

Lakeside Living Consultations



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1.0 Overview:

Research clearly shows that riparian areas have direct impacts on the lakes they border. Consequently, lakeshore homeowners and property owners play a critical role in maintaining the health of their lakes. The choices that homeowners make about how to manage their property impact the quality of the water, the integrity of lakeshores, and the presence of wanted and unwanted aquatic life.

With Montana Watershed Coordination Council (MWCC) grant funding, Clearwater Resource Council (CRC) launched a program called “Lakeside Living” in the summer of 2022. This program sought to work with lakeshore property owners in the Clearwater Valley, providing free one-on-one consultations that enabled homeowners to simultaneously improve their lakeshore property and the health of our region’s lakes. Homeowners left the consultation equipped with the knowledge and resources needed to enhance and implement sustainable practices on their property.

2.0 Consultation Composition:

The one-on-one Lakeside Living Consultations were structured by a standardized survey. This survey contained six different categories that pertain to lakeshore property management. The six categories are riparian zone, stormwater runoff, lawns and gardens, septic systems, aquatic invasive species, and hazardous wastes.

CRC’s Big Sky Watershed Corps (BSWC) member sat down with each homeowner during the consultation and discussed each of the questions in the six sections. These questions inquired about the status of the property and a variety of the homeowner’s management practices. In addition to asking questions, the BSWC member explained why these particular property management practices are important to the health of their lake. A summary of the importance of each section can be found in the survey. For example, homeowners learned that a healthy shoreline protection zone filled with a variety of native plants has a variety of benefits including erosion prevention, pollutant filtering, and shoreline stabilization. The standardized consultation survey can be found in Attachment A.

At the end of the consultation, homeowners were given a handout (see Attachment B) that illustrated some of the main best management practices for lakeshore property management. This handout re-emphasized what was discussed during the consultation.

Finally, each homeowner received a follow up email. This email provided answers to any specific questions they had and provided resources that the BSWC member determined to be helpful.

3.0 Results:

A total of 15 homeowners at 4 different lakes participated in the Lakeside Living consultation program. At an average of 2 acres per homeowner, this consultation program addressed approximately 30 acres of lakeside property in the Clearwater Valley.

3.1 Outcome:

Per the questions asked after the consultation, every homeowner indicated that they learned something new during the Lakeside Living consultation. Additionally, while this metric was not directly assessed, most homeowners expressed an interest to inform their fellow lakeshore homeowners and neighbors about what they learned. It can be assumed, therefore, that some of the BMPs discussed in the Lakeside Living consultation program reached more than just the 14 participants. Moreover, the table below details some of CRC’s direct findings from the consultations and their expected impact.

Table 1: Findings and Impact

Finding	Impact
More than half of the homeowners surveyed indicated that they intend to increase vegetation within their shoreline protection zone.	Native plants within a riparian area serve as a natural buffer that filters sediment and pollutants, stabilizes the shoreline, and prevents erosion among other things. An increase of native vegetation along the shoreline decreases the impact of human activities. This finding also potentially suggests that many lakeshore homeowners would be willing to increase riparian vegetation given further education.
Every homeowner indicated that they are either already using a phosphate-free	Phosphorus is a nutrient of concern in the Clearwater Valley. This nutrient absorbs

<p>detergent or that they intend to switch to a phosphate-free detergent.</p>	<p>strongly to soil and can eventually dissolve into the lake water. The reduction of phosphorus in household products is important for the reduction of this nutrient in our Valley's lakes.</p>
<p>None of the homeowners indicated that they were aware that it is best practice to burn debris more than 25 ft from the lakeshore.</p>	<p>Ash remaining from burning debris is highly alkaline and may change the pH of the surface water, potentially promoting algae and aquatic weed growth.</p> <p>This finding suggests that there needs to be further education about the impacts of burning on water quality.</p>
<p>More than a third of the homeowners indicated that they are using herbicide to control the invasive fragrant water lily.</p>	<p>This finding indicates, as CRC previously suspected, that invasive water lilies are a major concern for some residents in the Clearwater Valley. Moreover, this provides direct evidence that a variety of herbicides are being used in the lakes.</p>
<p>More than half of the homeowners indicated that they do not get their septic tanks pumped regularly or inspected regularly.</p>	<p>Old and unmaintained septic systems have long been identified as a potential source of pollution to the lakes in the Valley. This finding suggests that further education is needed on septic maintenance.</p>

