

COLUMBIA LAND TRUST

FALL 2014

vol 21 | issue 02

# Fieldbook

Conserving and Caring for Vital Lands, Waters,  
and Wildlife of the Columbia River Region



Coho alevin  
(*Oncorhynchus kisutch*)



# o1 Glenn's Muse

# o2 Hail to the Underdog

**Lower Columbia River**  
Could chum salmon be the comeback kid? We're doing our part to give chum salmon a fighting chance.

# o4 Laser Focus

**Kerry Island, Westport Slough, Oregon**

Once the tool of astronauts, Lidar is helping us conserve the last great places of the Pacific Northwest.

# o6 Deer Little Things

**Lower Elochoman River**

Listed as endangered since 1967, the Columbian white-tailed deer needs one thing we can help provide: good habitat.

# o8 He Is the Eggman

Video games, not so much. Frog eggs, yes. Meet Luke Slind, not your average American teen.



## Our Cover Man

Two shark-diving expeditions drove Campbell River, B.C.-based photographer Eiko Jones to start shooting life below the waterline. The resulting images include our cover shot and the toothy face of the chum salmon you see on this page. Jones's work has recently appeared in *National Geographic* and *Diver Magazine*. We are grateful to Jones for kindly allowing us to print his images. ([eikojonesphotography.com](http://eikojonesphotography.com))

# o9 We Want You

Two volunteer days that will make your fall feel good and wild.

Columbia Land Trust works with people throughout the region to conserve and care for land, water, and wildlife.

Columbia Land Trust has earned accreditation from the Land Trust Alliance, which recognizes land trusts that adhere to national standards for excellence, uphold the public trust with rigorous ethical standards, and take steps to ensure that conservation efforts are permanent.



Cover photo & this page by Eiko Jones

# The Eyes Have It

My wife, Sue, recently gave me a small hand lens with 10x magnifying power, a jeweler's loupe meant to illuminate the tiny and invaluable. Right in my own backyard, a new world opened up. Plants that I breezed by on my way out the door became intricate landscapes to explore. One week, I watched a bee pollinate a sunflower. The next, I observed the flower's base turn into a geometric pattern of seeds. Later, I turned my lens on the gap that remained after a chickadee fed on the flower head.

That experience got me thinking about how we see things at Columbia Land Trust: We look at land and nature through as many lenses as we can. We have a responsibility to do so.

Our stewardship team walks nearly every square foot of our land, carefully recording plants, trees, birds, habitat types, and changes they witness over time. Historic photos can show us how Columbia River islands have shape-shifted. Today, we use a high-tech tool called Lidar, which generates images of land using lasers. Lidar allows us to see the topography beneath visible layers. (You can read more about our use of Lidar on page 4.)

All of this is part of our commitment to adaptive management, a systematic approach to caring for land that ensures we're making the best decisions possible. Our stewardship team methodically observes, learns, creates plans, and restores land where needed. And then, once again, they observe, learn, and (if necessary) change plans based on new sets of data. "The fundamental element of adaptive management is seeing," says Stewardship Director Ian Sinks.

Some lessons we learn are short term: how a volunteer crew's newly planted saplings grow in a particular environment. Others are long term: how fish populations respond when we place wood in streams. Those lessons will take years or decades of careful observation to understand.

Adaptive management is key in a place as ecologically complex and diverse as the region around the Columbia River, the lifeline of the Northwest. Our land has so many layers, habitats, stories, animals, people, and mysteries. We need every available lens en route to understanding. Even a simple hand lens, I can attest, will change your perspective on nature. Your support allows us to bear witness to nature so we can then care for it. Forever. For that, we are truly grateful.

My best,

Glenn Lamb

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Photo by Eiko Jones

## Hail to the Underdog

We're giving Columbia River chum salmon—aka dog salmon—a fighting chance.

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Chum get a bum rap. Read any story about *Oncorhynchus keta*, and writers tend to note their troubles: They're nicknamed the dog salmon. Owing to their low fat content, they have "low table value." (Chum even used to be sold as dog food.) Stories of salmon's jumping prowess don't apply so well to chum; barriers that Chinook, coho, and steelhead crest with ease can keep chum from moving upstream.

