

Where the Going Gets Rough Annual Dozer Work Pays Off In Reliability, Safety

Up in the archives, in Washington Electric Cooperative's scrapbooks from the early years, there are some old photographs showing groups of men in the 1930s and the '40s laboring in the Vermont countryside to set the new utility poles in place. These were the Co-op's earliest, original poles. They had heavy equipment in those days, too, but in places far off the roadways you'd see a team of men, using long shafts, ropes and cables, carefully pushing the pole to its erect position. Frequently they'd bring the poles to the site with horses or oxen.

Building out its electric system took more than the small number of workers the bootstrap Co-op could afford to hire. So other people in those old photos were apt to be local residents – the farmer whose land the poles were crossing, carrying power for the first time to his house and barn; maybe his neighbor who'd been the last one to receive power, and the next farmer down the road or across the meadow.

Meadow? It wasn't always meadows. In acquiring rights-of-way from property owners in those early days, the terrain wasn't the biggest consideration. Most important was cost. The federal REA (Rural Electrification Administration) – a famous, life-altering agency in rural America through much of the 20th century – funded the nation's new electric cooperatives through subsidized loans. And they were risky

loans because who knew if these fledgling cooperatives would really be viable? So the REA insisted that co-ops pursue the shortest route possible from one new member's home to the next, to save on materials. For WEC, that often meant building upon steep hillsides or across landscapes marked by abrupt pitches and gullies.

Some 70 years later, however, reaching that remote infrastructure is more important than our predecessors could have foreseen. Nowadays, Washington Electric Co-op members have an expectation that their power will stay on, and if it goes out their 21st-century lifestyle mandates that it be restored in hours, not in days, which people once accepted.

But those very isolated, rural lines are vulnerable. They include some of the oldest poles and equipment on WEC's system, precisely because they are so difficult to reach. As the vegetation grows up around them, they're susceptible to damage from fallen branches and trees. Woodpeckers bang on them, and, as WEC's Engineering & Operations Director Dan Weston points out, hunters occasionally take target practice on utility equipment deep in the woods.

And there are bears. The Co-op has some sections of very important three-phase line – "feeders" directly from the substations – that

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A team of oxen stands ready to assist as men set a power pole during Washington Electric Co-op's early days. Though a truck can be seen on the left, it's likely, because of REA rules, that this section of line then marched off into the countryside. Many of the original rights-of-way are now very difficult to reach and service.

A Wild Week July Storms Raise Havoc in Co-op Country

A reasonably tranquil summer went haywire in the latter part of July, with radio stations crackling out severe-storm alerts from the National Weather Service and their warnings coming true as intense, often localized storms struck several locations in Washington Electric Cooperative's service territory. They left substantial damage in their wake.

With winds gusting at 45 mph or more, with lightning flashes and thunder claps, and periods of driving rain, the storms broke trees, which then fell across the electric wires and caused outages. In a few areas, the trees hurtled across the power lines with such force that the utility poles

were broken as well. WEC, in its on-line outage updates, repeatedly reminded readers not to approach them. Hundreds of members lost their power for periods ranging from an hour or so to nearly 24 hours.

Washington Electric's line crews – supported by the "birddogs" (other members of the Operations department) who scout ahead for more damages – worked long hours to restore power. So did the outage-response team at Co-op headquarters, coordinating the crews' work through their analysis of the data coming into WEC's computerized mapping system. And so did the member services represen-

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Washington Electric Cooperative
East Montpelier, VT 05651

Inside

Today's apprentices, tomorrow's veterans. Keeping a mixture of ages and personalities is WEC's plan for ensuring that the Co-op will always field a skilled and motivated line crew. Meet WEC's three youngest linemen on page 3.

Tech students check out Wrightsville. When CVCC's Natural Resources & Sustainability students wanted to see a hydroelectric plant firsthand, WEC's Dan Couture gladly demonstrated how the Co-op produces renewable power on the Winooski River. Page 8.

Efficiency Vermont does Ag! Farms use lots of energy, so they stand to benefit greatly from efficiency programs that can be accessed through EVT. See the "Energy Coach" on page 6.



This sign, at the entrance to the Burnt Rock hiking trail in Fayston, aptly describes the presence of black bears in central Vermont's forests. Unfortunately, these forest denizens have a "thing" for power poles, presenting a challenge for WEC.

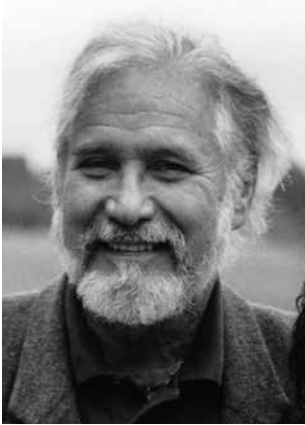
President's Message

Contending With July Weather, And Thanks To Concerned Members

Plus: Updates on Coventry Production and PSB Net Metering Rules

By Barry Bernstein

July continued to bring us beautiful summer weather. Unfortunately, it has also come with very hard rain and storms called micro-bursts, with intense winds that have caused severe damage throughout our service territory. The Corinth and Bradford areas were hit very hard on the weekend of July 23-24, bringing trees down power lines, with outages so extensive that at one point we had a total of 1,685 members affected. Just five days earlier we had experienced micro-burst-related outages affecting members in several towns including Corinth and Bradford, and keeping our line crews busy



throughout the night on July 18 with several broken poles.

As I write this, heading into the final week in July, the forecast is for very hot, humid weather and more severe storms, so please be patient.