Attachment A: Standardized Consultation Survey

Lakeside Living Consultation

Lakeshore property owners play a critical role in maintaining healthy water quality and aquatic habitat. The Lakeside Living program seeks to work with lakeshore property owners in the Clearwater Valley, providing free 1-on-1 consultations that will enable homeowners to identify ways to simultaneously improve their lakeshore property and the health of our lakes.

1. Name of Property Owner

2. Property Address

3. Approximate Size of Property

Riparian Zone

The Shoreline Protection Zone (Riparian Zone) is defined by Missoula County as "the land area which is within 20 horizontal feet of the perimeter of the lake and any adjacent wetlands when the lake is at the mean annual high-water elevation."

However, 20 feet is likely not large enough to protect water quality, especially during storm events. The larger the shoreline protection zone (SPZ), the more likely it is to capture nutrients and runoff before it reaches the water. We suggest as large an area as possible.

4. Riparian areas are strongly influenced by the presence of water and contain plants adapted to seasonally wet conditions. They serve as natural buffers between uplands and adjacent water bodies. This natural buffer of vegetation serves as a filter for sediment, nutrients, pathogens, and metals before they reach surface water. Plants within riparian areas stabilize soil with strong roots, reduce bank erosion, and reduce the risk of flooding by slowly releasing stormwater runoff from uplands into lake water.

How much of the SPZ is stabilized with native plant cover?

Mark only one oval.

- More than 90% of the SPZ is stable with plant cover. There is little to no active erosion.
- 70-90% of the SPZ is stable with plant cover. There is some active erosion.
- Less than 70% of the SPZ is stable with plant cover. Active erosion is very evident.
- Other: _____

5. Plants within riparian areas keep water cool by providing shade.

Is the lakeshore well shaded?

Mark only one oval.

- Lakeshore is well-shaded with trees and/or shrubs.
- Trees and/or shrubs provide some shade.
- Little or no shade is provided by trees and/or shrubs.

6. Riprap tends to increase the speed of water flow along an armored reach, as the water has no points of friction to come up against and nothing to slow it down. This additional strength of flow presents issues for lakeshore protection zones nearby a riprap protected bank, as water is deflected off the riprap and directed at other points of the lakeshore. The increased strength and speed of the water only increases erosion suffered at these new locations, the typical result of which is the necessity of installing additional armoring, which merely moves the problem. Riprap impedes the natural functions of a shoreline, as it interrupts the establishment of the shoreline protection zone, or the point of interface between land and flowing water. These changes to the shoreline increase wave energy in the lake and erode adjacent properties. They also change natural currents, alter beach dynamics and impact shallow water habitat that is important for invertebrates, fish and many other species of wildlife

Is rip rap or any kind of impermeable barrier present at the shoreline?

Mark only one oval.

- Rip rap (or any kind of impermeable barrier, e.g. concrete) is used at the shoreline.
- Rip rap (or any kind of impermeable barrier, e.g. concrete) is not used at the shoreline.

7. If an impermeable barrier is present, describe the type, location, and approximate size.

8. Lawns maintained all the way to the water's edge will accelerate erosion due to the shallow root systems of non-native grasses.

Are non-native grasses present in the SPZ?

Mark only one oval.

- Non-native grasses (lawns/turf) are not present in the SPZ.
- Some parts of the SPZ are comprised of non-native grasses (lawns/turf).
- The entire SPZ is comprised of non-native grasses (lawns/turf).

