

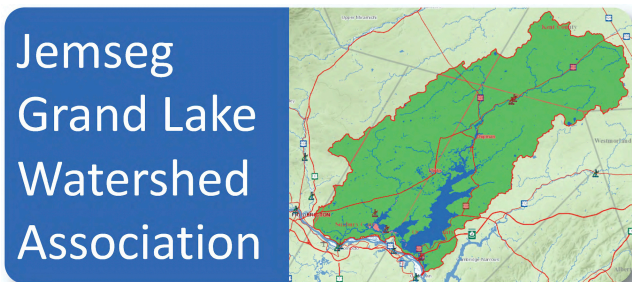
Jemseg Grand Lake Watershed Association  
Final Report of the N.B. Environmental Trust Fund Project  
210067

Riparian Zone Tree Planting in the Jemseg Grand Lake  
Watershed

by

Kim Reeder, Brad Nickerson and Michael Thorne  
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Jemseg Grand Lake Watershed Association Report 22-02



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Riparian Zone Tree Planting in the Jemseg Grand Lake Watershed  
**Jemseg Grand Lake Watershed Association**

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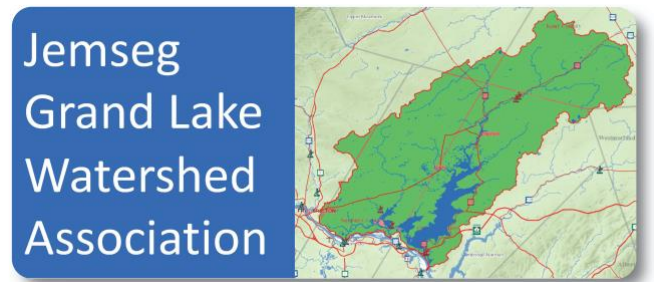
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## 1. Executive Summary

Establishing red-tip willows and other water-loving native plant species with strong root systems is an ideal way to help protect a shoreline from erosion. Restoring such vegetation helps protect properties from the destruction caused by flooding, strong currents, and heavy rains, which is a concern to many residents and property owners. A stable landscape and increased vegetation also contribute directly to the maintenance of a healthy watershed ecosystem. In addition, a green shoreline helps maintain water quality, moderate temperatures, and creates a habitat for wildlife. Heavy wave action can quickly erode shorelines and riparian zones. Grand Lake, in particular, is unique as the largest freshwater lake in the Maritimes, covering 171 square km. Its size gives rise to significant erosion caused by wave action.

In 2021 the Jemseg Grand Lake Watershed Association was able to deliver approximately 1,900 red-tip willows (*Salix eriocephala*) to 43 Association members for planting in riparian zones. With the assistance of our part-time project coordinator, we tracked the progress of growth during the growing season. We estimate that the transplanted red-tip willows cover an area of approximately 1.6 ha (4 acres) at a plant spacing of 3 feet on centre.

Based on visits to 21 planting sites, approximately 60% of the red-tip willows survived until Oct. 8, 2021. Throughout the season, and through two significant planting site visits, we learned that rooted cuttings do not like hot, full sun when transplanted. Rooted cuttings coming from the greenhouse are susceptible to overpowering sun conditions (even when well-watered) compared to being inside a greenhouse during the months of March and April. They will wilt, drop their leaves and can die from this lack of ability to withstand constant direct sunlight, even when transplanted into a pot with 14 times the volume of soil in a 1/40 multipot position. Our plans for 2022 reflect the lessons learned in 2021.

## 2. Priority Area/Priority Area Measures

Our June 30, 2022 revised priority area submission included the following:

(a) Protecting our Environment- Riparian zone restoration activities (e.g. tree planting, bioengineering). 1094 square metres; 1,520 red-tip willow plants, estimate based on 28.8 sq m for one multipot of 40 red-tip willow rooted cuttings

**Delivered:** 1,596 square metres, 1,900 red-tip willow plants, area estimate based on 33.62 sq m for one multipot of 40 red-tip willow cuttings or transplants planted at 3 foot on-centre spacing in a triangular pattern (see Figure 1 below).

