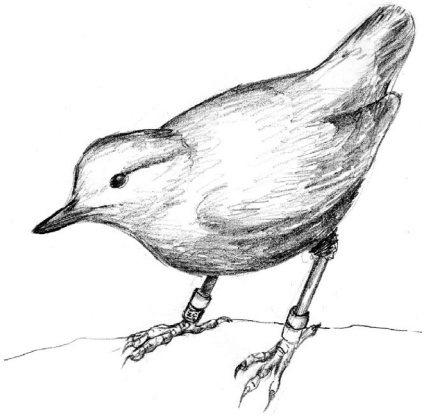


Discoveries

News and views from Discovery Southeast Spring 2007

American Dippers:

Songsters by the streams

Mary Willson

Go to the footbridge on Steep Creek or the Sheep Creek bridge on Thane Road, and you are likely to hear a long, rollicking bird song filled with repeated phrases. Look for the songster, probably perched on a rock by the water, and you'll spot a small gray bird, arguably the best singer in Southeast Alaska. It's the American Dipper, whose scientific name is *Cinclus mexicanus*. This species is North America's only aquatic songbird. One of only five species of dippers in the world, our North American species breeds from the Brooks Range in northern Alaska south through the mountainous west to southern Central America. All dippers live along mountain streams, feeding on aquatic insects (especially caddisflies, stoneflies, and mayflies) and small fish.

I have been studying American Dippers near Juneau for several years, funded in part by ADFG's non-game program, and ably assisted by Kathy Hocker and summer field technicians. There are several reasons for studying dippers. They are charismatic as well as biologically unique, and they can be a part of watchable wildlife programs. More importantly, perhaps, they are indicators of stream quality, in that they do not reproduce well in polluted streams.

Names

The American Dipper was formerly called the water ouzel. Ouzel apparently meant 'thrush' in Middle English, and the current German name of Wasseramsel for the European dipper means exactly 'water thrush'. But dippers are not thrushes. There is another European mountain bird, called the Ring Ouzel, which *is* a thrush. I'm guessing that taxonomists changed the common name of our dipper so that it did not imply some close relationship to the unrelated ring ouzel or to thrushes. Our dipper should really be called the North American Dipper, because there are two other species of dipper in South America. Its scientific name of *Cinclus mexicanus* adds to the confusion of names, because the bird is not just Mexican – but perhaps the first specimens came from there.

Dippers are known to be sensitive to all kinds of diminished water quality, including acidification, sedimentation, and waste material from industry, agriculture, and mining. Some stream disturbances are natural ones, such as landslides, avalanches, and floods, which are fairly frequent in our region of high precipitation and mountainous terrain. Some of the disturbances are anthropogenic, caused by road-building, logging, mining, and dam-building. Such activities can dump into streams an array of pollutants, including sediment and debris, heavy metals (lead, cadmium, etc.), and toxic wastes (e.g., cyanide, organochlorides). Therefore, given that all of Southeast is subject to numerous stream disturbances, we felt it was essential to have some baseline information on the distribution and habitat use of dippers in this area. Without a baseline, it is hard to know the status of a population when exposed to future environmental changes.

RH Armstrong

A dipper fledgling clamoring eagerly for food from its busy parent.

The Juneau dipper study

The first goal therefore was to map the distribution of nesting dippers on streams around Juneau. My crew and I surveyed almost 40 streams, ranging in size from tiny Lena Creek to major drainages such as Lemon Creek and Fish Creek. A few of these streams were accessible only by skiff and were visited only once to de-

continued on page 4

In this issue

Banner: Banded dipper, by Kathy Hocker from a photo by Arnie Hanger.

From the Director

Dana Owen

One thing about this year's long winter is that spring seemed especially abrupt. One day we were sliding on ice and the next we were planting annuals. It seems only a few days ago that we were marveling at – ok, bragging about – the record snowfall. My garden was buried under about five feet of snow I'd piled up from shoveling the driveway. Songbirds in my neighborhood were really quiet. I was beginning to suspect that someone had turned off the sun.

Suddenly, everything was different. Skunk cabbages were up, birds were in full throated chorus, and days were notably longer. There was just no stopping it.

As with spring, Discovery Southeast looks a little different this year, but the same demanding cycle drives activity as it always does. Connecting people with nature doesn't stop, even if we change focus from time to time. Kids are still eager to see what's out there, and we're just as eager to show them. We're still helping them unravel the stories told by the tracks in the snow, or showing them what happens to a landscape as a glacier advances and then recedes. We're still helping them understand their place in the natural world and to find their sense of wonder at it all.

Also with a new season comes a new issue of the newsletter. For some time now, I've been intrigued with Mary Willson's study of dippers, one of my favorite birds, and I am extremely grateful to Mary for her cover story. As always, I'm grateful to Kathy Hocker, Richard Carstensen and Jan Carlile for their contributions to a consistently outstanding newsletter.

This issue is also my valedictory. In December I was offered a job I would have been foolish to refuse, so this will be my last column as Executive Director. Working for Discovery Southeast has been a great experience, and I'll miss it terribly. Mostly, I'll miss working daily with such an impressive collection of people. Few organizations in our line of work have as deep a pool of expertise to draw on. We've got wildly talented naturalists, a committed, energetic and capable board, and above all we have strong community support and dedicated members. It's been a privilege to serve you.

I'll see you on the beach, or the trail, or volunteering for our favorite nature education organization. So long until then.

Last summer's teacher training expedition to Endicott Arm

Discoveries is published by Discovery Southeast, Southeast Alaska's leading source for natural history and conservation education. Founded in 1989 in Juneau and serving communities throughout Southeast Alaska, Discovery Southeast is a nonprofit organization that promotes direct, hands-on learning from nature through natural science and outdoor education programs for youth, adults, and teachers. By engaging youth and adults in the study of nature, Discovery Southeast naturalists deepen and enrich the connections between the people of Southeast Alaska and nature.

Editor: Richard Carstensen
Writers: Mary Willson, Dana Owen, Jan Carlile
Illustrations and photos: Bob Armstrong, Kathy Hocker, Mary Willson, Richard Carstensen, and DSE staff

Discovery Southeast
PO Box 21867, Juneau AK 99802
907/463–1500 phone • 463–1587 fax
e-mail: info@discoverysoutheast.org
website: www.discoverysoutheast.org

Discovery News

Auction

Our 18th Annual Discovery Southeast Auction and Dinner Fundraiser on April 6, *Wading Into Spring*, was a record setter! We had the biggest selection of auction items ever, brought in the most amount of money ever, and enjoyed a great evening with friends and supporters. In addition to our customary delicious dinner and suite of children's activities, we tried a couple of new things – delightful dinner entertainment by Ursa Minor and a table full of auction items just for kids. Many thanks to our wonderful Board, a host of volunteers, and the many contributors who helped make this event the success that it was. Your participation as a worker, contributor or attendee helps keep hands-on nature education in Southeast Alaska a reality!