9. Estimate the approximate makeup of the shoreline. For example, the SPZ is 60% grass, 10% rap, and 30% native plants.

10. Any other notes or important points about the SPZ?



Increased runoff is generally channeled into ditches, storm sewers, and road gullies, which often lead to lakes, rivers, and streams. Runoff picks up and carries pollutants such as fertilizers, pesticides, petroleum, heavy metals, and hazardous waste products. The movement of these materials into surface water creates a number of problems, including excess aquatic plant and algae growth; low dissolved oxygen (used up by decaying plants; negative impacts to fish, wildlife, and recreation; degraded spawning beds; and murky water. Runoff that is not diverted flows overland unmanaged, creating problems such as drinking well contamination, flooding, and erosion

11. Impervious surfaces increase runoff, and increased runoff can deposit more nutrients and sediment into the lake.

[If they are looking to rebuild, there are options to make the surfaces more permeable]

Are there impervious surfaces (such as sidewalks and driveways) close to the water?

Mark only one oval.

- There are impervious surfaces, such as sidewalks and driveways, close to the water.
- There are no impervious surfaces.

12. If there are any impervious surfaces, describe the type, size, and location.

13. What is the homeowner's driveway made out of?

14. Does the home have rain gutters?

Mark only one oval.

- Yes
- No

15. Is there a walking path sloping down towards the lakeshore?

Mark only one oval.

Yes

No

Lawns and Gardens

16. Improper use of fertilizers could contaminate surface water with excess nutrients such as nitrogen and phosphorus, contaminate drinking water from ground water wells with nitrates, contribute to severe fungal diseases on plants, make some weeds more competitive with the plants you are trying to grow.

Fertilizer used within the shoreline protection zone is likely to runoff into the lake, resulting in increased in unwanted nutrients into the lake. Soluble nutrients found in fertilizers are beneficial to yards and gardens but can cause problems when they enter surface waters. Nitrogen and phosphorus contribute to invasive lily and blue-green algae growth which depletes oxygen in the water, impedes water recreation, and is aesthetically unappealing.

Which of the following boxes apply to the homeowner?

Check all that apply.

- Soil has been tested to determine how much fertilizer is needed.
- If chemical fertilizers are used, slow-release (water insoluble) forms are chosen.
- Fertilizers with low phosphorus levels are chosen.
- Fertilizer is used within 25 feet of the lakeshore.
- Fertilizer is not used on property.
- Other: _____

17. Improper application of pesticides could harm or kill beneficial insects and earthworms associated with your lawn and garden, harm wildlife and pets that come into contact with you lawn or garden, result in chemical runoff during rainfall or irrigation into lakes, leach through t soil directly into groundwater which is used for drinking water.

Which of the following boxes apply to the homeowner?

Check all that apply.

- Homeowner does not apply pesticide when it is windy.
- Homeowner only buys the amount of pesticides needed during the current season.
- Homeowner triple rinses empty pesticide containers and reapplies the rinse water to the areas already treated.
- Homeowner never pours excess pesticide on the ground, into surface waters, or into sanitary treatment systems.
- Homeowner only uses the amount required to control the problem. In other words, the homeowner does not use the pesticide in excess
- Pesticide treatment is avoided in the SPZ. Within the SPZ, treatment is done by hand and applie only to specific targets.
- Other: _____

18. Application of herbicides could harm or kill beneficial native plants associated with your property, harm wildlife and pets that come into contact with your lawn or garden, result in chemical runoff during rainfall or irrigation into lakes, leach through the soil directly into groundwater which is used for drinking water. Does the homeowner use herbicides?

Mark only one oval.

- Yes
- No

19. Dog feces that enters the water through runoff also introduces an increased amount of nutrients into lakes and ponds. The increased addition of these nutrients may lead to more severe algae blooms or other water quality problems.

How does the homeowner manage pet wastes?

Mark only one oval.

- Homeowner picks up dog poop regularly from yard and discourages the dog from pooping near the shoreline.
- Homeowner does not pick up dog poop regularly and/or allows dog to poop near the shoreline.
- Homeowner does not have a dog.

20. Ash remaining from burning is highly alkaline and may change the pH of the surface water and promote algae and aquatic weed growth.