On the Columbia River, the story gets worse: The river's chum population is one of only two U.S. runs listed as threatened. Once upon a time, around 1.4 million chum returned each year. Since 2007, according to annual surveys by the Washington Department of Fish and Wildlife (WDFW), the estimated number of adults returning the Columbia River has ranged between 3,900 and 18,900. By any measure, these chum are true underdogs.

But Columbia Land Trust is working for the chum's survival by doing what we do: protecting its habitat. Today, we care for land in all three of the best chum-spawning sites that remain. "We've conserved places directly threatened by development or other uses. That saves key spawning grounds," says Stewardship Director Ian Sinks.

If you were asked to imagine prime salmon habitat, you would most likely think of a cold, glacier-fed waterway replete with deep pools and braided channels. But Sinks is standing on the Columbia River's banks: The concrete span of the I-205 bridge is so close you can see and hear 18-wheelers barreling past. This seemingly unlikely site is one of two along this stretch of the Columbia River that the WDFW refers to as the "I-205 spawners," and it counts as chum-spawning heaven.

"What makes this great for chum is what you can't see," Sinks says. From the upper slopes, underground springs deliver clear, fresh water over the spawning beds. The water is just a few degrees warmer than the Columbia River during the fall and winter months. Those springs are critically important, because they keep spawning beds clean, and chum are notoriously picky. "They like clean gravel with very specific water conditions," says Sinks.

Todd Hillson, a WDFW biologist who has been studying chum since 2001, explains that because they spawn during colder months (from October through December) the warm water helps their eggs develop more quickly.

Protecting the springs is a key reason we conserved seven acres where Sinks is standing. Right next to this property, you can see what threatened the springs and the chum beds: Steamboat Landing, a planned development of large homes right on the river. Had the Woods family, who owned the land, sold to developers, it would have been ruinous for the chum-spawning beds and a real hit to the Columbia River population.

Crazy Johnson Creek is about 105 river miles and a world away from I-205, but it also happens to host some of the best and most productive chum-spawning beds in the Lower Columbia River. A tributary of the Grays River in Washington's Wahkiakum County, Crazy Johnson shares at least one key characteristic with the I-205 spawners: The flow of groundwater helps create the conditions that chum love.

Last November, Columbia Land Trust Conservation Lead Nadia Gardner hiked in during spawning season. "There were hundreds of fish digging into the banks and carcasses littering the shores," she says. Today, we own 305 acres of river, floodplain, and forested hillside habitat along the Grays River and Crazy Johnson Creek, which helps protect this sensitive chum habitat.

Even with land protection, dog salmon numbers can fluctuate significantly from year to year. Between 2007 and 2009, biologists estimated some 3,000 to 4,000 fish returned to the Grays River to spawn. In 2011 and 2012, more than 10,000 returned. In 2013, the number dropped again to 6,500.

These population fluctuations partly correlate with what's happening in the ocean, notes Hillson. Just as chum like perfect spawning sites, they like ocean conditions just so: Factors like food availability, ocean temperatures, and coastal upwellings all affect salmon populations.

That's not to ignore what brought chum to this crisis point: dams, urbanization, logging, and commercial fishing. While logging practices have vastly improved, and chum harvest is illegal, numbers have never rebounded. The fact is that, once lost, high-quality spawning and rearing habitat is hard to recover. "It's critical to protect what small amount remains," says Sinks. —Jill Davis



Map by Tanner Scrivens

### 1. Crazy Johnson & Grays River [Main Chum Spawning Area]

The most important spawning grounds on the Lower Columbia. **Our role:** Own and care for 305 acres of river, floodplain, and forest, including the spawning beds themselves.

### 2. Germany Creek [Chum Restoration Area]

This is a former chum spawning site where remnant populations of chum salmon still spawn. **Our role:** Restore historic natural conditions by adding structures and planting trees on the banks.