Here's an important way you can help your Co-op, and yourself. One of the most frustrating

parts of restoring power is when members have downed power lines that affect only their home or business, and no one else's. If they have not called in to report their outage, our crews might restore power to the area around them and then head off to address problems elsewhere, not realizing that an individual service is out. When a

member calls in later it makes it necessary to send a crew back to their location, at additional time and expense. We realize members may not know that theirs is an individual outage, so the solution is to please call WEC when you experience loss of power; it makes for quicker and more efficient recovery for everyone.

I want to again thank our line workers and the rest of our employees who work these storms, especially on weekends and after hours. We also want to thank the crews from the Hardwick Electric Department and Vermont Electric Cooperative who assisted us in the past two restoration events. It's very difficult work, often in a maze of downed trees and dislodged power lines, and each crew member needs to remain vigilant, despite fatigue and a demanding workload, to protect their own safety.

Members who provided critical information

I want to thank some of our members for special assistance they provided that helped us respond to individual situations. Chet Cole and his wife, Viiu Niiler, from Marshfield, were keeping an eye on a longtime friend in Calais who, at 92, was recently diagnosed with ALS. In one of those July storms their friend lost his electricity and phone service. Chet reached out to me, and I alerted our staff at WEC, who sent an employee to look at the member's service. This turned out to be one of those "one outs" referred to above, where we had restored power to the area but were not aware of downed wires that cut service to Chet and Viiu's isolated friend but no one else.

WEC was able to divert a crew that was returning to re-stock their vehicle. They checked in at that location, discovered the problem, and had the man's power re-connected by that afternoon. So thank you Chet and Viiu, thank you Brent Lilley (WEC's Operations & Construction Services Manager), and thank you to our crew members who assisted in this effort.

The second member I want to acknowledge and thank is Steve Kroll of East Montpelier. Steve had become frustrated by repeated outages over a three-month period and called to discuss it with us. Dan Weston, Director of Engineering & Operations, sent someone to look at the line when we weren't in a storm-response situation.

One of the most frustrating parts of restoring power is when individual members have downed power lines that affect their home and no others. If they have not called in to report their outage before our crews have departed the area it makes it necessary to send a crew back, at additional time and expense.

Our employee discovered that a vacant home nearby had high growth that was interfering with a transformer, and that the line – which dates back to the early 1950s – had very old insulators with hairline cracks.

Once we are finished with the current storm cleanup we will schedule a crew to trim the overgrowth and replace any equipment that's needed to improve reliability. Members sometimes are not aware that your Co-op has 1,267 miles of distribution lines to patrol, maintain,

and update; to illustrate the challenge, that's almost exactly the distance from Montpelier to Birmingham, Alabama (1,241 miles). As hard as we work at this, it is with your help – people like Steve Kroll alerting us to a recurring problem – that we can further improve our service reliability.

Update on net metering new rules for 2017

The Vermont Public Service Board (PSB) recently issued a new draft of the final regulations for net metering starting in 2017. The draft will need to go through a new public-hearing process, since it is significantly different from the last draft. WEC has recommended that the PSB leave the existing regulations in place, including WEC's current program approved by the PSB in June 2014, until the final rules are fully implemented. This will allow the utilities a reasonable timeframe for getting new tariffs filed and approved, and it will give us time to set up changes to the billing system.

The new draft proposes that all net metering installations will pay their utilities' member (customer) charge, the energy efficiency charge (which helps fund Efficiency Vermont), and – for Gaz Metro/GMP – its low-income charge. This will mean that net metering customers will pay the same charges, other than the cost of energy, that the rest of Vermont's ratepayers do.

In our comments, WEC asked the PSB to allow the Co-op to continue the revised net metering program we started in 2014, in which we collect the member charge and a "grid service fee" that helps support our poles-and-wires infrastructure. That program now represents almost one-quarter of our total net metering installations, and has been fair to all WEC members. The rest of our net metering members were enrolled before the 2014 changes, and

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Co-op Currents

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WEC is part of the alliance working to advance and support the principles of cooperatives in Vermont.

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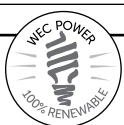
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The Board of Directors' regularly scheduled meetings are on the last Wednesday of each month, in the evening. Members are welcome to attend. Members who wish to discuss a matter with the Board should contact the president through WEC's office. Meeting dates and times are subject to change. For information about times and/or agenda, or to receive a copy of the minutes of past meetings, contact Administrative Assistant Dawn Johnson, at 224-2332.

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The Graduates

Three WEC Apprentices Attended GA Line Workers' School

When new, rookie line workers are hired to join Washington Electric Cooperative's Operations crew these days, chances are they've got a leg up on their predecessors who entered the field not long ago. More and more, they will have attended the 15-week "pre-apprentice" electric line workers' training program in Trenton, Georgia.

Having "a leg up" is an apt way to put it, because, as 25-year-old Scott Matheson, 21-year-old Mike Bent, and 20-year-old Patrick Morrissey, WEC's three apprentice linemen, will attest, the emphasis during the first weeks at the Southeast Lineman Training Center (SLTC) is on climbing poles, almost to the exclusion of anything else.

"It's up and down, up and down, for hours," says Mike.

"The idea is that practice makes perfect," adds Patrick, and Scott explains, "They're trying to get you comfortable on the pole so that you're not even thinking about it."

There will come a time when these trainees will have to perform many different and sometimes intricate tasks while they're perched near the top of a utility pole, often in terrible weather conditions. They'll need to handle those duties with competence and with constant attention to their safety working so close to electricity, so they can't afford to be distracted by what's actually a pretty unnatural use of their legs and bodies: gripping the poles with their gaffs (linemen's foot gear, with spikes and knee pads) and climbing belts. This is especially true for line workers employed by rural utilities like Washington Electric, where much of the infrastructure is off-road and inaccessible for trucks with lift buckets.

