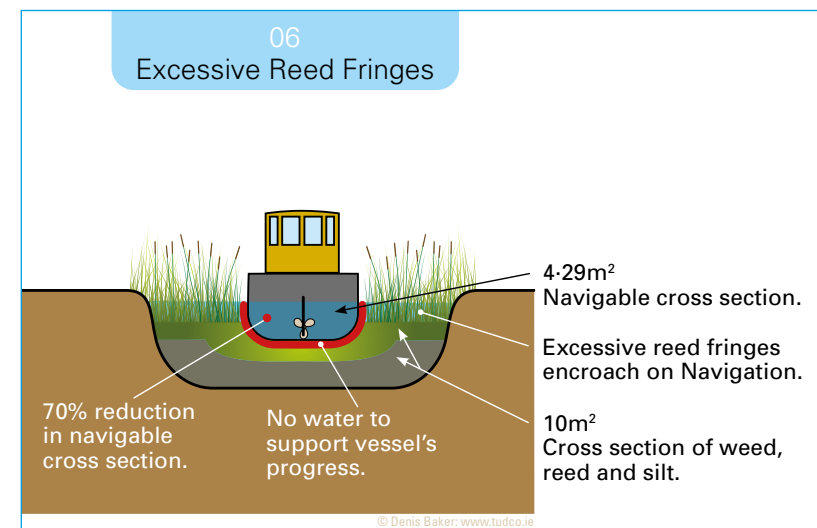


Figure 6 - Canal cross section with excessively large reed fringes

The image above (Figure 6) provides a cross section of the canal as shown in the photograph Figure 14. In this situation, there is an estimated 70% reduction of the navigation channel from the optimal condition. This significantly inhibits efficient progress of the vessel, and according to the vessel progress data in Figure 16 it is impossible to maintain consistent progress of even 1mph. For the purposes of navigating, these areas are only passable when the canal water level is at optimum, it would be virtually unnavigable if the water level was down by more than a few inches.

### 3.5 Excessive Weed Growth

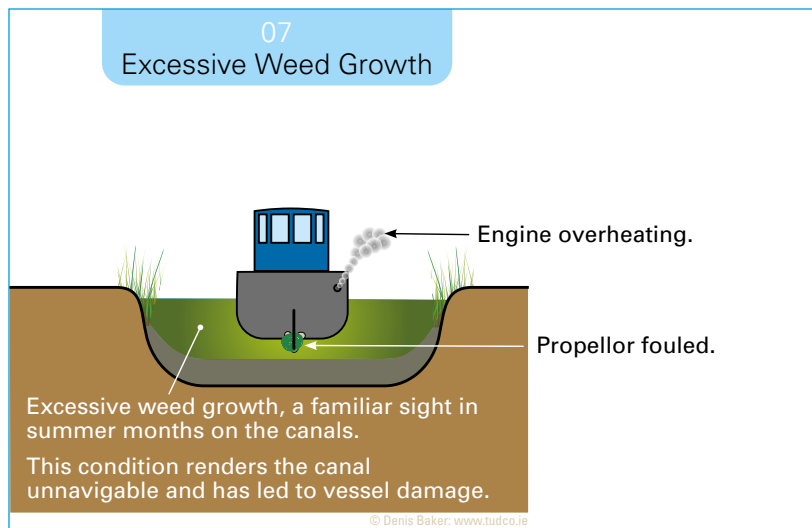


Figure 7 - Excessive growth of obstructive weed filling the whole canal channel

WI have committed to just a single cutting of canal weed, early in the year. However as the water temperature rises, the weeds grow back and thrive throughout late spring and early summer, in the underlying silt.

Figure 7 above show how weed takes over the whole navigational cross section, situations of high weed density, as shown in Figure 8, are commonplace and can have damaging effects on boats attempting to navigate the canal and Barrow network during summer months. In Figure 8 (right), the top left picture shows a section on canal with >70% weed density. The bottom left picture shows how the weed has wrapped tightly around the propeller and shaft – this quantity of weed causes significant strain to the



engine and propulsion system of the boat, it is not uncommon for a vessel to suffer damage as a result of navigating through weed this dense.

Frequently the engines of vessels navigating such conditions overheat due to either the excessive load on the propeller or the engine cooling system becoming blocked with weed. The right hand picture of Figure 8 indicates damage caused by excessive weed. The cutlass bearing (a part of the structural alignment of the propeller shaft) was dislodged from the Propeller Shaft Bracket commonly known as a 'P-bracket'. The P-bracket is a strut used to stabilise an unsupported area of the propeller shaft. Normally found just behind the propeller, the shaft spins inside it through a rubber bearing known as a cutlass bearing. Repairing such damage cannot be completed with the vessel in the water, the boat must be removed from the water with a crane/trailer or towed to a dry dock where necessary repairs can be undertaken.

Figure 8 - Excessive weed can have a destructive effect on the engine or stern gear of vessels





### 3.6 V Shaped Canal Bed Profile

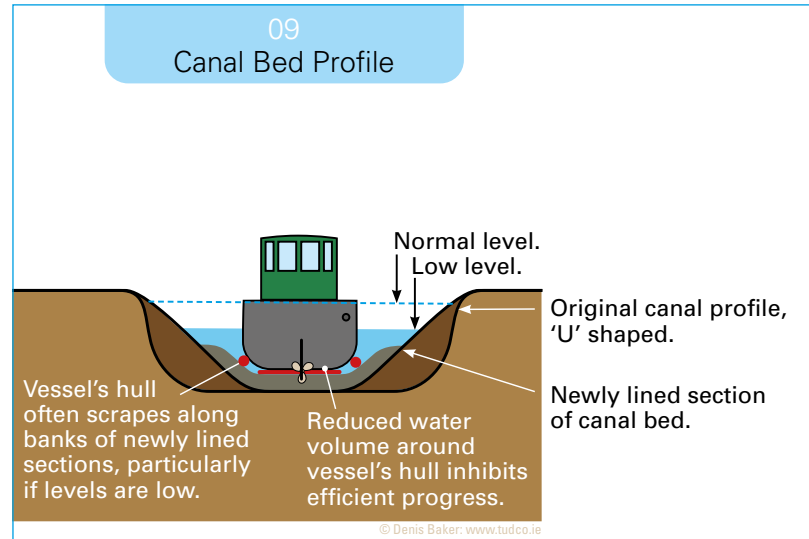


Figure 9 - Relining with sloped banks reduces the navigation channel.

Continued maintenance and improvements to the canals are recognised and appreciated by all boaters. However, there needs to be an understanding of the effects of changing the canal bed profile from U shaped to V shaped. This change has the greatest impact on the Irish Heritage trading boats built for the canals, particularly straight side barges like the M types. They are approximately 60' long by 12' wide require a depth of 3'.5" - 4' (1-1.2m) across their full width of 12'. The sloped banks present challenges to these, and other barges in the following ways:

- The V shaped sides of the canal, prevent the vessel getting close to the bank if there is need to alight or moor in a rural area.
- V shaped canal sides present navigational difficulties for M type barges. When they drive around corners on these sections, the V-shape profile reduces the width of the navigation which is necessary for these large vessels.
- If the water level is down from optimum, the vessel will scrape their sides on the V shaped banks of the canal.

It is vital the canals are maintained to a level where the Heritage Boats can continue to utilise the 220 year old Irish canals, which they were built to navigate. These boats have been featured in many of WI's programmes and literature in conjunction with the Heritage Boat Association.

### 3.7 Greenway Developments

The project team have been made aware of two places where the towpath was widened to facilitate the development of the Greenway, shown in Figure 10. On the Royal Canal between Bond and Jackson's bridges the canal was filled in to accommodate the specification of a wider pathway. The other location, just west of Allen bridge at Kilcock a similar measure was undertaken.

At the time of compiling this report, both of these levels are being maintained at a less than ideal level. The Maynooth level is being maintained at approximately 12" (0.3m) **below the optimum** level due to the risk of overflowing into the town of Maynooth, were there to be significant rainfall in the area. The 16<sup>th</sup> level above Kilcock is being maintained below a level where it leaks through the bank.

The challenges of navigating a vessel on a reduced level has been outlined previously, this is further compounded with the loss of 15-20% of cross section of the canal navigation due to infilling of the canal for the Greenway, in these two places wide beam vessels have grounded along the infilled sections.

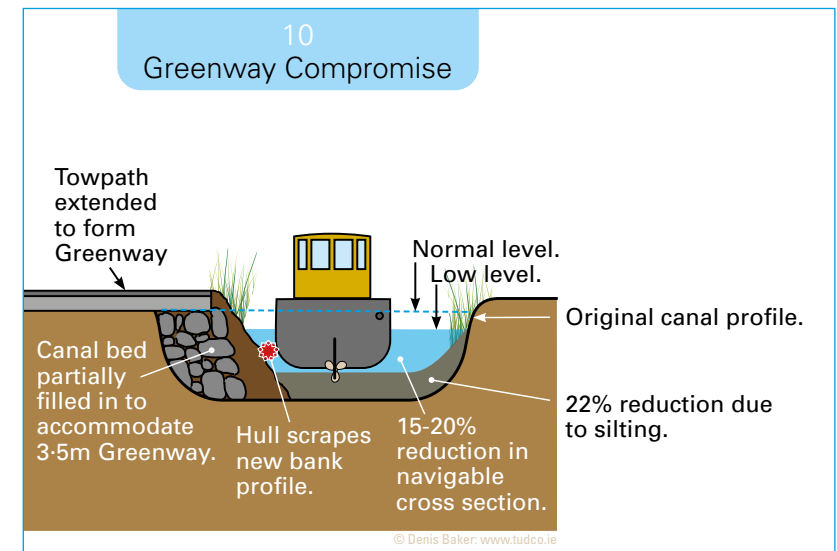
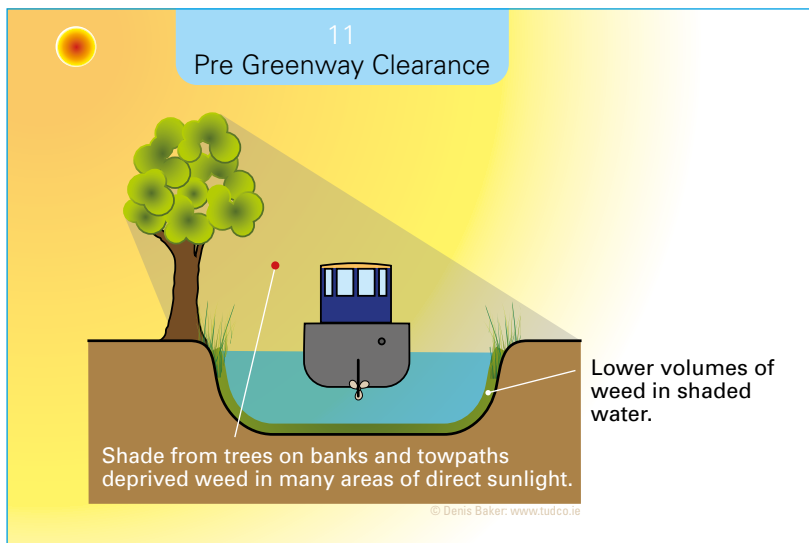


Figure 10 - Widening of green way path width by filling in the canal bed.



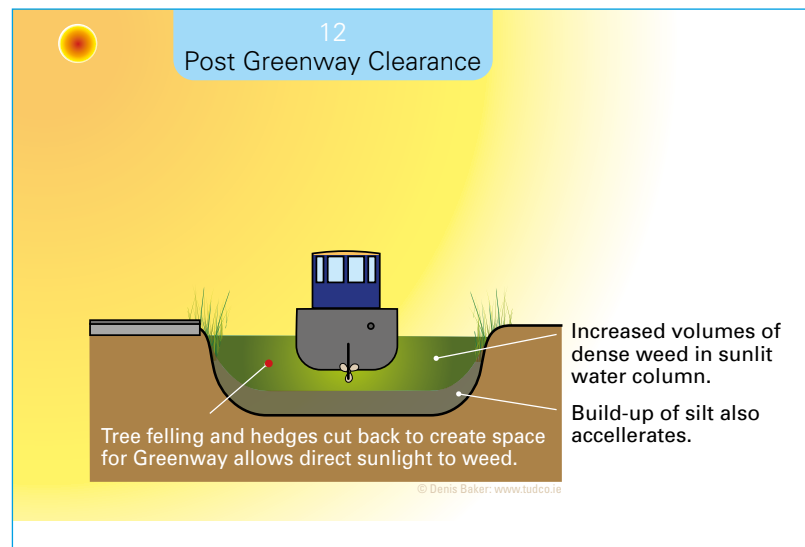
Caffrey (1993) observed the natural shading affects trees have to inhibit prolific weed growth in the canal, further the Waterways Corridor Study 2004 made recommendations of this method as a natural weed control method. Unfortunately, as the Greenways have been developed a significant culling of trees adjacent to the canal corridors was undertaken. The result of this has exposed the navigation channel to strong sun in spring and summer months which facilitates rapid weed growth. The illustrations below in *Figure 11* and *Figure 12* show how the natural weed control method has been lost.



*Figure 11 - An example of pre-Greenway development, adjacent trees providing natural shade to control canal weed growth.*

In recent years where the Greenways have been developed along the canals there is an obvious disconnect and a lack of understanding to maintaining the canals as a functional waterway for boats, some examples are:

- Maynooth harbour (see pics on opposite page) – the mooring posts have been removed as part of the Greenway development **detering boats from mooring in the harbour**. There are railings around the western bank making access to the canal bank very difficult. The water tap is located in this vicinity so there is a requirement for boats to visit this bank.



*Figure 12 - An example of post-Greenway development, the canal navigation is fully exposed to the sun, weed grows rapidly.*

- Allen Bridge Kilcock (see pic top right) – under the bridge safety railings have been installed to protect Greenway users, these railings prohibit boaters from accessing the tow path under the bridge – as boats travel the canals it is not uncommon for the 'lock crew' to disembark the boat at the bridge before the lock, or for boats to stop under the bridge where the water is deeper to remove weed and debris from the propeller.
- Lock 14 Royal Canal (see middle & bottom pics on right) – The balance beam of the lock gate was shortened to facilitate the Greenway width, within 70' the pathway goes under the road as a narrow tunnel with signage for cyclists to dismount – we are all in favour of the Greenway developments and sharing the space but exploiting and modifying heritage structures cannot be condoned. By doing so and implementing these changes in an unsympathetic way sullies the asset whereby it loses in appearance much of what makes it a unique heritage site.
- In Ballymahon, the Greenway has been laid directly over the original, historic quayside, completely obliterating it from view.