### 3. I-205/Woods Landing [Main Chum Spawning Area]

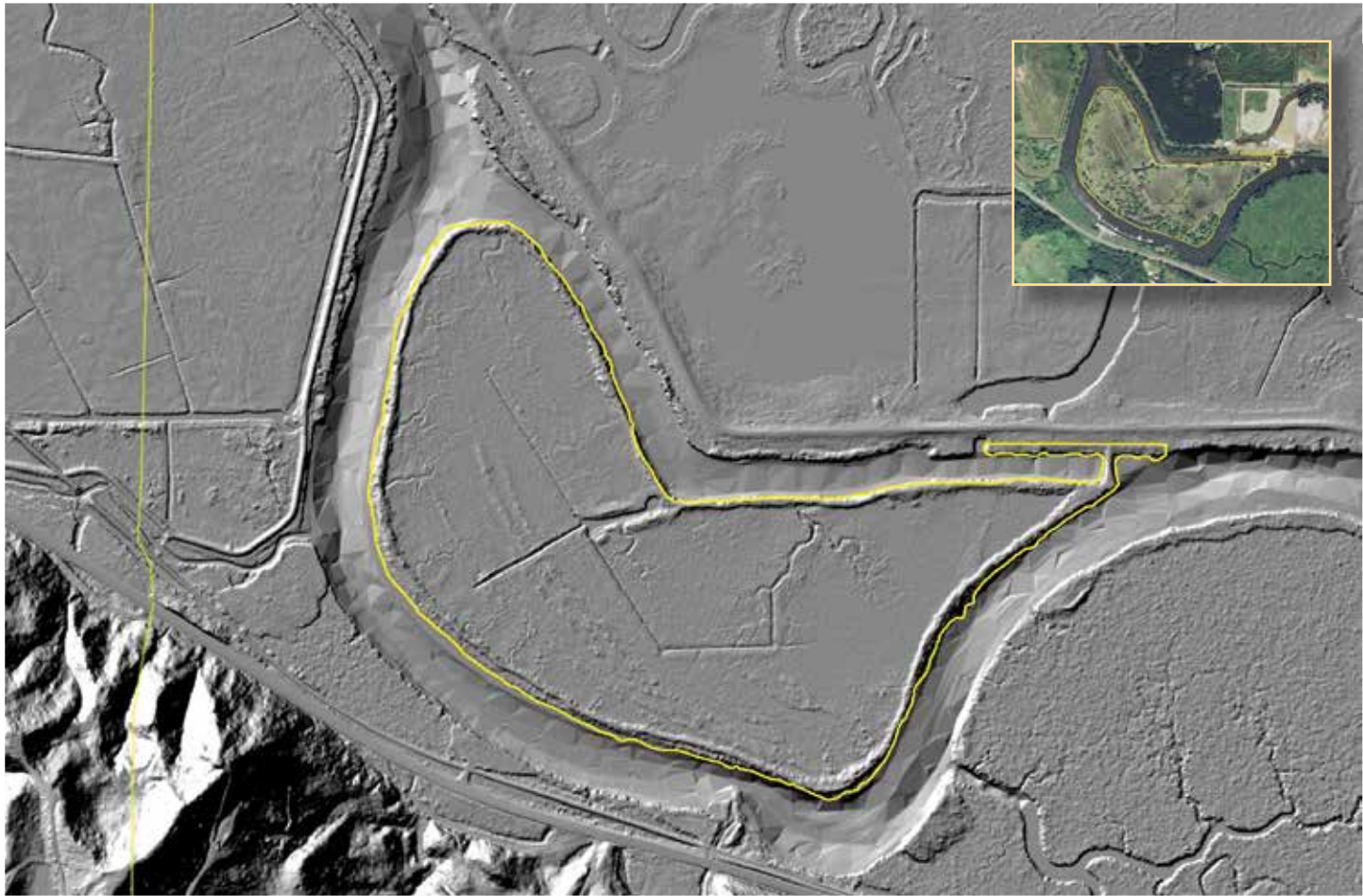
Owing to springs that keep spawning beds clean, chum spawn right on the Columbia River main stem. **Our role:** Protect the land along the river to keep groundwater flowing.