So at the Training Center, it starts with climbing. As training progresses, other facets of line work are added. The SLTC website trumpets its course this way:

"WE WON'T LIE TO YOU. This may be the most intense, physically and mentally challenging 15 weeks of your entire life. But if you make it through you'll be part of an elite highly trained group, equipped with tools, certifications & the ability to earn a great paycheck and ... You'll make your mama proud."

The SLTC provides a start – a leg up – but it does not turn out qualified linemen. That happens later, as utilities like WEC enroll their new employees in apprenticeship programs, with class work and additional training during and after work. If they stay with it they earn



These three young fellows decided what they wanted for a career, and then went for it. All of them central Vermont natives, they attended the Southeast Lineman Training Center in Georgia shortly after high school, and then found jobs as apprentice linemen at Washington Electric Co-op. Great additions to the crew, they are (from left) Patrick Morrissey, Scott Matheson, and Mike Bent.

the status of First Class Lineman.

The Georgia Center graduated its first class of 15 students in 2000, responding to a need in the industry for a pipeline for new, reliable workers who understand the rigors of the profession they've chosen. Not all the Co-op's hires come through the SLTC program; sometimes they come to WEC with previous line worker's experience. But Dan Weston, Washington Electric's Director of Engineering & Operations, says the Georgia-based training facility and another in Idaho have proven to be good resources for the Co-op, and for ambitious young workers eager to acquire highly marketable skills.

"The training centers do a very nice job of preparing someone for the line-worker trade," says Weston. "They provide the basic foundation, which includes proficiency at climbing, basic types of construction, and familiarity with the tools of the trade. Since the training centers are tuition-based, applicants are generally committed to completing the program. Therefore, the program tends to weed out the tire-kickers, and the result is that the industry is provided with apprentice line workers who carry a high level of commitment to the line-worker trade."

Eyes wide open

That was certainly Patrick Morrissey's vision when this East Hardwick native graduated from Hazen Union High School in 2013. He had friends who had attended the Georgia program and found good jobs because of it. Patrick took the SLTC course during the winter of 2014.

"This line of work gives you a good

career, with good benefits and a good union," he says, expressing a very practical outlook for someone so young. Patrick is the newest WEC employee among the three apprentices, joining the Co-op's crew in October, 2015.

Mike Bent and Scott Matheson have been with Washington Electric for two years now, starting in February, 2014. Both are central Vermonters, and they attended the same SLTC session in 2013. But that was by coincidence. Mike, who was from Braintree, got onto the technical-education track at the Randolph Technical Career Center and knew he was interested in line work because he had done some job-shadowing as a student.

"I went to Georgia right out of school," he says.

Scott Matheson tried other lines or work for a few years after graduating from U-32 in East Montpelier. He did carpentry with his father for a year or so, and then worked for Vermont Creamery in Barre Town.

"I always wanted to do something with electricity," he says, "so I finally bit the bullet and went to the (Georgia) training center."

One of the great things about the SLTC, Mike adds, is that for people who complete the program jobs are virtually assured. The school will help place you.

"But you've got to be willing to travel," he says. There are line workers' jobs for utilities around the country, as well as for contracting companies who dispatch crews regionally or nationwide, whether it's for emergencies or long-term line-construction projects.

"We got lucky enough to get jobs in our home state," says Mike.

Scott and Mike were hired 10 months before Tropical Storm Damon hit Vermont in December 2014, and experienced the nine-day marathon that ensued as the Co-op swung into action day and night to restore power – sometimes repeatedly – to more than half its membership. This was also a crash course in repair work for them, as the SLTC schools its students primarily in line construction. Scott and Mike also point out that, because Damon impacted so much of the Co-op's territory, it quickly got them more familiar with WEC's 41-town, 1,250-mile electric system.

Planning for the future

"It's not by accident that our crews are made up of individuals of different ages, different generations, and different backgrounds," says Dan Weston. "Having a good

mix of ages allows retirements to take place without significant interruption to the experience level on the crew. I have also noticed that the young perspective keeps us old codgers from getting too narrow minded! We also have a good mix of personalities, which adds a variety of perspectives, opinions, and approaches to projects.

"I can also tell you what all our crew members have in common," says Weston. "A good attitude and a high level of pride in what they do and how they do it. That is especially true of the newest additions to the crew, Mike, Scott, and Patrick."

General Manager Patty Richards added, "We look for the right fit when hiring employees, and we are looking for those who will carry out our cooperative mission. As a nonprofit, consumer-owned cooperative, we focus on our members' needs. And we are committed to protecting the environment. Mike, Scott and Patrick were chosen not just because of their technical skills but also because we see them doing the work in the spirit of the cooperative way, being member-focused, good team players, safety-conscious, and concerned for the communities we serve.

"We want dedicated employees on the line crew," said Richards, "and putting our members' needs first is imperative, especially during power outages when their work is often late at night and in adverse weather conditions. Showing up at 2 a.m. during a storm takes a special individual and these three new WEC employees have what it takes to make that happen for our members."



Dozer Work Pays Off

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traverse isolated woodlands to carry power to large numbers of members. One example is a feeder out of the Moretown substation that delivers power to Harwood Union High School in Duxbury, then crosses Route 100 and takes off into steep, isolated hill country. When it comes out on the other side it provides power to a large number of residential members along North Fayston and Center Fayston roads and their offshoots, and to the Mad River Industrial Park, home to Cabot Cooperative Creamery's administrative offices.

Bears are plentiful in that high terrain. Plus, the right-of-way, re-cleared on a cycle of several years, mimics what's known as early successional habitat: typically fields (rather than corridors) that have been cleared by nature (fire) or mankind (cutting), where vegetation is progressively re-establishing itself. It's a landscape that attracts many species of wildlife. As Forrest Hammond, of the Vermont Department of Fish & Wildlife, explains (see "Encroaching," page 5), that includes black bears.