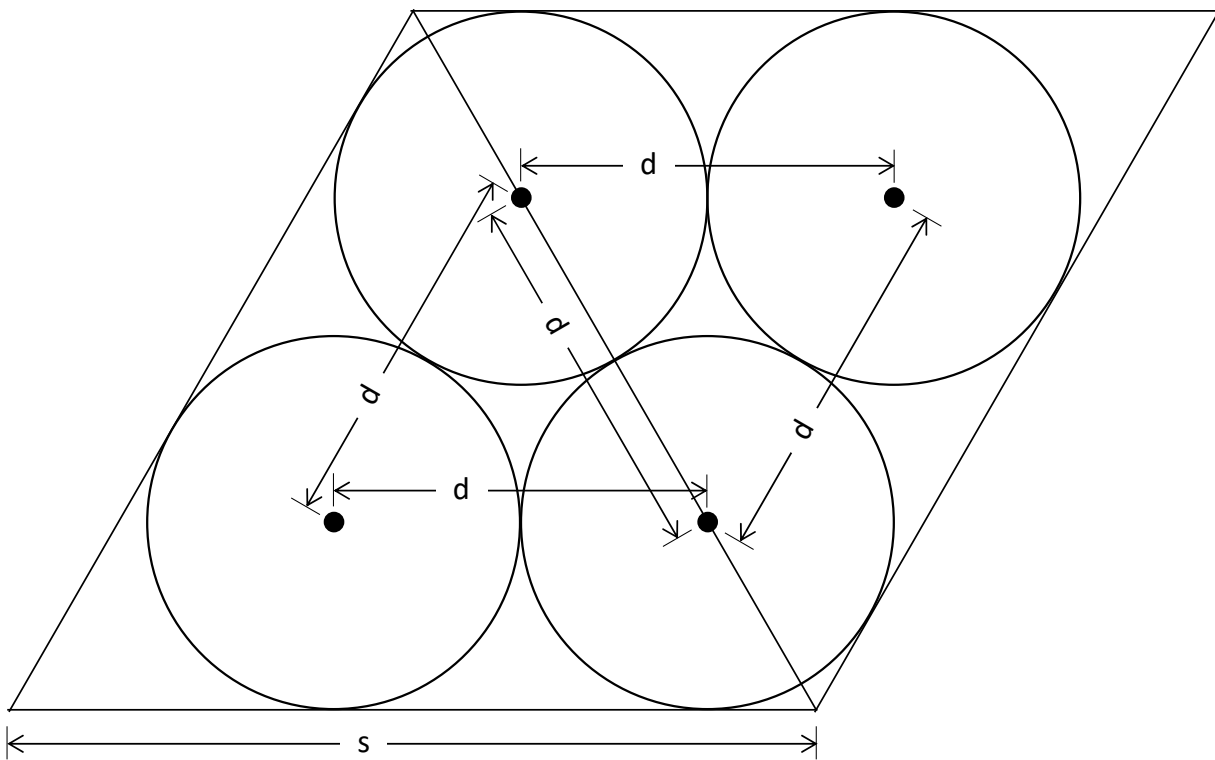


Figure 1. Estimating the area covered by four red-tip willows planted at the black dot locations in a triangular pattern at a distance  $d$  metres apart. The area  $A$  covered by the two equilateral triangles is assumed to be the planting area, and  $A = 4.0207 d^2$ . For  $d = 3$  feet =  $0.9144$  m, the area covered by four red-tip willows is  $3.362$  sq m, and 40 would cover  $33.62$  sq m, or  $0.84$  sq m per red-tip willow plant.

(b) Addressing Climate Change- This measure will track the number of people who have taken part in a climate change education/awareness initiative.