Transitions

With the loss of our director, Dana Owen, in January, we have made a few temporary changes in our operations. The office is only staffed part time for now; but the phone is checked regularly when we're not in and messages are returned. The Board is discussing how and when to fill the vacant Executive Director position. If you or someone you know might be interested in taking a leading role in fulfilling our mission of strengthening the bond between Southeast Alaskans and our natural home, give us a call or drop us an email!

With reduced staffing and with an eye toward strengthening our financial footing, we also made the very difficult decision to cancel our popular Outdoor Explorers summer day camp for this year. We ran one of our best summers ever last year with 7 weeks of this long-standing program – proof that this kind of active outdoor experience is valued by Juneau families. The calls we've received this spring requesting information on the camp have been encouraging, too; lots of wonderful accolades from new and returning families who love this unique offering from among the various summer youth opportunities. We have every intention of being back with Outdoor Explorers in Summer 2008!

Tracy Arm Cruise

Despite the low overcast and cool temperatures, an enthusiastic group of warmly clad folks boarded a Four Seasons boat on May 12 for our 4th Annual Tracy Arm Cruise. After a beat south under intermittent showers, we welcomed the pockets of sun that appeared as we worked our way down the arm. Thick ice allowed us to get in as far as Marguerite/Sawyer Island. We saw a good mix of standards and surprises – black bear, a mama brown bear with cubs, goats, many birds, and a couple dozen humpbacks. Spring is such a fantastic time to visit this wildlife wonderland! Thanks to the Board for their work to plan the trip, and thanks to all who joined us to enjoy the show and support our great programs. And thanks to Four Seasons Marine for partnering with us to make this cruise possible. Think about coming along next year!

Can You Help?

As we mentioned in our last newsletter, our highly popular *Common Birds of Southeast Alaska* field guide is out of print. We would love to have it back 'on the shelf' with our other great publications, but need some financial help to make that happen. If you would like to contribute some or all of the approximately $2500 a reprint would require, we–and all the folks out there itching to do some bird watching–would be grateful. We also have a brand new geomorphology field guide nearing completion. A generous donor has provided the design funding for this great new addition to our offerings; but we need some financial assistance to get the guide printed and out there for you to use. Please give us a call at 907-463-1500 if you would like to help move these projects along.

Summer Teacher Expeditions

Once again this year we are offering, in partnership with Alaska Discovery, Alaska Natural History Association, and the U.S Forest Service, three exceptional opportunities for teachers to participate in week long field studies and earn professional development credits at the same time. The classes are: *The Brown Bears of Admiralty Island* (June 5-11); *Seals, Ice and the Wilderness Idea* (June 26-July 2); and *Whales of Icy Strait* (July 19-25). In addition to observing the behavior and habitat of these animals with expert professionals, participants learn about safe, comfortable travel in wild country and collaborate on how to transfer some of this knowledge to students. The Bear trip is full, but we still have openings in the other two. Please contact the Discovery Southeast office at 463-1500 or our website (www.discoverysoutheast.org) ASAP for more information or to register.

Naturalist Scott Burton with his Harborview Nature Studies students near the flume above downtown Juneau.

continued from page 1

tect the presence of nesting dippers. Most of the streams were accessible from the road system or local trails, and these were patrolled regularly. By wading up the stream when the water levels permitted, or bushwhacking alongside when there was high water or a waterfall, we searched for dipper nests. We covered many miles of stream and found 38 nests in 2005 and 44 nests in 2006. Kathy mapped all these nests in GIS ("Geographic Information Systems" - computerized mapping that interfaces with a database).

In addition, we regularly monitored most of these nests, in order to learn more about nesting biology and nest success. Starting in April, we tried to find nest-building pairs, so that we could have the history of their nests from the beginning of the nesting cycle.

Dipper nesting

Dippers need both good nest sites and suitable streams for foraging. Most dippers nest along stream reaches that are full of cascades and riffles, where prey is abundant. Our data also show that dippers nest only on streams above a certain minimum size. This is probably because prey is more abundant in streams that have higher flow and cover more substrate where the prey live. Some streams that appear to be sufficiently large and productive do not have nesting dippers, but they lack good nesting sites.

Interestingly, and contrary to conventional wisdom, dippers are able to nest on streams of glacial origin. We found them nesting along Eagle River, Lemon Creek, and Nugget Creek, for example. They can do this, despite the glacial silt that makes the water opaque as the season progresses, because they nest rather early, before the heaviest silt loads come down, and they also forage in clear-water side-channels and tributaries.

RH Armstrong

A dipper nest, composed of many kinds of moss, with a side entrance.

Dipper pairs are very territorial, vigorously defending their own reach of stream against all other dippers. The length of each territory differs with circumstances but ranges up to 2 km long.

American Dippers form pairs in very early spring. Courtship activity usually centers somewhere near a prospective nest site. One good place to watch is near the end of the broken spillway on Gold Creek, where a pair has nested for the past several years. When the end of the spillway was wrecked in the fall floods of 2005, the birds moved to the new end, farther upstream. From the streambank here, you can observe a good length of the creek, and springtime courtship activity can often be seen. The birds chase each other and display on the rocks, with wing-fluttering and strutting.

They may start nest-building in April, but the majority of nests around here are started in May. In a cold, wet spring (such as 2006), nesting is delayed by 2-3 weeks. Nests are round balls of moss, a bit smaller than a volleyball, with a side entrance. Inside the nest is a cup of grass and leaves that makes a bed for the eggs and nestlings. The nests are commonly placed on cliff ledges right next to the stream (sometimes even behind a waterfall), but caves and crevices under piles of boulders are also fairly common nesting sites. More rarely, nests are placed under bridges (where the beams may offer horizontal ledges), in old wooden dams left from the min-

RH Armstrong

Dipper nestlings begging to be fed. Usually only one chick is fed each time an adult visits the nest.

M Willson & K Hocker

Dipper nest locations on Gold, Peterson and Kowee Creeks, indicated by white arrows. Typical nests are on cliff ledges or under boulders, but sometimes on bridges or in old wooden dams, and rarely on top of boulders.

ing era almost 100 years ago, and on top of big boulders. Almost all nests have an overhang of some sort, which protects the nest from weather, but a few lack any protection at all. Most nests are inaccessible to predators, but mink, weasels, squirrels, and ravens can reach some of them. Nests that are placed beside popular fishing holes on Fish Creek and Montana Creek are sometimes disturbed, inadvertently, by fishing activity, and one nest site is regularly vandalized by irresponsible persons.