Unfortunately, bears can be rough on power poles, even to the point where they need to be replaced. That adds another reason why these vulnerable sections of WEC's right-of-way must be made more easily, and more safely, accessible for the Co-op's line crews.

Summer is the time to tackle these jobs.

Heavy equipment

That brings us to the bulldozer. And its junior partner, the Bobcat.

WEC's efforts to move its power line rights-of-way (ROW) from the deep woods, closer to the roadsides, has been well-documented in Co-op Currents. It's not always possible, as landowners (Co-op members), for their own good reasons, sometimes prefer to leave the power line corridors where they are. WEC therefore expends a lot of effort in landscaping and improving the off-road ROW, so that line crews can reach and work in those remote places quickly and safely when necessary.

However, the challenge is greater in some places than others. So for the past six years WEC has rented a bulldozer for six weeks in the summertime, and for the last four years First Class Lineman Kyle Sands has used it to make the land beneath the power lines in these rough, nearly inaccessible places more manageable.

Kyle is the man for the job. Before hiring on at WEC in 2007 he gained a lot of experience operating Snowcats – large trail-grooming equipment – on the steep slopes at Sugarbush Resort.

"Kyle Sands, operating the dozer, is as good as I have



The projects undertaken each summer with a rented bulldozer and the Co-op's smaller, more maneuverable "Bobcat," are focused on the roughest, least-accessible sections of WEC's right-of-way. The goal is to make it safer and easier for line crews to reach those areas for repairs and maintenance. Lineman Kyle Sands (above, left) gained experience operating heavy equipment at Vermont ski areas. Donnie Singleton (right), whose title is Equipment Operator, functions as WEC's outreach coordinator, making sure property owners are receptive to the work and happy with the results.

seen, like an artist," says Operations Director Weston. "He improves those rough-to-work-in areas tremendously, and we get good reports on his work from the landowners who have given us

permission to smooth out the terrain."

This summer, Kyle's work has focused on problematic sections of right-of-way in East Montpelier and Middlesex, and in Chelsea and Washington. Often working near him, on other stretches of the ROW that present enormous challenges to WEC line crews, is Lineman First Class Hans Pope-Howe, who operates a smaller, more dexterous Bobcat earth-moving vehicle. The Bobcat can negotiate terrain that would be too dangerous for the rented bulldozer.

Before Kyle comes along WEC has reached out to the landowners to secure their permission. Operations & Construction Services Manager Brent Lilley sends postcards advising those members of the Co-op's plans; then jack-of-all-trades Donnie Singleton makes personal contact with each person to answer their questions, to describe how Kyle, if he is allowed, will work to smooth out and clear the surface, and why that's important.

Donnie has the personal gifts for these interactions. He's a good listener, and unfailingly considerate and polite.

"The people are really great," he says, "especially the older folks who have been with the Co-op for a long time. Sometimes they'll say, 'Well, we're going to be away, but just go on into the garage and borrow any tools you need.' We don't need to do that, of course, but that's what kind of people they are."



Kyle keeps at it, working the dozer to dislodge a huge boulder that could be treacherous for linemen and "birddogs" tracking outages in winter weather. Says Donnie Singleton, "No one could realize how much better it makes our lives to know, in the winter, that the ground is even and safe."

It is a longstanding policy of Washington Electric Cooperative not to use herbicides in its right-of-way management program.

On these projects, WEC can take no for an answer. The sections where the dozer and the Bobcat will work are usually remote from homesteads and usable lands, but Operations Director Weston says, "We've had landowners say 'I really wish you wouldn't do that,' and we've said okay."

Gaining ground

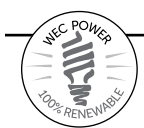
The objective is to make these stretches, which in most cases can be reached only on foot, or snowshoe, passable at least for an ATV (all-terrain vehicle), and hopefully for WEC's large track vehicle which has the equipment to replace poles if necessary. In areas not far from the roadside, perhaps a utility truck could be used. A more manageable ROW results in shorter outages for WEC members; even more important, it means safer working conditions for your Co-op's linemen.

"No one could realize how much better it makes our lives to know, in the winter when there's snow covering everything, that the ground we're walking or traveling over is even and safe," says Donnie. "Things go better, quicker, and smoother."

Other important points:

- WEC follows a vegetation-management plan that outlines in detail how the Co-op must manage its ROW corridors. The plan is adopted by the WEC Board of Directors, reviewed state utility regulators, and approved as part of an Integrated Resource Plan (IRP) that WEC must submit

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Encroaching On Bear Territory

WEC, And Its Power Poles, Pay The Price

If this were China, we might call it The Year of the Bear. Vermonters seem to be seeing black bears far more frequently than usual this spring and summer, and in closer proximity to civilization. One explanation offered in a recent newspaper article was that we had a dryer early-summer than usual, causing a delay in the development of berries and perhaps other bear foodstuffs in the woods; this has led them to venture into human-inhabited areas to find something to eat. It has also been said that bears were late to bed (their dens) last winter because it was unusually warm, so they had used up their storage of fat and woke up with more need for nutrition than usual. Additionally, the bear population in Vermont, and the Northeast in general, is said to be robust.

Unfortunately for Washington Electric Co-op, bears have an affinity for wooden utility poles. Forrest Hammond, Black Bear Program Director for the Vermont Department of Fish & Wildlife, says that's something wildlife biologists have known for a long time. And though Hammond and his colleagues believe they understand why this is, he adds that "none of us really know how bears think. There may be reasons only bears understand.