A) Number of participants: 38, **Delivered:** Number of participants: 48

B) Type of activity: hands-on planting, transplanting, watering, taking care of red-tip willows, **Delivered:** hands-on planting, transplanting, watering, taking care of red-tip willows, education via website availability of planting instructions and examples of red-tip willow shoreline erosion protection, in-person instruction on planting red-tip willows, follow-up surveys of planted red-tip willows.

C) Activity duration: 1,632 hours, **Delivered:** 2,256 hours, four members to water and care for 120 transplants each for 70 days, watering once every 2 days (on average), 42 members each planting, watering and caring for 40 rooted cuttings for 3 hours per week for 16 weeks, volunteers to obtain pictures and post website content, 21 members to engage with the project coordinator to send pictures and report on red-tip willow growth and survival rate.

### 3. Project timeline and milestones

In January of 2021 two volunteers from the Jemseg Grand Lake Watershed Association harvested approximately 650 3 to 5 foot red-tip willow (*Salix eriocephala*) whips from one of the volunteers' willow plantation in Waterborough, NB (Figure 1). An additional volunteer was engaged, and the whips were delivered to the Irving Woodlands greenhouse in Sussex.





Figure 1. Association volunteer readying whips for delivery to Irving Woodlands Sussex greenhouse.

In March, the red-tip willow cuttings (approximately 8 inches long) were started in 40-plant multipots in the Sussex greenhouse of Irving Woodlands (Figure 2). At the end of April, the Red-tip willow rooted cuttings moved to a cold frame.



Figure 2. In the Irving Woodlands Sussex greenhouse.

In mid-May, volunteers picked up 70 multipots containing approximately 2,800 red-tip willow rooted cuttings in Sussex and delivered them to a volunteer's home. The volunteers kept the willows watered. A huge thanks goes to Irving Woodlands Sussex greenhouse staff for contributing their expertise in growing 2,800 healthy rooted cuttings, and in providing advice on how best to grow transplanted rooted cuttings.

At the end of May, the project coordinator and multiple volunteers transplanted 9 multipots at the homes of three more association volunteers' homes (Figure 3). The Association had previously purchased potting



soil, transplant pots, trays to hold the transplant pots, water soluble PlantProd 10-52-10 fertilizer and hermitically sealed pots to hold the fertilizer.



Figure 3. Transplanting rooted cuttings.

A pickup day was held in Waterborough on May 22, 2021 for members who had reserved multipots (Figure 4). This event took place under social distancing and mask wearing rules. A planting instructions and questionnaire sheet (see Appendix 1) was given to all those picking up red-tip willows. Additionally, in the last week of May new members joined, and picked up their multipots. Association volunteers also delivered some multipots to new members who couldn't easily travel to Waterborough for pickup on May 22.



Figure 4. Pickup day, May 22, 2021.

On May 29, 2021, 13 multipots of willows were planted in the willow plantation in Waterborough after the plantation owner prepared the ground with his tractor. The purpose of this planting of 520 red-tip willows is to provide additional red-tip willows for harvesting, growing into rooted cuttings, and delivering to watershed association members for planting in riparian zones. The plantation owner also cultivated around some of his existing rows of red-tip willows, and installed a pump to draw water from an onsite pond for watering the transplanted red-tip willow rooted cuttings. Figure 5 illustrates some of the transplanted red-tip willows in the plantation.





Figure 5. Red-tip willow rooted cuttings transplanted to a willow plantation to increase the supply of red-tip willow stakes and rooted cuttings for riparian zone tree planting. Picture taken June 24, 2022.

At the beginning of June, three volunteers completed another transplanting day at the home of one of the association's senior members (Figure 5). Until mid-June, association volunteers delivered and shared many more of the Red-tipped willow multipots, including to the Chipman Communities in Bloom group. That group had hired a summer student to help with the Communities in Bloom program, which included distribution of red-tip willows to their members for planting on shorelines.



