Rainwater Harvesting Webinar

Sept. 29, 2020, 6:30 – 8:00 p.m.

Speakers: William Shulba, Islands Trust, and

Shannon Cowan, Salt Spring Island Watershed Protection Alliance

Questions and Answers[1]

Shannon Cowan William Shulba Rhonan Heitzmann

1. **What is being done to encourage the inclusion of cisterns or outdoor water tanks intended to collect and store non-potable water from roofs on all new domestic building projects?**

Shannon: To my knowledge, Saturna Island might require potable rainwater storage, treatment and delivery systems. I am not aware of any policy work in the Islands Trust Area to encourage nonpotable rainwater use. The Salt Spring Island Land Use Bylaw Section 3.15.9 states that the following new buildings require "rainwater storage, treatment and delivery for potable water": full time rental cottages exceeding 56 square metres floor area, and cottages with additions that exceed 11.6 square metres. Gillian, I cannot speak for the entire Islands Trust Area. I am familiar with the Salt Spring Island Land Use Bylaw water sections only. In the Regional District of Nanaimo there has been a successful rainwater harvesting rebate program for more than 7 years that repeats annually and is allocated on a first-come, first served basis for a minimum of 1,000 gallons of storage and up to $750 of qualifying expenses towards the collection or storage of rainwater. Salt Spring Island Watershed Protection Alliance is working on coordinating a similar incentive program with the Capital Regional District. Sunshine Coast Regional District has a rainwater rebate program that is tied into a rate pay structure for Keats Island.

2. **Is the increasing death of cedar trees as opposed to other trees caused by a shallower root system than say a Douglas-fir?**

Shannon: Drought increases the susceptibility to wildfire, pests and disease. I can substantiate that Western Red Cedar does typically have a more shallow root system than a Douglas Fir, however the type of soil and substrate as well as the slope and aspect (direction of incident sunlight during growing season) have a large impact on how resilient trees can be during times of low or no precipitation. Much of the Salish Sea islands are characterized by rocky slopes with little topsoil. As such, seasonal drought is affecting Douglas-fir, Grand Fir as well as Cedar. Even species that are very resilient to drought (Arbutus and Garry Oak) are demonstrating signs of drought stress.

[1] Due to time limitations not all questions could be answered during the webinar.

3. **Should we be planting different trees in our reforestation areas given that the months and amounts of max rain are going to change over time?**

Shannon: Yes, climate action is affecting intensity and timing of rainfall. That said, wetlands are likely to get wetter in the winter and drier in the summer, and the way water is managed on the landscape (surface runoff, shallow groundwater movement) will potentially impact soil tilth, and change vegetative communities to naturally select those that withstand wetter winters and drier summers. It calls on us to plant drought-tolerant native tree, shrub and herbaceous species in non-wetland terrains that humans are stewarding in the Salish Sea. One might refer to the Plants of British Columbia Southern Interior (Pojar and McKinnon) which has been experiencing longer and more intense seasonal droughts than the Coastal regions and may yield ideas for native species to plan in these times on the Coast.

4. **Can rainwater storage be made at cost to Islanders?**

Shannon: See above.

5. **Colour or opacity of colour of poly cistern differences. Is black cistern better than a dark or lighter green opaque tank comparable?**

Shannon: Light ray penetration through black opaque polyethylene vs. green opaque would be lower, so black is likely to have less algal growth strictly on the basis of the amount of light reaching the stored water. Other factors such as tank location, pollen, debris and leaf particles also impact algal production so tank colour is not the only factor to consider. Algae needs light to grow. I always recommend black tanks to my customers for exactly this reason. I have never seen algae grow in a black tank, even one that is contaminated with pollen and or other debris. I have however seen algae grow in dark green tanks (and lighter coloured ones) where the water is otherwise perfectly clean. So concerning algae, black is better. Some people are not concerned about algal growth however when it comes to non potable water for garden use and they prefer to choose a green colour for personal aesthetic reasons. 7.

6. **In the rainbow gardens 2.4 liters of bleach how often?**

Shannon: Annually. An exception being if a tank has run dangerously low during the season and Rainbow Road Park Allotment Garden gardeners have a significant fill from a rainstorm in which case they will add a small amount of bleach.

7. **I'd love to have tips on how to clean the large polyurethane tanks?**

Shannon: Please consider connecting with a rainwater collector either in your area, or through the SSI Virtual Tour to find out how others are cleaning their tanks safely. Draining the tank as much as you can through the pump or gravity outlet first before you begin cleaning is the first step. The most ingenious system of cleaning and sediment removal that I've witnessed for 1,000 gallons or larger is adding a long extension (several taped broom handles) to a shop vacuum suction implement. ShopVacuums are a safe way to handle wet, messy sludge and sediment. Nestled up to the tank was a scaffold (a sturdy ladder would serve) to enable the owner to open the lid for visual checks any time. At cleaning time, the owner would stand above the tank opening to extend the ShopVac into

the tank right to the bottom and vacuum out the remaining water, sediment and any sludge. If desired, a dilute solution of bleach can be added to a cloth to wipe the inner surfaces: affix the extended pole with a horizontal broom end wrapped in a rag to wipe all of the inside tank walls and floor, and especially along the seam where walls join the floor and sediment could collect. It is not safe to enter a tank for cleaning for reasons of ventilation. Let the clean tank stand open for several hours to allow chlorine bleach fumes to escape (there is a very swift evaporation rate for bleach). Cover and make sure you clean the roof and gutters before you begin collecting rainwater.