Once the nest is built, the female lays four or five white eggs, and she does all the incubation. Birds incubate eggs by means of a brood patch; the incubating bird loses all the feathers from a large part of the breast. This area becomes highly vascularized, so that heat from the adult's blood can be transferred to the eggs when the adult sits on them. Only female dippers develop brood patches and incubate, but their mates often bring food to them while they are sitting in the nest. Although incubating females are fed sometimes by their mates, they also emerge from the nest to stretch and feed themselves.

After a little more than two weeks, the eggs hatch. The female broods the tiny chicks, which are almost featherless, feeble, and unable to regulate their own body temperature. For the first week or so, then, the male does most of the food deliveries to the chicks. He also removes fecal sacs from the chicks and dumps them in the stream. Gradually, the chicks need less warmth from the female and demand more and more food. So both parents get really busy, dashing back and forth, bringing prey from the stream to the nestlings. Sometimes the chicks are fed more than 20 times an hour (and occasionally the adults take breaks to forage for themselves). The youngsters get strong enough to stick their heads out of the nest entrance and call to their parents for *More Food, More Food!*, and they can back up to the nest entrance to eject their feces out of the nest. The chicks grow very quickly as they develop a good coat of feathers and the physiological ability to keep themselves warm.

We try to capture the adults during the nesting period. This is a good time for us to do this, because the adults are flying busily back and forth, usually several times an hour. And they are so intent on feeding chicks that this interruption does not deter them from resuming when we release them. We capture the birds by stretching a mist-net across the stream. This

Housecleaning and parasites

We became curious about the observation that dippers often clean out the nest lining when the nesting cycle is finished. In 2006 there was an accomplished rock-climber on my crew, which allowed us to reach a number of nests. We checked the nests after the cycle was complete and found that lining is removed if the nest was successful but not if it failed. I do not know why they do this, but it might be related to the risk of bird blowflies or other parasites that afflict the chicks and the possibility of using the nest for a second brood (at least in some years). We found blowfly pupae in several nests and sent them to an expert in Washington state for identification. In most cases, chicks were able to survive and leave blowfly-infested nests, but severe infestations might lead to failure. There remains much to be learned on this score.

RH Armstrong

Adult dipper carrying juvenile coho salmon to its nestlings (the nest is a few feet above the bird).

kind of net is made of fine black nylon thread and is almost invisible to a bird that is flying up and down the stream. When a bird flies into the net, we wade out and remove it from the net, bring it to shore, weigh it and look for a brood patch (so we know what sex it is), and put light-weight bands on their legs. By using several small bands of differing colors, we can create unique color combinations so that we can identify each individual. This whole process takes less than ten minutes, and the birds go back to their business of feeding chicks very quickly.

Once the adults have been banded, we can then watch the nests and record visits by male and by female, so we can learn how often each one feeds the chicks and get some information about what kind of prey they are bringing. It is quite easy to identify small salmonid fish and sculpins, sometimes possible to identify the larger invertebrates, but smaller items are impossible to identify. We found that female dippers tend to bring more fish to their chicks than the males do, but both parents are very attentive to their offspring. An adult dipper can catch a juvenile salmonid even if it already has one or two in its beak; in fact, dippers are capable of carrying at least four small fish at a time. We learned in a previous study that chicks that are fed partly on fish tend to weigh more than chicks than are fed only aquatic insects, and fewer fish-fed chicks die in the nest.

It takes about 3.5 weeks for the chicks to be ready to jump out of the nest and start learning how to forage for prey. When the chicks leave the nest, they are almost as big as their parents, and they can even fly a little. The fledgling chicks are pretty clumsy at first, and beg a lot of food from the parents, but after a few days they are reasonably proficient and can feed themselves—even catching a few small fish. But they go on begging from their parents for up to two weeks and occasionally win a meal that way. They hang around the old nest site for a while, but gradually move farther and farther away, and by winter they may be in another stream altogether. By next spring, they will be very proficient at foraging, ready to find their own mates and raise their own chicks.

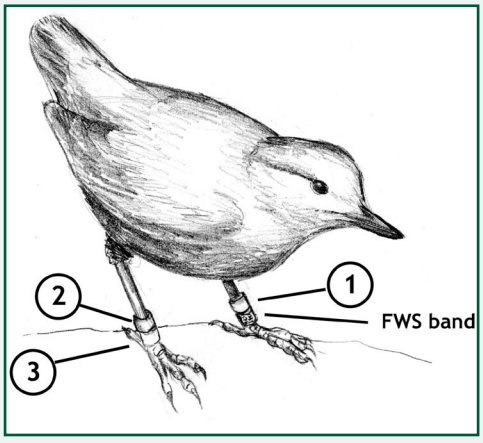
Finding banded birds

The more eyes are looking, the more banded birds are likely to be seen. So when you are out and about near our local streams, it would be helpful if you'd note the presence of dippers with bands. Remember that each bird has a unique color combination plus a US Fish and Wildlife Service aluminum band. There are two bands on each leg (unless one got lost). On the left leg there's a color band above the silver FWS band; on the right leg there are two color bands. We read the color bands in a consistent order: top left, top right, bottom right (Bands, 1, 2 & 3 in the illustration below). We don't make a point of stating the aluminum band, because all the birds have one.

For example, the male at the Steep Creek nest in 2006 was BRO (blue red orange), and his mate was BWY (blue white yellow). The male at the nest in Salmon Falls near the salmon-bake was ORG (orange red green) and his mate was RWG (red white green). This green is a pale one and easy to mis-read, so watch carefully!