Figure 5. Caretaker of transplants and Communities in Bloom partner.

By mid-June, not including the transplants in the plantation, 12 multipots were transplanted into six-inch pots at members' home for them to water, feed and look after for four to six weeks, until the Association's summer resident members had arrived at their cottages for the season (Figure 6). The rest of June involved answering questions and coaching members in their planting endeavors.





Figure 6. One site that hosted plants while awaiting pickup by summer residents. Picture on the right shows a well-rooted transplant planted on July 3, 2021.

In the early days of July, the project coordinator and a volunteer delivered seven six-packs of transplanted red-tip willows throughout the region and discussed with members their shorelines, and the Riparian Zone project. They then moved the remaining nine multipots of red-tip willows to the volunteer's home and transplanted 180 red-tip willows from multipots to six inch transplant pots with help from another Association volunteer.

Around the same time, the Association faced two concurrent challenges. One set of multipots that were awaiting pickup from summer residents dropped all their leaves (Figure 7), and in another location the landlord of the volunteer caring for the plants wanted them moved. Volunteers moved these transplants to the main pickup location in Waterborough.



Figure 7. Transplants seen in Figure 6 suffered leaf drop; picture taken on July 6, 2021.

In mid-July various Association members picked up transplanted willows from the main collection to plant along their shorelines.

Close to the end of July the project coordinator visited 18 Association member red-tip willow sites to review the status of planted red-tip willows and met with 11 homeowners. Seven of the homeowners were not available, but the coordinator was able to view most of their planted willows with prior permission from the members. Some of the planted willows could not be found, and the coordinator suggested that in the 2022 planting season, the Association should tie a piece of colourful wool yarn onto new red-tip willow rooted cuttings for easier field identification. An estimated survival rate of 75% was observed for red-tip willows



planted (Figure 8). The coordinator was also able to deliver nine six-packs of transplanted willows to two members who requested them during her July visit.



Figure 8. Status of growth, various sites, July 2021. Notice in the bottom picture that the full sun transplant has dropped its leaves while the partial sun transplant seems to be growing well.

In August, sixteen six-packs of transplanted red-tip willows were picked up by new members at the Cambridge Narrows Life at the Lakes event (Figure 9).



Figure 9. Four association volunteers providing environmental education in August 2021.

As well, the eleven six-packs of transplanted red-tip willows (66 red-tip willows) that had dropped their leaves in July were picked up and brought to the main pickup location, 28 were completely dead (no green at all,  $38/66 = 57\%$  survival rate) (Figure 10). The rest of the transplants which had dropped their leaves completely around July 6 had very small, limited leaf growth. Also picked up were eight six-packs of transplanted willows from an off-site location, which were very healthy, and with some about three feet tall. The primary difference in the leaf-drop versus healthy site was that the healthy site was primarily shaded by high trees during the day, whereas the leaf-drop site received sunshine for the entire daylight hours. The red-tip willows were transplanted at both locations on May 21 and had been growing in their transplant locations for 85 days, or almost three months. Watering and feeding at both locations was regular, with water as needed, and feeding with one level teaspoon of water soluble 10-52-10 PlantProd fertilizer in 7 to 8 liters of water once per week.





Figure 10. Main pickup location hosting red-tip willows in various conditions. Note the metre-tall transplants at the back compared to the leaf drop transplants in the foreground. Picture taken Aug. 13, 2021.

In the 3<sup>rd</sup> week of September, the final 34 plants at offsite locations were brought to the main pick up and collection site. Only eight of the 24 plants had leaves on them. Concurrently, four multipots and 8 six-packs of willows from the main pick-up location were delivered by a volunteer to the Nashwaak Watershed Association for planting in the Campbell Creek dam removal restoration site.

In the first week of October, the project coordinator visited 10 Association member red-tip willow sites to review the status of planted red-tip willows. She also followed up by contacting other members she could not visit and obtained some photos and estimated survival rates from them.

