



Discoveries

News and Views from the Discovery Foundation

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Streamwalkers

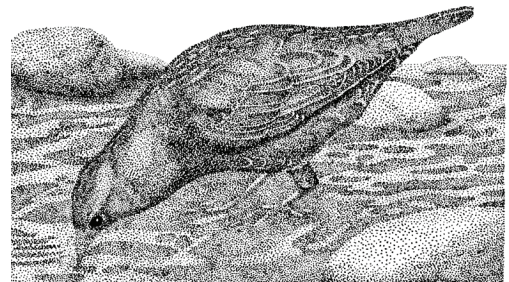
by Richard Carstensen

Dan Bishop was one of those lucky souls who get paid to do what they'd do anyway for love. In Dan's case it was splashing up the streams and rivers of an overflowing land. The nature trail he helped design behind Auke Bay School is called the Dan Bishop Bay Creek Trail.

My first job with Dan Bishop was on the Chuck River, 70 miles southeast of Juneau. The Forest Service wanted Dan's opinion about potential impacts of logging-induced siltation on key spawning reaches in the upper river. We flew down in February, 1985, tent-camped at -7°F , and collected 500 pounds of sediment samples from the river bed. With pantograph, air photos and autolevel data I drew my first stream habitat map by the light of a Coleman lantern. Several miles above its mouth in Windham Bay, the Chuck is a medium-sized stream, too big to let wind-toppled trees lie where they first slam to earth, but not yet muscular enough to flush them down to sea or pile them high on the banks. The result is a series of big log jams, separated by long, log-free spawning riffles.

I'll never forget some images from that week on Chuck River: standing in a magnificent forest of clean, middle-aged, 30-inch riverside spruce ("perfect cabin logs!" was Dan's highest tribute); watching in amazement as Dan's 6-foot 4-inch associate Leigh Smith sloshed numb-toed up the river in leaking hip-waders with an 80-pound CO_2 canister under each arm, singing "I feel like *dancin!*"; and helping Dan wring out his clothes after he popped neck-deep through plate ice. On the upper river Dan also introduced me to frazil ice, which forms on subzero nights as a blizzard of slush in the supercooled water, then floats downstream and piles against debris dams. Rearing fish are disoriented in the whiteout and sometimes killed *en masse*. Dan often claimed that you can't understand a stream until you've walked it in winter. Watching him fall in a number of times, I now wonder if he didn't also feel that full bodily contact led to even greater comprehension.

In his last year, Dan skied Montana Creek on breaks between chemotherapy sessions in Seattle. Montana Creek is home to water ouzels, or dippers, who sometimes sing even on the mid-winter ice. John Muir and Stewart Udall both named the dipper as their favorite bird, and Dan Bishop chose it as his business logo.



Dippers usually make me laugh, partly at their clowning fearlessness and partly at the reassurance they offer, that I stand on a healthy stream. Most ardent of streamwalkers, dippers seek well-oxygenated waters, selecting most of their prey from the orders of mayflies, stoneflies and caddisflies. These insects are known to the volunteers in monitoring programs like *Water Watch* and *Adopt-A-Stream* as the "EPT" group, which contains mostly pollution-intolerant species. Dippers, therefore, are nature's Aquatic Seal of Approval. Dan's clients were usually people who wanted to build something or cut something down, or both, so his oval-shaped logo showed a dipper bobbing on a stream which bubbled forth from a dam in the background, proof of Dan's faith that people and nature, with skillful arbitration, can reach constructive agreements.

From Dan I learned to dig holes, sniff sulfur, slurp through horsetail marshes, take pictures hanging from tree limbs, turn over rocks, hack survey lines through willow thickets, roll mud in my fingers, and then write about it. What I teach kids today is the same mucky, enlivening *natural history* – the art of paying sensory attention and asking continual questions. A naturalist's questions rescue us from rootlessness: Where *are* we?! How did this place get like this? What's around the next bend?