### 4. Bonneville [Main Chum Spawning Area]

Ives Island, as well as Hamilton, Hardy, and Duncan Creeks (all located near Beacon Rock) host prime chum spawning beds. **Our role:** Own and care for nearby Pierce Island, ensuring its shores provide clean spawning beds and removing invasive plants to protect the area's shoreline habitat.

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## Laser Focus

4 **Once the tool of astronauts, Lidar now helps us conserve the last great places right here on Earth.**

Walk atop the 100-year-old dikes hemming in Kerry Island, and from that vantage point, the island appears a bucolic flatland. Clumps of trees emerge from fallow pastures, which have subsided over time; here and there, shallow wetlands stubbornly defy human efforts to keep the island’s 109 acres dry.

This visible surface tells one story of Kerry Island, but it also obscures the island’s past. “There are things you just can’t see with your naked eye,” says Columbia Land Trust Conservation Director Scott McEwen. “You can’t see the complex patterns of nature’s historic signature.” To truly understand Kerry Island’s natural history, McEwen says, we have to look deeper.

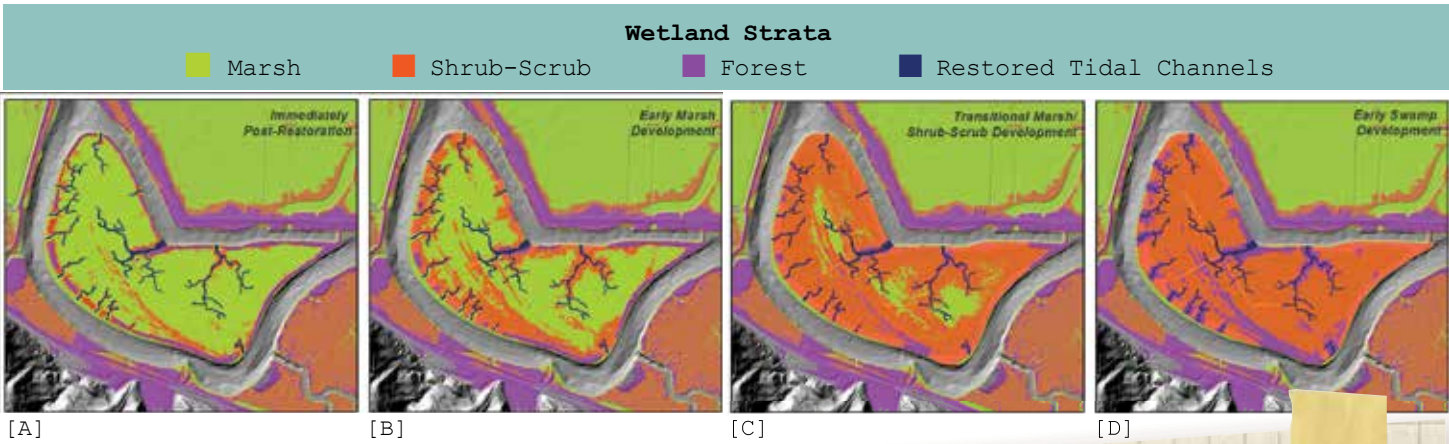
That’s why Columbia Land Trust relies on Lidar. Mounted to the bottom of, say, a fixed-wing plane, Lidar devices work by sending millions of laser pulses to the Earth and measuring their rate of return. Because these laser pulses

The power of Lidar, which uses millions of laser pulses to create precise, three-dimensional images of terrain, is well illustrated above. The color inset image shows Kerry Island as it appears from the air. The black-and-white image, created using Lidar, shows how Kerry Island’s terrain looks beneath the visible trees and vegetation. Each of the tiny squiggles on the island’s interior is a natural stream that has gone dry owing to diking. The stick-straight lines are human-made drainage ditches.

can penetrate objects like trees, Lidar (after some computer processing) generates precise, three-dimensional images of the real contours of the terrain. It’s like peeling away the surface to see what the eye cannot.

The black-and-white image of Kerry Island above shows what’s beneath the trees and grass: Those squiggles on the island’s interior are the still-visible imprints of tidal channels that have been dry for almost 100 years.