### 3.8 Weed Management Strategy

The current weed management strategy of WI is **not sufficient** to maintain a navigation throughout the summer months. The reduction of mechanical cutting to a single cut per year has led to a deterioration of the navigational quality of the canal. As each summer passes, the weeds are becoming denser and more obstructive growth is evident earlier each spring. Before long, the current strategy if maintained without alteration will either require significant annual budget allocation to overcome excessive weed or it will render the canal navigation completely unusable. The authors have identified two particularly obstructive species which are widespread on the canal navigations.

#### 3.8.1 Obstructive Weed Species

##### 3.8.1.1 *Myriophyllum verticillatum*

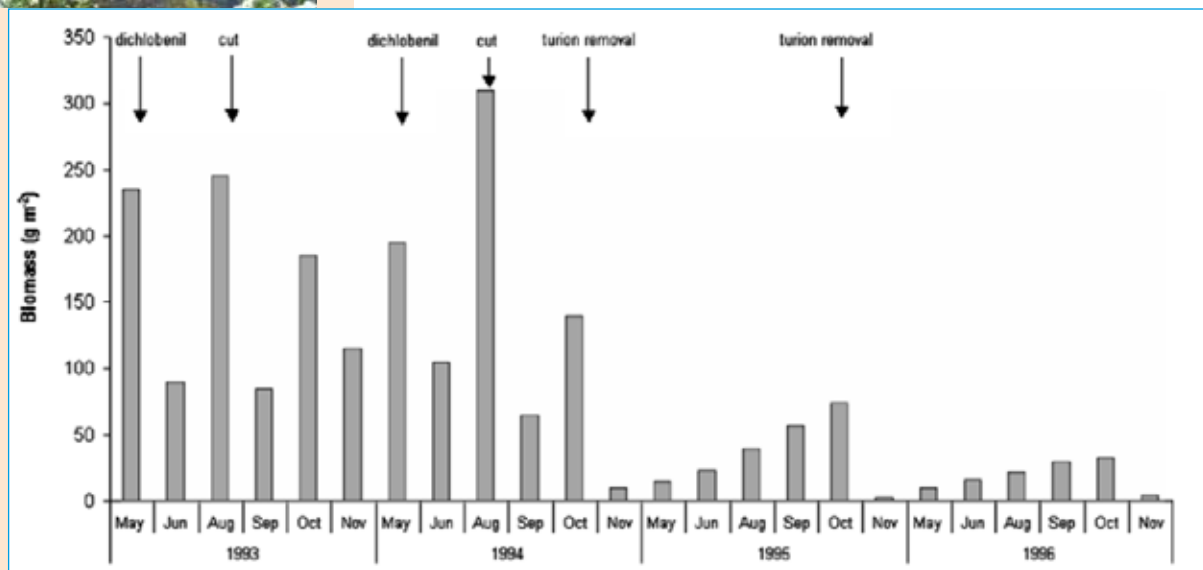


Figure 13 - Effects of dichlobenil treatment, mechanical cutting and turion removal on the biomass development of *Myriophyllum verticillatum* on a section of the Royal Canal between 1993 and 1996 (Caffrey and Monaghan 2006).

The authors have reviewed a paper by Caffrey and Monaghan (2006) where they identify *Myriophyllum verticillatum* as a dominant and obstructive weed which is prolific in approximately 100km of the canals. The paper refers to the period of research 1993-1996



which is now years old. From observations it is believed this weed (*Myriophyllum verticillatum*) is more widespread than observed by (Caffrey and Monaghan 2006). In their paper they present a control strategy of harvesting the turions (seed pods) in autumn before they sink to the bottom of the canal and grow the following spring. They present the effects of their study in Figure 13 below left; adopting a strategic approach appears to significantly reduce the regrowth year on year and helps bring the weed management under control.



Figure 14 - Common example of obstructive growth of *Myriophyllum verticillatum* October 2019.

The picture in Figure 14 on left also illustrated by the cross section in Figure 7 shows an example of obstructive weed growth, this is a common sight

throughout the Grand and Royal canals and canal sections of the river Barrow. This density of weed is highly obstructive to vessel progress, the speed drops to hours per kilometre instead of kilometres per hour. The weed density can put severe strain on the vessels engine causing overheating and most likely damage to the gearbox and propeller shaft as shown in Figure 8.



### 3.8.1.2 *Elodea Nuttallii* / Nuttall's Waterweed

The second most obstructive weed encountered by the authors was Nuttall's Waterweed. It is a perennial aquatic weed which grows rapidly towards the surface without branching out, it over winters (lays down on the canal bed) in Ireland as horizontal shoots which generate new lateral upright shoots as the temperature reaches 6-8°C (InvasiveSpeciesIreland.com 2020).



*"Reproduction and spread in Ireland is entirely by breakage of the shoots. The resulting fragments can readily form new plants. Seeds are not produced in Ireland because there are no male plants"* (biodiversityireland.ie 2020).

Figure 15 - Nuttall's Waterweed

It is also worth noting (InvasiveSpeciesIreland.com 2020) make a correlation between the increasing density of Nuttall's Waterweed and an impact on aquatic invertebrate population. The increasing density of this weed in the waterways is not only obstructive to boats it also impacts invertebrate such as the white-clawed crayfish, a naturally occurring species in Ireland.

## 3.9 Threat to Biodiversity in our Canals and Rivers

by Alan Booth (Botanist)

Construction of the canals originally commenced in the mid to late 1700's, where they were to be used for passenger services and for freight. Although the freight services have since ceased, the canals are still used by the general public today.

With their slow flow and gentle gradient, the canals offer hundreds of kilometres of habitat, perfect conditions for a diverse range of species. We have all gone for a walk along the canal banks; taking in the smell of water mint, seeing the vibrant pink colours of the willowherb and listening to the buzzing of the bees dashing from flower to flower, or the beat of the dragonflies wings as they snatch flies out of the air. Fishermen

can utilise the rich coarse fishery habitat while boats and kayaks can avail of the slow, peaceful flow.

Invasive weed species like Canadian pondweed (*Elodea canadensis*), Parrots Feather (*Myriophyllum aquaticum*) and Curly Leaved Waterweed (*Lagarosiphon major*), to name a few, have taken over our canals by outcompeting native species, and if not controlled, they are causing devastating effects. Excessive growths can lead to fish stunting and overpopulation, which occurs because the production of too much habitat prevents effective feeding of small fish by larger fish. Overpopulation of these fish species can cause excessive nutrient input to the canals and deoxygenate the waters.

Aquatic weeds can also cause fish kills as they take oxygen out of the water. For example, plants at night respire (take up oxygen) without producing it. As the plants die and decompose, microbial action also contributes to deoxygenating of the water, and the production of algal blooms.

### **Excessive weed growth impedes water flow and causes flooding.**

It also causes sedimentation as they start to decompose, which can shade out the aquatic environment and inhibit the species which depend on the penetration of light below the surface. This shading also affects the temperature regulation as a result. The deposition of weeds, as well as sediment and debris can cause the gradual filling in of bodies of water, and can impact on the spawning habitat for fish as the silt smothers the eggs.

As most of the invasive weed species are shallow rooting, they fail to help in the stabilisation of sediment on the canal bed, as a result there is no retention of sediment for native plant species to root. These native plant species are crucial for our wildlife which have evolved by utilising them as food and for habitat in which to lay their eggs. Invasive weeds on banksides, such as Himalayan Balsam (*Impatiens glandulifera*) are also problematic in this regard. It competes with native plants for light, nutrients, pollinators and space, excluding other plants and reducing biodiversity. It then dies back in the winter, leaving banks bare and open to erosion. Like with the instream vegetation, dead leaves and plant debris from the weed block the waterways and lead to flooding.

As we can see, the canals and rivers offer hundreds of kilometres of diverse habitat for aquatic and amphibian species. It is essential that there is a plan in place for regular maintenance, for as well as causing problems for boaters, it can also have serious negative consequences on the wildlife which resides in them.





### 3.10 Summary

There are many factors which can individually inhibit progress to vessels on the canals however, in situations where a vessel encounters a combination of these factors it can render the canal practically unnavigable. In such a situation there is a significantly increased risk of damage to the vessel.

Concerned and interested parties such as the regional branches of the IWAI and the Heritage Boat Association organise annual destination type trips to ensure WI maintain sections of the navigations to facilitate the passage of boats. In these instances WI operations and maintenance crews work very hard to ensure clear navigations and sufficient water levels, there has been good collaboration in the past. However, if a boat skipper intends to undertake a journey to an area in which a group is not travelling, they will encounter a different reality and very little support.

The picture below shows the canal navigation at Levitstown lock on the Barrow navigation (taken in July 2020) - this is practically unnavigable for boating and blueway users. This level of excessive weed is highly obstructive for the boat and completely inhibits efficient progress through the navigation.



The survey of such conditions where encountered, is covered in the next section.

## 4. Survey Research

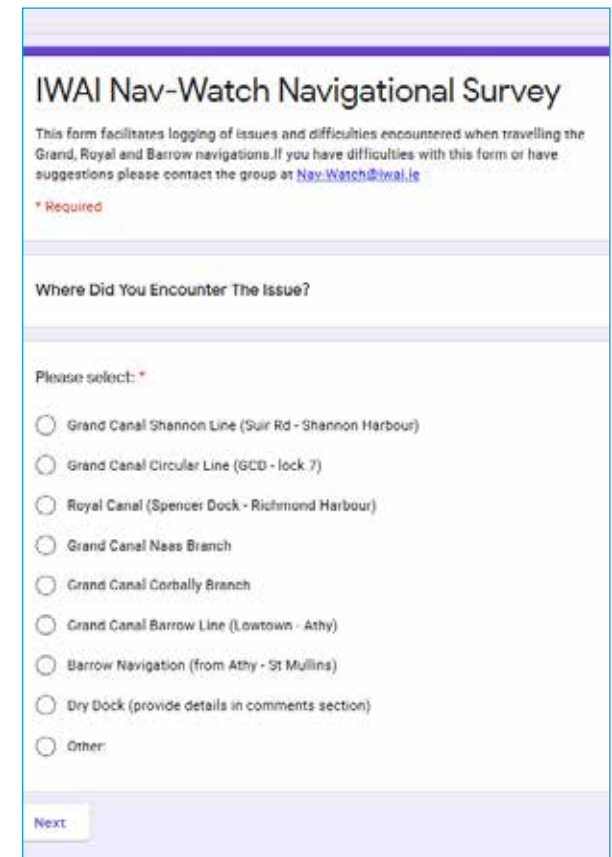
Here we present the online survey tool we developed and the survey data collected subsequently. The team also undertook depth and speed progress surveys on some sections of the waterways.

### 4.1 Methodology for online survey

The team started with the idea of acquiring tacit knowledge of known issues from boaters and collating these to a report. The flaws and subjectivity of this method quickly became apparent if reliable data was to be presented.

The online survey resource was developed to be simple and user friendly especially on mobile devices, this helped to ensure the task of logging issues could be completed as quickly and easily as possible for boaters of all technical abilities. However it became clear that three points of reference would be useful; the survey inputs, the depth surveys and the travel progress reports.

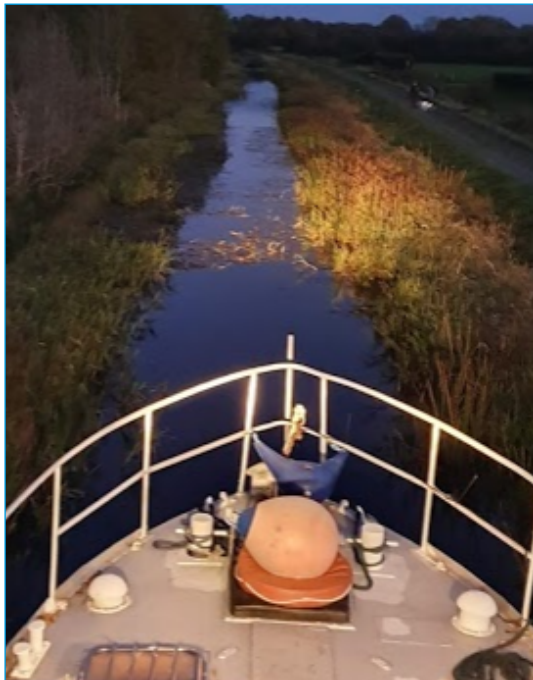
Figure 16 - Nav-Watch Online Survey, Page 1.



Protection of personal data and adherence to GDPR guidelines were followed. Personal data is only used where necessary to validate a reported issue, once the reports have been validated the personal data is stripped from the spreadsheet to ensure there is no risk of sharing personal data when analysis was carried out. The detail from these user reports is outlined in Section 5.

#### 4.1.1 Personal Reporting Survey

During the 2019 calendar year, **248** reports were logged by boating canal users as they travelled through the systems, encountering various issues, e.g. the picture below in *Figure 17* highlights where reed fringes have become so thick the navigable channel is reduced to less than the width of the vessel.



