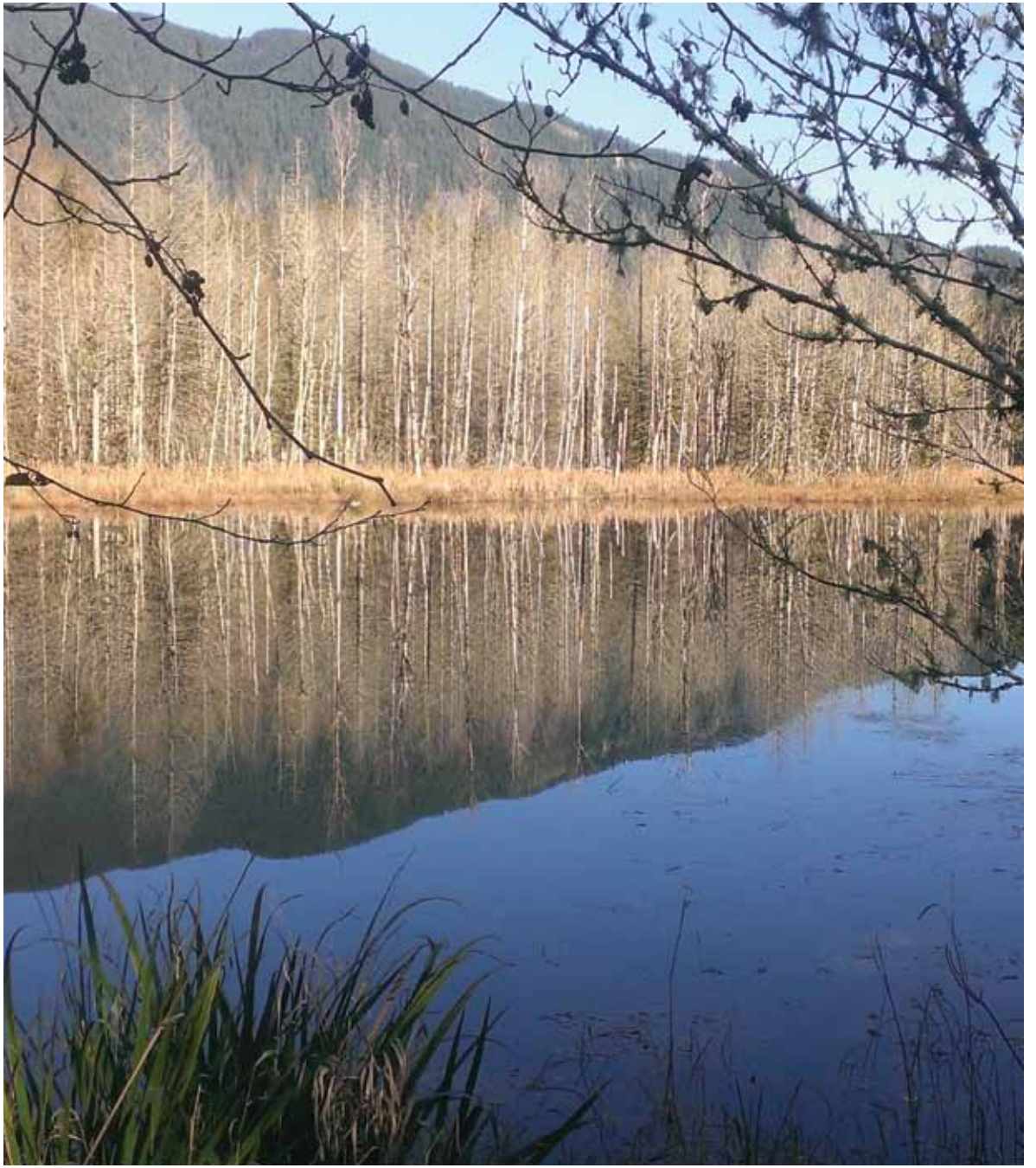
Seattle City Light

2014 Environment Report



Our Mission

Seattle City Light is dedicated to exceeding our customers' expectations in producing and delivering environmentally responsible, safe, low-cost, and reliable power.

Seattle City Light is studying salmon habitat restoration options with the Washington Department of Fish and Wildlife and the Skagit River System Cooperative for the Barnaby Slough section of the Skagit River.

"Dedicated to the sustainability of our resources, Seattle City Light is committed to providing reliable, affordable power while protecting the environment. This goal has driven every aspect of our operations for more than three decades."

–Jorge Carrasco, General Manager and CEO

Clean, renewable hydropower is the primary source of electricity for Seattle City Light customers. City Light's Boundary Dam produces about 27 percent of all the power the utility delivers.

The nation's greenest utility. That's a bold statement, but one Seattle City Light backs up with more than a century of providing power from clean, renewable resources and a history of conservation and environmental stewardship.

City Light's evolution as a utility with a sustainable focus started when Seattle residents approved a large bond issue to develop a hydroelectric facility on the Cedar River. It was the beginning of public power in Seattle, founded on a clean, renewable resource. In 1905, Seattle City Light was born and soon after its second superintendent, J.D. Ross, had a vision to harness the waters of the Skagit River and create additional hydroelectric power for the city.

In the early 1980s, City Light was faced with another choice: build Ross Dam higher or find another solution. Once again the utility shed the conventional thinking of the time in favor of an emerging concept in the utility industry: Environmental stewardship is good for business, customers and the community. Instead of building the dam higher to produce more electricity, Seattle signed an agreement with Canada's BC Hydro that provides City Light an equal amount of energy. Simultaneously, an international fund and commission were established to protect the upper Skagit watershed.

Today, about 50 percent of the power delivered by City Light to the Greater Seattle area comes from its own dams on the Skagit, Tolt, Pend Oreille and Cedar rivers. Additional electricity is purchased from the Bonneville Power Administration. Hydropower is a primary reason City Light's greenhouse-gas emissions are low. City Light further reduces carbon emissions with aggressive efficiency and conservation programs, which also help commercial, industrial and residential customers save energy.

In 2000, City Light sold its share of a coal-fired power plant while increasing investments in renewable energy sources and energy-efficient programs. In 2005, City Light became the first electric utility in the United States to achieve zero-net carbon emissions by fully offsetting emissions created by day-to-day operations and the power City Light purchases to supplement its own clean, hydroelectric generation.