At the end of October, volunteers moved the remaining 43 six-packs (258) transplanted willows in six-inch pots to a protected winter location in the plantation (Figure 11).





Figure 11. Moving remaining potted red-tip willows to a winter location.

#### 4. Lessons Learned

Throughout the season we learned that rooted cuttings do not like hot, full sun when transplanted. In one location where the rooted cuttings were transplanted to six-inch pots, the transplants dropped all their leaves on July 6, and only about 50% recovered. These were in a very sunny area with no shade at any time during the day. In a second location where transplants were in a more shaded area, all the transplants survived, and some grew to over a meter in height. In both locations the watering and feeding of plants was done regularly. The plantation owner also noticed that the 520 rooted cuttings he planted in his willow plantation suffered significantly during hot days in June even though he was watering them regularly from an irrigation pond. Figure 8 also illustrates partial vs full sun

- 650 harvested whips were grown into approximately 2800 rooted cuttings at the Irving Woodlands greenhouse in Sussex
- 4% (112) of these died or are unaccounted for
- 28% (780) of the total rooted cuttings went back to the red-tip willow plantation in Waterborough, N.B. (67% planted and 33% stored)
- 68% (1,890) red-tip willows were planted on shorelines, (approximately 3% as transplants)
- Of the 1890 red-tip willows planted on shorelines 60% (1,134) survived by Oct 8, 2021. (In July survival rate for 21 sites was 83% - both statistics based on 21 of the sites which reported twice or 28% of willows distributed).
- 72% survival rate in Oct (based on 21 members = 640 rooted cuttings and 210 transplants)
- The average condition of the shoreline plantings in October, 2021 was fair to good.
- The shoreline plantings were spread over 47 sites.
- Based on our calculations of 2 red-tip willows/m<sup>2</sup> we helped establish **1,600m<sup>2</sup> of shoreline restoration.**



We also tracked the number of the number of participants **in environmental education/awareness initiatives**. Activities included planning, transporting, planting, watering, weeding, and general care of red-tip willows. Activities also included providing education about shoreline erosion, adaptation methods and the benefits of natural shoreline protection, as follows:

**42 members and 2 community groups were involved in planting**, watering, weeding, and general care of red-tip willows.

Of these, **6 volunteers and one paid staff member** were involved in formal delivery of education regarding shoreline erosion, adaptation methods and the benefits of natural shoreline protection, including **20 person-hours of information booth type activity, approximately 80 hours of one-on-one interaction** with those conducting shoreline planting, as well as planning and providing website content.

**4 volunteers and the Irving Woodlands greenhouse** in Sussex, were relied upon for red-tip willow preparation and advice before May pick up and transplant operations.

Transplanting activities involved **7 volunteers and one part-time contract staff and took approximately 6 hours**.

**8 volunteers** took on the responsibility of care-taking red-tip willows for varying periods of time from 1 to 3 months, while watering as required and fertilizing one-weekly.

In July, 2021, our Association started discussions with N.B. DELG staff about the necessity of obtaining a WAWA permit for permitting each property owner to plant native red-tip willow rooted cuttings in the riparian zone on their own properties. The current WAWA permit application process does not fit our need for one WAWA permit to cover multiple sites as required in this project. A suggestion was made to staff at the N.B. DELG Source and Surface Water Management (SSWM) Branch and to Minister Crossman to add a new exception to the Watercourse and Wetland Alteration Regulation, NB Reg 90-80 section

*3(3) Persons undertaking or proceeding with any of or any combination of the following activities are exempt from the requirement to obtain a permit under paragraph 15(1)(b) of the Act:*  
to exempt those wishing to plant native trees on their property shoreline from obtaining a WAWA permit.