*Figure 17 - Reported issue, excessively large reed fringes encroaching on navigation.*

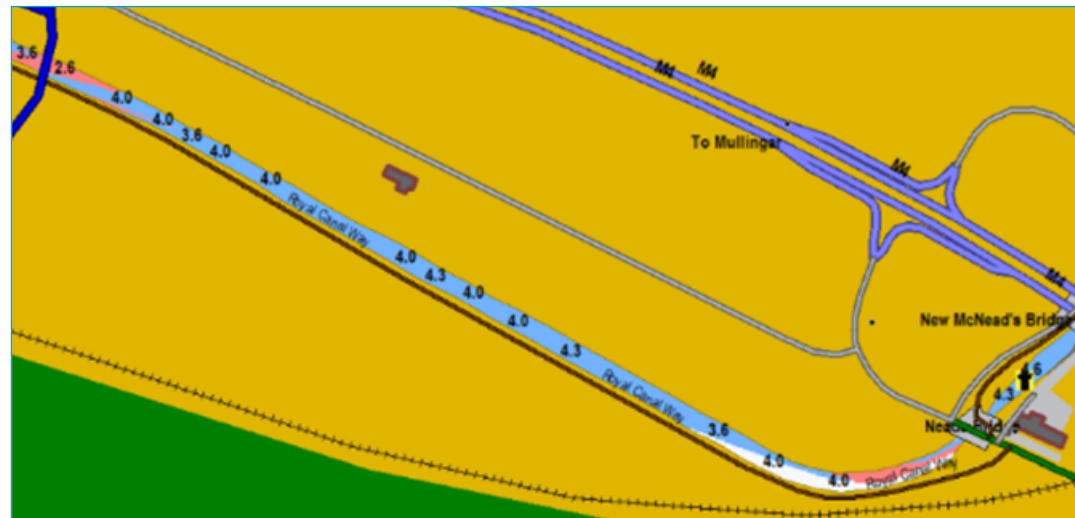
#### 4.1.2 Depth Surveying

The Nav-Watch project established a collaboration with the IWAI Charts Special Interest Group (CSIG). The CSIG group have undertaken depth mapping of the Shannon and Erne Systems in recent years,

which, they published in electronic format as the most comprehensive and up to date maps of the Shannon and Erne system ever acquired.

The Nav-Watch project was given a loan of survey equipment from the CSIG, it comprised of a GPS depth finder (Humminbird 898Ci) and a high frequency transducer. The equipment was interfaced to a laptop, using the CSIG acquisition software, depths and GPS locations were captured at 1 second intervals and populated to a log file. The file was then parsed to a depth profile and overlaid onto a map.

The transducer was secured to the front of the survey vessel (see pic on lower right) at a depth to minimise any interference from the vessel hull and turbulence. The transducer was set to a high frequency of 800kHz to reduce the effect of weed affecting the depth and giving erroneous readings. At each section between locks, the surveyor took a datum of the water depth at each upper cill. An observation of the condition of the water level was also noted and if it was thought to be below optimum level, a measurement was taken to compensate when the final depth map is being generated. The final depth map indicates depths of the centre of the canal when the section levels are optimum. Using this information, it is then possible to determine areas which critically inhibit the progress of larger vessels. Colour contouring is used to illustrate areas where the depth is below 3ft, these areas are shaded in red.



*Figure 18 - Depth Survey of canal centre, the numbers indicate the depth (in ft) from the water surface to the top of the silt layer +/- 3 inches*





### 4.1.3 Vessel Progress Survey



The down side of the 'single track' survey method is it only captures the depth of the centre of the canal. To gather a full profile of the canal bed from bank to bank would take many hours and would be outside the remit of the project. The best indicator of variations on the canal bed is to use the concept of 'Efficient Progress' of the vessel, as discussed in Section 2. With the CSIG survey equipment it is also possible to capture the vessel speed and overlay this to a map. Using a colour scale on the map it is possible to visually see areas where the vessel progress was impeded. Colour contouring is used to illustrate progress as follows:

- Red** – for speed less than 1mph
- Orange** – for speed between 1-2mph
- Yellow** – for speed between 2-3mph
- Green** – for speed exceeding 3mph

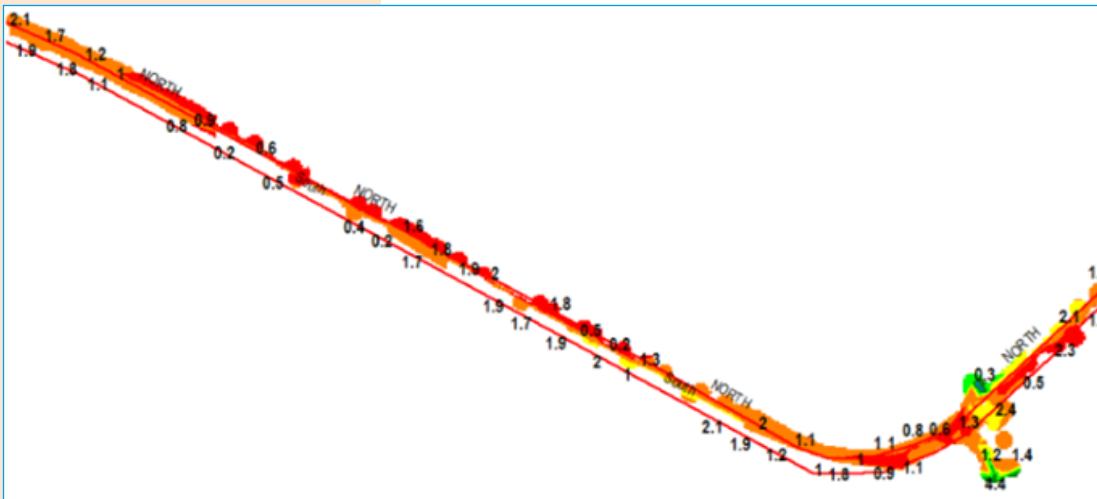


Figure 19 - Vessel progress, the numbers represent the vessel speed (mph) colour contouring is used to highlight areas where the efficient progress of the vessel was inhibited.

### 4.1.4 Three points of reference to highlight issues

Using the three independent points of reference, (survey inputs, depth surveys and travel progress reports), it is possible to identify most of the areas which may impede progress of vessels on the canal and Barrow systems. Using this data, WI can complete targeted maintenance to improve the navigation in a sustainable long term manner.

## 5. Survey Findings

This section presents the 248 results of the issues encountered by boating users on their travels in 2019. All data was logged independently to the online system using the Nav-Watch reporting tool. Input showed the location of the incident, and type of navigational or infrastructural issue encountered. There were 145 navigational issues and 103 infrastructural issues reported across a range of situations.

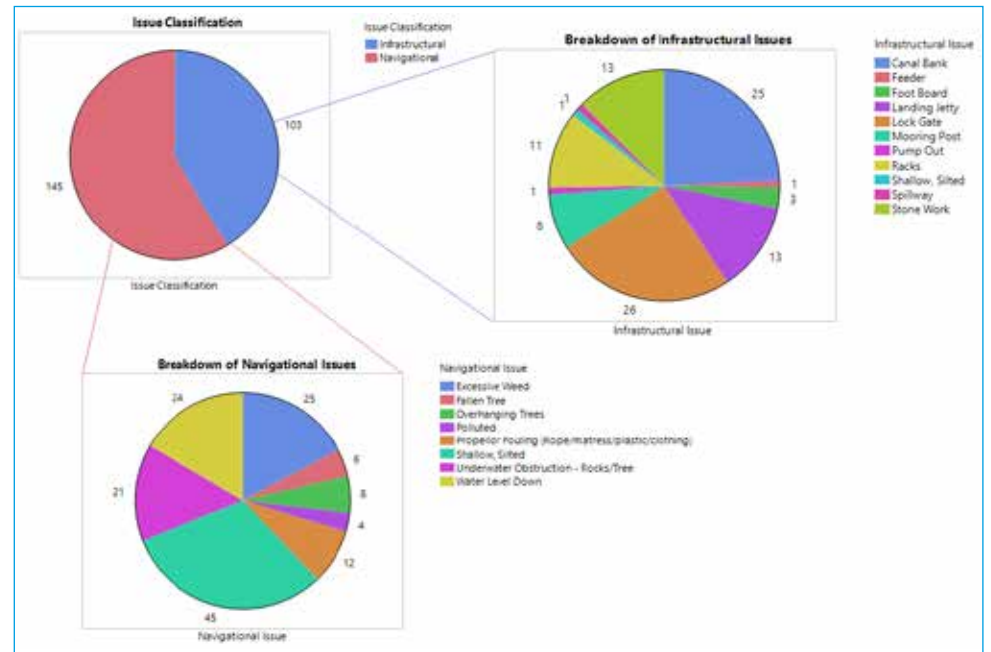


Figure 20 - Classification of issues 2019



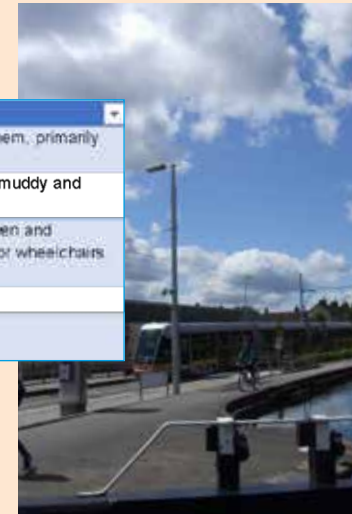
The range of issues across the two strategic areas are outlined below.

## 5.1 Grand Canal Circular Line

### 5.1.1 Reported Infrastructural Issues

Table 1 - Grand Canal Circular Line – Reported Infrastructural Issues

From Lock Number	To Lock Number	Reported date	Infrastructural Issue	Enter details below
GCD	Lock C7	May-19	Racks	Leaking racks on locks on circular line. The locks of the Circular Line are generally in better condition than those just above them, primarily because they are being used regularly by restaurant boats travelling back and forth and into GCD.
Mainline Lock 1	Lock C7	Sep-19	Canal Bank	Canal towpath is impassable under Rialto Bridge at most water levels, the towpath surface needs raising, also the towpath is muddy and slippery and needs re surfacing.
Mainline Lock 1	Lock C7	Sep-19	Canal Bank	The canal towpath at Sallys Bridge is impassable for most people, and dangerous for anyone who uses it. The surface is uneven and degraded by tree roots, and the pathway is too narrow for safe passage. The pathway is not passable for bicycles or buggies or wheelchairs. The pathway under Sallys Bridge is below water level at many times.
Mainline Lock 1	Lock C7	Sep-19	Racks	Both land racks broken from the paddle upwards
GCD	GCD	Dec-19	Lock Gate	Buckingham Lock, balance beams of the tail gates have collapsed - the lock is not useable. Balance beams need replacing.



### 5.1.2 Reported Navigational Issues

Table 2 - Grand Canal Circular Line – Reported Navigational Issues

From Lock Number	To Lock Number	Reported date	Navigational Issue	Enter details below
Mainline Lock 1	Lock C7	Apr-19	Underwater Obstruction - Rocks/Tree	Large submerged tree between Rialto bridge and dolphins barn bridge.
Mainline Lock 1	Lock C7	May-19	Water Level Down	Water level down 8inches today - 16th May 2019
GCD	Lock C7	May-19	Excessive Weed	Scum build up 40ft long above the breast gates - excessive weed growth in spring/summer
Lock 3	Lock 4	Jun-19	Underwater Obstruction - Rocks/Tree	Sunken traffic cones and beer barrels between C3 and C4.



## 5.2 Grand Canal Shannon Line

### 5.2.1 Reported Infrastructural Issues

Table 3 - Grand Canal Shannon Line, Reported Infrastructural Issues, Lock 1 - Lock 20

From Lock Number:	To Lock Number:	Report Date	Infrastructural Issue	Enter details below:
Lock 01	Lock 12	May-19	Lock Gate, Mooring Post Racks, Stone Work	The Dublin Locks 12 - 1 are generally in poor condition from lack of basic maintenance. These locks closer to Dublin are used less and suffer because of it. 1. Dangerously leaking racks on several of them. 2. Mooring posts rotten or broken on some. 3. Shrubs rooted in the gaps between stones in Lock chambers catch on boats as they rise and fall in the lock. Smaller boats could hang-up and overturn. 4. Inches of limescale build-up on many gates restricts access for barges and wider beam vessels.
Lock 09	Lock 09	May-19	Racks	Rack in the middle gates at Clondalkin badly leaking. A 60ft barge was almost swamped by the leak as the vessel was locking down in the lower chamber, as they became level with the leak it sprayed onto the aft deck - almost filling the engine room. The top lock had to be slowly emptied before the vessel could continue down through the lock. <b>POTENTIALLY VERY DANGEROUS</b>
Lock 12	Lock 13	Mar-19	Mooring Post	Mooring posts rotten and damaged during bridge widening and need to be replaced.
		May-19	Foot Board	Foot boards on the lock are damaged
		Mar-19	Mooring Post	Mooring posts at 13th Lock chamber rotten at base and in need of replacement. Missing post should be reinstated.
		Apr-19	Landing Jetty	Lock 13: 2x reports of broken planks on the landing jetty at the 13th has broken planks and is dangerous. The planks have a gap between them and the canal bank.
Lock 14	Lock 14	May-19	Lock Gate	Breast gate at lock 14: 2x reports of difficulty opening and closing gates. Collars of gates loose, gate bottom dragging bottom and difficult to close.
		Jul-19	Racks	Land rack at lock 14 not operational. This presents danger when longer vessels use the lock as the risk being flooded, and possibly sunk, by the sluices on the lock gate.
		Oct-19	Racks	Lower rack on the left hand side beside the house has teeth missing and does not lift
Lock 15	Lock 15	Apr-19	Lock Gate	Lock 15 Breast Gates. Gravel caught under breast gates, very difficult to move gates.
		Oct-19	Stone Work	Stone beside bollard fell into the canal as crew member stood on it. This nearly caused his foot to crush between the boat and the wall.
Lock 17	Lock 17	May-19	Racks	Lock 17 has a badly leaking rack.
Lock 18	Lock 19	May-19	Canal Bank	The bank on the South side was recently cleared of trees /bushes and the bank rebuilt. An area was dug out for cattle to drink out of the canal. Last year this was a lovely area for wildlife. on the south side bank the cattle can walk into to the canal. Further down below cock bridge cattle have damaged the bank nearly all the way down to Healy's Bridge. Fencing required to keep cattle off the banks.
		Jun-19	Landing Jetty	Robertstown Jetty: Missing planks.
		Jul-19	Landing Jetty	Lock 18: New landing jetty recently constructed west of lock has no mooring bollards, which makes it unfit for purpose.
Lock 19	Lock 20	Sep-19	Landing Jetty Obstructed	Lowtown Lock Jetty Obstructed



Table 4 - Grand Canal Shannon Line, Reported Infrastructural Issues, Lock 20 - Lock 30