Are you wondering whose footprint is pictured above? Ask any 4th grader in the Discovery Foundation Nature Studies Program. (They'll tell you that the only local beach track with 5 webbed toes belongs to the otter.) Illustration by Richard Carstensen

Special thanks...

to outgoing executive director **Susan Goes**, to whom the Discovery Foundation is forever indebted.

to outgoing naturalist **Kathy Hocker**, who is pursuing a graduate degree at UC Santa Cruz.

to outgoing board members **Bruce Gifford, Carol Griffin, Bob Janes, and John Lindback**.

...and to Nature Studies field trip volunteers...

Dixie Boggs, Anne Fons, Erik Goldsberg, Carole Healy, Joan Herbage, and Doreen Stangel

Hydrologist Dan Bishop bushwacking through a willow thicket on Chilkat River. Stem on right has been ridden down and snapped by a moose. Illustration by Richard Carstensen

Like Dan Bishop, biologist K. Koski has walked streams all over Southeast Alaska. For the National Marine Fisheries Service (NMFS), K. has coordinated long-term, multidisciplinary studies at Porcupine Creek on Etolin Island, and the Situk River at Yakutat. Alaska's great contribution to the watershed researchers of the lower 48 is that only here do we have an abundance of essentially pristine streams and rivers. Healing (or even recognizing) the sick is impossible without understanding the healthy.

I've gotten to know K. Koski on the Duck Creek Advisory Group, where I help the Discovery Foundation to form a bridge between research and education. K. and fellow NMFS biologist Mitch Lorenz remind me of dedicated doctors, unwilling to surrender a failing patient. Duck Creek once hosted 10,000 chums, who ran to its headwaters near the glacier's terminal moraine at today's Taku Boulevard. That chum run is extinct, and today's cohos, dollys and cutthroats, some with spinal deformities, expire from low dissolved oxygen, dewatered channels, wandering cats, and periodic flushes of lead and zinc as snowplow berms melt into roadside tributary ditches at winter's end. Dippers on Duck Creek are about as common as wolverines in Detroit.

I asked K. what he most wants future generations to know about streams. "That they can't be separated from their watersheds," he replied. "What we do at the stream mouth affects the headwaters, and what we do in the uplands affects the stream bed." These may be familiar concepts to readers of a newsletter like *Discoveries*. But Duck Creek is proof we aren't applying them. This,



I suspect, is why K. and Mitch won't give up on Duck Creek. It's where we live. To heal Duck Creek is to heal ourselves.

And what do scientists still need to learn about streams? "We should know more about the interactions of streams with the riparian zone," says K., "...the plants and insects and wildlife that benefit from, and give back to streams." Stream management regulations are based on fish, which decades of work have begun to quantify. But fish are just part of the equation. Recent studies have shown that thousands of salmon eggs per day are lost as other redd-digging fish bury them or expose them to the current. On healthy streams such loss to salmon is *gain*: to attending dollys and sculpins; to gulls waiting down in the estuary; to mergansers paddling through the spawning orgy; and to mink skulking in the streamside brush.