City Light recognizes that the water used to provide clean energy to our customers is vital to fish and wildlife. It is also a source of scenic beauty and provides recreational opportunities that are critical to the quality of life in the Northwest. For these reasons, City Light is committed to resource protection, environmental stewardship and environmental education.

Our environmental commitment is embedded in the six-year Strategic Plan for the utility, which was approved by the City Council in 2012. City Light's efforts also are fundamental to the Seattle Climate Action Plan's goal of making Seattle a carbon-neutral city by 2050.

This area along Boulder Creek was among the land acquired by Seattle City Light to conserve fish and wildlife habitat.

City Light's first environmental report traced the history of environmental stewardship within the utility through 2008, and introduced our environmental and conservation programs. In this report, discover our achievements over the past five years and learn how the utility intends to raise its own green bar even higher.

Protecting and Restoring Fish and Wildlife Habitat

Since 2008, City Light has acquired 1,904 acres of wildlife habitat, expanding the lands in the Skagit River Hydroelectric Project Wildlife Mitigation Program to a total of 10,299 acres. These lands provide critical habitat for a wide range of animals. Some of the newly acquired acreage has high quality, old-growth conifer forest.

City Light also acquired 768 acres in the Skagit and Tolt river drainages, specifically to protect habitat for threatened and endangered fish. The utility now owns 2,780 acres of key spawning and rearing habitat for Chinook salmon, steelhead and bull trout. Combined with wildlife habitat parcels, City Light now protects a total of 13,079 acres of land.

In degraded areas, City Light routinely works with federal and state agencies, tribes and environmental nonprofits to restore and improve fish and wildlife habitat. The utility plants trees, shrubs and grasses; controls weeds; removes unnecessary roads; and repairs damage from public access. Recent restoration activities conducted in collaboration with agencies and tribes include:

- Removing an old levee from along Illabot Creek near its confluence with the Skagit River to improve salmon spawning habitat.
- Replanting fields with trees to recreate forested wetland habitat near Savage Slough.
- Removing a noxious weed—Japanese knotweed—from riparian habitat along the Skagit River.
- Removing two noxious weeds—purple loosestrife and yellow iris—from Boundary reservoir shorelines.
- Improving elk forage habitat along the upper Skagit River near Rockport.

Tolt River restoration area – *In 2011, City Light received an award from the American Fisheries Society for riparian habitat restoration work along the Tolt River. This project was accomplished with several partners and involved relocating levees to reconnect 55 acres at the floodplain confluence of the Tolt and Snoqualmie rivers.*

"Seattle City Light is an invaluable conservation partner for Skagit Land Trust. For years the trust and City Light have cooperated closely to protect critical salmon habitat along the Skagit River and major tributaries."

–Molly Doran, Executive Director, Skagit Land Trust

Protecting Fish

The historical spawning grounds for salmon in the Skagit River are located downstream of City Light's dams, below a natural migration barrier. However, if flows are not carefully managed, the water used in power operations can negatively impact salmon downstream. City Light manages river-flow levels to protect salmon and steelhead eggs from too much or too little water in the river and to protect juvenile fish from being stranded. City Light's actions continue to contribute to maintaining large, healthy populations of native salmon species in the Skagit River.

In 2012, City Light received biological opinions developed by the U.S. Fish and Wildlife Service and National Marine Fisheries Service for the three threatened fish species affected by the Skagit River Project. The agencies concluded that City Light's flow management measures likely improve the overall survival of bull trout, steelhead and Chinook salmon in the Skagit River. Conservation measures in the biological opinions ensure that additional habitat for these species is acquired and protected.

Spawning pink salmon, Goodell Creek.

Boundary Dam was built without fish passage facilities because downstream dams blocked salmon migrations to the project area. Declines in local fish species populations, however, have increased the focus on improving conditions for migrating resident fish. The new license for the Boundary Hydroelectric Project, which was issued in March 2013, includes measures to improve the survival of fish passing through turbines or over spillways; reduce the risk of fish becoming trapped in isolated pools during flow reductions; enable fish to migrate upstream of the dam; and establish self-sustaining populations of mountain whitefish, cutthroat trout and bull trout in the tributaries to Boundary reservoir.

City Light utilizes river-flow measures established under the 1991 fisheries settlement agreement for the Skagit Hydroelectric Project license, the 1988 settlement agreement for the Tolt Hydroelectric Project License and the 2000 Instream Flow Agreement for the Cedar River habitat conservation plan.

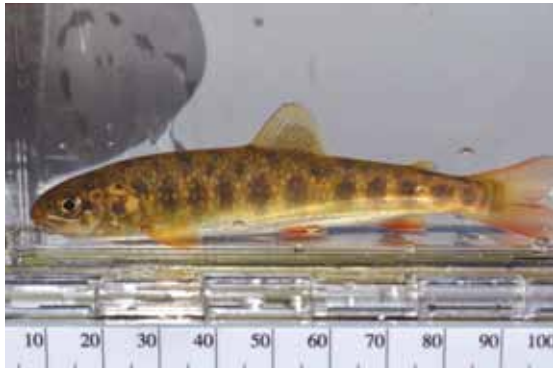
Contributing to Science

City Light understands that the essence of sound fiscal environmental management lies in the ability to embrace science-based decision making. To license all its hydroelectric projects, City Light developed a set of environmental measures that were based on scientific research. Research to inform our operations and gauge the success of environmental stewardship actions continues at our Skagit River, Boundary and Tolt projects in partnership with state and federal agencies, tribes and nonprofit organizations.