From Lock Number:	To Lock Number:	Report Date	Infrastructural Issue	Enter details below:
Lock 20	Lock 21	Jun-19	Landing Jetty	Landing jetty above Lock 21. There is a gap between the bottom of the bollards and the planking. Ropes jam in the gap.
		Jun-19	Lock Gate	Breech Gates at Rathmore Bridge - eastern Lock Gate, on north bank automatically swings into closed position. On pushing it into open position to pass through, felt like there might be rubble/sand in cup.
		Sep-19	Rubbing Strakes	Former BnM bridge above lock 20, near Lullymore 2 x reports of protruding bolts, wooden rubbing strakes need to be replaced - SIGNIFICANT HAZARD TO VESSELS
		Sep-19	Pump Out Jetty Obstructed	Lowtown: Pumpout Jetty Obstructed
		Oct-19	Lock Gate	Lock 20: Breast gate leaking, limescale on gates and chamber walls
Lock 21	Lock 22	Apr-19	Water point	Daingain Harbour: no water point, missing lifebuoy
		Jun-19	Racks	Lock 22 - Breast gate, inside rack on right hand gate, rack is broken, will not open.
		Oct-19	Lock Gate	Lock 22 Top Gates - leaking
Lock 23	Lock 23	Oct-19	Lock Gate	Lock 23 Top Gate north side - leaking
Lock 26	Lock 27	Jun-19	Canal Bank	Tullamore Harbour, East side: The grass verge has been extended into the navigation on the bridge opening and this new bank has been built at an angle into the water. Barges and large vessels have difficulty turning into the harbour and encounter groundings during manoeuvring.
		Jun-19	Stone Work	Tullamore Harbour, western side: Paving slabs are uprooted causing a trip hazard at the water side.
		Jun-19	Mooring Post	Tullamore Harbour, western side: mooring bollards are missing
		Jun-19	Pump Out	Tullamore Harbour: unable to use pump-out, facility is locked up & out of commission for more than 2 years
		Oct-19	Lock Gate	Lock 26 Top Gates - leaking badly in centre
		Apr-19	Landing Jetty	Lock 27: Landing jetty obstructed by moored vessel (April 2019)
Lock 27	Lock 28	Mar-19	Stone Work	Tullamore Harbour - Loc 53.27688°N, -7.48753°W Path beside Waterways Ireland building has fallen in and presents difficulty mooring - shallow beside wall.
		Apr-19	Landing Jetty	Hole in ground between jetty and towpath, partly covered by grass.
Lock 29	Lock 30	Apr-19	Landing Jetty	Lock 28: Landing jetty obstructed by moored vessel (April 2019)
		Apr-19	Landing Jetty	Lock 29: Landing jetty obstructed by moored vessel (April 2019)
		Apr-19	Landing Jetty	Lock 30: Landing jetty obstructed by moored vessel (April 2019)
		Aug-19	Canal Feeder	Canal feeder supply no longer in use.



Table 5 - Grand Canal Shannon Line, Reported Infrastructural Issues, Lock 31 - Lock 35

From Lock Number:	To Lock Number:	Report Date	Infrastructural Issue	Enter details below:
Lock 31	Lock 32	Apr-19	Landing Jetty	Lock 31: Landing jetty obstructed by moored vessel (April 2019)
		Oct-19	Canal Bank	Lock 31: Excrement left by animals around lock - impossible to avoid
		Jun-19	Landing Jetty	Lock 31: Several boards on grass side of jetty are rotten, some are broken. Some new planks have been replaced however, the whole jetty needs work. (June 2019)
		Jun-19	Canal Bank	Greenway on north bank, east of Pollagh and before Turraun, path has sunk and is about 10 cm above the water surface
		Jul-19	Landing Jetty	Pollagh: landing jetty planks are rotten and need replacing. <a href="#">Whole jetty replaced by Waterways Ireland</a>
		Aug-19	Canal Feeder	Feeder on South Bank, West of lock 31 now has very low flow.
		Sep-19	Stone Work	Lock 31: Wall collapse above the lock Wall has collapsed into the canal south east side of the lock entrance, Stones present navigation hazard.
		Oct-19	Lock Gate	Lock 32: Tail gates not open fully.
Lock 34	Lock 34	Sep-19	Stone Work	Lestrange Bridge: stonework collapse Stonework has collapsed into the canal south east side of the wall, causing danger to navigation.
Lock 34	Lock 35	Jun-19	Turning Point	Turning Point East of Griffith Bridge: There are mooring posts and boats moored on the south side of the canal at this spot. The moored boats present difficulties for large vessels manoeuvring in the turning point.
Lock 34	Lock 35	Apr-19	Stone Work	Shannon Harbour: Missing cap stone from edge, south side of Harbour, west of dry Dock entrance.





## 5.2.2 Reported Navigational Issues

Table 6 - Grand Canal Shannon Line, Reported Navigational Issues, Lock 6 - Lock 19

From Lock Number:	To Lock Number:	Report Date	Navigational Issue	Enter details below:
Lock 06	Lock 07	May-19	Underwater Obstruction - Rocks/Tree	Up to 5 shopping trolleys plus some large tyres in the canal. Waterways staff were aware of this but said there was no way to get access with the long arm excavator to remove them. A maintenance barge is necessary to retrieve difficult to reach obstructions.
Lock 09	Lock 10	Aug-19	Excessive Weed	Excessive weed along this level severely impedes vessel progress
Lock 12	Lock 13	Apr-19	Excessive Weed	Lots of floating weed built up at the 13th lock. At least 60ft build up
		May-19	Navigation Obstructed - Moored Boats	Hazellhatch area: Boats on either side of the Navigation are obstructing the main channel. Boat is double moored and has a tarpaulin tied, the tarpaulin has fallen from the boat and is submerged in the main channel making it difficult to pass.
		Jul-19	Propellor Fouling (Rope/matress/plastic/clothing)	Matress in navigation channel 15 June 2019, fouled propellor. Our diver secured a rope now tied to mooring pin on north bank east of Hazelhatch bridge, to allow removal. Other junk nearby waiting to fall into canal.
		Apr-19	Underwater Obstruction - Sunken Boat	Hazelhatch Bridge: 2 sunken boats (1 each side of bridge).
		Apr-19	Water Level Down	Water level down by 12 inches since last week. No marine notice issued
		Apr-19	Overhanging Trees	Hazelhatch area - Trees overhanging on the north bank. Boats are moored on both sides which makes it difficult to line up for the bridge.
		Apr-19	Shallow, Silted	All three turning points are silted and have depths of 2-3 feet this makes makes turning a canal boat impossible. In summer months there is excessive weed in these areas making it even more difficult.
Lock 13	Lock 14	Jul-19	Underwater Obstruction - Rocks/Tree	Several large boulders, and some smaller rocks, on bed of canal beside of channel under Henry bridge above lock 13. Likely to damage propellor or even hole a deeper draft vessel.
		Jul-19	Navigation Obstructed - Moored Boats	Navigation channel width is obstructed by moored boats just west of Hazelhatch bridge, there is insufficient width for safe navigation of vessels
Lock 15	Lock 16	Jun-19	Shallow, Silted	SHALLOWS, less than two feet depth, from Leinster aqueduct to the new bypass bridge.
		Jul-19	Shallow	Shallows around Sallins railway bridge have been known about for many years, but have not been dredged
		Jul-19	Underwater Obstruction - Sunken Boat	Submerged abandoned open boat underwater just west of Sallins bridge, locals advise it has been there for some time (July 2019)
		Jul-19	Shallow, Silted	Leinster Aquaduct is impassible for an M type heritage barge due to silt build up it took much ramming and pulling by rope from the shore to get the barge through. This heritage barge only draws 3 foot.
		Oct-19	Silted	Liffey Aquaduct - south side east - badly silted, went aground.
		Oct-19	Propellor Fouling (Rope/matress/plastic/clothing)	Carpet fouled propeller
Lock 18	Lock 19	Apr-19	Shallow, Silted	Robertstown and surrounding areas are shallow.
		Apr-19	Shallow, Silted	Stretch from Burgh Bridge to Borynge Bridge badly silted.
		Jun-19	Shallow, Silted	Dragging the boat through mud, especially coming up to Robertstown.
		Jun-19	Shallow, Silted	The canal is seriously shallow/silted on the bend at the Blackwood Feeder, East of Robertstown.
		Jul-19	Water Level Down	WI staff kindly assisted vessel owner up through locks 16, 17, 18. The 18th level was very low. After 3 hours of ploughing mud, attempts were abandoned by the vessel owner who went ashore to check the status of the locks. The vessel owner discovered that WI staff had opened sluices to drain off the level the vessel was on and the water level was reducing, the sluice was padlocked and all WI staff gone. The vessel owners progress was halted until the water level could be recovered.
		Oct-19	Overhanging Trees, Rubbish/Plastic Bags, Weed Not Cut	Bog of Moods section - Sallys growing over water, Reeds need cutting back, rubbish in water, turning circle needs clearing out.
		Oct-19	Underwater Obstruction - Rocks/Tree	East of Borynge Bridge - 5 metres or thereabouts, smashed into obstruction in middle of navigation, went up and over it. Ended up in the trees.

Table 7- Grand Canal Shannon Line, Reported Navigational Issues, Lock 19 - Lock 28

From Lock Number:	To Lock Number:	Report Date	Navigational Issue	Enter details below:
Lock 19	Lock 20	Jun-19	Underwater Obstruction - Rocks/Tree	Milennium mooring near Shee / Scow Bridge, Allerwood. Submerged Obstruction, an Engine Block, in the centre of the navigation, directly opposite the Millennium Jetty.
		Oct-19	Underwater Obstruction - Rocks/Tree	Hit something hard, centre of navigation, about 18 metres east of Lock 20
		Oct-19	Overhanging Trees	South Bank outside ex Lullymore Peat Factory is overgrown with Brambles and Trees overhanging water. North Bank is well maintained.
		Oct-19	Weed Cut - But Floating	East of Lullymore Bridge, weeds cut back but stored on bank and floating on water
Lock 20	Lock 21	Apr-19	Water Level Down	Water level down 6/8 inches. Problem reported to lock keeper, investigated and prompt action taken to rectify the problem. Planks on overflow west of Tobberdaly bridge had been removed, thus reducing water level. Reduction of the water level by this amount makes navigating the level very difficult.
		May-19	Excessive Weed	Ballycommon entrance to Kilbeggan Line - weed and silt
		Jun-19	Excessive Weed	Ballycommon at entrance to Kilbeggan Line.
		Jun-19	Excessive Weed	Navigation impeded by encroaching reed fringes. Location, fishing pegs 1 to 40 between Blundell Aqueduct and Lock 20.
		Jun-19	Shallow, Silted	Very shallow at most mooring posts between the bridge and lock in Ballycommon.
		Oct-19	Weed Cut - But Floating	Reeds cut back to 0.5 to 1.0 metre on either side, stacked on banks, result floating in water.
		Mar-19	Shallow, Silted, Weed Not Cut	Carlind Bridge – west of Edenderry. Stretch that includes Loc 53.3405141°N, -7.1092581°W Badly silted. Went aground at one stage, progress at 1 kmh.
		Mar-19	Excessive Weed	Carlind Bridge – west of Edenderry. Stretch that includes Loc 53.3405141°N, -7.1092581°W Huge weed growth.
Mar-19	Shallow, Silted	Edenderry Bridge - approach from east and entrance to Branch around Loc 53.34012°N, -7.05628°W Silted up with weed right across canal – very difficult to manoeuvre through bridge and into Edenderry Branch.		
Lock 22	Lock 23	Jun-19	Excessive Weed	Navigation impeded by encroaching reed fringes between lock 22 & 23
Lock 23	Lock 24	Jun-19	Shallow, Silted	Shallow, less than 2'9", and weeds encroaching across the navigation make it difficult for the vessel to displace water.
Lock 24	Lock 25	Mar-19	Water Level Down	water level down approx 6"
		Jun-19	Excessive Weed	Navigation impeded by encroaching reed fringes
Lock 25	Lock 26	Mar-19	Water Level Down	water level down approx 6"
		Jun-19	Underwater Obstruction - Rocks/Tree	Below Lock 25, there is a rock and debris in canal. Hit rock.
Lock 26	Lock 27	Apr-19	Propellor Fouling (Rope/matres/plastic/clothing)	Picked up fleece jacket on propellor, under first footbridge (easterly side).
		Mar-19	Shallow, Silted	Tullamore Harbour – Silt in Harbour.
		Mar-19	Excessive Weed	Tullamore Harbour – Weed in Harbour.
Lock 27	Lock 28	Oct-19	Silted	Lock 27 jetty west of lock silted went aground when approaching [Note: South Bank has been repaired east of Shra Bridge]
		Mar-19	Excessive Weed	Lock 28 was filled with a bed of reeds, Passage through the lock took 90 mins instead of 15. Huge mass of floating reeds pushed into the lock chamber by the wind.
		Apr-19	Underwater Obstruction - Rocks/Tree	Water level was good but vessel still hit rocks in the middle of the channel between Lock 28 & Lock 27. Vessel draws less than 3'6".