This resulted in a Zoom meeting on Jan. 11, 2022 between staff of the Source and Surface Water Management (SSWM) Branch and members of our Association. Working together, we arrived at a reasonable approach that sees our Association apply for one WAWA permit to cover all members who plan to plant red-tip willows on their property. On February 24<sup>th</sup>, 2022, we received a confirmation email from **Frederic Paillard**, Director - Source and Surface Water Management Branch, acknowledging that this approach was satisfactory a 2022 version of this project. The approach includes changes to our current membership application form to note where the willows will be planted for new members, and a reservation form pickup sheet that clearly states that our Association is applying for a WAWA on behalf of the member, and includes the address where the willows will be planted. Sample versions of these forms are in the attached appendices 2 and 3. Additionally, the Association's proposed amendment to add an exemption

*(g) property owner planting of New Brunswick native plant species using hand tools only in riparian zones or wetlands for the purpose of protecting, preserving and enhancing the Province's natural environment.*

to section 3(3) of the WAWA Regulation, will be taken into consideration by the Source and Surface Water Management Branch.

## 5. Plans for 2022 Season

Various ideas have been collected to ensure a successful 2022/2023 riparian zone planting program and include:

- Reservations should start in January to attain an appropriate number of willow rooted cuttings.
- Experiment with planting cuttings with no roots (also called stakes) after soaking when removed from freezer storage.
- Less transplanting as it is very time consuming. Only 3 of 31 members requested red-tip willows later in the season (e.g. mid-June).
- Recommend planting in a somewhat shaded area (high overhead shade is the best).
- Recommend adding potting soil, bone meal and/or manure when transplanting into shoreline locations (as we recommended in 2020).
- Recommend daily watering (when not raining) for at least the first month for best survival rates.
- Recommend a colourful biodegradable tag – like red yarn or a small wooden blue coloured labelled stake of some sort to identify locations of transplanted red-tip willows. This will make surveys of plant growth progress much easier.
- Planting instructions should be updated to recommend not to plant in full sun for best survival rates.



## Appendix 1. Planting instructions for 2021 red-tip willow recipients

Please return your multipot(s)... Thanks!



May 21, 2021 Instructions and Questionnaire for planting, care, and reporting results for growing red tip willows (*Salix eriocephala*) rooted cuttings

### Planting instructions

The Red-tipped willows (*Salix eriocephala*) that you plant will benefit the local ecosystem and help stabilize your shoreline.

**Where it works:** In a full sun location on your shoreline, in a place that has some gravel, sand or soil. The finer material is usually underneath the larger rocks or coarser gravel.

**Basic idea:** Take a **shovel or hand tool** and make holes (at least six inches deep) around 2 feet apart in a triangular pattern. If planned, place potting soil (or other added planting medium, bone meal) in the hole. When removing the plug, always push it out by **pushing up on the hole in the bottom of the multi-pot**. Make sure that they are snugly packed in the surrounding soil (roots don't like air pockets). They will sprout roots and more leaves as they grow. Please water your willows and provide general care to give them a good chance of getting established. They can be planted directly and do not require any "hardening off".

Help us spread the word. Please send us a photo of your planting by email to: [jemseggrandlakewatershed@gmail.com](mailto:jemseggrandlakewatershed@gmail.com) and post a photo on social media. You can tag us on Facebook, Instagram and Twitter (see our website for links).

The Jemseg Grand Lake Watershed relies on the support of its members & their generous contributions of both time and money to help promote, understand and improve the health of our Watershed. Membership cost \$10 per person, however any donation you choose to make helps support our goal of a **healthy watershed ecosystem for all**. Your membership also gives you a voice in helping to shape the future of the Watershed. Visit our website [jemseggrandlakewatershed.ca](http://jemseggrandlakewatershed.ca) and join today! Lots of additional information about greening your shoreline is available on our website.

### Questionnaire

1. Planting location, address:
2. Date planting material received:
3. Number of plants received:
4. Date(s) planted:
5. Description of soil where willows were planted: e.g. gravel, clay, rocky, sandy, silty, peaty
6. Did you use potting soil or other materials (e.g. peat moss, fertilizer, bone meal) when planting the willows? If so, approximately how much for each plant was used?
7. How often did you water the willows? Willows love water. In dry weather, regular watering is important as the plants take root.