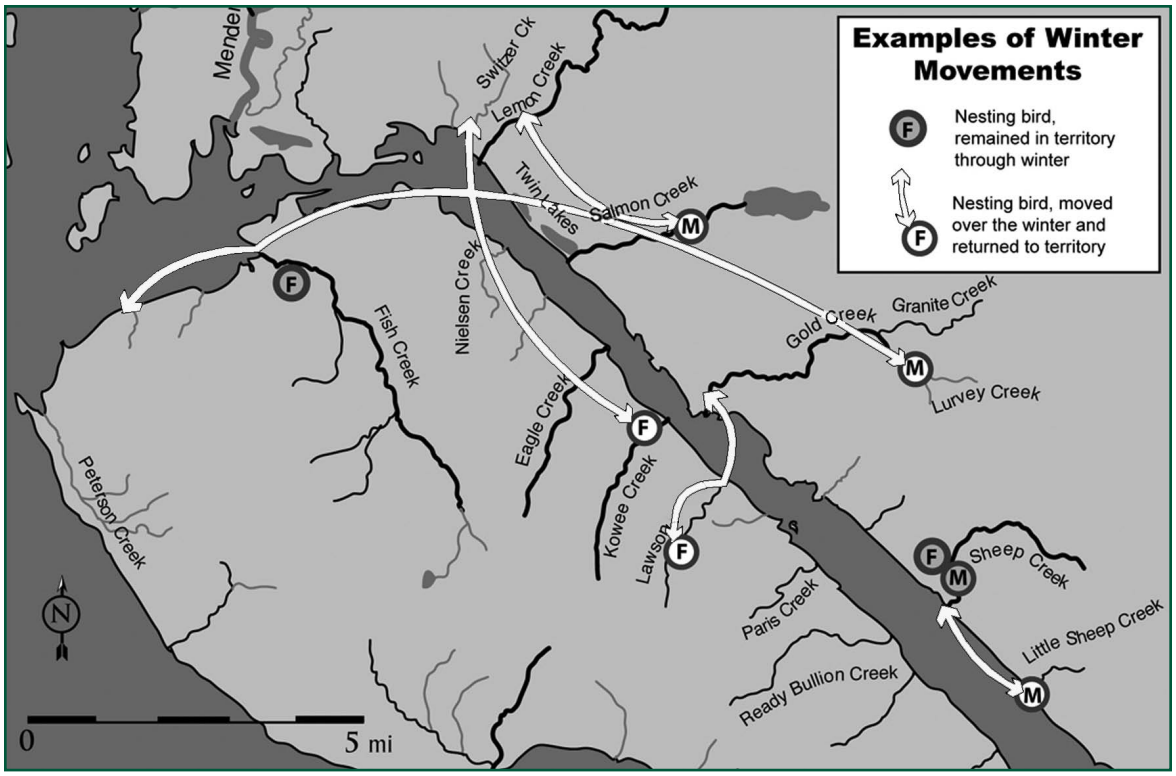
The more birds are re-sighted, the more information we can accumulate about movements, mate changes, and survival. So your help will contribute to the growing fund of knowledge about our local dipper population. Please contact:

Mary Willson: mwillson@gci.net
or Kathy Hocker: alcyon@gci.net



K Hocker

Meanwhile, the parent birds sometimes start a second brood. This is only possible at nests that were started early in the season, so in nasty springs such as the spring of 2006, second broods are very rare. We think that access to young salmonids and sculpins also increases the likelihood of starting a second brood, because



The Juneau dipper study showed that some birds move as much as ten miles between nesting and wintering areas. F = female; M = male. Stream volume is roughly proportional to line width.

K Hocker

pairs that nest on streams with juvenile coho salmon or near an intertidal area seem to make second broods more often than those without easy access to abundant fish.

Each nest we found was monitored every few days until the chicks fledged or the nest failed, so we can estimate the level of nest success in rearing chicks through the nesting cycle. Over the past three years, nest success was about 90% in two years but only 65% in 2006. Dipper nests are generally more successful than nests of birds that build open-cup nests (robins, sparrows etc.); the level of success tends to be more similar to that of cavity-nesters such as woodpeckers and chickadees.

Because the adults are banded, we can also estimate the probability that they will live from one nesting season to the next. Of course, we can't be sure that they did not move to some other area altogether, but all of the moves we could detect occurred within the same watershed, so we think that birds that disappeared are very probably dead. Annual survival of adults was 57-67% over two years, but only 38% from 2005 to 2006. Our oldest known bird was a female banded in 1998 in an earlier study; she lived to be at least seven years old; in her last year, her nesting attempt failed because her hyper-aggressive neighbors drove her and her mate away.

If both members of a pair survive, and if they nested successfully in the previous year, they are likely to pair up again. We have one pair that has nested together for three years, raising two broods every year in the same location (in 2006, they were the only pair to do so). Several other pairs have been together for two years. In other cases, only one member of a pair was seen in the following year, with a new partner, sometimes on a different territory.

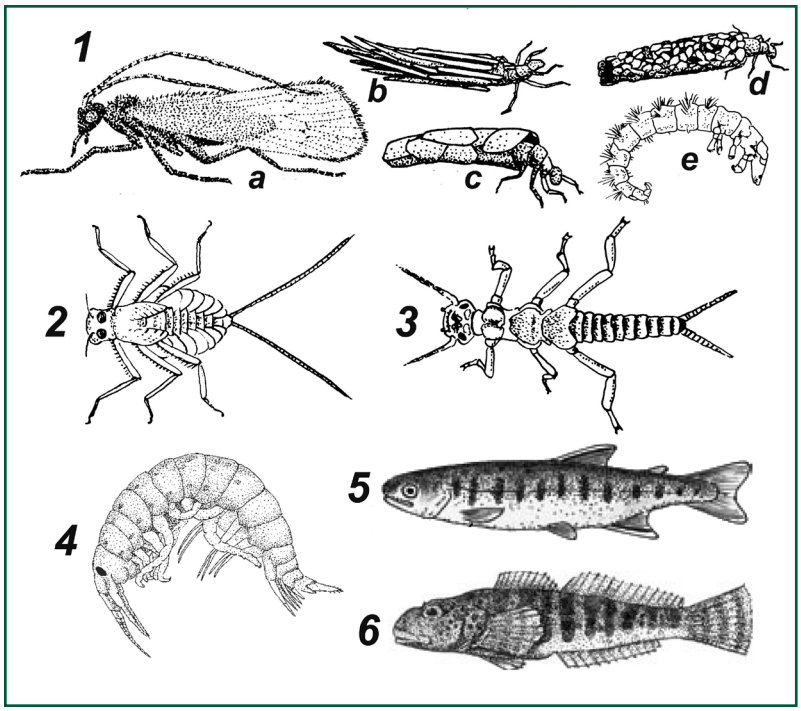
Dippers in winter

Dippers do not migrate south for the winter, although they may move from high elevations to low, or make regional movements from interior to coast. They are known to overwinter in the Brooks Range in northern Alaska and in the Yukon Territory, where winter temperatures plunge far below freezing. This is possible because in some locations there are upwellings that prevent the stream from becoming totally covered with ice. Dippers then can forage

A dipper resting between foraging bouts in a small opening in the ice on one of the ponds in the Dredge Lake area.

RH Armstrong

K Hocker & R Carstensen



Dipper prey items: *1) caddisfly (a = adult, b, c and d =cases of needles bark and sand, respectively, e = free-living caddis larva); 2) mayfly larva; 3) stonefly larva; 4) amphipod, a brackish water species; 5) coho fry; 6) coastrange sculpin, a freshwater form.*

for insects and small fish in the openings in the ice. Despite this appearance of toughness, evidence from the closely related Eurasian Dipper suggests that low winter temperatures probably diminish survival.

After the nesting season, dippers molt their old feathers and get a new coat of fresh feathers. During this time they are much more shy and secretive than at other times of year. By late September, however, they start moving around and occur in many places not used for nesting. In fall and winter, we often find them on very small streams and on deltas where the freshwater stream flows out over the tide flats at low tide. They are still feisty and aggressive, but no longer territorial.

We have found banded dippers over ten miles from their nesting areas, and many wintering birds move around from one stream to another. Others seem to spend most of their time in one area, and some use the same area for several winters. Dippers regularly cross Gastineau Channel in the off-season: birds from Douglas Island are seen on mainland streams and deltas, and vice versa.