"What we think goes on," he continues, "is that bears like to use utility poles as scent posts. It's a way for bears to communicate as to which bears are in the area. They do the same with some trees in the wild, especially in areas where bears will congregate (around) a seasonal food source."

In some of the most isolated parts of Washington Electric Cooperative's 1,250-mile right-of-way, like the high-elevation section in Duxbury and Fayston between Route 100 and the North Fayston Road, the cleared power line corridor traverses forestland. These corridors become little havens for foodstuffs, because the vegetation is cut back just every seven-to-ten years or so; in the interim, energized by sunlight that's rare in these otherwise shaded forest areas, the corridors are ideal for low berry bushes.

That's one attraction of utility rights-of-way, Hammond says. Another appears to be the poles themselves.

"They seem to like red pines above any other tree to select as a marking tree, and a lot of utility poles are made from red pines."

Other kinds of pine and fir also are used for power poles, but they have a common ingredient of natural resin that either attracts the bears or amplifies their scent (or both).

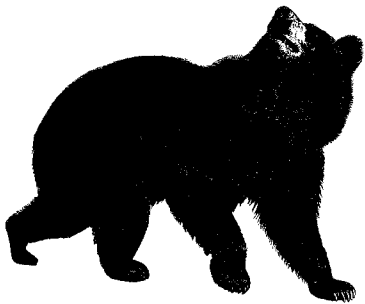
We see the marks they leave on the poles, but what's surprising is the full-body assault they perform: rubbing their backs and shoulders against the poles ("They seem to have scent glands between the shoulder blades," says Hammond); turning their heads and biting into the poles; using their claws to aggressively scratch up the wood, often leaving hairs stuck into their claw marks. They don't seem to be climbing the poles; their markings usually extend no more than five or six feet from the ground.

The damage they do is considerable. Companies like Washington Electric Co-op, with a lot of infrastructure in remote wooded areas (bear habitat), have experienced it for years. On a recent ride on one of WEC's six-wheel ATVs (all-terrain vehicles) through the steep, plunging ROW in Fayston, WEC Equipment Operator Donnie Singleton was taken aback by how many poles had been damaged, some quite severely, by black bears.

This was one of the first corridors made passable by the use of a rented bulldozer six years ago (see "Annual Dozer Work Pays Off," page 1). And a lot of WEC members depend on these power lines; it's a main, three-phase feeder (picture three lines running parallel across the top of the poles) directly connected to WEC's Moretown substation, and it transports power to a large volume of homes, camps, and businesses, including Cabot Cooperative Creamery, in Fayston. As the crow flies, the right-of-way isn't too far from roads, schools, stores,

"What we think goes on is that bears like to use utility poles as scent posts. It's a way for bears to communicate as to which bears are in the area."

— Forrest Hammond,
Black Bear Program Leader



and homes. But with thick woods enveloping the mountainous corridor on both sides, it feels like wilderness.

Pole after pole, virtually every one that Donnie came upon on the ATV had been affected, and many were markedly reduced in breadth in their lower portions. Slivers, splinters, and bits of fur stuck out from the pole.

"This could really be a concern," said Donnie, examining one of them. "If you get a lineman and his gear climbing this pole, that's a lot of weight at the upper end to put on this weaker part at the bottom."

WEC has a pole-inspection program, and a system for tagging poles that are deemed unsafe. The tags alert linemen against climbing them, and meanwhile they're put on a list of poles to be removed and replaced when time permits. Donnie planned to alert the Operations team about his findings.

Returning to where his truck and trailer were parked, Donnie stopped in to visit Ferris Buck, whose property on Smith Road adjoins a section of the forested right-of-way. Her father had bought the property as a summer getaway in 1963; consequently, the area is known as Buck Hill. Ferris, now in her 70s, was sitting on her deck enjoying a beautiful summer afternoon.

"Oh, we're very used to seeing bears here," she confirmed to Donnie. She wasn't the slightest bit alarmed by his reportings of bear activity; that's apparently the way things are up on Buck Hill.

Back at WEC Headquarters, however, Dan Weston was surprised to hear how many poles along that right-of-way were damaged. Weston is WEC's Director of Engineering and Operations; with input from his staff, he makes the eventual decisions about where WEC should invest its resources in maintaining and upgrading its many miles of power line.

"It costs \$3,000 to \$5,000 to remove and replace a pole," Weston said. And while the bulldozer work six years ago had vastly improved accessibility, the corridor is still quite steep in many places as it traverses the mountain, heading toward Duxbury and Harwood Union High School. Donnie had had to travel slowly on his ATV, so getting the Co-op's track vehicle in there would be a major operation.

Assuming that the damage continues and poles will need to be replaced, what could WEC do to prevent a continuation of the harm and cost resulting from bears just being bears?

Weston had one thought playing through his mind: purchasing metal culverts, six-to-eight feet long, like the ones that channel groundwater beneath roads and driveways; slicing them open lengthwise, and then wrapping them around the poles. To

enable line workers to climb the poles if necessary, Weston suggested using a torch to cut intermittent openings through the metal where iron "pole steps" (alternating rods, about eight inches long, that can still be seen on some phone and power poles) could be driven into the wood.

Will that be WEC's solution to its bear problem? No one knows yet, but it's clear WEC is going to have to do something, because the bears are having a field day out there – not just in this Year of the Bear, but every year in WEC's wildest, most challenging territory.

Bears, explains biologist Forrest Hammond, rub, claw, and bite utility poles, leaving their scent as a message to other bears. With a lot of remote territory, WEC's poles come in for significant abuse.

July Storms

continued from page 1

tatives, and CRC (WEC's after-hours call service) who took phone calls from members reporting outages.

This didn't happen just once; it was a recurring story from Monday, July 18, through Sunday, July 24. But the first storm, which hit WEC's territory in mid-afternoon on July 18, set the pattern for the storms that would follow – including a second intense storm on that very same day.