Fish Research

Understanding the life histories and abundance of the fish species occurring in the Skagit, Pend Oreille, Tolt and Cedar rivers is an important part of confirming whether measures taken by City Light to protect fish are effective. Results of some of our recent fisheries studies include:

- **Tolt River Steelhead –** A tagging study of juvenile summer steelhead that live above a canyon along the Tolt River provided data on how long the fish stay above the canyon, when they leave, their estimated age and how fast they are growing. A recent genetic study confirmed that the summer steelhead population found above the Tolt Canyon is different from the winter steelhead population found below the canyon.
- **Skagit River Bull Trout Genetics –** A comprehensive bull trout genetics study found that populations of this species are extremely diverse in the Skagit River drainage, with genetically unique populations present in almost every major stream. Most important, the bull trout present in the three Skagit reservoirs are genetically very different from those found downstream of the Skagit River Project and have likely been isolated from the fish in the lower watershed since the end of the last ice age.
- **Skagit River Steelhead Hatchery and Wild Steelhead Interactions –** This study was conducted to assess whether hatchery steelhead have harmful ecological and/or genetic impacts on wild steelhead populations in the Skagit watershed. It found ecological impacts from hatchery-release steelhead on wild steelhead populations.
- **Skagit River Project Native Char Populations –** This study found that bull trout populations have increased almost 10-fold in the Ross Lake drainage over the past decade, a likely result from a major change in the forage base for these fish over this period. This study also discovered that Dolly Varden are present along with bull trout in all three Skagit reservoirs, which may be the only lakes in the United States where both of these fish species are found together.



Bull trout and this Dolly Varden are species of native char — trout-like fish in the salmon family.

In the summer of 2013, the first two adult steelhead tagged in 2010 returned to the south fork of the Tolt River on their way upstream to the Tolt Canyon.

City Light is a leader in sponsoring genetic research studies to improve the management of threatened fish species in the Pacific Northwest.

- **Boundary Project Mountain Whitefish –** This study of mountain whitefish, a native salmonid species discovered in the Pend Oreille River, found that populations in Boundary reservoir were smaller than expected due to low survival of eggs. Results are being used to improve spawning habitat in the reservoir.

Wildlife Research

The North Cascades is one of the most rugged, isolated and least studied areas in Washington. The Skagit River Hydroelectric Project Wildlife Mitigation Program provides grant funding for wildlife research in the North Cascades ecosystem to universities, agencies and consulting firms. The grant program places an emphasis on graduate student research and education. Findings from recent studies include:

Seattle City Light's hydroelectric dams, including Diablo Dam, depend on mountain snowpack to provide water to generate electricity in the summer, which is why City Light is doing what it can to address climate change.

Seattle City Light-funded research confirmed the presence of wolverines in the North Cascades and provided insights into their behaviors.

- **Mountain Goat Population Connectivity in the Cascade Range of Washington and Southern British Columbia –** This study analyzed the genetic makeup of goats. It identified roads as significant barriers to movement with negative impacts to the overall health of the goat herds.
- **Wolverine Distribution and Ecology in the North Cascades Ecosystem –** This ongoing long-term radio-telemetry study confirmed the presence of wolverines in the North Cascades, identified breeding locations, quantified territory size and determined key habitat requirements.
- **Cascades Carnivore Connectivity –** Researchers collected hair samples from hundreds of black bears in the North Cascades and found genetic differences in bears north and south of state Route 2. Modeling indicated that black bears' movements in the North Cascades might be limited by high elevations and rugged topography. This finding highlights the importance of maintaining connections between lower elevation, high-quality, forested habitats for black bears.

Climate Research

The Skagit River watershed contains almost 400 glaciers covering about 50 square miles. The glaciers provide 6 to 18 percent of total summer runoff for the river. But this valuable resource is shrinking — declining 50 percent in the last century in some

areas — with climate change playing the major role. City Light is collaborating with the National Park Service and other partners to fund research on how climate change will affect glaciers over time; and what the loss of glaciers will mean for stream flows and temperatures, fish habitat and hydropower generation on the Skagit River.

Nesting platforms installed by City Light give ospreys alternatives to building nests on power poles.

> Seattle City Light has played a leading role in helping to understand the impacts of a warming climate on water resources in the Skagit basin. They have contributed financial and logistical support to monitor snowpack, the glacial contribution to stream flow and stream water temperature in the Skagit Valley."
>
> Jon L. Riedel, National Park Service geologist, North Cascades National Park

Seattle City Light manages vegetation along its transmission rights-of-way with the goal of improving wildlife habitat while protecting the reliable delivery of electricity.

Working with Nature

Natural habitats along City Light's electrical transmission corridors are a source of clean water, carbon storage and crop pollinators. These habitats benefit all of us and are essential to sustaining the region's environmental health.

In 2013, City Light began an Environmental Leadership Initiative to study the way vegetation is managed along transmission-line corridors. There is a natural sequence of changes, known as succession, in the types of plants living there. The utility will use this natural succession to help manage vegetation and improve the value of habitat, while ensuring safe and reliable electricity for its customers.

City Light's transmission towers and distribution poles also provide attractive structures for nesting osprey. Nests on power poles can be problematic for the delivery of electricity and hazardous for the birds, so City Light works with local landowners, an osprey expert and the Washington Department of Fish and Wildlife to provide alternative locations for nesting ospreys that avoid those risks. Since 2010, City Light has installed three osprey nesting platforms throughout Seattle, with two others planned this year.

Contributing to Environmental Education

City Light employees are committed to caring for the environment. It is part of our mission to promote environmental education for our customers — children and adults.

One way we do this is by sponsoring annual field trips for Seattle public elementary schools with ethnic demographics that have been under-represented in natural resource careers. Scientists from City Light's Environmental Affairs Division took students to visit a site on the Cedar River for the ninth year in 2013.

City Light's Skagit Tours strengthen the bonds between people and nature. Dating back to the late 1930s, the tours continue to be offered during the summer. Since 2011, the tours have been conducted in partnership with the National Park Service and the North Cascades Institute, with more emphasis on environmental education. A guided boat trip on Diablo Lake beautifully illustrates the connection between the North Cascades environment and City Light's energy production.

Another example is City Light's partnership with the North Cascades Institute. City Light built the Environmental Learning Center for the institute to provide environmental education. Among its programs is Mountain School — a three-day immersion learning experience for 5th graders from schools around Puget Sound. The center also offers a variety of workshops for adults, three-week field learning courses for teenagers and a graduate program in environmental education. City Light scientists have given multiple presentations at the center over the past five years.

City Light helped establish the Skagit Environmental Endowment Commission as part of an agreement with Canada to not build Ross Dam higher, and the utility provides ongoing administrative and technical support for the group. The commission continues to invest more than $500,000 every year in environmental, recreation and educational projects.