When wintering dippers forage in streams, their prey choices seem to be similar to those in the nesting season. In contrast, when dippers forage on deltas, their prey is quite different. On deltas, the flowing stream is still fresh water but the area is inundated twice a day by salt water. There are virtually no stream insects that tolerate salt water, but there are small shrimp-like crustaceans called amphipods that can live in both fresh and salt water. Dippers commonly hunt amphipods by turning over small rocks on the stream bottom; amphipods often congregate by the dozens in such places, and if a dipper turns over the right rock, it can capture as many as 20 or 25 amphipods in a minute or so. However, amphipods that we sent in for analysis contained much less fat than many aquatic insects, so they appear to be poorer prey.

Wintering dippers also eat fish, especially sculpins. Sculpins have big heads and spines, so they are rather hard to handle. Dippers whack sculpins into edible condition by pounding them on rocks, sometimes for many minutes. I have seen dippers swallow subdued sculpins up to about 4" long—quite a feat for a bird that is less than 8" in total length, including the tail! In late winter (February-March), salmon fry start emerging from the gravels where the eggs were incubating. If they emerge a little prematurely, still with yolk sacs attached to their bellies, they sometimes try to rebury themselves. I have seen yolk-sac young with their heads buried in the gravels but their tails still waving in the current. When a dipper encounters a group of these tails, it plucks the fry from their imperfect hiding places, much like us pulling carrots from a garden. And the fully emerged fry also make good foraging in early spring.

Salmon eggs are a good source of food, too. Some eggs are poorly buried by female salmon or get dug up by later spawners. These eggs are not incubated properly and will not hatch. They are readily available to foraging dippers (and other predators such as sculpin) in fall and into winter. And they are full of fat, providing a rich supply of energy to the consumer.

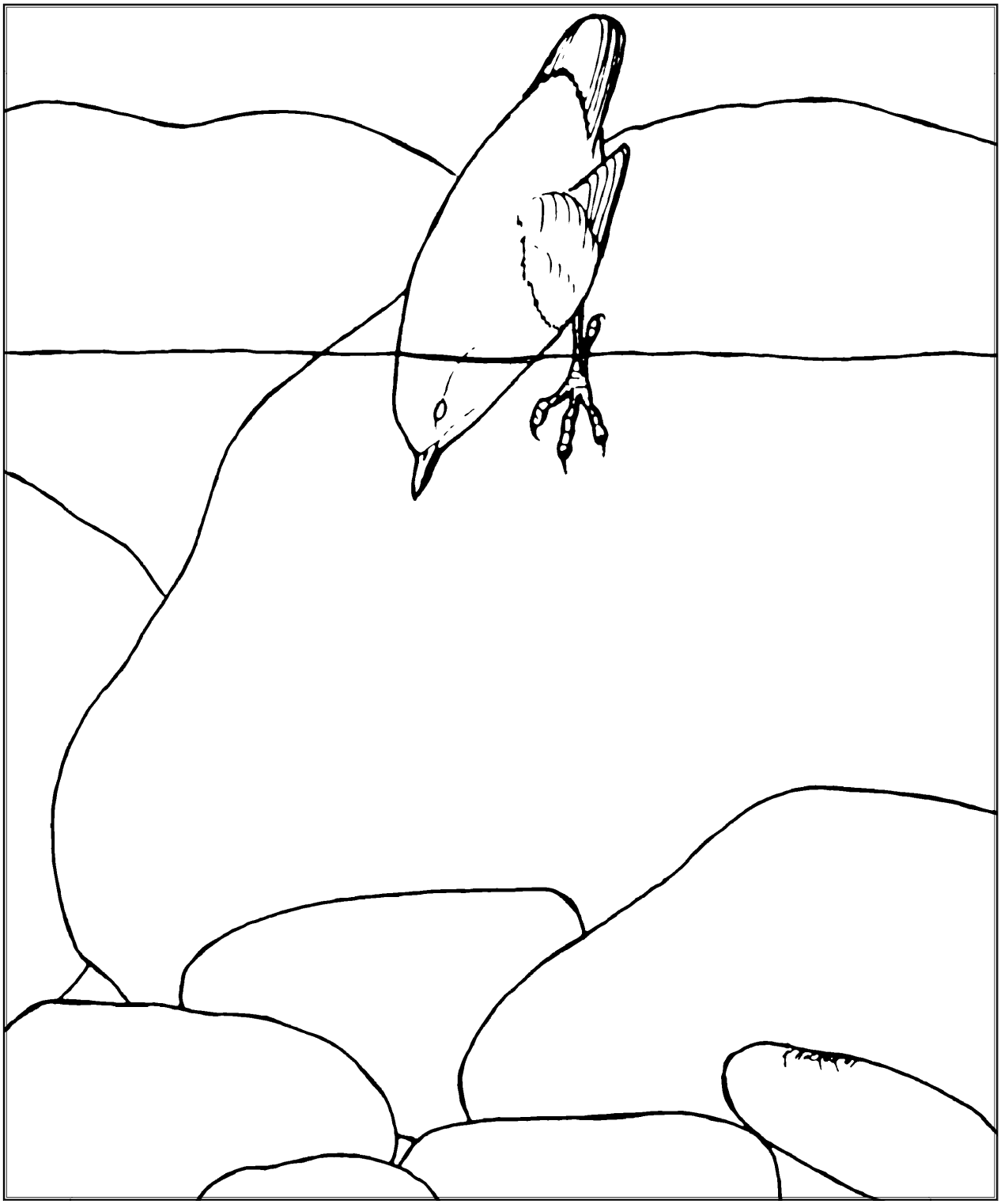
Winter is a good time to observe the foraging behavior of dippers. If you go to the Sheep Creek delta at low tide, for instance, you can often find three or four dippers making the best of the short winter days by foraging very actively. If you take the time, you'll be able to observe several different foraging behaviors. Sometimes the birds 'snorkel'—by swimming around with their heads under water, searching for prey; if they see something suitable, they'll dive down to grab it. Often they wade in the shallows, gleaning the rocks. When turning over rocks on the deltas in the search for amphipods, they may flip over the rock with a quick turn of the head or actually pick it up and toss it away. Sometimes they leap off the rocks to snag an insect floating by. Find a dipper near a pool, and watch it swim (with its wings) underwater in pursuit of food. Watch a bird extract a caddisfly from its case. Occasionally, a dipper will catch a caddisfly or small fish, store it temporarily on a rock or the ice, and go back to get more.

And of course, you'll see dippers standing on rocks, bobbing up and down. That's presumably how they got their name. Why do they bob? No one really knows!