Even a layperson can understand the power of Lidar to help Columbia Land Trust restore land. Lidar imagery can be used by restorationists to design complex projects.



The word Lidar is short for light detection and ranging, and it’s helping us predict how our restoration work on Kerry Island may affect the habitat over time. What will this place look like in, say, 50 years after we bring tides back to channels that have long been dry?

On Kerry Island, Lidar helps us see where, a few years from now, the dike that kept the tides at bay should likely be removed. “We want to restore hydrologic processes at the confluence of the old channels and Westport Slough,” says McEwen.

Lidar also helps us predict how our restoration work on Kerry will affect the island’s habitat over time. What will this place look like in 50 years after we’ve brought back the tides to those dry channels? Above, the four images of Kerry Island show a Lidar map overlaid with colors, which represent elevation changes over time. Each square displays 10-year increments of expected habitat development after the tides are returned—an account of Kerry Island in the slow process of returning to what it was: a tidally charged spruce swamp. “It’s a little like SimCity, with an ecological focus,” says McEwen. “Putting water on the land is really only one step in a very long process that won’t be finished in our lifetimes.” In other words, these images map the stages of our end goal: to put back some of the most important habitat in the Lower Columbia River.

“Twenty years ago, we were still using topo maps and trying to understand the land and how to care for it based on line marks that measured change in terms of feet,” McEwen says. “Now we can measure change in centimeters.” Having that kind of accuracy means better decisions and better outcomes. “It’s a critical part of our work,” notes McEwen. —Jill Davis

[A] Change will come slowly after tides return, as this series of maps illustrates. The colors overlaid onto this Kerry Island image show how the elevation might change over time, post-restoration. Once natural channels carry water again, sediment will begin to be deposited on the island’s interior. The lime green areas on the first map indicate low elevations that are typical of marsh habitat. (Each map represents about 10 years.)

[B] The orange areas show where, after 20 years, the island may gain enough elevation to grow shrubs such as willow and dogwood.

[C] After 30 years, we’ll likely begin to see areas where trees such as cottonwood and ash can grow (indicated in purple).

[D] After 40 years, Kerry Island will start to become the kind of Lower Columbia River island it once was: a tidally influenced Sitka spruce swamp.



On the left, an interior pastureland on Kerry Island; on the right, Westport Slough



## Deer Little Things

**Floods. Coyotes. Cars. Mountains it can't cross. The endangered Columbian white-tailed deer doesn't exactly have it easy—but we're doing our part to give it more places to forage, breed, and roam.**

She was a real cutie, just standing there on the side of the road: cinnamon-colored fur, big ears, a ring of white setting off a pair of glassy black eyes. We slowed down; she bounded away, a blur, flashing her namesake white tail before disappearing into the shadows of the woods.

Here in the Northwest, deer sightings barely register as remarkable. But that doe was a true rarity: She was a Columbian white-tailed deer, one of 400 or so on the Julia Butler Hansen Refuge near Cathlamet, Washington, and one of only about 850 that live along the Lower Columbia River. U.S. Department of Fish and Wildlife Biologist Paul Meyers, whose job is to manage the refuge for deer, had told us that a sighting was unlikely. Most deer had retreated to the safety of the forest, in order to keep their spring fawns safe. We were lucky to get a glimpse.

It's not hyperbolic to call the Columbian white-tailed deer (*Odocoileus virginianus leucurus*) a marquee species of the Northwest; it lives nowhere else. Back in 1967, the deer's future was so ill-fated that it was one of just 14 mammals originally listed under the Endangered Species Preservation Act (the precursor to the Endangered Species Act), where it shared the spotlight with high-profile animals, such as the Florida manatee, the Sonoran pronghorn, the grizzly bear, and the black-footed ferret.

It remains on the endangered list today.

"From a legal standpoint, the Endangered Species Act says you must attempt to recover a species," Meyers notes. The Julia Butler Hansen Refuge, established in 1972, was part of that mandate. But the refuge alone isn't enough. The deer need large swathes of contiguous habitat to breed and forage. That's where Columbia Land Trust comes in.