How does the homeowner go about burning debris?

Mark only one oval.

- Homeowner burns within 25 feet of the lake.
- Homeowner does not burn within 25 feet of the lake.
- Homeowner does not burn.

21. Soil eroding into the lake impacts the clarity of water, covers spawning beds, and carries phosphorus. Unlike nitrogen which moves quickly through the soil, phosphorus attaches itself to the soil particle and holds on tight. When soil is washed into water the phosphorus may dissolve and become available to plants. This makes aquatic invasive species and algae grow.

Does the homeowner have any areas of bare soil?

Mark only one oval.

- The property has no areas of bare soil.
- The property has some areas with bare exposed soil.

22. If bare soil is present on the property, describe the size and location.

23. Land that steeply slopes toward lakeshore areas are at a higher risk of soil destabilization and erosion.

Does the property slope towards the water?

Mark only one oval.

- Property steeply slopes towards surface water.
- Property has a slight slope towards surface water.
- Other: _____

24. Over-watering may cause pesticides, fertilizers, herbicides, and sediments to either runoff to surface waters, or leach and contaminate the ground water.

Which of the following boxes apply to the homeowner?

Check all that apply.

- Homeowner avoids watering after applying chemicals.
- Homeowner leaves grass clippings on the lawn.
- Only 1" to 2" of water are used for irrigating per week (when needed).

**Septic
Systems**

If your home is near the waterfront it is particularly important to have a properly functioning septic system. Surface water contaminated with septic waste is extremely hazardous to the health of humans, wild- life, and our natural resources.

[make connection with groundwater, have an illustration of how septic systems work and how they can reach groundwater and eventually surface water]

25. Many septic systems are either old, unmaintained, or located too close to lakes, rivers, and streams. For this reason, it is important to maintain your septic system.

[does homeowner flush pharmaceuticals (provide list of collection services), cleaning product etc. down the toilet]

Which of the following apply to the homeowner?

Check all that apply.

- Homeowner gets their septic tank regularly inspected to make sure bacteria is sufficient and th tank is not too full.
- Homeowner uses additive in system.
- The septic tank is pumped every 3-5 years or whenever recommended by a licensed profession during annual inspections.
- There is not a vegetable garden located over an absorption field.
- There are no trees growing over the system.
- A grass cover is kept over the absorption field.
- A garbage disposal is not used in the household.
- A liquid, phosphate-free laundry detergent is used.

26. If homeowner uses an additive in their septic system, what kind is used and how often is it used?

27. Reducing the amount of wastewater entering the system is important because less flow (volume) equals better treatment, longer system life, and less chance of overflow. Excess flow is a principal reason for system failure (wastewater surfacing or backing up in house). Less flow improves treatment by increasing the time waste spends in the septic tank, thus providing more time for solids to separate, settle, and decompose. Less flow also means improved aeration and increased soil contact, providing better treatment in a soil absorption field.

Does the homeowner use any low flow systems?

Check all that apply.

- Household has low flow shower heads.
- Household has low gallon flush per toilet.
- Household has a low flow dishwasher.

**Aquatic
Invasive
Species**

Invasive species are a form of biological pollution; they can be detrimental to the economy, human health, and natural resources. They spread easily in today's global network of commerce and are difficult and costly to control. Invasive species can impede industries, damage habitat, threaten agriculture, and reduce our quality of life. Introduced species outcompete native plants and animals and alter important ecosystem functions such as food chains, habitat, fire, and flooding. Invasive species also hybridize with native species, causing complex environmental changes.

[specifically mention the goal is to prevent zebra and quagga mussels from colonizing the Clearwater Watershed]

28. Do you have invasive fragrant waterlilies?
[note the best ways to cut and dig the lilies (must capture all rhizomes)--NOT pulling or raking]
-

29. Which of the following apply to the homeowner?

Check all that apply.

- Homeowner has a boat on the lake.
- Homeowner transports their boat to other lakes.
- Homeowner has a dock.
- Homeowner allows non-residents to dock their boat.
- Homeowner ensures any boats they put into the water are clean, drained, and dried.