Dipper coloring page

Kathy Hocker

When a dipper is hungry, she sticks her head just below the water to watch for food such as aquatic insects, fish, and fish eggs. Then she dives in and “flies” underwater to the bottom of the stream to catch her prey. What does this dipper see underwater? Draw some things she might want to dive for. Then color the picture. Dippers are dark gray with brownish-gray heads. Their legs are grayish-pink, their eyes are brown, and their bills are black.



Many thanks to our great supporters!

Grant support

Discovery Southeast thanks the following foundations and organizations for their generous support in the past year.

City and Borough of Juneau
Outdoor Explorers, Bear Education
Douglas-Dornan Foundation
Discovery Days
ESRI
ArcView Software
Leighty Foundation
Operating Support, Nature Studies
National Audubon Society
Terrestrial Ecosystems
Rasmuson Foundation
Office Technology and Field Equipment
SB Foundation
Operating Support
Skaggs Foundation
JDHS Naturalist Scholarships
US Forest Service
Teachers' Expeditions

Business/Organization Sponsors

We're grateful to the following businesses and organizations for their contribution in our community.

Discovery Circle ($2,500 and above)
Barrett Professional Building, LLC
Cellular One
Four Seasons Marine
Kennecott Greens Creek Mining Co.

Naturalists Circle ($1,000 to $2,499)
Alaska Discovery Wilderness Tours
Juneau Emergency Medical Associates

Honors Circle ($500-$999)
Anchor Electric
Mark Kelley Books and Calendars
Sheinberg Associates
Wm. Spear Design

Contributors Circle ($250-$499)
Coeur Alaska
Gustavus Inn
Juneau Lions Club
Sockey Cycle
Wostmann and Associates

Friends of Discovery (up to $250)
Bear Creek Outfitters
Laura Lucas Designs
Northern Keta
Nugget Alaskan Outfitter
PEO Sisterhood
Princeton Hall, Ltd.
Simpson Tillinghast
Sorensen&Longenbaugh
Wee Fishie Shoppe

Auction Donors

Alaskan and Proud Supermarket
Taku Fisheries/Smokeries
Alaska Wild Salmon Company
Marcy and Geoff Larsen
Coca-Cola Bottling Company of Juneau
CostcoWholesale
Fred Meyer
Super Bear
Carrs-Safeway
Friends of Admiralty
Dana Owen
Roy's Select Alaskan Catch
Bob and Elaine Schroeder
Sue Baxter
Above and Beyond
Cross Sound Express – MV TAZ
Gustavus Inn
Barb Sheinberg and Norman Cohen
Jim Barron
Kathy Hocker
Beast Feast Folks
Northstar Trekking
Colleen and Lindy Jones
Alaska Fly 'n' Fish Charters
Jon and Debbie Tillinghast
Rich Culver
Whalewatch Lodge and B & B
Wings of Alaska
Icy Strait Point Development
Jeff and Terri Campbell
Ben and Colleen Goldrich
Gastineau Guiding
Michael Stark and MJ Grande
Kurt Iverson
Cathy Conner
Jan Carlile
Joyce Sarles
Martha Murray
Sherri Brown
Marie Larsen
Cindy Scott
Play-It-Again Sports
Perseverance Theatre
Princess Tours
Jeff Sloss
Leslie Bennett
Rainbow Foods
Landscape Alaska
Acupressure Institute of Alaska
Driftwood Lodge
Skeins Fine Yarns
John Greeley J-Kraft
Dianne Anderson
Moondance Designs by Colleen Goldrich
Fran Ulmer
Richard and Jane Stokes
Chilkat Guides, Ltd.
Thunder Mountain Sports Camp
Sockeye Cycle
Captain's Choice Motel
Peggy Wertheimer
Cher's Hair Care
Paul Voelckers
Hanger on the Wharf
Faulkner-Banfield, PC
The Island Institute
Frank Rue
Odin Brudie and Frankie Pillifant
Karla Hart
Shoefly
Eric Torgerson
Judy Brakel and Greg Streveler
Chez Sante of The Alaska Club
Barbara Craver
Alaska Island Hostel
Alaska State Parks
Alaska Natural History Association
Gary Miller
Foggy Mountain Shop
Wild Spice Restaurant
Rob and Koren Bosworth
Eric Kueffner
JL Sherburne Landscaping Design

JRC – The Alaska Club
Jim Alter
Dick Monkman and Tina Kobayashi
Mount Roberts Tramway
Spirit Walker Expeditions
Puanani Maunu
Linda Buckley
Toby Harbanuk
Legend Charters LLC
Capital Disposal
Alaska Waters
Alaska's Capital Inn Bed and Breakfast
Shrine of St. Therese
Tracey Miller
Alaskan Barbershop
Dave Haas and Mary Ellen Arvold
PAWS
Paradise Café
Gross Alaska
Blockbuster Video
The Northwest Pewter Co.
Bear's Lair
Dr. Emily Kane
Heaven and Earth Massage
Jeff Brown
GCI
Baranof Hotel
Rie Munoz, Ltd.
Nugget Alaskan Outfitter
Frontier Organics
City Center Chiropractic
Out Backyard
Juneau Artists Gallery
Sarah Moore
Silverbow Inn
Juneau Limousine
Hearthside Books and Toys
Pet Nanny's Place
Good Hardware
Jay Query
Island Pub
Macaulay Salmon Hatchery
Tony Newman
The Creating Place
Cycle Alaska
Michelle Kaelke
Alex Wertheimer
Alaska Folk Festival
Ernestine Hayes
Alaska Therapeutic Massage
Fitness Essentials
Rainforest Naturopathic Medicine
Lou Edwards
Douglas Café
Rainy Day Books
Jerry Adams
Stephanaie Hoag
Mary Pat Wyatt
Dana White
The Sandpiper Café
Rainforest Yoga
Natalee Rothaus
Raven's Brew Coffee
Full Circle Farm
Seattle Mariners
Arnie Weimer
Pat Harris
Kevin O'Malley and Steffi Schreiber
Rebecca Braun

Auction Volunteers

Richard Stokes
Mike Stanley
Cindy Scott
Larry West
Cathy Connor
Ron Clarke
Bonita Nelson
Tim Moore
Walt Chapman
Kathy Hocker
Natalee Rothaus
Alex Wertheimer
Scott Miller
Dave Haas
Joe Giefer
Andy Romanoff
Kristen Romanoff
Terri Campbell
Brady Scott
Colleen Goldrich
Jan Carlile
Joy Lyon
Suey Linzmeier
Ron Heintz
Christy Long
Diane Antaya
Susan Pollard
Sarah Moore
Elisabeth Wertheimer
Gastineau Human Services
Guohua Xia and Ursa Minor

Members Honor Roll

Our thanks to all the great folk who are current members of Discovery Southeast. Your support is fundamental to our capacity to provide the finest nature education programs for Southeast Alaskans. Not represented here are anonymous gifts. All of your contributions are essential and we greatly appreciate your commitment. We couldn't do it without you!