Students from Martin Luther King Jr. Elementary visit the Cedar River.

A boat ride on Diablo Lake is just one of the highlights of a Skagit Tour.

All new overhead transformers – and many others – are filled with a USDA BioPreferred esterified vegetable oil.

	Recyclables (in pounds)				
Year	**2008**	**2009**	**2010**	**2011**	**2012**
Paper and cardboard	172,855	169,345	160,575	166,352	146,125
Plastic	1,389	1,569	1,256	1,004	1,148
Aluminum cans	427	386	472	321	238
Scrap metal				531,223	720,020
Aluminum				268,237	143,860
Copper				540,809	976,280
Alkaline batteries	2,969	2,026	1,226	3,117	2,332
HID lamps (number of lamps)	20,036	9,783	14,828	7,362	9,634

Year	**2008**	**2009**	**2010**	**2011**	**2012**
SCL Paper Usage (reams)	11,224	11,384	11,035	9,565	10,950
Percent reduction from baseline	31%	30%	32%	41%	33%

Operating Efficiently

At City Light, environmental stewardship extends beyond protecting the natural resources at our power plants and environmental education. Reducing waste, recycling, minimizing use of chemicals and saving energy are all important ongoing programs that are part of our routine operations. These programs not only benefit the environment but also save money.

Recycling

City Light recycles paper, cardboard, glass, plastic, metal, ceramics, mercury, fluorescent lights, batteries, yard waste and antifreeze. Glass and metal bands from electric meters, ceramics from electrical equipment, metals from transformers and burned-out compact fluorescent lamps from customers are also recycled, along with an abundance of other materials.

Reducing Paper Use

City Light has continued its paper reduction efforts, which began as the Papercuts Program in 2005. The utility has reduced paper usage by at least 30 percent each year compared to the baseline year prior to the start of the program.

Purchasing Green

City Light has utilized green purchasing practices for many years. This means that:

- Products used by City Light for maintenance and operations are evaluated for environmental and safety criteria, such as recycled content, or reduced toxins. Those that meet stringent standards are

tested by employees. Products that perform well become the approved supplies, while new products continue to be evaluated and approved.

- Chemicals are evaluated for environmental and safety concerns. Alternatives are assessed for products of concern and substitutions are recommended where feasible.
- Computers purchased by the utility must meet strict environmental standards. For several years, all the purchased computers have met the higher E-PEAT (Electronic Product Environmental Assessment Tool) gold standard. To meet that standard, the computers use less toxic material, less energy and are easier to recycle.
- All new overhead transformers — and many other transformers — are filled with a USDA BioPreferred esterified vegetable oil, a sustainably sourced, low toxicity, biodegradable product. Bio-based chainsaw oil and hydraulic fluids are used and bio-based turbine oils are also being investigated.
- City Light has been using wood poles that are treated with copper naphthenate for more than 20 years. This is the only wood preservative approved for poles inserted underground that is not a restricted-use pesticide according to the U.S. Environmental Protection Agency. The utility's cedar poles are dipped in a vat of the preservative so only the bottom of the pole is treated (the buried part plus a few extra feet). The top of the pole is untreated and naturally rot-resistant western red cedar.

Ross Lodge, before renovation – *Built in 1938, the lodge was a one-and-a-half-story building to house single men, who shared common eating and lounging areas.*

Saving Energy

In addition to helping our customers save energy and money, City Light takes prides in its own efforts to be more energy efficient. Several recent examples are described below.

- Since 2010, Seattle City Light has converted more than 40,000 streetlights to energy-efficient light-emitting diodes (LEDs). The new streetlights will reduce the amount of energy used by up to 60 percent and save the City of Seattle about $2.4 million a year in operating costs.
- City Light owns over 50 houses for employees working at the Skagit River Hydroelectric Project in the towns of Newhalem and Diablo. Built between 1925 and 1960, none of these homes met current energy efficiency standards. In 2010, City Light embarked on a program to install heat pumps, insulation and energy-efficient windows, all while preserving the historic characteristics of the houses. When complete, the project will make the homes more comfortable and save energy and money.

Ross Lodge, after renovation – *It now serves as a meeting and conference facility.*

> Seattle City Light should be applauded for its preservation efforts recently completed in the Skagit National Register Historic District. The rehabilitation work on the Gorge Inn, the anchor building along old Main Street in Newhalem, is top-notch and reflects an understanding of and commitment to preservation by the utility. Likewise, the preservation work completed on the Ross Lodge in Diablo, is equally impressive. The utility is embracing stewardship of their unique cultural resources in a bold and thoughtful manner. Our hats are off to Seattle City Light!
>
> Gretchen Luxenberg, Cultural Resources Specialist with the National Park Service

Reducing Waste, Restoring Buildings

City Light has almost 90 structures listed on the National Register of Historic Places. Many of these old buildings are located in the historic towns of Newhalem and Diablo at the Skagit River Hydroelectric Project. Several of these buildings have not been used in recent years because they were in poor condition and cost a great deal to heat and maintain. Instead of tearing them down and replacing them with new construction, City Light has restored these historic buildings, upgraded their energy systems and put them to new use. Restoration saves materials, reduces waste and preserves our history.

Protecting Our Waters, Cutting Emissions

To maintain underground power lines and transformers, City Light workers often have to pump out water and debris from the vaults where that equipment is located. Currently, that waste water must be trucked to a distant facility for filtration and disposal. To save money, protect local waterways and reduce trips and carbon emissions, City Light began construction in 2013 of a new decant and carbon filtration facility. Once in operation, the system will separate storm water and moisture from solid material. Without the water those remaining solids are significantly lighter, meaning it won't cost as much to haul them away and properly dispose of them. The liquids stay at the facility and are pumped through a series of filters to remove contaminants. Once filtered, the water is discharged to King County's sanitary sewer for additional treatment.

Seattle City Light installed Sonic Bloom at Pacific Science Center as an artistic way to demonstrate how solar works in Seattle.

Conserving Energy Resources

Energy savings are a primary focus for City Light because energy efficiency is the lowest cost, lowest risk, lowest environmental impact means of ensuring we can meet Seattle's growing needs in a sustainable way. For 35 years, City Light has helped its customers become more energy efficient. The 2012 goal was 14 average megawatts, an increase of 66 percent over the previous year's goal.