Table 8 - Grand Canal Shannon Line, Reported Navigational Issues, Lock 28 - Lock 36

From Lock Number:	To Lock Number:	Report Date	Navigational Issue	Enter details below:
Lock 28	Lock 29	Apr-19	Underwater Obstruction - Rocks/Tree	2x Reports of shallows for up to 200m west of lock 28
		Apr-19	Shallow, Silted	Mooring posts east of tullamore harbour - very shallow, vessel could not come close enough to the bank to secure ropes. Mooring posts are not usable for majority of vessels.
		Sep-19	Underwater Obstruction - Rocks/Tree	shallows at Killina, west of Charleville Aqueduct, west of lock 28 The water level is measured at only 900mm, despite this level being full at time of measurement. There is rock and stone causing shallows at the pedestrian sign on the bank.
		Oct-19	Weed Cut- But Floating	Cut reeds floating on surface
Lock 29	Lock 30	Apr-19	Shallow, Silted	2x Reports of shallow areas east of lock 29.
		Oct-19	Weed Cut- But Floating	Cut Reeds floating on top of water - large clumps in places
		Oct-19	Overhanging Trees	Lock 29: Tree on south side is overhanging the navigation when approaching lower Lock gates. Needs to be removed as it causes damage to boats.
Lock 30	Lock 31	Jun-19	Excessive Weed	Excessive weed along this level severely impedes vessel progress
		Jun-19	Shallow, Silted	Seriously shallow between lock 30 & 31 also below lock 31 for about 500 yards.
		Mar-19	Propellor Fouling (Rope/matress/plastic/clothing)	Charleville Aqueduct, east of Tullamore – stretch that includes Loc 53.27351°N, -7.57427°W Weed, Rubbish and Silt in canal. Rubbish consisted of various lengths of rope/twine, yellow binding tape, sacking, black plastic, thick blue rope, orange twine, fishing line. Considerable time needed to cut a piece at a time from prop.
		Apr-19	Shallow, Silted	400 meter length West of Charleville Aqueduct
Lock 31	Lock 32	Jun-19	Excessive Weed	Excessive weed along this level severely impedes vessel progress
		Jun-19	Excessive Weed	Derry Bridge to McCartney Aqueduct, cut reeds and weeds on surface, reeds growing in channel. Navigation channel reduced to less than 3 metres wide on stretch approaching McCartney Aqueduct.
		Jun-19	Excessive Weed	Between Derry Bridge and MACARTNEY Aqueduct (Eel grass) weed extends the whole width, almost touching the surface of the navigation.
		Oct-19	Excessive Weed	Reeds growing on both sides of canal in places - navigation reduced
		Mar-19	Excessive Weed	West of Pullough – along 'alligator alley' – did not note exact location. This is a stretch where there are reeds planted in huge swathes along both sides. Weed in canal along this stretch. Every few metres forward, needed to stop and go astern in an attempt to remove weed. Cleared long amounts of weed off prop, that was tightly wound around shaft
		Mar-19	Excessive Weed	East of Pullough – long straight stretch that includes Loc 53.279635°N,-7.7053754°W Weed in canal, reeds encroaching far out into canal leaving just a small corridor of water for navigation
		Mar-19	Excessive Weed	Lock 32 was filled with a bed of reeds, Passage through the lock took 90 mins instead of 15. Huge mass of floating reeds pushed into the lock chamber by the wind.
Lock 32	Lock 33	Apr-19	Shallow, Silted	500 meter length West of Comalour Bridge
		Jun-19	Excessive Weed	Excessive weed along this level severely impedes vessel progress
Lock 33	Lock 34	Oct-19	Excessive Weed	Reeds growing both sides of canal - navigation channel is 12 to 13 ft, no passing room, can't get ashore to moor
		Jun-19	Excessive Weed	Cut weed on bank, falling into water in places. Clumps of pondweed in several places
Lock 35	Lock 34	Oct-19	Silted	Lock 33 waiting jetty below (west) - silted badly when approaching jetty to moor - went aground
Lock 36	Lock 34	Mar-19	Excessive Weed	Weed all around Harbour – massive amount, makes manoeuvring in harbour difficult.
Lock 36	Lock 36	May-19	Underwater Obstruction - Rocks/Tree	Below Lock 36 at confluence of Brosna: Sunken tree in centre of channel. <b>Hazard removed by Waterways Ireland a few days after the report.</b>



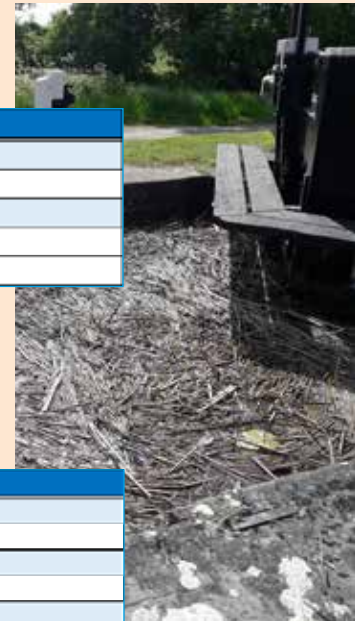


### 5.3 Grand Canal Barrow Line

#### 5.3.1 Reported Infrastructural Issues

Table 9 - Grand Canal Barrow Line, Reported Infrastructural Issues

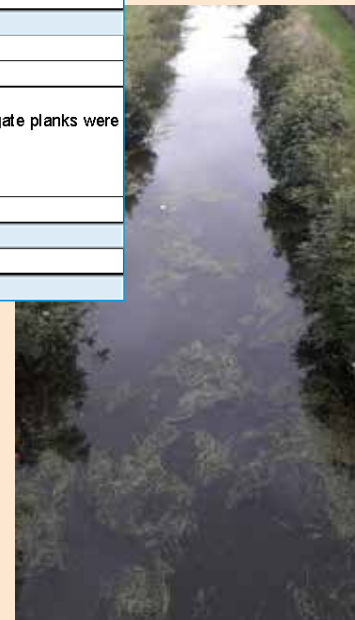
From Lock Number:	To Lock Number:	Report Date:	Infrastructural Issue	Enter details below:
Lock 20	Lock 21	Apr-19	Racks	Lock 20 Bottom Gate one Rack will not raise, rack gearing does not engage .
Lock 21	Lock 21	Apr-19	Canal Bank	Work appears to be completed on Locks 20 & 21 however the Towpath remains Closed
Lock 23	Lock 24	May-19	Stone Work	The stonework is damaged on the canal bank at Wilson Bridge. I have pics.
Lock 24	Lock 25	May-19	Canal Bank	Between Umeras Bridge and Macartney Bridge. The bank is been damaged by cattle grazing and dringing from the canal.
		May-19	Stone Work	At Shepherds's Brook Bridge. The stonework under the waterline is damaged.



#### 5.3.2 Reported Navigational Issues

Table 10 - Grand Canal Barrow Line, Reported Navigational Issues

From Lock Number:	To Lock Number:	Report date:	Navigational Issue	Enter details below:
Lock 19 Old Barrow Line	Lock 20	Aug-19	Water Level Down	Water levels way down from Lowtown to Athy. From Monasterevin to Athy they are down at least 18 inches.
Lock 20	Lock 21	Aug-19	Water Level Down	Water levels way down from Lowtown to Athy. From Monasterevin to Athy they are down at least 18 inches.
Lock 21	Lock 22	Aug-19	Water Level Down	Water levels way down from Lowtown to Athy. From Monasterevin to Athy they are down at least 18 inches.
Lock 22	Lock 23	Aug-19	Water Level Down	Water levels way down from Lowtown to Athy. From Monasterevin to Athy they are down at least 18 inches.
Lock 23	Lock 24	Aug-19	Water Level Down	Water levels way down from Lowtown to Athy. From Monasterevin to Athy they are down at least 18 inches.
Lock 24	Lock 25	Aug-19	Water Level Down	Water levels way down from Lowtown to Athy. From Monasterevin to Athy they are down at least 18 inches.
Lock 24	Lock 24	May-19	Weed Cut - But Floating	Lock 24: Reeds on the upper level of Ballykelly lock 24. Obstructing access to the lock.
Lock 25	Lock 26	Aug-19	Water Level Down	Water levels way down from Lowtown to Athy. From Monasterevin to Athy they are down at least 18 inches.
		Apr-19	Shallow, Silted	Lock 25: The five boat mooring bay below Lock 25 is extremely shallow.
		May-19	Water Level Down	Water level down about 10 inches on 22 May. The reporter investigated the issue and discovered sluice stop planks had been removed feeder and noticed the sluice gate planks were out. Reported it to WI. We had the same water level problem 5/6 weeks earlier. WI where contacted and the level came up within 2 days.
		May-19	Underwater Obstruction - Sunken Vessel	Lock 25: Sunken WI work barge - navigational hazard.
Lock 26	Lock 27	Aug-19	Water Level Down	Water levels way down from Lowtown to Athy. From Monasterevin to Athy they are down at least 18 inches.
Lock 26	Lock 25	Jun-19	Shallow, Silted	Fisherstown Bridge: Very shallow 200 yards each side of Fisherstown Bridge.
Lock 27	Lock 28	Aug-19	Water Level Down	Water levels way down from Lowtown to Athy. From Monasterevin to Athy they are down at least 18 inches.



## 5.4 Grand Canal Naas Branch Line

### 5.4.1 Reported Infrastructural Issues

Table 11 - Grand Canal Naas Line, Reported Infrastructural Issues

From Lock Number:	To Lock Number:	Reported Date:	Infrastructural Issue	Enter details below:
Soldiers Island	Naas Harbour	Mar-19	Racks	Land racks not working. The ratchet travels up and down but the paddle have rusted off ratchet arm

### 5.4.2 Reported Navigational Issues

Table 12 - Grand Canal Naas Line, Reported Navigational Issues

From Lock Number:	To Lock Number:	Report Date:	Navigational Issue	Enter details below:
Soldiers Island	Lock 1	Mar-19	Shallow, Silted	Between Soldiers Island and Naas Lock 1 – stretch includes Loc 53 24284°N, -6 67427°W Silt and Weed all along this stretch. Suspect weed is Nuttalis but need to get samples in 2019 to confirm.
		Mar-19	Excessive Weed	From main line to lock 1 of Naas branch (including each side of Soldiers Island) 4 x reports of excessive weed severely inhibiting progress to vessels.
		Mar-19	Shallow, Silted	Lock 1 Landing Jetty Too shallow to moor at landing jetty - can't get close to jetty.
Lock 1	Lock 1	Oct-19	Shallow, Silted	Silting at landing jetty below the first lock
Naas Harbour	Naas Harbour	Oct-19	Shallow, Silted	Only 18 inches of water and over 3 ft of silt at back of harbour, silt is being deposited by canal feeder which enters at this point.

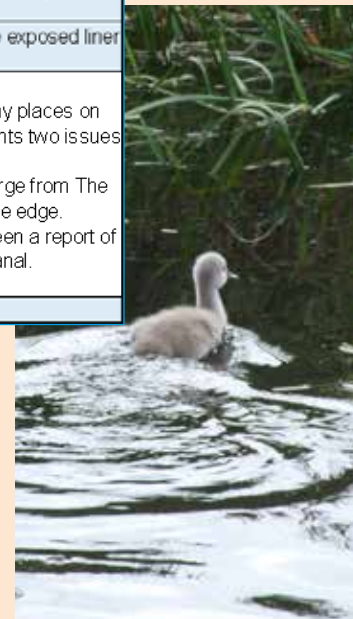
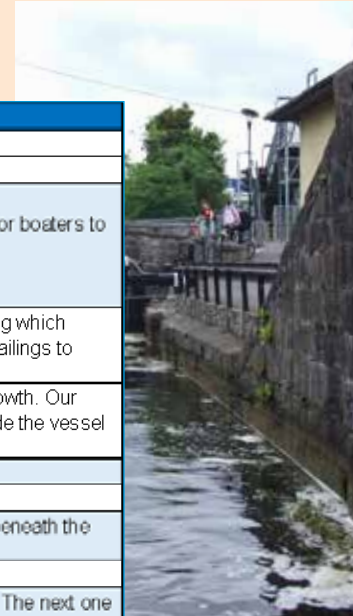


## 5.7 Royal Canal

### 5.7.1 Reported Infrastructural Issues

Table 13 - Royal Canal, Reported Infrastructural Issues, Lock 01 - Lock 46

From Lock Number	To Lock Number	Report Date	Infrastructural Issue	Enter details below:
Lock 01	Lock 02	May-19	Landing Jetty	Landing jetty deck has been pulled up but supporting frame still exists. This is not cordoned off
Lock 04	Lock 04	Dec-19	Lock Gate	Beam of lock gate has deteriorated over time and is in need of replacement before it collapses
Lock 05	Lock 06	Sep-19	Mooring Post	2019.08.28.01... Royal Canal Locks 5-6 Phibsborough A solid path and quay wall has been constructed without any mooring bollards, and there is now no method for boaters to plant mooring pins, which prevents any mooring to land crew for operating the locks. Action to take – Waterways Ireland to install mooring bollards to make lock operating possible.
Lock 13	Lock 14	Apr-19	Landing Jetty, Mooring Post	Maynooth Harbour: There are no mooring posts in Maynooth harbour, the water taps are outside a large railing which isolates the towpath from the water edge - vessel have to tie to the railings and crew have to climb over the railings to access the tow path - this is a very undesirable situation for boaters.
		Apr-19	Landing Jetty	Maynooth Harbour: Approach to water tap at Maynooth is very dangerous due to low water and high weed growth. Our barge went aground beside the tap. The problem was made worse after filling the the water tanks which made the vessel heavier and thus lower in the water - this posed significant difficulty pulling away from the tap.
Lock 15	Lock 16	May-19	Mooring Post	Mooring bollard above the 15th Lock is disintegrating - in need of replacement.
Lock 18	Lock 18	Apr-19	Lock Gate	Large Obstruction behind right breast Gate (traveling west)
Lock 25	Lock 26	Oct-19	Stone Work	Part of quayside missing at Belmont bridge on summit level. Several Quay stones are missing on one side beneath the bridge
Lock 26	Lock 27	Mar-19	Stone Work	Mullingar Harbour: Cap stone missing from wall of south bank
Lock 38	Lock 39	Oct-19	Spillway too low	Spillway in Abbeyshrule close to the pumps has water flowing over when level is up. It needs a board added. The next one heading East has grass growing beside it. Water pumped in at Abbeyshrule, as the level comes up, can be flowing over the spillway while the next spillway heading East from there has grass growing around it permanently.
		Oct-19	Canal Bank	In a couple of places on this level, on the north bank, the pottle clay has slipped exposing a plastic liner. The exposed liner is vulnerable to damage.
Lock 40	Lock 45	Mar-19	Canal Bank	Canal Bed profile: A 'V' shaped profile instead of the conventional 'U' shaped profile has been adopted in many places on the western sections of the canal, the canal bank slants at a 45 degree angle towards the centre. This presents two issues for large barges: 1 - It is not possible for a barge to moor on any of these sections, the profile of the canal bed prevents the barge from The result is boats are mooring out into the channel, making access to the bank difficult and leagetting close to the edge. 2 - The 'V' shaped canal bed inhibits the efficient displacement of water as a wide barge travels, there has been a report of a traditional Mbarge scraping along both sides of the banks while travelling along a 'V' section for restored canal.
Lock 46	Lock 46	Mar-19	Toilet Block	The shower block ceiling was covered in mould and dampness.