30. Montana currently has aggressive state-wide prevention efforts in place, however, active participation by all water users is key to addressing this important issue. Because human actions are the primary means of invasive species introduction, it is our responsibility to work towards positive solutions. Prevention is far less expensive than control.

Were the following discussed with the homeowner?

Check all that apply.

- Homeowner is aware that anything that gets wet, needs to be cleaned. This includes boats, trailers, inflatable rafts, life jackets, flippers, waders, fishing rods, etc.
- Homeowner is aware that it is important not to release plants, animals, or fish into a body of water (unless they originally came from that particular body of water). If your family no longer wants your aquarium and aquatic pets, do not dump any of the plants, animals or water into nearby water, storm drains, or toilets.
- Some aquatic invasive species are sold online and in some cases at local nurseries.

**Hazardous
Wastes**

Many common household products contain ingredients that are corrosive, toxic, or flammable. When used improperly or disposed of improperly, these products can become personal health and safety concerns, and have the potential to contaminate soil, drinking water, lakes, streams, and rivers. Small (and sometimes large) unusable amounts of hazardous materials are at times spilled, buried, or dumped onto residential properties.

31. Cars and boats are a major source of pollutants such as heavy metals, oil and grease, and other hydrocarbons through exhaust, leaks, spills, corrosion, and wear and tear of parts. These pollutants are deposited on roadways and carried into receiving waters by stormwater runoff.

Which of the following apply to the homeowner?

Check all that apply.

- Vehicles are washed on the lawn or at a commercial car wash.
- Oil, antifreeze, and gasoline are never dumped down storm drains, ditches, or on the ground.

32. How does the homeowner dispose of pharmaceutical and personal care products?

Miscellaneous Notes

33. Anything miscellaneous to note

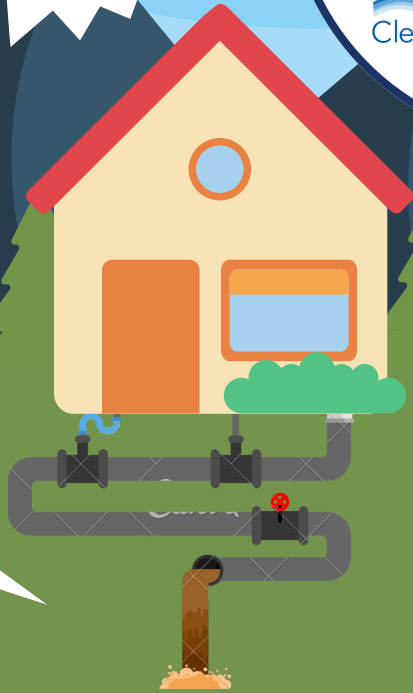
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Google Forms

Attachment B: Handout



Improperly maintained septic systems can eventually leach into lake water. Get regular septic tank inspections and get the tank professionally pumped every 3-5 years.

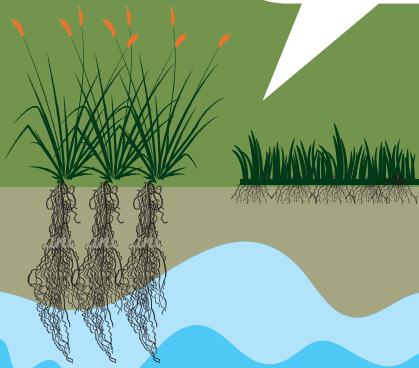


Excess pesticides, herbicides, and fertilizers can runoff into the lake water. If chemical application is absolutely necessary, use only the minimum amount needed and apply by hand if possible.



Help prevent the introduction of invasive species like zebra mussels! Make sure to "Clean, Drain, and Dry" your boat if it is coming from another body of water.

Unlike lawn grass, native plants have deep root systems that protect from lakeshore erosion and upland runoff.



Rip rap does not absorb any of the force from waves. Instead, it disperses the force and erodes adjacent shoreline. If possible, do not use rip rap.