For members with wireless devices, such as phones, laptops, and tablets, Washington Electric's web site is a good way to keep tabs on where outages are and the progress WEC is making in restoring electric service. For the wild July 18 storm, General Manager Patty Richards' first "Outage Update" on www.washingtonelectric.coop began telling the story soon after it struck.

July 18, 2016-3:30 p.m. "We had several isolated but severe thunderstorms move through central Vermont in the past few hours. We have numerous locations of reported downed trees and lines... Currently we have 587 members out of power . . . with heaviest affected towns being Marshfield, Calais, Worcester, and Cabot (and) smaller numbers of members out in East Montpelier, Middlesex, Peacham, and Walden."

An hour and a half later:

July 18-5:00 p.m. "We . . . have restored power to hundreds; we are now down to 204 members without power. We are still seeing storm clouds roll through." Richards then posted a report from the weather service indicating that more storm activity was likely into the evening. Those predictions came true.

July 18-8:00 p.m. "We are making great progress in towns in Washington and Caledonia counties, and had the number of members out of power down to 200 by 6 p.m. Unfortunately, another round of storms pushed through in Orange County, (where) we now have over 700 members out."

Here, Richards announced the first broken poles, in Corinth. The Co-op now began receiving valuable help from the Hardwick Electric Department. And, with damages mounting from the second wave of storms, she began advising people that they should prepare to be without power overnight.

The crews and CRC worked through the night. The following morning's posting read:

July 19-8:20 a.m. "While the storms have rolled by and the sun is coming out, we are still picking up the pieces... We have four towns still impacted at this time. We have 34 out in Bradford, 50 in Corinth, 3 in East Montpelier, and 3 in Groton... Cleanup efforts can take time, as we have many trees down."

Then, just 15 minutes later:

July 19-8:35 a.m. "We just restored power in Bradford." But that good news was tempered by this:

"Members in Corinth are looking at an all-day cleanup as the storm impact is simply a mess." Before linemen can reach areas with power line problems, they frequently have to cut through the tangle of limbs and trunks to reach them. WEC's contracted tree crews were on the scene, but Richards advised Corinth-area members, "Please plan that your power could remain out until mid-afternoon."

Finally, a big sigh of relief, and slightly earlier than expected:

July 19-2:30 p.m. "We have everyone back online!" In her post for WEC's members, Richards continued, "Thank you for your patience and understanding. Crews worked all night to cut trees, clear storm debris, and make repairs. A big thank you goes out to all WEC staff... We are proud of their resilience and perseverance. They will go home today and get a well-deserved rest!"

PIZZA! And timely help from other utilities

WEC Operations Director Dan Weston afterward recounted the events and responses that colored the July 18-19 double-storm ordeal. Following the first storm, he said, repairs had gone pretty well "and we were feeling kind of lucky." Then, around 8 p.m., came storm number two.

"The second one was headed to track just north of our office" in East Montpelier, Weston said. "But when it got to Montpelier it took a sharp right turn and headed southerly through Orange and Corinth. We ended up with three or four maple trees going

through the lines. Roads were blocked in Corinth and we spent a lot of time cutting our way to where the outages were."

Weston continued: "We worked our crews through the night, which is not always the case."

It can be less efficient to work everyone through the night, because the work proceeds more slowly in the dark. More often, the Co-op will keep one crew on duty, making progress where the situation is worst, and bring the full staff back on duty in the early morning. But this time the decision was made to keep at it, and to push through to the end, in mid-afternoon on Tuesday, July 19.

"We had some really tired workers," said Weston. "Those are really uncomfortable working conditions, in the humidity and heat, the mosquitoes are horrible, you're wet and soaked. Getting two Hardwick Electric Crews, really, was instrumental in helping us get on top of this relatively quickly. Kudos to the Hardwick Electric Department!"

Weston had praise for lots of Co-op members, too, who could see what the workers were enduring. One member in particular went out of his way to help.

"Joe Truss, a member in Corinth, took five or six pizzas to some of our crews early Tuesday morning," said Weston. "That was really welcome. What a great gesture it was! Thanks, Joe!"

No letup


It would have been nice if things had ended there, but as the week progressed more severe storm

warnings were issued, and WEC's staff was again making preparations. By Friday (July 22) Co-op members were dealing with the impacts of more powerful, volatile weather, and Washington Electric's crews were back at it. Saturday was a repeat performance; Weston reported to WEC Board members that three violent cells had struck the service area, spreading now to the Duxbury/Fayston part of the Co-op's territory. There was a point, he wrote, at which 1,585 WEC members were without power.

Fortunately, things then calmed down a bit. The Duxbury/Fayston problems were largely resolved by 7 p.m. Elsewhere, work continued. Here's the web site's post from Sunday morning.

July 24, 2016-7:21 a.m. "Crews worked throughout the night and were able to restore to some 200 members in the Orange/Corinth area. We now have 255 members without power spread across 18 separate outages, with multiple spans of wire on the ground. The focus this morning will be in the areas of Tunbridge, Vershire, Washington, Williamstown, Topsham and Brookfield.

"Vermont Electric Cooperative crews are assisting with restoration today. We are estimating that power will be restored to most members by early afternoon, with the rest of the system up by mid to late afternoon."

Indeed, the work was done by Sunday evening. Tired crew members went home to their families and WEC members readjusted to life as normal – a normal, however, with lots more damaged trees on the landscape. 

President's Report

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remain in our "Legacy" program. Legacy members can zero out their bill and completely bypass the member charge because they are permitted to apply the credits they earn for generating "excess" power and providing it to the grid; also, Legacy members are not subject to the grid service fee, which was part of the Co-op's 2014 program revisions.