## 5.7.2 Reported Navigational Issues

Table 14 - Royal Canal, Reported Navigational Issues, Spencer Dock – Lock 14

From Lock Number:	To Lock Number:	Report Date	Navigational Issue	Enter details below:
Spencer Dock	Lock 01	Sep-19	Water Level Down	12 inches of water on the level. Dock superintendent advised that he is leaving the gates open. The level is now tidal and the flood defenses are not in use!
Lock 01	Lock 02	May-19	Propellor Fouling (Rope/matress/plastic/clothing)	2 mattresses were noticed on this level. One beside the red railings below lock 2 and 1 on the approach in to lock 1.
Lock 02	Lock 03	Jun-19	Shallow, Silted	The level between locks 2 and 3 is very short, although the water level was full - The reporters vessel (3'6" draft) went firmly aground above lock 2 and needed to be towed to get to lock 3. The vessels propellor became fouled and it was necessary to assess the propellor in lock 3, the reporters propellor was wrapped a ball of blanket type weed which also hung 4-5ft off the propellor. The level needs to be dredged.
Lock 08	Lock 08	Jun-19	Shallow, Silted	Vessel grounded under pedestrian bridge just before lock 8.
Lock 09	Lock 09	May-19	Shallow, Silted	Lock 9: Landing jetty below the 9th Lock is shallow - vessel grounding.
Lock 12	Lock 13	Mar-19	Fallen Tree, Overhanging Trees	Deep Sinking: Some serious work, cutting down trees, had taken place before we went through this section at the end of March 2018. However, branches need cutting back and there is a nasty tree sticking out on the north bank between Kennan Bridge and Clonsilla.
		Jun-19	Water Level Down	The level has dropped a foot. Miserable to cruise. Running a business with water levels this low is totally impossible.
		Jul-19	Water Level Down	Water level down 10" - vessel progress severely impeded - turning point silted with excessive weed - turning almost impossible
		Mar-19	Polluted, Silted	Land drain/feeder close to new railway bridge at Clonsilla. Ground water from adjacent housing development being discharged into the feeder. Filling the canal with highly silted water and changing the colour of the canal water. concerns of additional silting at the water outflow as a result.
Lock 13	Lock 24	Mar-19	Water Level Down	Water levels too low to travel.
Lock 13	Lock 14	Oct-19	Water Level Down	Maynooth level: water level on Maynooth is now kept artificially low since excessive rainfall event caused the canal to flood into the town. The level is constantly 8-10" below optimal level and significantly impedes vessel progress.
		Jun-19	Excessive Weed	Weed growth very very thick - vessel progress impossible
		Jun-19	Excessive Weed	Weed growth very very thick - vessel progress impossible
		Jun-19	Underwater Obstruction - Rocks/Tree Water Level Down	This level was down approx 8-12". For about 100 metres immediately after Pike Bridge and Quay at Carton House the bottom was rocky and gravelled, we struggled through it. This would indicate that the level was less than 3' 6" at this point and in need of dredging.
		Jun-19	Shallow, Silted Water Level Down	In Maynooth Harbour the section between the island and the slipway is generally silted. This level was also down 8-12" at the time. We motored into the harbour but it was very difficult to leave from a standing start.
		Jun-19	Shallow Water Level Down	For 100 metres after Bond Bridge outside Maynooth Harbour it's rocky and very shallow. We inched through it very slowly, this level was down but needs dredging.
May-19	Propellor Fouling (Rope/matress/plastic/clothing)	Large canvas sheet on the south bank 1/2 way between Jackson's and Bond bridge - Update Feb2020 - still at the side of the canal.		



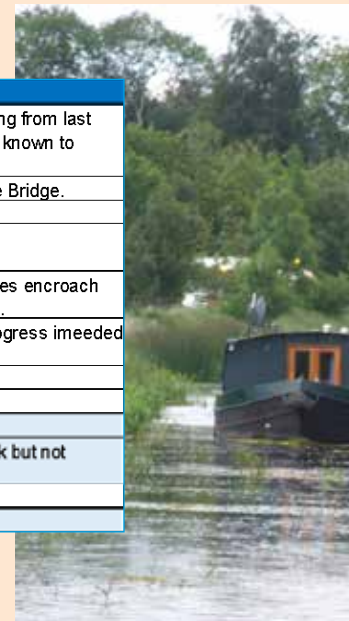
Table 15 - Royal Canal, Reported Navigational Issues, Lock 14 - Lock 24

From Lock Number:	To Lock Number:	Report Date:	Navigational Issue	Enter details below:
Lock 14	Lock 15	Dec-19	Polluted, Silted	Land drain/feeder below lock 15: Ground water from adjacent housing development being discharged into the feeder. Filling the canal with highly silted water and changing the colour of the canal water. Concerns of additional silting at the water outflow as a result.
Lock 15	Lock 16	Jun-19	Excessive Weed	Weed growth very thick - vessel progress impossible
		Jun-19	Low Air draft	Kilcock Harbour: canoe polo nets obstructing navigation of harbour - hanging in place 24/7
Lock 16	Lock 17	Jun-19	Excessive Weed	Weed growth very thick - vessel progress impossible
		Jul-19	Shallow	Concrete manhole at the side of the canal at old Leaf plant
		Sep-19	Water Level Down	Water level down for 4-5 weeks - no marine notice
Lock 16	Lock 13	Jul-19	Excessive Weed	Could not travel due to weed
Lock 17	Lock 18	Mar-19	Fallen Tree	West of Longwood: Debris in the canal from trees and shrubs cut down on south bank between Blackshade and Hill of Down/Killyon Bridges
		Mar-19	Fallen Tree	West of Longwood: Debris in the canal from trees and shrubs cut down on south bank between Blackshade and Hill of Down/Killyon Bridges
		Mar-19	Shallow, Silted	Hill of Down: Much improved since 2012 but vessel grounded on approach to Bridge
		Jun-19	Excessive Weed	Some areas where reed fringes encroach reduce the navigation channel - severely impeding vessel progress
		Nov-19	Shallow, Silted	Enfield area, approach from the west: The canal becomes shallow approaching the area where the trees become dense between towpath and canal (53°24'50.5"N 6°50'57.0"W) and continues shallow through Enfield until past Ballindemin Bridge
		Jun-19	Rubbish/Plastic Bags	Broken up sailing boat on North canal bank between blackshade bridge and Boyne aqueduct
		Aug-19	Water Level Down	water level low for 2 weeks
Lock 18	Lock 19	Oct-19	Excessive Weed	Vessel progress impossible - weed too dense - cutting required before vessel could continue
Lock 19	Lock 20	Oct-19	Excessive Weed	Vessel progress impossible - weed too dense - cutting required before vessel could continue
Lock 20	Lock 21	Oct-19	Excessive Weed	Vessel progress impossible - weed too dense - cutting required before vessel could continue
Lock 21	Lock 22	Oct-19	Excessive Weed	Vessel progress impossible - weed too dense - cutting required before vessel could continue
Lock 22	Lock 23	Oct-19	Excessive Weed	Vessel progress impossible - weed too dense - cutting required before vessel could continue
Lock 23	Lock 24	Oct-19	Excessive Weed	Vessel progress impossible - weed too dense - cutting required before vessel could continue



Table 16- Royal Canal, Reported Navigational Issues, Lock 25 - Lock 44

From Lock Number:	To Lock Number:	Report Date:	Navigational Issue	Enter details below:
Lock 25	Lock 26	Jan-19	Water Level Down	Water level almost down to nothing on the summit level. Very disappointing as the level was slowly recovering from last year's drought. A boat, The Elizabeth Rose, has been left stranded in the muddy channel. The owner is well known to Waterways Ireland and was notified of the impending drop in level. No Marine Notice has been issued.
		Mar-19	Rubbish/Plastic Bags	Apr 21 2018 Mullingar: Huge amounts of rubbish in the canal between the west side of the town and Grange Bridge.
		Apr-19	Water Level Down	Water level down approximately 10"
		Oct-19	Excessive Weed	Coolnahay to shandonagh bridge very narrow weed fringes shallow canal bed profile. Reed fringes encroaching on navigation and severely impeding vessel progress
		Oct-19	Excessive Weed	Summit Level: Shallow across the whole level - vessel progress severely inhibited in areas where reed fringes encroach on the navigation and reduce the width and disrupt the water displacement which facilitates vessel progress.
		Oct-19	Excessive Weed	Summit Level: Section before Mary Lynches - dense reed fringes encroaching on the navigation - vessel progress impeded further by weed not cut in the centre channel. To travel 800m took 1 hour!
Lock 39	Lock 40	Oct-19	Fallen Tree	Tree in edge of the channel on left above lock 39.
Lock 40	Lock 39	Oct-19	Shallow, Silted, Water Level Down	Spillway after Ballymahon well down, weeds and grass growing all round and well established.
		Oct-19	Water Level Down	40th water level down 11"
Lock 40	Lock 41	Oct-19	Shallow	The section from Cloonbreany Bridge to the 40th Lock is in need to dredging at the sides. Central depth is ok but not enough water to allow the boat to go forward.
Lock 42	Lock 43	Oct-19	Water Level Down	Water level down ~2ft
Lock 43	Lock 44	Oct-19	Water Level Down	Water level down ~2ft

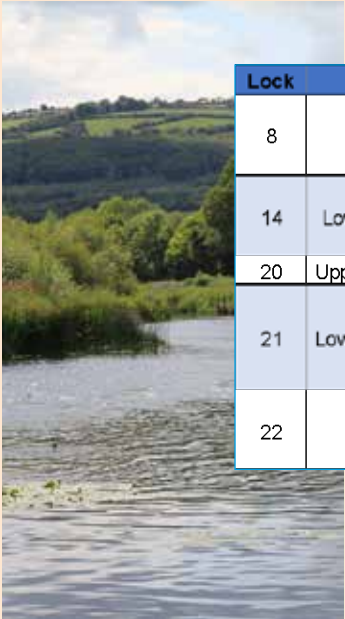


## 5.8 Barrow Navigation

### 5.8.1 Reported Infrastructural Issues

Table 17- Barrow Navigation, Reported Infrastructural Issues

Lock	Lock Name	Report Date:	Infrastructural Issue	Enter details below:
8	Rathvindon Lock	May-19	Stone Work	The 'key stone' is missing on the North Side of the brick bridge North of Rathvindon Lock
			Lock Gate	Misaligned mitre of tail gates
14	Lower Ballyellen Lock	May-19	Lock Gate	Misaligned mitres of both sets of gates. User reported debris behind the tail gates - It was not possible to open tail gates fully.
		May-19	Lock Gate	The breast gates do not open fully, submerged debris causing obstruction.
20	Upper Tinnahinch Lock	May-19	Lock Gate	The breast gates do not open fully, submerged debris causing obstruction.
21	Lower Tinnahinch Lock	May-19	Lock Gate	Offside tail gate - very difficult to open.
			Racks	Racks on tail gates are very difficult to open - these racks are reported to be the most difficult on the Barrow navigation. The user reported some back pain following operating these racks.
22	Carriglead Lock	May-19	Lock Gate	Misaligned mitre of top gates causing a leak under the offside gate.
			Racks	Rotten footboard and rack pedestal on tail gate. Rack slips when operation is attempted.

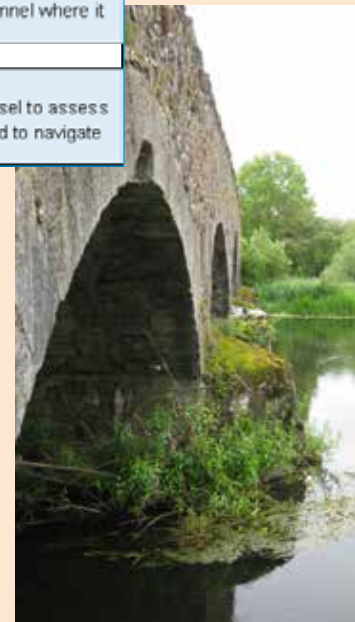
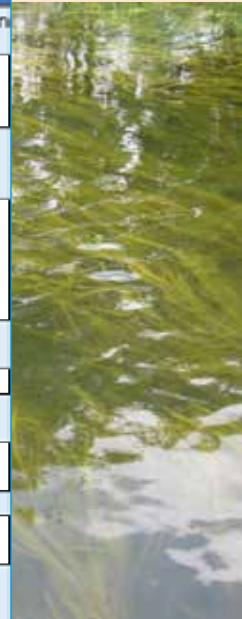




## 5.8.2 Reported Navigational Issues

Table 18 - Barrow Navigation, Reported Navigational Issues

Lock	Lock Name	Report Date:	Navigational Issue	Enter details below:
1	Ardreigh Lock	May-19	Navigation Marking	User reported that some bridges throughout the barrow navigation do not indicate the navigable arch, despite the navigation guide stipulating that navigation arch is marked Green & Red.
2	Levitstown Lock	May-19	Overhanging Trees	Below MAGENEY Bridge there is about three hundred yards of saplings encroaching over the 'boatstream'. The user had to drive through these branches to ensure sufficient depth under the vessel. Navigating the river to avoid these branches increases the likelihood of the vessel grounding outside of the boatstream
6	Clogrennan Lock	May-19	Underwater Obstruction - Rocks/Tree	Underwater obstacle approximately 200 meters upstream of Clogrennan Lock, vessel draft 2 ft 9" at the skeg / stern. In a midstream position (The vessel struck a solid underwater object and was shifted to the right - no vessel damage was incurred.
7	Milford Lock	May-19	Fallen Tree Navigation Marking	AUGHNABINNA ISLAND - TREE ACROSS THE NAVIGATION (May 2019) There is a 40 foot tree across the Navigation at Aughnabina Island, which is downstream of Milford Lock. The base of the tree is high on the East bank, two almost vertical branches enter the water and caused an obstruction to the navigation.  MISSING NAVIGATION SIGN - North end of Aughnandinna Island
9	Rathellan Lock	May-19	Shallow	Entering the lock cut on approach to Rathellan lock the depth drops below 3ft impeding progress to vessels, silting continues along the cut to 2ft depth approaching first bridge.
12	Slyguff Lock	May-19	Shallow	Downstream of Slyguff lock, on approach to lock users vessel grounded in shallow/silted area.
13	Upper Ballyellen Lock	May-19	Overhanging Trees Shallow	Saplings obstructing the Navigation on the off-side. Lock Cut depth shallow downstream of lock when reentering river.
14	Lower Ballyellen Lock	May-19	Shallow	The lock cut from the lock to the weir was reported to be shallow (less than 2'9") throughout its length. Excessive weed growth reported along the length of the cut.
15	Ballytiglea Lock	May-19	Shallow	There is a sand bank at the downstream approach to this lock, less than 2'9" of water depth.
16	Borris Lock	May-19	Fallen Tree	Fallen tree almost completely blocking the tow path. Situated about half way between Borris Lock and Ballingrane Lock, just above Mountain River outlet.
20	Upper Tinnahinch Lock	May-19	Shallow Silted	Moored vessels causing obstruction to lock moorings. The mooring and entrance to Upper Tinnahinch Lock has less than 3 feet of water depth.  The feeder stream downstream of Upper Tinnahinch lock has caused silting of the right hand side of the channel where it re-enters the river and is causing difficulty to navigation of vessels.
22	Carriglead Lock	May-19	Shallow	The lock cut upstream of carriglead lock is very shallow and is impeding vessel progress.
23	St Mullins Lock	May-19	Overhanging trees Navigational hazard	Between Carriglead Lock and St Mullins Lock there are two submerged weirs. A tree on the towpath is obstructing the view of the first weir which causes difficulty for the master of the vessel to assess the river ahead especially in higher flow situations. Safe navigation of the river and weir meant the master had to navigate close to the tree which meant branches were scraping the side of the vessel.