Over the last five years, City Light has secured most of its energy savings from energy-efficient lighting. Savings come from residential, commercial, industrial and street lighting customers and span a variety of technologies from compact fluorescent lamps to LEDs. Some examples include:

- The utility's Quick Lighting Upgrade Initiative helped business customers upgrade their obsolete T-12 fluorescent lighting to new energy saving T-8 technology. In eight months between 2008 and 2009, the program retrofitted more than 148,500 fixtures for an energy savings of more than 41 million kilowatt-hours. That's enough electricity savings to run about 4,800 homes for an entire year.
- Through retail partners, the utility has offered customers incentives that resulted in the purchase of more than 4 million compact fluorescent lamps.

Innovation drives the energy conservation field. The utility is exploring innovative incentives and keeping track of technological advances to deliver cost-effective energy savings for its customers. Commercial buildings still offer significant energy savings potential and the utility may need to offer new programs and incentives to secure savings from these buildings. Technology is changing quickly as is witnessed by the rapid adoption of LED lighting technology. Within the last few years, LED lighting technology has become more affordable and available. Seattle City Light's conservation programs have seen this energy-efficient lighting technology gain traction as a mainstream lighting option across all market sectors.

Sonic Bloom's flowers light up at night and "sing" harmonic notes when people approach.

Solar panels on top of the flowers and the Pacific Science Center roof provide all the power for Sonic Bloom.

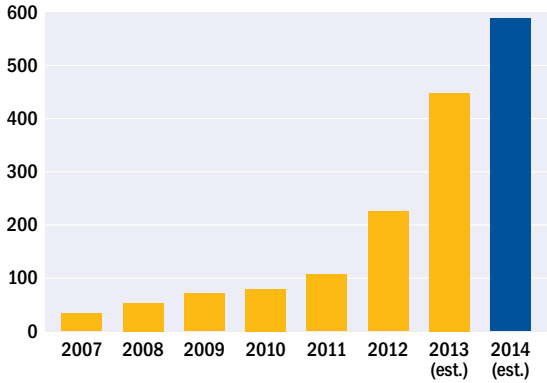
Supporting New Renewable Energy Resources

Seattle City Light demonstrates its continuing commitment to clean energy by building on its hydroelectric legacy with the acquisition of new, renewable resources. Since January 2009, City Light has contracted for 1.1 million megawatt-hours of electricity from the Columbia Ridge landfill gas plant and King County's West Point cogeneration plant, along with the associated environmental attributes — called renewable energy credits — through 2021. The utility also contracted for 2.4 million renewable energy credits from 16 wind projects, one geothermal plant and one landfill gas project through 2021.

These purchases will allow City Light to reliably serve our customers' need for energy and help the utility meet the requirements of I-937. The voter-approved measure requires 15 percent of City Light's energy portfolio by 2020 to come from renewable energy resources developed after 1997. Additionally, Seattle City Light's Green Up program allows customers to invest in new sources of renewable energy (geothermal, wind, biogas, solar) by paying a little more on their electricity bills. More than 14,000 customers participate in this effort, which also supports renewable energy demonstration and education projects. The latest Green Up demonstration project is Sonic Bloom, a solar-powered work of art consisting of five flowers up to 33 feet tall at Pacific Science Center.

City Light further offers a variety of ways for customers to "go solar," including an award-winning Community Solar program with locations at Jefferson Park and the Seattle Aquarium, and by partnering with the local nonprofit Northwest Sustainable Energy for Economic Development on a Solarize Seattle campaign. Community Solar participants own a portion of a larger, public-oriented solar installation and receive credits on their bill through 2020. Solarize provides education and technical support that empower neighborhoods to go solar through free workshops, solar site assessments and affordable group purchasing and financing.

Annual New Customer Solar Installation



> By adopting innovative technology and working with architects, engineers, as well as trade allies, City Light leads the way to increased energy savings.

These efforts have significantly contributed to increased awareness about solar power, and the number of systems installed in the utility's service territory:

- Community Solar at Jefferson Park and the Seattle Aquarium: total 73 kW.
- Solarize Northwest Seattle (January — July 2013) resulted in 141 new solar installations, equaling all previous Solarize Seattle campaigns combined.
- Solarize Central/Southeast Seattle (May — December 2013) resulted in 75 new installations as of mid-November 2013.
- The total number of customers who installed home solar systems nearly doubled in 2013, from 234 to approximately 450 customers.

City Light is home to the largest customer solar installation in the state at Century Link Event Center (780 kW) and the greenest commercial building in the world — the Bullitt Center, which has a 240 kW solar installation.

A worker installs some of the solar panels on top of the Seattle Aquarium.

Community Power from the Sun

Seattle City Light installed the largest solar array at any West Coast aquarium in the fall of 2013 at the Seattle Aquarium as part of the utility's Community Solar and Green Up programs.

Solar panels were purchased from Marysville-based Silicon Energy, promoting green jobs in Western Washington. Each 24-watt unit of the solar installation cost $150 for customers to purchase and customers could buy up to 125 units. The 1,850 units available sold out in fewer than six weeks.

Participants receive credit on their City Light bills for their portions of the solar panels' output through 2020 along with all state production incentives. Together, those credits amount to $1.15 per kilowatt-hour. Each unit is expected to generate about $29 annually in credits during the life of the project.

Additional Green Up program revenue was used for education, display and demonstration. With over 800,000 visitors per year (including 40,000 school children) at the aquarium, this is a good investment in educating our customers and the general public about solar energy and our renewable energy and conservation programs. Live monitoring information from the project is available online at http://live.deckmonitoring.com/?id=seattle_aquarium.

Community Solar lets many people come together to build a solar array and share in its benefits. At Seattle City Light, we choose locations that are a good fit for solar – sunny, visible to the public and on properties that bring other public benefits to our community.

Participants benefit through economies of scale, better siting and the opportunity to take part at a much lower entry-level cost. Instead of paying many

The Community Solar project is the largest solar array on any aquarium on the West Coast.

thousands of dollars to install a solar electric system at the customer's site, the customer can get financial benefits and support solar in the community by investing in a fraction of the entire project.