Leadership Circle ($1000 and above): J Michael Blackwell • Nate and Liz Johnson

Benefactor ($500-$999): John Day and Tessa Muehllehner • Clay Frick and Anissa Berry-Frick • Michael and Dee Ann Grummett • Ken Leghorn and Sue Warner • Mike Stanley and Natalee Rothaus • Dick and Jane Stokes

Sustaining ($250-$499): Bob Armstrong • Elizabeth M. Bishop • Laura L. Carstensen • Margaret Dowling and Jim Thompson • Thom Ely • Richard Farnell and Carolyn Hess • Dave Haas and Mary Ellen Arvold • Mary Claire Harris • Marie Larsen and Larry Holland • KJ and Peggy Metcalf • Mark and Esther Millea • John and Judy Neary • Eric Olsen M.D and Vicki Bassett • Steve Parker and Suzanne Malter • Brady and Cynthia Scott • Julie and Edward Sinclair • Mary-Claire Tarlow-Bernstein • Alex and Peggy Wertheimer • Reuben Willis

Sponsoring ($100-$249): Aaron Angel • David and Cindy Audet • James Barron • Bob N. Bartholomew and Kaye Kanne • Sue Baxter and Dave Sturdevant • Jack and Margie Beedle • Ken and Sherri Brown • Scott Brylinsky • Annie Calkins and Dave Hunsaker • Edwin and Pam Carstensen • Greg and Tamara Cook • Peggy Cowan and Dick Wood • Sioux and Paul Douglas • Pat and Anna Eberhardt • Gregg and Judith Erickson • Dick and Debbie Fagnant • Scott Foster • Christopher J Frank • Charles and Marilyn Freymueller • Joe Giefer and Karey Cooperrider • Maria Gladziszewski and Eric Kueffner • Clay Good and Claire Fordyce • Skip Gray • John Greely and Marla Berg • Mary Hakala Ord • Kathy and Tom Hanna • Pat Harris • Margorie C. Hermans • Phil and Gail Hocker • Frank and Jane Homan • Patricia Hull • Glenda and Bob Hutton • David Job and Marinke Van Gelder • Connie Keithahn and Mike Rawson • James and Mary Lou King • Kurt and Christine Kondzela • Geoffrey and Marcelle Larson • Hank Lentfer and Anya Maier • Marshall and Lois Lind • Karen Lipson • Sharron and Cliff Lobaugh • Bobbie Lowden • Judith Maier • Jono and Laurie McKinney • Glenn Miller • Jeannie Monk and Tim Blust • Tim Moore and Nancy Cooperrider • Peter and Julie Neyhart • Dana Owen and Joyce Thoresen • James Protz • Catherine Reardon • Kim S. and Tracy Rivera • Kristen Romanoff and Andy Romanoff • Frank and Sally Rue • Sally Saddler and David Teal • Barbara Sheinberg and Norman Cohen • John Sisk and Mary Pat Schilly • Jeff and Susan Sloss • Ethel and Kim Smith • Greg Streveler and Judy Brakel • Paul Suchanek • Van Sundberg and Tracey Miller • Saralyn Tabachnick • Christine and Donald Thomas • Sandy Warner • Jetta Whittaker and Rob Steedle • Henry and Anita Wilde • Jeff and Karen Wilson

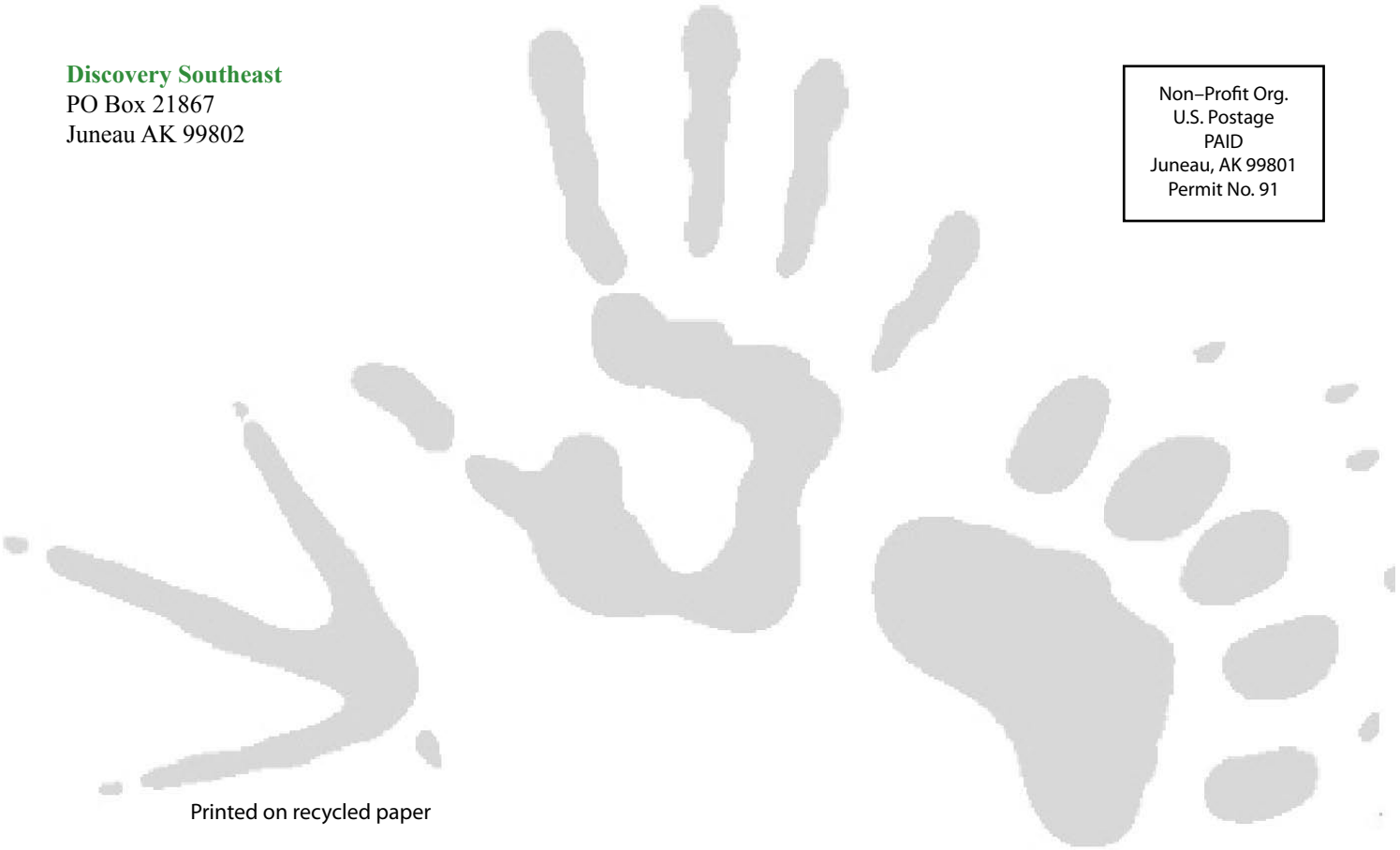
Contributing ($50-$99): Eleanor Anderson • Birger Baastrup • Rai and Susan Behnert • Kristine Benson • Joyanne Bloom • Koren and Robert Bosworth • Becca Braun and John Caouette • Jamie and Melanie Brown • Brian and Jeanette Budke • John and Karla Bush • Butch Carber • Jan and Dave Carlile • Jean Carlile • Annie and Bud Carpeneti • Janice Caulfield and Tom Paul • Cristine Crooks and Dean Guaneli • Bob Cross • Logan and Frances Dameron • Julie DeLong and Jay Query • Chiska Derr • Michael F. and Gail Ford • Anne Fuller and Mike Sakarias • Donald and Marion Gotschall • MJ Grande and Michael Stark • Maureen and Tim Hall • Debbie and Kent Hart • Mary Hausler and Douglas Woodby • Beverly Haywood • Amy Hiley • Mary Irvine and Jim Ustasiewski • Sarah A. Isto and Gordon Harrison • Barbara Kelly • Molly Kemp and Nick Olmsted • Brad Ketcheson and Louise Anderson • Mark Kjerstad • Theresa Lauterbach • Patrick and Edna Leamer • Gary and Nancy Lehnhart • Craig and Barbara Lindh • Mary C. MacNaughton and Susan Haymes • Jenny and Pat Malecha • Ronald and Susan Marvin • Jill Matheson • Judy McAllister • Mary McDowell and Gordy Williams • Michael E. McKrill and Lisa Rollin • Jan and Steve McPhetres • Linda Miller • Gary Moeller and Mary Bedore • Sarah Moore • Roman J. Motyka • Ruth Mulligan • Marie Olson • Bette Owen • Kay Parker • George and Jean Rogers • Linda Rosenthal • Jan A. Rutherdale and Jeffrey Bush • Jay Satterfield and Lisa Oberle • Herman and Paula Savikko • Philip Schempf and Janet Hall Schempf • Jerry and Laurie Schoenberger • Ed Schoenfeld and Betsy Longenbaugh • Bob and Elaine Schroeder • Michael and Flora Sigler • Sally Smith • Ritchie Sonner and Greg Pease • Cinda Stanek and Fred Hiltner • Charlene Steinman • Thomas B. Stewart • Reed Stoops and Betsy Brenneman • Mary Sweeney • Nancy Thomas • Cheryl VanDyke • Freda Westman • Dick and Lynn Williams • Vickie Williams and John Kuterbach • Mary Willson • Charla Wright • Rick and Wanda Wright