## 6. User Case Studies



Navigating a boat along either Canals or the River Barrow should be effortless for all boaters. Enticing Irish and overseas visitors onto these systems provides the socio-economic benefits of slow tourism and staycations to the waterside towns and villages in Carlow, Dublin, Kildare, Kilkenny, Longford, Meath, Offaly and Westmeath.

Most Irish inland boaters have not yet travelled on the Canals. They have expressed concern about the difficulties they hear others have experienced on these waterways. Understandably, they do not wish to go there.

We are missing out by not marketing these waterways to overseas boating tourists who could be convinced to undertake the 'Green & Silver' and the 'Goodly Barrow' routes, navigations that could be marketed within 'Ireland's Ancient East' and 'Ireland's Hidden Heartlands' initiatives. Visitors, especially those from Great Britain, France, Germany and the United States, who have in the past hired from companies on the River Shannon, would be allowed to take boats along the Green and Silver route, if the hire companies could be assured their boats did not experience extraordinary wear and tear and their clients could be assured of a pleasant journey without navigation difficulties. **Currently, barges hired from companies on the Canals, are experiencing unprecedented difficulties.**

The appearance of a hire boat on the canals is a moment for an exclamation of surprise by local inland boaters, a declaration of delight that visitors are getting an opportunity to experience the wonderful Irish midlands from the water.

As well as utilising contemporaneous survey input from boaters as they travelled along the Grand, Royal and Barrow systems, we consider it useful to include in this report the documented experience of some boaters on their journeys along the canals and the Barrow.

It is important to note there are useable stretches on the system in terms of depth and lack of weed, but any confidence in ease of passage is absolutely impossible to predict. Our Nav-Watch brief is to point out the challenges today, which unfortunately, outweigh any experience of effortless movement along the navigation.

We acknowledge the effort WI staff make to facilitate boats travelling in a group, where it is well planned in advance. In these cases, water is raked onto levels when required, extra staff from other duties are made available to operate locks and boaters are facilitated in every way on their journey. However, in cases where there are just one or two private or hire boats attempting travel on an ad-hoc basis, the same type of service will not be available.

### 6.1 Private Boater Experiences

We chose five case studies for viewpoints of a variety of boaters. These are just a selection from many stories from folk who have undertaken canal journeys over the years. Some have had positive experiences, others experienced the other end of the spectrum, an arduous and anxiety inducing journey for the boat owners and their crew. It is important to emphasise that in many ways the difficulties faced by all of these boats are unfortunately, quite typical.

The first boater is a seasoned traveller. We view a seasoned traveller as someone who has navigated the canal system and Barrow several times, has had their boat built or has purchased their boat within the navigational specifications and based on this, believe their journey can be undertaken safely and with efficient progress.

#### 6.1.1 Boat Journey No.1

Heritage Boat, 'M' Barge.

*"In 2013 we undertook the circular Green and Silver route in our M barge. The Royal canal was recently re-opened and was for the most part, in very good condition certainly as far as Mullingar from the Shannon. This is where we encountered the first of our difficulties with shallow water and rubbish, an experience which became far too common as we approached Dublin.*

*To my mind, the canal had been restored with no thought for a proper depth of water for boats of 4ft draft. A minimum depth of 5ft is necessary to allow navigation of the heritage barges which used to travel the system fully loaded.*

*The canal was far too shallow in some places, especially on the summit level.*

*We qualified and are very proud of our Green and Silver award, but it was a trip for the bucket and I certainly would never attempt it again in a barge.*

Our second boater owns a cruiser and at the time, was new to the canal system. Their boat however, had a shallow draft and was well within the navigational specifications.

### 6.1.2 Boat Journey No. 2

- *Cruiser, Royal Canal, spring 2019. Intention of the skipper to do the Green and Silver. Shallow draft cruiser. Non-regular traveller on the canal system. A shorter set of bullets but similar feedback to above and perhaps typical of a boater new to the canal system.*
- *Ongoing difficulty at every step of the way along all of the journey in to Dublin;*
- *Encountering of various navigational and infrastructural issues affecting efficient progress, similar to those encountered by the barge above, on the Grand Canal;*
- *Water depth particularly difficult in many locations, this is a specific issue for the Royal;*
- *Some good support from local WI staff however much reliance on the local volunteer waterways community many of whom are IWAI members;*
- *Ongoing reporting of issues to WI and appeal for assistance;*
- *Enthusiasm for the beauty of the trip and the commitment to make it and further market it to other waterways users, very much undermined by the experiences encountered however the trip was completed;*
- *Hundreds of euro damage to the boat, repairs to which were undertaken by the owner.*

The third boater is an experienced skipper, well versed with canal conditions and how best to deal with them. Their vessel is a heritage boat with a draft of 3ft and well within the navigational specifications.

### 6.1.3 Boat Journey No. 3

*"In autumn 2019 I planned to bring my boat east on the Royal Canal for the winter. In recent years prior to 2019 the Royal canal had been closed due to water shortages, it was not feasible to travel east due to low water levels and high weed. Because of the canal closures the weed growth was very dense however, Waterways Ireland committed to late season cutting and did a good job over the length of the canal. The weekend before I had planned to travel from Richmond Harbour I travelled the western section of the canal by car and discovered 6 levels were more than 2 foot down. I notified Waterways Ireland of my intention to travel and the levels were improved the following weekend, however, difficulties with two levels that weekend meant I had to travel on a level which was significantly low. The rest of my journey east was quite trouble free except for areas where reed fringes are excessively wide. The area east of Coolnahey and west of Mary Lynches were very difficult to make headway. The 800m section before Mary Lynches took an hour and a half to travel due to a combination of wide reed fringes, silting and weed in the center channel. These reed fringes also present a safety hazard, I was unable to get close enough to the bank to get off the boat even to manually pull the boat through the section.*

*The following weekend I encountered very dense and obstructive weed growth on the Killucan flight of 8 locks, rather than subjecting my boat to having to travel through this weed I stopped my journey and requested Waterways Ireland to cut before I could move. The maintenance crews kindly obliged and the following week I was able to continue my journey east without any further major issues."*

The fourth boater is also an experienced skipper, familiar with canal conditions and had done the Green & Silver previously in a different vessel. Their current vessel is a heritage boat with a draft of 3ft 6in and is also well within the navigational specifications.



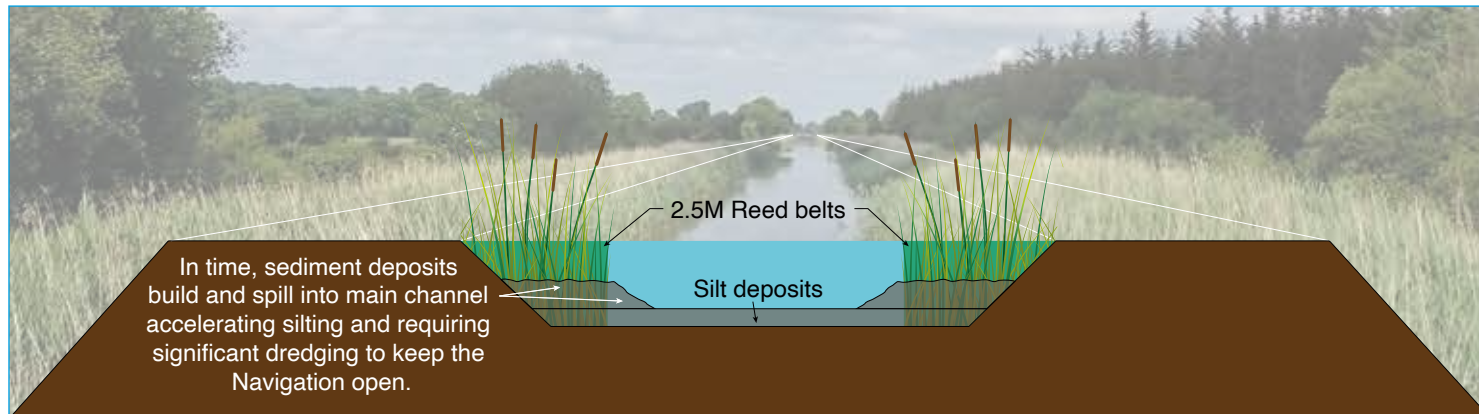




#### 6.1.4 Boat Journey No. 4

In 2019 I travelled the length of the Royal Canal from Dublin to Clondra by barge. I had done the journey three times before on a motor cruiser and found it quite manageable once you got the hang of the basics and any local issues. This time I was doing the journey in a 60' barge, 12' 6" wide and drawing 3'6" (depth). This was a totally different experience, one which gave me a healthy respect for the bargemen who originally plied their trade working barges of a very similar size.

The Reed Fringe continually hampered progress as I travelled both the Royal and Grand, it turned what should be a thoroughly enjoyable experience into a drudged chore. The very long stretches of Reed Fringe slowed progress significantly. Dense Weed in the navigation channel and deepening silt which causes us to bottom out are normally the main hindrances to passage but this added another huge hurdle to the equation.



There are other unforeseen problems with leaving a Reed Fringe:

1. Normally when operators are harvesting the Weed out of the canal, they deposit it on the grassy side and leave it to dry. Now, in areas where the Reed Fringe is wide, they cannot reach the bank with their outstretched hydraulic arm. This results in much of their cut Weed being dumped in the Reeds or on the edge of the bank, where it often slides back into the canal. This massively increases the build-up of decaying material floating on and just below the surface in the canal.

2. The Reed Fringe with intermingled Weed, often occurs in areas where it can cause added risk to boaters. For example, outside landing jetties at locks, it makes the jetty almost impossible to board from a boat

and outside many mooring posts, it renders them inaccessible, further depleting the number of secure mooring points available.

3. On two occasions I found I could make no progress. If the canal section is at all narrow then the Reed Fringe is literally brushing the barge on both sides. Progress is very slow through these sections with water displacement hampered. Having also caught Dense Weed on the prop I was not moving forward and came to a dead stop. Under normal circumstances I would moor on the nearest bank, anchor a couple of mooring pins to secure the barge leaving room for other boats to pass while I get into the water to remove debris from the prop. On these occasions the Reed Fringe prevented me from mooring and securing the barge, safely. This meant getting in the water behind a thirty-ton barge which could possibly be blown backward over me. An extremely dangerous situation which had to be undertaken because there was no other option available.

PICTURES:  
 (Top left) - Weed belts alongside mooring posts render them useless as boats can't get close to the bank to moor.  
 (Btm. left) - Weed belt by landing jetty at lock.

(Top right) - Displaced water flows past both sides of the barge causing lighter weed and reeds to lean over down into the water only to rise up again as we pass.

(Mid. right) - Weed belts leaving Richmond Harbour.

(Btm. right) - Dense weed belts hamper progress

#### 6.1.5 Boat Journey No. 5

Heritage M Barge, Grand Canal, spring 2019. Seasoned canal user.

- Many records of reporting navigational impediments from as far back as 2013 such as sunken vessels, debris, broken stonework and masonry in the water, low water, water pump failure, high weed growth and weed impact on water intake, gearbox and engine;

- *Towpath problems impacting on safety of access to boat; limited mooring available in many locations; as well as limited mooring bollards where mooring was in place (or even none even for instance even in the case of a new landing jetty!); bridge underpass towpath access not being maintained and mooring impeded;*
- *Stalling of boat due to silt built up resulting in the need to literally pull the barge by rope by hand over the undredged area of 3 feet depth when the canal was built to a depth of 6ft;*
- *Land racks broken at locks resulting in need to use lock gate racks which flood the decks of boats and is therefore a dangerous practice, and no locks keys available to customers to purchase by boaters at the height of the season;*
- *Records of water being racked off from underneath the barge as it was en route, physically grounding it and causing danger to the vessel and sluice gates were padlocked to the boater could not assist themselves to gain water, all down to lack of communication between a lockkeeper on one level and a lockkeeper on a neighbouring level, that a boat was in situ;*
- *Records of ongoing frequent correspondence with Waterways Ireland with acknowledgements and no results on the issues, some of which had been reported for many years;*
- *Records of ongoing engine damage costs of which must be undertaken by boat owner;*
- *Some commendations for local staff on the ground and in general a thanks to Waterways Ireland where the navigation is maintained;*
- *Correspondence with the Minister at the time, also outlining the above issues, with no results however a response that Waterways Ireland "operates independently".*

## 6.2 Commercial Boating Operator

Operating a business on the waterways also appears to have its challenges and is taken as the second perspective within the case study scenario. Static services such as the restaurant boats in Dublin do not encounter issues around moving boats and/or hiring to customers. Nav-Watch has been in contact with four businesses, and has mixed up their responses below so as not to identify any of them in particular. The comments are presented as quotes.