"Our role in the Columbian white-tailed deer story is to permanently conserve and care for lands where they can feed and breed," says Conservation Director Scott McEwen. Since 2006, in five separate acquisitions, we've conserved 930 acres near the refuge, much of it specifically to support the deer. While some of that land already held excellent deer habitat, in other areas we're restoring degraded land—creating habitat where there was none before. Every acre conserved helps guarantee the Columbian white-tailed deer's story will be one of hope and recovery.

**"If we allow species to disappear, we lower the value of our surroundings by some intangible amount. But it adds up."**

The deer's story follows a familiar narrative of decline: In the early 1800s, Columbian white-tailed deer ranged throughout the river valleys west of the Cascades from southern Oregon to the Puget Sound. Unregulated hunting and agricultural clearing nearly sent the deer the way of the dodo. By the 1930s, only two populations remained, separated by some 200 miles: one in southern Oregon's Douglas County and one along the Lower Columbia River.

After a hunting ban and a push to link and expand the deer's habitat, Douglas County had good news. "The deer did what deer do," as Meyers puts it. They roamed, foraged, rutted, had fawns. And those fawns survived, so that the local population soared to 6,500 animals. In 2003, the Douglas County population was removed from the endangered species list.

The Lower Columbia River population hasn't fared nearly as well. "We have postage stamps of habitat here," Meyers says, noting that this population also faces more on-the-ground complexities. High hills hem in the deer's range. Coyotes prey on fawns. Floods during the rutting season can put a big dent in the population. Dikes can cause land to subside, which in turn can cause land to become too wet, which the deer don't like. Every year, some get killed by cars. Managing the population here is a constant balancing

act, requiring the efforts of many partners, agencies, landowners, and citizens.

In 2013, after a dike's imminent failure threatened to flood the Julia Butler Hansen Refuge, 37 Columbian white-tailed deer were relocated to Washington's Ridgefield National Wildlife Refuge. Now the deer have a new place to roam. The move could be the key to the Lower Columbia River deer population's delisting, which requires three separate "viable and secure" groups to be established. "Delisting," notes Meyers, "would be a very big deal."

I ask Meyers why anyone should bother caring about the Columbian white-tailed deer, which hasn't earned a place in the public psyche the way, say, the bald eagle or salmon has. Meyers talks about genetic diversity, how animals are like libraries of the natural world, how we have an obligation to save the data. Legally we have an obligation to do so, he tells me—all very logical.

But later he sends me another answer. "The question is, is there some inherent or objective value in a living thing?" his email reads in part. "If we allow species to disappear, we lower the value of our surroundings by some intangible amount. But it adds up." And though he hasn't said it, it strikes me that we all have a role to play in the ultimate equation. —Jill Davis



Not just any deer: This doe is one of our region's native Columbian white-tailed deer.



Radio collars like this one help wildlife biologists track individual deer.



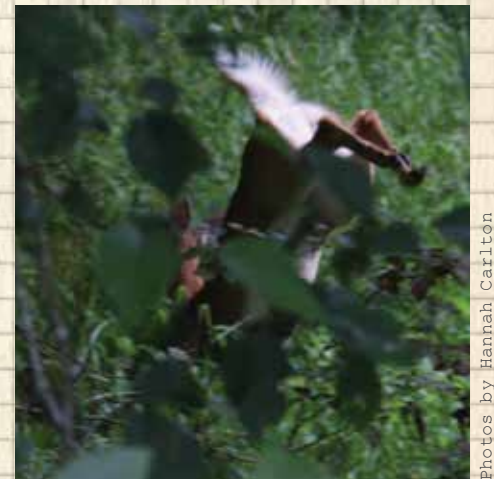
From June to September, you can look for deer (and many other animals) along Center Road at the Julia Butler Hansen Refuge.



U.S. Fish and Wildlife Biologist Paul Meyers at the refuge



A voracious weed, reed canary grass must be constantly managed on the refuge; it overtakes deer's food sources.



The deer's namesake white tail can measure up to 17 inches long. It's wonderfully flashy.



## He Is the Eggman

To 16-year-old Luke Slind, frogs and salamanders are the real stuff of life.