The aquarium site was selected after review of a large number of potential sites based on location, solar exposure, appeal to Seattle residents, interest and shared aims (conservation and sustainability) of the host and timing.

There are 247 solar modules that make up the 49.4 kilowatt system – 44.4 kilowatts comprise the Community Solar project, and a 5 kilowatt portion benefits the aquarium directly as part of the Green Up demonstration project. Installation of the system by Northwest Wind & Solar took approximately three weeks in October 2013.

City Light created an online enrollment system, including a mechanism for customers to spread out payments over two billing cycles. This and the low cost of the units – the lowest entry price for any Community Solar project in the nation – address the City of Seattle's Race and Social Justice Initiative interests by making solar affordable to a wider economic spectrum. This is the second Community Solar project developed by City Light.

The utility completed its first Community Solar project at Jefferson Park in South Seattle in 2012, with help from a Department of Energy Solar America Cities Special Projects grant. Three solar picnic shelters were built and currently generate over 26,000 kilowatt-hours annually.

Seattle City Light customers were able to buy a portion of the Community Solar's production for as little as $150.

"This is a great idea. It saves us a lot of hassle and is the right thing to do. Also it helps us show our kids that we're starting to slow down some of the damage our generation is doing to the planet."

– A participant who bought 50 units

"Thanks. Super fast and much easier and cheaper than trying to install them on our house!"

–A participant who bought 2 units

"We are excited to support this very forward-thinking project!"

– A participant who bought 1 unit

"I have already been spreading the word, especially to renters and people who live in multifamily buildings where it's difficult to get their own solar arrays installed."

– A participant who bought 125 units

"We're so happy that these units are available. We would love to have solar on our own home, but our site is not suitable."

– A participant who bought the last 3 units and wanted more

Making Smart Decisions for the Future

Seattle City Light has not only achieved carbon neutrality, it has also adopted an integrated resource plan that relies on only new, renewable energy resources and energy efficiency to meet future customer demand.

Although City Light is reducing carbon emissions, climate change is a global challenge that could affect the long-term business health of the utility. City Light's hydroelectric dams, which produce low-cost power for our customers, depend on mountain snowpack to store water for generating electricity throughout the summer. Climate change that brings more precipitation as rain or starts the melt-off earlier in the spring would threaten the utility's ability to generate the electricity it needs to serve its customers in late summer. City Light is doing what it can to reduce its climate impact and to help its customers do the same.

Shore power for cruise ships reduces greenhouse gas emissions because the ships don't have to run their engines while they're at the dock.

In an effort to reduce its carbon footprint, the city of Seattle is turning to green technologies that significantly reduce the idling times of engines, lessen maintenance and equipment downtime and decrease fleet fuel consumption.

City Light's goals for 2014 and beyond include a 30 to 40 percent reduction in fuel usage through diverse technologies:

- Use B20 biodiesel in all Seattle-based diesel equipment. An 80/20 mix of diesel and recycled biomass, B20 is a true recycled resource.
- Utilize compressed natural gas/gasoline dual-fuel equipment, which offers a cleaner fuel that costs 60 to 70 percent less than diesel or gasoline.
- Add more all-electric vehicles to City Light's motor pool for local on-the-job travel.
- Install more auxiliary power units for the heavy equipment used for work such as pole digging. These auxiliary units supply electricity for emergency light systems, bin heaters, battery charging, as well as cab heat in the winter, without running the engine. This technology eliminates up to 90 percent of engine run-time, saving fuel and reducing the amount of truck noise in the areas where we work.

In 2010, the city's Green Fleet program was named the No. 1 Government Green Fleet in North America by 100 Best Fleets. The award recognizes excellent integration of alternative fuels into existing operations and comprehensive examination of where and how petroleum reduction policies and procedures could impact the fleet.

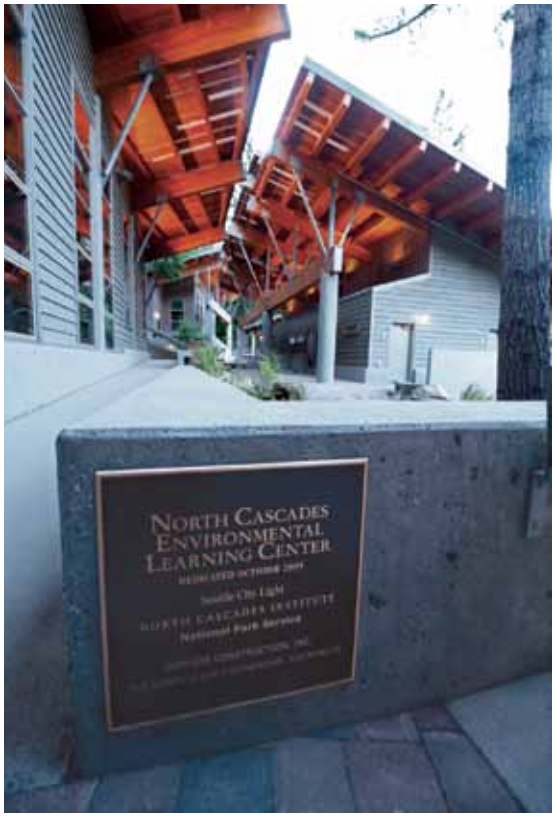
City Light works with the Climate Action Reserve and other third-party organizations to offset its greenhouse-gas emissions, including:

- Using biodiesel fuel for Seattle-area busses, ferries and garbage trucks
- Offering electric shore power for cruise ships at the Port of Seattle
- Aerobic composting of local food and yard waste
- Capturing and disposing of methane at dairy farms and landfills
- Digesting organic waste from a Washington State food processing facility

Partnering for Environmental Stewardship Success

City Light understands that collaboration and partnerships are integral to the success of its environmental stewardship programs. We continue to develop and strengthen relationships with federal, state and local government agencies, tribes, watershed councils, nonprofit environmental organizations and land trusts. Some of the work we have done with our partners over the past five years is summarized below:

- Since 2011, City Light's popular Skagit Tours have been a partnership with the National Park Service and North Cascades Institute.
- Acquisition and restoration of habitat in the Skagit, Sauk and Tolt rivers have been completed in partnership with the Nature Conservancy, Skagit River Land Trust, Upper Skagit Indian Tribe, Skagit River System Cooperative, Tulalip Tribe, Skagit Fisheries Enhancement Group, Skagit Watershed Council and Skagit, Snohomish and King counties.
- The species composition and abundance of native char populations in the upper Skagit River basin are monitored in cooperation with National Park Service, Washington Department of Fish and Wildlife and British Columbia Ministry of Forests Lands and Natural Resource Operations.
- Weeds near the Skagit, Tolt and Boundary projects are managed with assistance from the Skagit Fisheries Enhancement Group, Sound Salmon Solutions and Pend Oreille County, respectively.
- Using Skagit Project recreation program funds, the U.S. Forest Service, Mt. Baker-Snoqualmie and Okanogan National Forests, constructed a new section of the Old Sauk Trail outside Darrington to American Disability Act-accessible standards, repaired boat ramps along the Skagit and Sauk rivers and upgraded trailheads along state Route 20.
- The National Park Service used Skagit Project recreation project funds to complete the Hozomeen Trail at the north end of Ross Lake and to install a new gateway sign at the west entrance to North Cascades National Park Complex.
- A report on the long-term genetic and population impacts of hatchery programs on native steelhead in the Skagit River was completed in partnership with the Skagit River System Cooperative, Upper Skagit Indian Tribe, Washington Department of Fish and Wildlife and the Wild Fish Conservancy.
- Skagit River Project Wildlife research grants are awarded in cooperation with the National Park Service, U.S. Fish and Wildlife Service, Washington Department of Fish and Wildlife, U.S. Forest Service and Sauk-Suitattle Tribe.
- Salmon spawning surveys at the Skagit and Tolt projects are conducted with assistance from the Swinomish and Tulalip tribes, respectively.
- City Light biologists partnered with the U.S. Forest Service, National Park Service and local volunteers to monitor wintering bald eagle populations along the Skagit River. Peregrine falcons nesting near the Skagit Project are monitored by City Light biologists in cooperation with the Washington Department of Fish and Wildlife.



Seattle City Light built the Environmental Learning Center for the North Cascades Institute and continues to work in partnership with the institute on programs and Skagit Tours.

- City Light partnered with the U.S. Forest Service, Colville National Forest, to remove and revegetate old roads that accessed several decommissioned water monitoring wells near the Boundary Project.

Seattle City Light's support for energy-efficient lighting has helped many customers, including the Paramount Theatre, reduce their electricity use and save money.

Completed Energy Savings

Energy conservation savings from projects completed in that calendar year:

	2009	2010	2011	2012	2013
Annual Energy Savings Goal*	10.27	9.84	9.84	12.01	12.01
Residential Savings	5.74	5.02	5.61	4.15	4.10
Commercial - Industrial Savings	5.98	7.50	5.53	5.85	5.63
NEEA Savings**	1.3	3.64	3.26	3.33	3.74
Total aMW Savings Acquired	**13.02**	**16.16**	**14.41**	**13.33**	**13.47**

*Annual Energy Savings Goal is associated with Seattle City Light's I-937 Target
**Northwest Energy Efficiency Alliance. Includes direct- and indirect-funded energy savings.

Notes:

Energy savings are reflected in aMW. One aMW = 8,760,000 kWh

Energy Conservation Savings are from completed projects and include savings from regional market transformation activities (NEEA), third-party delivered efforts and avoided transmission and distribution losses.

Energy savings are typically not finalized until June of a calendar year. This data was compiled as of March 6, 2014, and the 2013 NEEA energy savings are based on data that was available at this time. We anticipate NEEA will provide updated 2013 data in May 2014.

For 2010-2011, these energy savings are aligned with Seattle City Light's I-937 reporting.

For 2012-2013, these savings have not yet been reported to the State for I-937 purposes and do not include Opower-related energy savings. This program is being evaluated and the energy savings will be added once the evaluation is complete.

The 2013 NEEA energy savings are estimated and could change.

Bacon Creek in the Skagit River watershed.

Celebrating Stewardship Accomplishments

Seattle City Light is honored to receive recognition for its commitment to environmental stewardship.

2013	2012 Wastewater Treatment Plant Outstanding Performance Award for Newhalem	Washington State Department of Ecology
	Climate Registered status in recognition of its climate leadership for reporting and verifying its 2010 and 2011 carbon footprint to the highest standard	The Climate Registry
	Named a Tree Line USA Utility for best practices in protecting and enhancing urban forests in its service territory	Arbor Day Foundation
2012	2011 Wastewater Treatment Plant Outstanding Performance Award for Newhalem	Washington State Department of Ecology
	2011 Wastewater Treatment Plant Outstanding Performance Award for Diablo	Washington State Department of Ecology
	Innovation Award	Interstate Renewable Energy Council
2011	2011 Award in Excellence for Riparian Management for the Tolt River Floodplain Reconnection Project	American Fisheries Society
	City Light biologist Ed Connor receives the Skagit Watershed Council Annual Award for contributions to salmon recovery in the Skagit River Watershed	Skagit Watershed Council
	2010 Outstanding Wastewater Treatment Plant Award for Diablo	Washington State Department of Ecology
	2010 Outstanding Wastewater Treatment Plant Award for Newhalem	Washington State Department of Ecology
	Green Globe Award	King County
2010	2009 Outstanding Wastewater Treatment Plant for Diablo	Washington State Department of Ecology
	2009 Outstanding Wastewater Treatment Plant Award for Newhalem	Washington State Department of Ecology
	The City's Green Fleet program was recognized for its excellent integration of alternative fuels into existing operations and comprehensive examination of where and how petroleum reduction policies and procedures could impact the fleet	Green Fleet Magazine
2009	Nominated for the 2009 Public Power Wind Pioneer Award	U.S. Department of Energy Wind and Hydropower Technologies and the American Public Power Association Demonstration of Energy-Efficient Developments
	2008 Outstanding Wastewater Treatment Plant Award for Diablo	Washington State Department of Ecology
	2009 Directors Award for work in helping to restore Wiley Slough in the Skagit estuary	Washington State Department of Fish and Wildlife
	North Cascades Environmental Learning Center, built by City Light, is awarded Leadership in Energy and Environmental Design, Silver	U.S. Green Building Council
2008	Outstanding Stewards of America's Waters Award in the category of Recreational, Environmental and Historical Enhancement for work done in 2007 in the Endangered Fish Species Recovery Implementation Program on the Skagit	National Hydro Association
	Partners in River Stewardship recognition for helping to protect and restore the outstanding resources of the Skagit River system	U.S. Forest Service
	2007 Outstanding Wastewater Treatment Plant Award for Diablo	Washington State Department of Ecology

Learn more about our programs, challenges, successes and plans for the future.