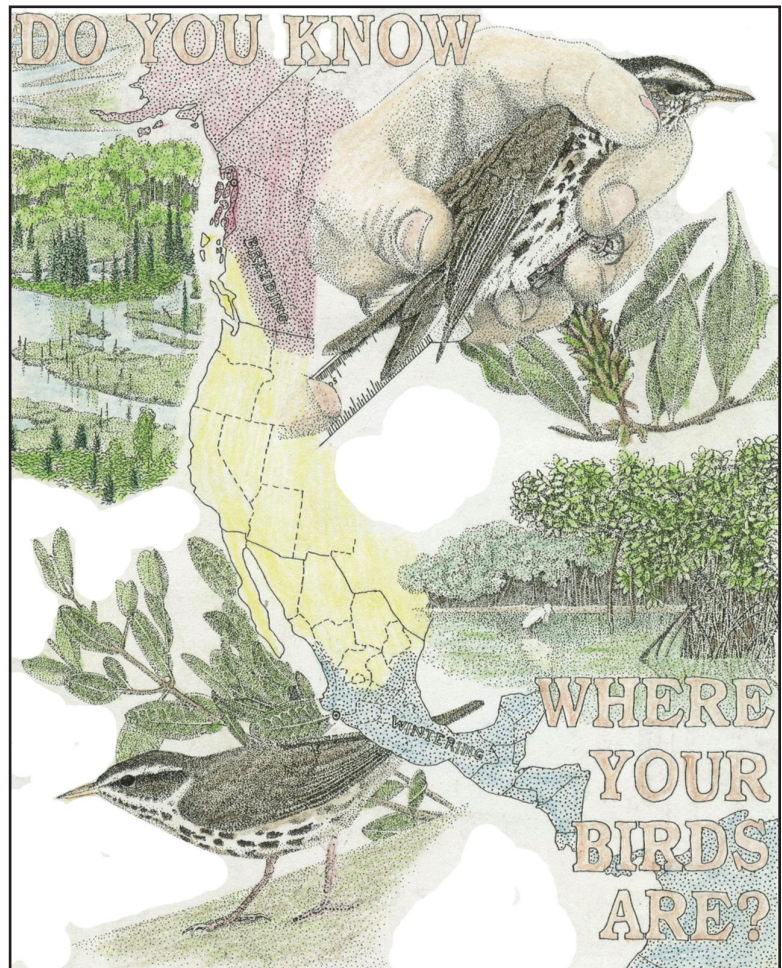
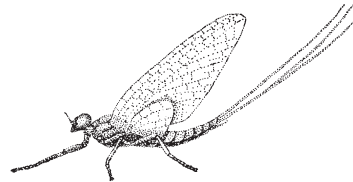
Some of these riparian relationships are being measured by Mark Wipfli, an aquatic entomologist with the Forestry Sciences Labs (FSL). Mark studies insects as food for fish, and fish as food for insects. Many of the insects eaten by rearing fish come from the terrestrial surroundings – shrub and tree leaf-eaters that inadvertently fall into streams – while the rest are aquatic species like mayfly nymphs. When the salmon return to die, their carcasses are colonized directly by certain stoneflies and midges, and many other stream insects benefit indirectly via the microbial community that develops on the stream bed because of nutrients that leak from carcasses. On land, dead fish are recycled by marsh fly larvae and other invertebrates.

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Mary Willson, a terrestrial ecologist with the FSL, would like to know if those salmon-fed insects are important to the birds she studies. And what blossoms from nutrients returned to riparian soils by disintegrating fish that hang up on the way downstream, or which get dragged into the salmonberries by bears, or shredded on the bars and pooped from trees by eagles? New methods of stable isotope analysis can tell whether carbon in streamside vegetation is of marine or terrestrial origin. Anadromous streams are where the land incubates the sea's future bounty, and where the

sea repays its debt to the land.

Norman Maclean's *A River Runs Through It* strikes an old chord. We're suckers for flow, born gravel-nuzzlers, hypnotized by creek-gurgle, anchored by still pools. Big rivers, bulging with slurry from a dozen glaciated mountain ranges, silence every human sin. People come clean on river float trips. You could tell from Dan Bishop's bottom-scraping laugh that he'd never spent enough time away from rivers to get much dirtied. Let's scan the ranks of young streamwalkers for more Dan Bishops. Watch for third graders curiously jabbing bare hands into frazil ice.



The Northern Waterthrush is a common but rarely-seen skulker on the brushy margins of Alaskan streams and ponds. Like other neotropical migrants that we think of as "our" birds, the waterthrush only stays here for the 3 months needed to nest and fledge a family. The banded bird was captured near her nest by the Mendenhall Glacier Visitor Center. The lower bird is foraging in the mud of a tidal mangrove thicket near Manzanillo, Mexico.