*"our customers admire how scenic the waterways are, especially seeing them from a boating perspective. They are also shocked at how few boats they meet ... they cannot understand why it is so underused.."*

*"over the years, we've had many problems related to weeds and water levels. In the last few years in particular, we've noticed an increase in weeds clogging the canal, and consequent boat damage."*

*"I've lost a substantial number of propellers due to low water levels on the canal... when there is a lack of dredging"*

*"three engines have blown up and a number of gear boxes have been destroyed as a direct result of weeds"*

*"Celtic Canal boats (20 boats), Lowtown Hire Boats (2 boats), Canalways (6 boats), Leisure Afloat (2 boats) and Valley Boats (6 boats) have given up"*

*"It is catch-22; weed cutting and navigation maintenance encourage more private boats onto the waterways. In turn, more boats help with keeping down the weeds. Private boat owners are tourists and staycationing, keeping revenue in Ireland. More private boats on the Canals and River Barrow will also lower anti-social behaviour along the waterways"*

*"the main issue is weeds, and the reduced hours of WI workers (they lost their few overtime hours) has led to the gradual and continual deterioration of the system..."*

*"being confined to x level keeps the weed down by travel every few days"*

*"Ireland needs these Canals and the Barrow River to be navigable. It is most important to encourage home tourism so they can navigate these waterways like the canals of England and France."*

*"We have a good relationship with the WI staff and on the ground, they work hard and are doing their best with what they have, but don't seem to have the personnel and maintenance staff or weed-cutters etc. to maintain the waterways. The Grand, Royal Canal and River Barrow should be promoted more. The more boats encouraged to use the waterways, the better for everyone."*

It is clear from both the survey input, from individual boaters case studies and the business operators that there are several themes emerging which could be considered critical success factors, addressed in this report as conclusions and recommendations.





## 7. Conclusions



- The wide volunteer base of the IWAI, the geographical spread of its branches and the expertise within the membership is a significant resource. This resource can be viewed as complementary to the remit of WI and can support collaboration in achieving constructive aims.
  - Our analysis of WI's finances shows an increasing shortfall of funds year on year with a reducing workforce. This has impacted maintenance operations on the Grand, Royal and Barrow navigations in recent years. The deterioration of the canals in recent years, making them virtually impassable for many boats from June to September, means that boaters have been unable to join with local organisations in events at towns and villages along the system. These events bring much needed income to rural locations.
  - The survey results highlight that there is a need to undertake a comprehensive review of maintenance on the navigations. In the summer months (May - Oct) much of the canals are unnavigable due to either excessive weed or fluctuating water levels.
  - Many of the faults collated by this Nav-Watch report can be repaired or improved. However, infrastructural faults and lack of dredging are serious problems. Regular weed control appears to be a major failing.
  - To solve the current infrastructure and maintenance problems, it may be possible to target resources more effectively.
    - WI management has stated that the current weed control methodology has been decided on an economic basis. However, if small changes are made and a sustainable weed management method is adopted, as outlined by Caffrey and Monaghan (2006), it would be possible to significantly reduce some of the obstructive weed from the navigations and to have that positive impact continue into the future year upon year.
    - The experiences of many boaters are echoed in the issues logged to Nav-Watch, confirming that the **current weed control strategy is not working to maintain an open navigation where vessels can proceed efficiently** at all times of the year.
  - Reliable and ongoing weed management and dredging programmes are absolutely key to attracting and keeping boats navigating the Canals and Barrow systems.
  - Appeals for assistance are frequent and sometimes met with a reactive response by WI, however more often than not the response is an acknowledgement of the issue raised rather than an actual change of practice to address the problem.
  - For regular users of the waterways, reporting to Nav-Watch, it is significantly apparent that a reduction in staff and budgets in recent years has had a disastrous impact on the waterways, coupled with what does not seem to be in any way a transparent management process around weed control and depth management.
  - The perception is that resources are being directed towards Greenways and Blueways rather than the actual waterways.
  - The tourism potential of the canals and Barrow waterways has yet to be discovered and fully understood by the relevant agencies (Councils, Fáilte Ireland, Tourism Ireland and Waterways Ireland). Tourism Ireland, the all-island marketing organization who brought us 'Ireland's Ancient East' and 'Ireland's Hidden Heartlands', do not include the canals and the River Barrow in these campaigns. They are not viewed as having the same scope for tourism as the Shannon and Erne, which are seasonal. In many respects these navigations are undiscovered jewels, which, given the same focus and promotion as the Shannon and Erne could yield significant tourism opportunities to the benefit of local rural economies. Tourism on the canals has year-round possibilities as the canals are open throughout the winter and are a safe cruising ground. Warmer winters further enhance this possibility.
- Once again, the report can state that where works have been done, whether it is a deep weed cut, some deep dredging or replacement jetties, that work is to be strongly acknowledged as it makes all the difference. This report is produced from the perspective of hoping to positively contribute to the future of the waterway and it gives the project team no pleasure to advise on the current level of issues that we have been able to collate.
- We hope this report is seen as a helpful document to chart the way forward for improvement and use of these historic navigations.



## 8. Recommendations

- View the items listed in this report as a list of opportunities to improve the Grand Canal, the Royal Canal and the River Barrow. Their development into a set of upgrade tasks can form part of an implementation plan and schedule, for the benefit of all those using them.
- Initiate procedures to understand the variation in weed density and species, and implement a comprehensive control strategy to minimise the obstructive growth of weed in summer months which renders the canal unnavigable right now.
- Department to assign funding to WI, for a one-off Capital project in 2021, to remove the current build-up of silt and reed/weed in the navigations on the River Barrow, the Grand Canal and the Royal canal. Department to increase the annual 85/15% Basic Funding to WI starting in 2021, to ring-fence specific funds for resources to be assigned exclusively to maintaining clear navigations on the River Barrow, the Grand Canal and the Royal Canal, so they are not allowed to deteriorate again.
- Analyse the socio-economic benefits of the Green and Silver route, Ireland's only circular navigation, market as a year-round destination within *Ireland's Ancient East* and *Ireland's Hidden Heartlands* brands.
- Encourage more boating by Irish and overseas tourists on the River Barrow and market within the *Ireland's Ancient East* brand.
- Grow tranquillity tourism on the Canals for Irish and overseas tourists to enjoy quiet locations along the Canals and Barrow.
- Include inland navigations as part of the development plans created by local authorities.
- Work with local town and county councils to provide summer events along the waterways to highlight local heritage. Bring together users of the Greenways, Boaters on large and small vessels and the local community to support these events.
- Market the canals and the Barrow as not just historic navigations, but places that can be enjoyed as unique Living History experiences, of interest to Irish and overseas visitors.

- Nav-Watch to continue its operational activities, online logging system and to continue contributing to WI's view of the canals and Barrow system, from the boater's unique perspective.

Through continued collaboration between all parties, we hope to see boating tourism on these navigations develop and grow.

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## 10. Looking Back, to Move Forward



*Clashganny Lock River Barrow  
2011, by C. Nolan*

In a research project like this, where we wanted to uncover the remedial actions required to bring the navigations back to a useable condition, we were very conscious of the need to avoid blame, and to look at the underlying causes behind the neglect on the Grand, Royal and Barrow in recent years.

As experienced boaters and frequent travellers of these waterways we have grown fond of and admire those WI staff on the ground, who assist us when we get in trouble. We all have our stories of the 'incidents' in our watery travels from Dublin to the Shannon or south to Waterford. As conditions have worsened in recent years, WI staff have been there to assist. They have helped us when we went aground with the offer of a rope from the shore. They have towed us from shore, through rocks and silt, when engaging the engine would have caused serious damage to our boats in dangerous situations. They have stood on watch when we had to go into the water to remove rubbish from our props. They at times, have made sure we got to a safe mooring for the night and did all they could so that we might continue to enjoy our holidays, in spite of the struggles. WI should be proud of those staff who go out of their way to provide this level of customer support.

The authors would like to express their appreciation of the management, maintenance and operations teams. The knowledge and passion of the teams is evident in their daily operations. Working on the canals, a 200 year old waterway, requires a high level of knowledge and experience. WI's maintenance and operations teams are constantly faced with new challenges which they have to overcome to maintain the canals and navigation in a manner which is sensitive to the environment and the functional heritage of the canals. This requires a high degree of intangible tacit knowledge which, has been passed down through operations teams over the years and hopefully, will continue. We welcome that WI have restarted the lock gate factory and are investing in preserving such heritage carpentry skills. We hope the same approach can be adopted to other relevant specialised skills and be utilised and integrated with current engineering advancements. It is imperative to pass these skills on, for the benefit of maintaining and managing these historic navigations.

We can see the huge tourism potential of the canals and the Barrow. These waters are a piece of our industrial heritage, still operating as they did two

hundred years ago when they were the country's highways and main cargo routes. Greenways and the various activities which they support are possible and are enhanced by bordering these heritage navigational structures. They are in effect 'Living History'. Today they are of interest to tourists from Ireland and abroad as a place to enjoy healthy outdoor fun. Unfortunately, the difficulties detailed in this report are preventing people from enjoying them and in turn, denying additional income to the urban and rural communities, in the counties adjacent to the canals and river.

Many types of boat find it impossible to negotiate the Grand, Royal and Barrow, because of the silt build up. English type barges with 2ft drafts, have become very popular. Traditional Irish barges and barges built twenty years ago with 3ft drafts are now denied access because of the difficulties in forging ahead through silt and weed. Another part of our heritage is waning; the many heritage boats which survive can no longer have access to their traditional waters. Horror stories of poor conditions spread, resulting in many barge and boat owners vowing to never return to the canals.

The Royal Canal has unique difficulties. Despite the very restricted access posed by the Newcomon Rail Bridge at Spencer Dock in Dublin, many do make the considerable effort to bypass this obstacle. Those who do are rewarded with views of an undulating green corridor which runs from the heart of Dublin to the Shannon. Having completed the trip, most vow to return to repeat the journey more slowly.

For those whose business involves hiring boats to customers on the waterways, the situation is more dire. Breakdowns, damage and lack of headway results in spoiled holidays and directly affects the reputation and income of these businesses, it also reflects badly on Ireland's reputation as an international tourism destination.

We have watched the canals deteriorate in recent years. One of the main conclusions in this report is that the canals need to be maintained regularly, so there is clear water in which boats can navigate. The difficulty in putting forward a case to put money back into maintaining canals, is the immediate return on this investment cannot be measured in either footfall or money. The return is intangible. Showing clear, vibrant canals, with ancient structures and boats moored, underway or going through locks, improves the visual 'setting' for the visitor, making the immediate surroundings more engaging. But how does this translate into Euros spent in the local village or town? On the other hand, if we fail to remove silt, rocks and weed from these navigational waters, what is the price that will



need to be paid to re-create the channels in the future when those in government realise what we have lost? Or there is no more space for the water to go and the land and homes on either side of the Barrow has extended flooding?

Tourists from Ireland and abroad are enthralled by our canals and canal boats. For many of us, the opportunity to interact with people in a crowd or individually while going through a lock, adds to our enjoyment. It is not uncommon for a tour bus or a car to stop and gather to watch as the water flows in and out of the lock. This happens both in urban and rural locations. Most of us like being 'waterways ambassadors', answering questions about the history and operation of the canals, distributing WI literature and sharing IWAJ magazines to those with an interest.

In years past, we have enjoyed festivals and events along the canals and Barrow. On a Friday evening it was not unusual to see boats and their crews, gathering in harbours and on quay walls, eager to participate in the upcoming boating rallies and local festivals. Some might be there for the weekend, others on longer holidays, but all looking forward to meeting up with other crews and spending time in the local community. Due to the current conditions and the difficulties traversing these waterways in late Spring and Summer, participating in these town and village events is no longer an option. For example, in 2019 many boaters attended the revived Edenderry Easter Festival, but then headed west onto the Shannon before

the weed in the canal grew worse, not returning until the beginning of October, when the weed had started to die down, in the colder weather.

*The following are photographs of some well attended, vibrant gatherings on the Grand, Royal and Barrow. We hope vessels can return in even greater numbers in the near future and help to build an international reputation for our canals as a year-round idyllic cruising destination.*



Edenderry GC 2019, by D.M-Baker



Abbeyshrule RC 2012, by D. Woolhead



Edenderry GC 2019, by D.M-Baker



Liffey 2014, by J. Cahill



Edenderry GC 2019, by D.M-Baker



Edenderry GC 2019, by D.M-Baker





Castleknock RC, by D.Woolhead



Goresbridge RB 2011, by E. O'Loughlin



Abbeysrule RC 2012, by D.Woolhead



Ballycommon GC 2009, by G. Gavin



Corbally Branch GC 2016, by J. Moloney



Mullingar Harbour RC 2012, by E.O'Loughlin



Shannon Harbour GC 2010, by E.O'Loughlin



Portobello GC, 2014, by J. Cahill



Naas Harbour GC 2017, by J. Moloney





Tullamore Harbour GC 2009, by Richard May



Tullamore GC 2012, by E.O'Loughlin



Tullamore GC 2016, by E. O'Loughlin





Sallins GC 2018, by Bargetrip.ie



Sallins GC 2020, by Bargetrip.ie



Kilcock RC 2012, by D.Woolhead



Athy Castle, River Barrow 2010, by Barrowline Cruisers



Liffey 2012, by D.Woolhead



Dublin GC 2012, by Conor Nolan



Maganey, River Barrow 2011, by Barrowline Cruisers

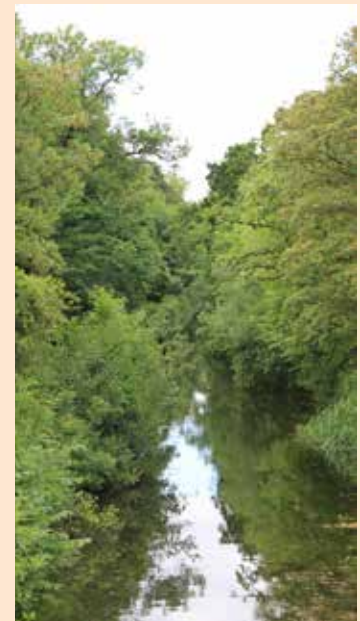


GCD Dublin 2009, by M. Kinahan



Coolnahay RC 2012, by E. O'Loughlin





*“They plied their trade throughout the land,  
Down the Barrow, the Royal and the Grand,  
A wider network brought their cargo farther,  
Now, few barges pass through Shannon Harbour.”*

Denis M-Baker



Inland Waterways Association of Ireland



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