We appreciate that, therefore, some members in the Legacy net metering program have asked how they can contribute to WEC's infrastructure costs, even though the program exempts them from doing so.


The PSB has been attempting to balance many divergent interests: the utilities' need to provide just and reasonable rates to everyone; sustainability of the renewable energy industry; net metering's impact on some 300,000 Vermont ratepayers; and Vermont's goal of receiving 90 percent of its energy from renewal sources by 2050.

In a recent discussion with a solar developer working in WEC's territory, I was told that a net metering installation, in WEC's service area and subject to the fees of our current program, still provides a 5-percent to 6-percent rate of return on the investment, after taxes, and takes between 12 and 14 years to pay off. That doesn't seem too bad to me. How about you?

WEC also finds the PSB to be reasonable in its plan to set annual limits in the net metering program. Such limits will provide breathing room so the PSB can respond to rapid deployment and rate impacts that could have disruptive effects.

We all support the state's renewable

energy goal (90 percent by 2050). We seek to work with the PSB to implement net metering plans that are rationale and reflective as we move forward. The new draft is a right step in that direction.

Fellow Co-op members: Enjoy a safe and happy summer! 

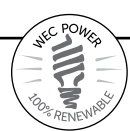
ASK THE ENERGY COACH

Q. Are there energy efficiency programs geared specifically to agriculture that you could recommend?

A. Efficiency Vermont (EVT) has partnered with the VSECU credit union to provide loans to Vermont farmers for qualifying energy efficiency improvements. You can finance 100-percent of your project – up to \$35,000 – at low interest rates: 3.25 percent for loans up to three years, and 4.25 percent for loans up to five years. From July through December, EVT is also providing rebate forms for agricultural lighting, including grow lights, outdoor lighting, and indoor lighting (dairy barns, sugar houses, and other agricultural buildings); for agricultural equipment such as plate coolers (for herds of at least 75 cows), variable speed milk transfer systems, heat recovery units, and variable frequency drives for milk vacuum pumps and maple sap vacuum pumps; for energy efficient ventilation fans (dairy); and for the purchase of select reverse osmosis systems for maple sugaring operations.

Information is available from Efficiency Vermont through its web site (www.encyvermont.com), by phone at 888-921-6990, ext. 7803, or by email from the program manager at twalker@efficiencyvermont.com.

Got a question about energy conservation? "Ask the Energy Coach" (email energycoach@wec.coop, or call 224-2329) so we can use this space to share the information with your fellow WEC members.



Dozer Work Pays Off

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- and update regularly. The IRP is a document that, among other things, outlines the methods WEC will use to manage vegetation in its power line corridors in a safe, efficient, and environmentally sound manner.
- WEC does not disturb wetlands in this bulldozer and Bobcat work. Walking through a very isolated and newly graded section of ROW off North Street in East Montpelier, it can be seen that the lowest levels, where the ground is saturated, are untouched. The higher, unkempt vegetation provides evidence of this.
- Every section that Kyle and Hans groom is immediately re-seeded in grass. Within two weeks they show the faint, wispy green of new grass returning. "By the end of the summer the grass will be thick through here,

and the ground will be completely green and healthy," says Donnie Singleton.

- All work is delayed for 48 hours while the Co-op clears its plans with the Dig Safe program, which inventories the locations of underground equipment and infrastructure.

In a remote part of Washington, just off the road to Williamstown, Kyle was working under the July heat to improve a particularly difficult section of ROW. His dozer tracked and rocked up the steep, precipitous hills and navigated over ledge, smoothing the ground as it went and stopping to dislodge large boulders sticking out of the ground and push them safely to the side of the corridor.

This is an area that WEC has recognized as a priority, because local Co-op members and those "downstream" from them on the power

lines suffer more outages, on average, than their WEC counterparts.

"Three hundred and fifty-nine homes and farms are affected by that section," says Weston.

For that reason, substantially rebuilding the power line through here is a part of the Co-op's current Four-Year Construction Work Plan. Kyle's work with the dozer was preparing the way. Says Weston, "Our goal is to get poles set there this fall, and run new wire in

during the winter."

This time, the poles will be set with modern utility equipment. Horses and ropes and chains served to create WEC's electric-distribution territory in the old days, but these are the days of "smart meters" and loftier member expectations. So WEC spends part of every summer gaining ground on the rough-and-tumble ROW those pioneers bequeathed to the Cooperative some 77 years ago.



While most right-of-way maintenance consists of routine re-clearing and trimming of vegetation, WEC's history as a very rural co-op means there are areas requiring more extensive work to make them reachable for linemen. An example is this steep, wooded hillside in Chelsea (left). In all projects, WEC follows a vegetation-management plan approved, for any environmental impacts, by state regulators. The equipment works around important vegetation, such as the apple tree in an isolated part of East Montpelier (above), and never disturbs wetlands. All areas are re-seeded with grass immediately after the work, and WEC does not use herbicides in its rights-of-way. At right, Donnie Singleton is seen against the sky atop a steep hill in the almost hidden right-of-way in East Montpelier.

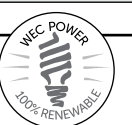


Coventry Open House

Washington Electric Cooperative will host its annual open house at the Coventry electric-generating station on Friday, August 26, 2016. Come see how power is produced by burning landfill methane, a powerful greenhouse gas, for fuel. The adjoining landfill, owned by Casella Waste Management, will hold its open house at the same time. Hours 10 a.m. to 2 p.m. Call the Co-op to inquire about ride sharing.