Luke Slind

In the Northwest woods, downed logs act as beacons for curious children. Lift up a length of decaying fir, and in the dark depression of earth thrives a netherworld of life: ants, worms, slugs, snails, insects, eggs, snakes. These slithering, crawling scenes have always enticed Luke Slind, who began traipsing through the Northwest wilds with

his dad before he could even walk. His favorite discoveries? Salamanders and frogs, no contest. “Even when I was three, I loved amphibians,” Luke says. “It was some sort of obsession.”

Luke lives in Longview, Washington, and while other students in his school pursue sports or high-score honors in Call of Duty, Luke prefers wetlands, woods, hunting with his dad, and learning what he can about the natural world. Though he’s only 16, Luke has become a near expert at locating and identifying amphibians and their egg-mass sacs—definitely not on the top 20 list of things typical American kids like to do.

Columbia Land Trust and Willapa Hills Audubon Society have long partnered to conduct amphibian egg-mass surveys. Luke shows up to just about every event we offer. Because frogs are so sensitive to habitat changes, surveying is one way to assess water quality, the health of a piece of land, or whether wetland-restoration projects are working well.

One cold February morning at Indian Jack Slough, our property near the Elochoman River, Luke—suited up in chest waders and brandishing a frog wand—walked into the water to demonstrate egg-mass-identification techniques. The adult volunteers (egg-mass-identification newbies, all) stood on the bank to watch Luke and learn what to do. “Here’s one,” he said. He slipped the wand under a baseball-sized blob and lifted it to the surface. Adults pulled out their cheat sheets to compare the eggs with the illustrations on the card.

Luke first learned about egg masses in a class hosted by the Willapa Hills Audubon Society. He learned the plants and environments different amphibians prefer, the seasons when they lay their eggs. He learned to distinguish between long-toed salamanders and Pacific tree frogs, both



[a] a red-legged frog egg mass  
[b] an egg-mass-ID sheet  
[c] an egg mass on a frog wand  
[d] Luke in his comfort zone:  
a good wetland

Photos by Jill Davis

of which have similar-sized egg packets. Then he went out, sometimes weekly, to practice his skills on Washington rivers: the Bone River, the Newaukum.

His growing expertise may one day be parlayed into a career. He wants to be a biologist or a herpetologist. “I’m starting to learn about what makes amphibians work,” he says. “Amphibians are just so fragile; you have to be careful handling them, but the wild is a harsh place. How do they evolve and survive? It’s a curious thing.” —Jill Davis

## We Want You!

Two great volunteer days are coming up: Join us! For more info or to register, you can contact Volunteer Coordinator Sam Schongalla (volunteer@columbialandtrust.org; 360-213-1214). Or visit us online: columbialandtrust.org/news/volunteer-opportunities/.

### SEPTEMBER

#### Washougal River Wetland Adventure

Saturday, Sept 27, 10am–1pm

Get an insider’s tour of Schoolhouse Creek in the morning, and then help us assess the success of a three-acre tree-planting. (Our survey method involves hurling bamboo stakes, so this should be fun!) Located off the main stem of the Washougal River, Schoolhouse Creek is worth a visit: It’s one the few remaining large, high-quality wetlands found in the area. We’ll search for the wetland’s unique freshwater mussels, check out the beaver lodge, and take a look at the channels we successfully restored for juvenile salmon.



Columbia Land Trust



Above: staff conducting a freshwater-mussel survey on Schoolhouse Creek, just off the Washougal River  
Below: a really good-looking oak on the Klickitat River

### OCTOBER

#### Acorns to Oaks on the Klickitat River

Saturday, Oct 4, 9am–5pm

We’ve removed 4.5 miles of road along the Klickitat River, and now we need your help planting the oak woodland where the old road used to be. Led by longtime Stewardship Lead Lindsay Cornelius, you’ll walk the shore, gather acorns from nearby oaks, and then plant them in the former roadbed. Our pace will be determined by the group, but we’ll be hiking 6 to 10 miles along the shoreline. This is a great opportunity to get up close and personal with one of our area’s most beautiful rivers and to learn about one of our most inspiring restoration projects.

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