*Please turn over*

Please return your multipot(s)... Thanks!

8. How many of the willows survived until October 15, 2021?

9. How many of the willow plants survived the 2022 spring freshet? How many are still alive as of May 31, 2022?

10. If possible, please send some dated pictures showing your planting process, type of soil (see 6. above), and progress through the growing season. Please send dated pictures, with your **location name**, to jemseggrandlakewatershed@gmail.com



Planting May 8, 2020



May 8, 2020

Rooted cuttings were each planted with two double handfuls of potting soil in holes dug with a shovel in a **two-foot triangle pattern** as mentioned in the instructions.



Watering May 25, 2020



Push up root plug from bottom

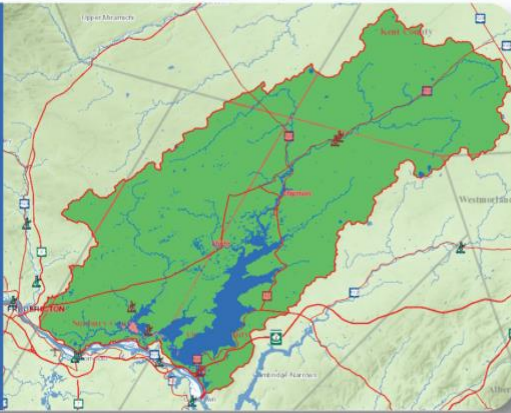


Typical root plug, May 17, 2021

A huge thanks goes to [Irving Woodlands](#) Sussex greenhouse staff for contributing their expertise in growing these healthy rooted cuttings.



**Appendix 2. Revised membership application with WAWA permit note**



**A community focused on education, sharing best practices, measuring water quality, and adapting to climate change**

[www.jemseggrandlakewatershed.ca](http://www.jemseggrandlakewatershed.ca)

**OUR GOAL: a healthy watershed ecosystem for all**

**Membership Form**

Name: \_\_\_\_\_

Email: \_\_\_\_\_

Permanent Residence Address:

\_\_\_\_\_ Postal Code: \_\_\_\_\_

Seasonal Residence Address (if different from above):

\_\_\_\_\_ Postal Code: \_\_\_\_\_

Home Phone #: \_\_\_\_\_ Mobile Phone #: \_\_\_\_\_

Topics of Interest: \_\_\_\_\_

Do you wish to receive emails regarding volunteer opportunities?  Yes  No

Annual membership fee is \$10.00 per person. Send an image (e.g. from your mobile phone) or scanned copy of the completed form to our e-mail address below, or send the completed form by paper mail to the address below. **To pay**, send an Interac e-Transfer payment to the email address below, or send a cheque payable to **Jemseg Grand Lake Watershed Association** with your completed form by paper mail, or pay in person. A receipt will be sent to you.

Email: [jemseggrandlakewatershed@gmail.com](mailto:jemseggrandlakewatershed@gmail.com)

Facebook: [www.facebook.com/JemsegGrandLakeWatershedAssociation/](https://www.facebook.com/JemsegGrandLakeWatershedAssociation/)

Instagram: [instagram.com/jemseggrandlakewatershed/](https://instagram.com/jemseggrandlakewatershed/)

Address: 104 Garnett Road  
Whites Cove, N.B. E4C 3T7

ATTN: Treasurer, Jemseg Grand Lake Watershed Association

**FOR OFFICE USE ONLY:**

MEMBERSHIP#: \_\_\_\_\_

MEMBERSHIP DATE: \_\_\_\_\_

RECEIPT#: \_\_\_\_\_

I hereby provide my consent for the Jemseg Grand Lake Watershed Association to apply for a WAWA permit on my behalf for the planting of native trees on my property at the above starred (\*) address. \_\_\_\_\_ (initials)