Ronan: When we clean tanks we use this method:

1.Drain tank as much as possible.

2. Place a sump pump to remove the remaining few inches in the bottom and

3. if needed/desired use a pressure washer from the hatch to rinse the sides down. Then use a garden hose sprayer to do a final rinse and "sweep" remaining debris towards the sump pump.

4. Use a shop vac with extension pipe taped on to reach bottom….head placed in the low spot and sweep the debris towards it to remove final dregs of dirty water.

5. Disinfect the tank with a mild disinfection proportion of bleach (¾ cup per 1000 gallons) when full again before using (ideally with some time to let the chlorine dissipate before use) This proportion can be less if you know the water going into the tank is very clean and/ or if there is a post tank treatment before use.

8. **Cisterns of non-potable used for irrigation: I draw from the bottom of the tank. Is it better to draw from the top?**

Shannon: Yes. Due to the likely build-up of organics in a non-potable tank you should use a floating filter intake which can take water from the safe zone out through the bottom or the top, depending on how you set it up.

William: It is better to not disturb the bottom of the tank as the sediment at the bottom increases sedimentation due to negatively charged particles in that settled material.

9. **For cleaning a tank where water is used for irrigating a garden is it ok to use bleach in the tank or better to use hydrogen peroxide which decays?**

Shannon: 10% - 20% solution (very dilute, in other words) of household bleach will also be suitable. Both bleach and hydrogen peroxide will decay quickly when left open to air (and there is air circulation). Please refer to page 47 of the SSI Non-Potable Rainwater Harvesting Best Practices Guide.

10. **Our limited research has shown that small water storage tanks will have a problem with freezing. This is a significant problem for summer communities trying to save water over the winter for summer use. Are you aware of solutions?**

Shannon: Hopefully your household/group has the option to fill all of the required tank volume between March and July, omitting pollen season. Another possible solution is to install heaters for

the winter months that will keep the water in the tanks warm. The Rainbow Road Park Allotment Garden group is investigating this option and you might connect with them directly about feasibility. They are looking at heating 2,500 US Gallon tanks so smaller ones should be even more straightforward.

Ronan: In my observation the problems with freezing relate mostly to the lines and pipes conveying the water from the tank to the point of use. If these unprotected lines are drained in the fall with faucets left open and the main valve at the tank closed there are no problems. The water inside a tank can freeze but typically has enough room to expand and will not burst the tank. It will thaw again in time for summer use. Insulating and winterizing the outlet valve and pipes is mostly an issue only if the water is to be needed during the freezing period.

11. **Do you have access to Islands Trust Area rainwater mapping? A: The graphics shown in the presentation were provided by the Capital Regional District. Islands Trust may look into requesting mapping in the future.**
12. **Can IT help change the regulation to allow for rainwater for laundry purposes?**

Shannon: Please refer to the national standard Canadian Standards Association (CSA B805-18) . Changes to what is permissible as far as water quality standards for specific uses lies outside of the Islands Trust jurisdiction. A useful manual to follow if you are planning to use light greywater is this: https://www2.gov.bc.ca/assets/gov/environment/waste-management/sewage/provincialcomposting-toilet-manual.pdf

13. **What are some of the benefits to micro spray or drip irrigations systems vs. hand water?**

Shannon: If you are setting up a new irrigation system or making changes to increase water conservation, please consider consulting with a professional for the design of your irrigation system. Hand watering has the benefit of reducing loss caused by evaporation on the soil surface adjacent to the plant crown. That said, it's not always practical. Some tips about irrigation and sizing of piping and emitters: At times, since there is little filtration in most nonpotable rainwater systems, the size of the emitters (micro especially) can be a limitation for successful use with stored rainwater. This is due to tiny particles that remain suspended in the stored rain. Use of drip irrigation set to go on automatically in the early morning is improved by adding a second filtration pre-storage (to 600 microns, ideally) and more so by adding another cartridge filtration step catching particles on their way out into the irrigation lines, at a lower micron size. Finally, using 3 inch buried pvc piping, even down the rows in your garden and not just along the main line from the source to garden, is a very good idea to reduce clogging. For Salt Spring I. https://www.ssiwpa.org/2020/07/24/salt-spring-rainwater-pros-and-localsuppliers/

14. **Can bidet still be used if using non-potable water in toilets? Seems like would be a no from Health Canada, but are there easy ways to have bidet nozzle have potable and toilet tank have non-potable?**

Shannon: We would highly recommend consulting with a plumbing professional with this question. However, since the dual plumbing into the bathroom would require that the sink and tub/shower if applicable be serviced by potable grade water only, the bidet would have to be attached to the potable water line.