In 2015, Washington Electric Co-op won a \$500 grant through the Green Thumbs at Work program to create a vegetable garden behind the Co-op's administrative building in East Montpelier. Gardens provide employees a healthy outdoor activity known to be supportive of their physical and emotional well-being and their productivity. Earlier this summer, well-known horticulturalist Charlie Nardozi (above, right) came back to see how things are going. Greeting him were, from left, Operations & Engineering Director Dan Weston, General Manager Patty Richards, and the project's original booster at the Co-op, Administrative Assistant Dawn Johnson.



Tech Students Tour The Wrightsville Hydro Plant

CVCC Program is Branching into Sustainability

Each year in late summer or fall, Washington Electric Cooperative holds an open house at its generating station up north in Coventry, Vermont, which attracts Co-op members and others who want to learn how WEC generates electricity from the renewable resource of landfill methane. Most years the visitors also include students from middle school through college for whom the tour is part of a science and resources curriculum.

WEC's other generating unit, its hydroelectric station below the Wrightsville Dam on the North Branch of the Winooski River in Middlesex, doesn't attract as much attention. It is far smaller – a 1-megawatt (MW) generating system as opposed to Coventry's 8 MW – and provides around 3 percent of WEC's power while Coventry provides about 60 percent. Generating power by using landfill gas – gleaning something useful from Vermont's waste stream – is also perhaps more exotic than hydropower, which is one of the earliest ways humans found to produce electricity. (The first hydro station was built in Wisconsin in 1882.) Nevertheless, hydroelectric generation is an incredibly important technology, as it's used to produce a great portion of the world's energy.

Instructor Amanda Garland and the students in her Natural Resources and Sustainability class at the Central Vermont Career Center visited the Wrightsville hydro station on March 25, where they were hosted by WEC System Maintenance Technician Dan Couture. Dan's job includes monitoring the operation of the plant, checking on the condition and the production of the three turbines deep inside the small brick powerhouse on Mill Street, and ensuring that the system is functioning within the parameters set by the Vermont Department of Environmental Conservation (DEC).

The Wrightsville Dam was built for flood control by the U.S. Army Corps of Engineers in 1935, part of the state's response to deadly flooding that had occurred in the 1920s and '30s. Constructing a dam on the river created the Wrightsville Reservoir, which is now a popular boating, swimming, picnicking and recreational facility. The dam protects Montpelier and other down-river communities from flooding, but DEC rules ensure a level of flow in the river that sustains aquatic habitat.

Washington Electric Co-op secured permission to build its generating plant, about 200 feet south of the dam, in the early 1980s. The plant was brought on line in 1985. The building's entrance is at ground level; inside, a steep staircase leads down to a mezzanine with a small control room; another steep set of stairs descends to the concrete floor below, where the intake pipes enter the building and connect to the turbines.

WEC's operating license requires the Co-op not to draw the water level of the reservoir below 634 feet above sea level in the summer months (June



through August), and 633 feet the rest of the year. Water diverted to the hydro plant flows in through three large pipes, each about three feet in diameter, and then is passed through the long, cylindrical turbines. The turbines operate independently of each other.

The water intake can be terminated

by closing large valves inside each of the pipes – “like the cylinders in a gasoline engine,” as Dan described it, adding. “It's really loud.” He demonstrated this to the CVCC students by briefly shutting down the number three turbine.

“It sounded like a jet engine!” said Amanda Garland. “The students were excited about that.”

The students' questions, she said, went beyond technical issues.

“Some were about what kinds of jobs are available at WEC. And we talked about cooperatives and how they run. We think about co-ops (being) for food. They were interested that when people paid their energy bill the money isn't going to a CEO who's making millions of dollars; the money is going back into the physical infrastructure, which is



As winter was turning to spring, six high school students from the Central Vermont Career Center toured Washington Electric Co-op's 1-megawatt hydroelectric plant north of Montpelier. The students, enrolled in the Career Center's Natural Resources & Sustainability class, were hosted by System Maintenance Technician Dan Couture (above), who showed them the turbines and demonstrated how the equipment harvests electric energy from moving water.

really important.

“Dan was really great with the teenagers,” she said. “He's mellow, but he has a great kind of energy. He also joined us outside, above the dam, and pointed out the spillway. I was very grateful for his time; it was a good outing for the class.”

'Rebranding' technical studies

The Central Vermont Career Center was formerly known as the Barre Technical Center, and is based at Spaulding High School in Barre. The new name, Amanda said, is a sort of “rebranding” for the tech center, a “choice” school that draws students from Spaulding, U-32, Harwood Union, Montpelier, Twinfield, and Cabot high schools who prefer hands-on, technical education to traditional classrooms.

“They study in the fields you would expect, like automotive and electrical technology, plumbing and heating. But now for two years we've offered the Natural Resources and Sustainability program. Instead of tech ed, where students are entering a track toward a specific job skill, there's a broad interest in environmental issues and sustainability issues. There are getting to be great opportunities for jobs in those fields.”

Importantly, she said, the course

gives students a chance to get out and see what sorts of things are happening in the region in alternative energy and other fields related to sustainability – and not just to see such projects, but to participate. The students spend as much as half of their time outdoors.

“We might work with local organic farmers, which we've done, doing harvesting and pest control. We have raised beds here at the tech center; we planted an apple orchard at the elementary school.”

Other renewable energy-related experiences in the works for the Natural Resources and Sustainability program include visiting a biodigester at Vermont Technical College in Randolph, and going to Coventry to see WEC's generating plant that draws its fuel from the landfill operated by New England Waste Services.

“This program is student-driven,” said Amanda, its founder and instructor. “They are the drivers of this, and that's my favorite part. They're working to be the creators of the future.”

At CVCC, learning about ways to generate electric power while sparing the earth from harm and protecting resources from depletion, has become a field of technical training. Considering what's at stake, that's good news for all of us. 