Member ($30-$49): Jerry Adams • Stephanie Allison • Lupita Alvarez and Bruce Botelho • Mary Ellen Anderson • Alex Andrews and Ellen Naughter • Kimberly Andrews • Bruce and June Baker • Paul Barnes • Lorayne Barnhart • Leslie Bennett • Katherine Benning • Laurie Berg and John Connally • Paul Berry • Karen Blejwas • Tom and Eva Bornstein • Cathy Botelho and John Clark • E.O and Laura Bracken • Crystal Broderick • Jennifer Brown • Christine Bryson • Eileen Buchanan • Kristi and Eric Buerger • Shirley Campbell • Peggy Chandler • Eleanor W Chapman • Susan and Jim Clark • Marlene Clarke • Kristine Coffee • Judy and Nathaniel Cole • Tom Cosgrove • Elsa Demeksa and Peter Froehlich • Sharon Fisher • Odette Foster • Pam Garcia • Carole Germain • Marcy and Al Gillie • Susan and Jim Goes • Amy Goffinet • Richard Gordon • Suzy Greeley • Dana Haff • Marjorie Hamburger • Maria Hazel • Kimberly Homme • Bob Janes and Dawn Wolfe • Pam Johansen • Anjela Johnston • Suzanne Johnston • Chuck and Alice Johnstone • Alberta Jones • Sierra Kaden • Dr. Emily Kane • Shannon Keegan • Gretchen Keiser and Bob Wild • William T Kenyon • Anne Kincheloe • Julie and Bart Koehler • Steve Krall and Cindy Boesser • Steven & Tonia Kramp • Mary Lihou • Susan Loseby • Rich and Joy Lyon • Molly McCormick • Mary Alice McKeen and David Ottoson • Marjorie McKeown • Ted and Doreen Merrell • Marie Messing • Raandi Miller • Joy Morgan • Ben and Cathy Muse • Rachel Myron • Kathy Obersinner • Pamela Owen • Corey and Ellen Pavitt • Caro Polley • Amy Randolph • Alice Jane Rarig • Claire Richardson • Joann Rieselbach and Kurt Riesebach • Bill Roodenburg • Sharol Roys • Barbara Schrader • Mark Schwan and Debi Ballam • Ellie and Lewis Sharman • Brita Shaw • Mary Anne Slemmons and Jim Baldwin • Jeanine Smith • Karen Smith • William W. and Janet Smoker • Carin Smolin and Jon Heifetz • Tony Soltys • Marsha and Steve Squires • James and Cindy Sundberg • Nancy Sutch • Martin Suzuki • Susan Suzuki • Curt Terrall • Debbie and Jon Tillinghast • Annette Ulmer • Rene and David Walker • Daniel Wayne • Linda Whitman Nicklin • Sara Willson • Roger Withington

Friend ($1-$29): Brown/ Conerton Family • Elizabeth Cuadra • Laura and Kenneth Imamura • Joyce Levine • Mary and Jack Manning • Kathrin McCarthy • Ke Mell • Cher Stone • Linda Vallie

Discovery Southeast
PO Box 21867
Juneau AK 99802

Non–Profit Org.
U.S. Postage
PAID
Juneau, AK 99801
Permit No. 91



Printed on recycled paper

Help support hands-on nature education in Southeast Alaska with your special contribution.

Our mission is to deepen and enrich the connections between people and nature.

Discovery Southeast members receive our newsletter, *Discoveries*, discounts on adult-education workshops, and notification of special events.

Contribution and Membership Form

❑Yes, I want to support Discovery Southeast. Enclosed is my gift of:

❑ $30* ❑$50 ❑$100 ❑$250 ❑ $500 ❑$1000 ❑Other $

*This amount or more entitles you to all of your membership benefits

Name: _____

Address: _____

City/State/zip: _____

Telephone: _____ E-mail: _____

❑ My check is enclosed (payable to Discovery Southeast)
❑ Please bill my ❑Visa ❑Mastercard

Account Number: _____

Expiration Date: _____ Sig: _____

Return to Discovery Southeast, PO Box 21867, Juneau, AK 99802