Boundary Hydroelectric Project
http://www.seattle.gov/light/generation/boundary/

Conservation
http://www.seattle.gov/light/conserve/

Environmental Affairs
http://www.seattle.gov/light/environment/

Green Fleets – City of Seattle
http://www.seattle.gov/fleets/

Past Environmental Report
http://www.seattle.gov/light/environment/envstewrpt_02_2009.pdf

Skagit Environmental Endowment Commission
http://skagiteec.org/

Skagit Hydroelectric Project
http://www.seattle.gov/light/tours/skagit/

Follow City Light to keep up with the latest news, trends, challenges and impacts of our work.

Facebook
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Twitter
https://twitter.com/SEACityLight

YouTube
http://www.youtube.com/channel/UCXpqQ2CoMECyL2HEkR5_ydg

Front cover, back cover and page 15 photos by Keith Lazelle.

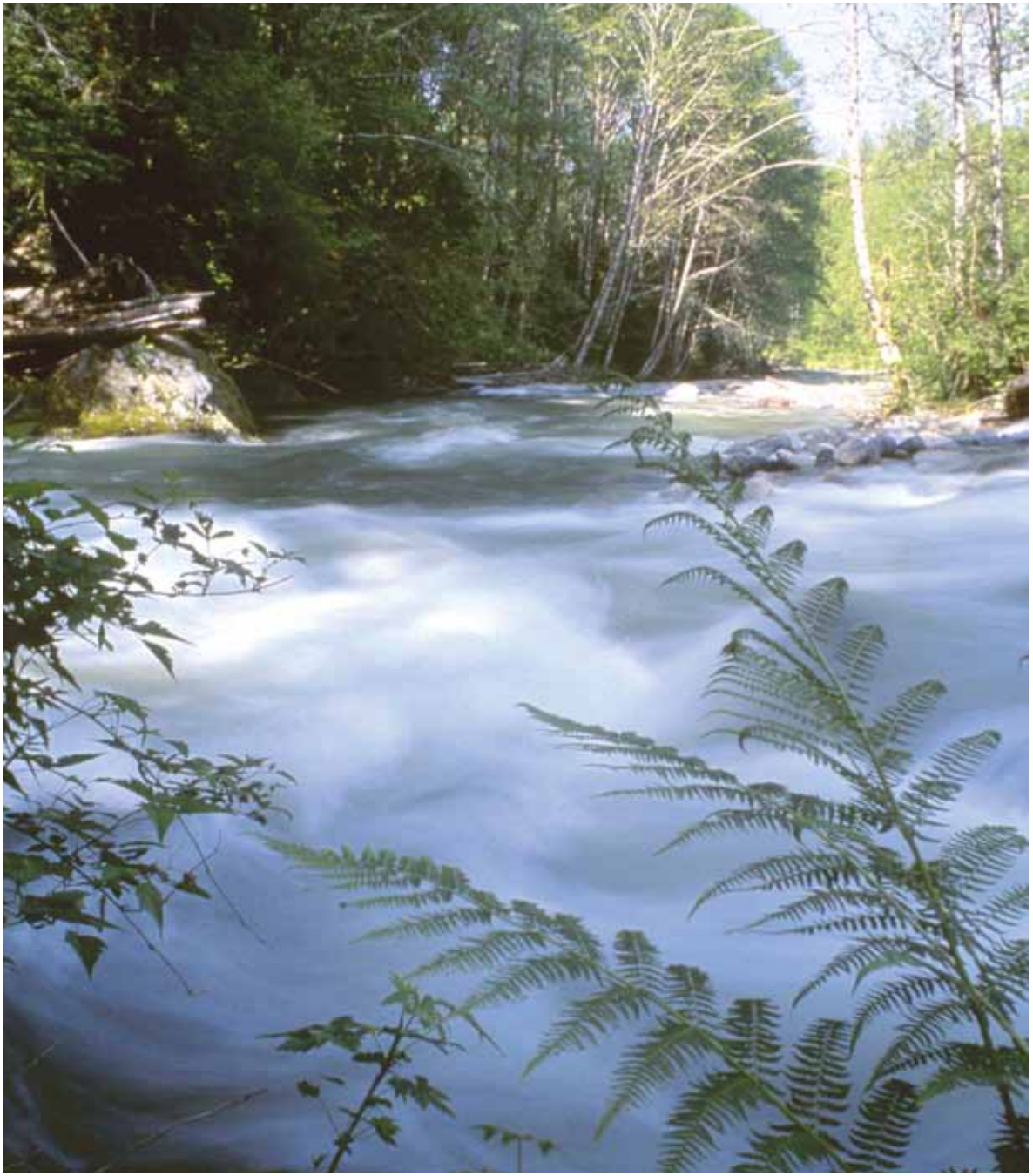
Fish photo on page 4 courtesy of David Batchelder.

Wolverine photo on page 6 courtesy of U.S. Forest Service.

Osprey photo on page 7 courtesy of Neal Chism.

Sonic Bloom photos on pages 12 and 13 courtesy of Dan Corson.

Environmental Learning Center photo on page 14 courtesy of North Cascades Institute.



Illabot Creek provides important spawning habitat for salmon. City Light removed an old levee from the creek near its confluence with the Skagit River to improve conditions for the fish.

Seattle City Light

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Seattle City Light is dedicated to exceeding our customers' expectations in producing and delivering environmentally responsible, safe, low-cost and reliable power.

This report was printed on 100 percent post-consumer recycled paper that is free of chlorine chemistry. The paper is Green Seal and Forest Stewardship Council certified. It was manufactured with 100 percent renewable energy and made Carbon Neutral Plus, which ensures a reduction in carbon emissions plus a commitment to conserve the environment.

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