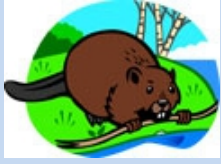


7/17/2015



Some Dam – Hydro News™ And Other Stuff



Quote of Note: *“He who has the fastest golf cart never has a bad lie.” --Mickey Mantle*

Some Dam - Hydro News → *Newsletter Archive for Back Issues and Search* <http://npdp.stanford.edu/>
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“Good wine is a necessity of life.” - -Thomas Jefferson
Ron’s wine pick of the week: 2012 Handley Cellars Pinot Noir “Helluva Vineyard”
“No nation was ever drunk when wine was cheap.” - - Thomas Jefferson



Dams:

(Might as well start off with the same old negative! No mention of the alternative costs!)

July 4, 2015 in Letters, Opinion

Can we afford Snake dams?

spokesman.com

Do you believe the four lower Snake River dams are critically important to the power supply of the Pacific Northwest? Here are facts derived from Bonneville Power Administration and Corps of Engineers data: The dams operate at just 31 percent of their nameplate capacity, providing less than 3 percent of Northwest energy resources. The Northwest now produces 4,616 annual megawatts of surplus power, about 16 percent of total power supply and nearly five times the power produced by the Snake dams. If these dams were decommissioned today, in 2025 the Northwest would still have surplus power. Expanding wind and solar will add to that surplus. Pacific Northwest wind energy produces twice the power generated by all four Snake dams. The Corps of Engineers considers 35-45 years a dam turbine’s lifespan. Within 15 years, all 24 turbines in the Snake dams will exceed their useful lives. Three turbines are now being rehabbed for \$97 million. Thus, the estimated cost for rehabbing all 24 turbines is \$776 million (today’s dollars). As more information about costs of the Snake dams accumulates, the issue becomes not whether we can afford to breach these dams, but whether we can afford to keep them.

Linwood Laughy, Kooskia, Idaho

(For only a few people. Give me terra firma!)

Penobscot dam removals enable national paddling event

By Nok-Noi Ricker, BDN Staff, July 04, 2015, bangordailynews.com

OLD TOWN, Maine — Removal of the Great Works Dam in Bradley and the Veazie Dam, part of the Penobscot River Restoration Project, had an added benefit for those who like whitewater, according to organizers of the upcoming Penobscot River Whitewater Nationals Regatta. “It’s got some challenging whitewater rapids,” Scott Phillips, a Penobscot Indian and race chair, said Friday of the stretch of river located below Indian Island, where the two dams have been removed in the last three



years. “Since we took the dams out, it’s a challenge [for paddlers].” “When the dams were removed, we looked at the river and said, ‘This would be a great course to host the national competition,’” he said later of the Whitewater Open Canoe Downriver Competition held every year by the American Canoe Association. “We sent out a bid, and we got it.”

The 9.4-mile section of river, where the various race events will be held from July 22 to 26, starts at the waterfront park in Old Town and ends at the Eddington Salmon Club. “We expect over a hundred boats for the downriver races, and there will be races for kayaks, decked canoes, standup-paddle boards and special events for kids,” Phillips said in an email. The race course includes three Class II-III rapids, numerous rips and quick water, according to the regatta’s website. The event will include four days of paddling events and will conclude with the American Canoe Association crowning the downriver racing national champions. “The stretch of river containing the race courses ... is the stretch most affected by the restoration project,” the regatta website states. “Two dams were removed in the last few years releasing impoundments of water and revealing the ancient rapids.”

In addition to the newly exposed whitewater, the region is “also easily accessible. It’s easy for people to get here, and there are places for people to stay,” said Phillips, who has worked on the river restoration project for 13 years and has worked at Old Town Canoe and Kayak for 20 years. “And it’s new,” he said of the whitewater race course. The Whitewater Open Canoe Downriver Competition has been held on the Nantahala River in North Carolina for the last three years. The event was held in Maine on the Kennebec and Dead rivers in 2009 and on the Lower Dead River in 2005. The Penobscot Indian Nation is hosting the event in partnership with the American Canoe Association. Organizers said the regatta will be an opportunity to expose participants to the local native culture. “As part of being a host to the Championships, we will provide educational and cultural activities during the event,” the regatta website states. “Community tours and historical and cultural presentations are just a few of the culturally relevant river-focused educational opportunities we will provide.” Penobscot Nation Cultural Director James Francis is working on programs. Penobscot Nation artists will be displaying and selling items during the daylong July 25 riverfront gathering at the waterfront park, and the Boomhouse Restaurant will be hosting a public dinner that evening, Phillips said. Those interested in participating in the regatta can register online until 4 p.m. the day before each scheduled event; those who register by July 10 will save \$25 per person. “You cannot register on the morning of any event, because each boat needs to be measured and inspected for each race,” Phillips said. Pre-race meetings are held 5:30 p.m. the day before each race and are mandatory, he said. People who want to watch the regatta should have a good view from Front Street in Bradley, the race director said. “There is going to be

a huge contingency of Maine paddlers,” Phillips said. “A lot of the national championship paddlers are from Indian Island. We know how to paddle whitewater.”

~~(Mining, oil wells, etc. should be a no no under any dam regardless of size.)~~

A dam will be rebuilt. When remains a question

July 5, 2015, observer-reporter.com

Later this month, Ryerson Station State Park, PA will mark the 10th anniversary of the demise of Duke Lake. On July 28, 2005, the state Department of Conservation and Natural Resources began to drain the water from the 62-acre lake, the centerpiece of the park, when cracks in the lake's concrete dam developed to a point at which the dam was deemed unsafe. About a week and a half later, DCNR removed a section of the dam after expressing concerns about the dam's ability to hold back water should the lake fill during heavy rains. Much has happened since then toward the lake's restoration: Studies have been completed and plans developed for replacement of the dam, and lengthy litigation over the apparent cause has been resolved. But unfortunately, we still don't know how long it might be before a new dam is built and the lake again brims with water.

Immediately after the lake was drained, DCNR hired an engineering firm to begin investigating the cause of the dam's deterioration. Several years later, in February 2008, the department filed a lawsuit in Allegheny County against Consol Energy, claiming underground mining near the park by the company's Bailey Mine was responsible for the damage. The court directed DCNR later that year to file its claim with the state Department of Environmental Protection (under the state's mine subsidence law, which then required DEP to make a determination on whether subsidence from the mining had caused the damage. DEP completed its investigation and announced in February 2010 that mine subsidence was responsible for damage to the dam. Consol disagreed with the determination and filed an appeal with the state's Environmental Hearing Board.

Faced with what could potentially have been years of litigation, the state and Consol settled the case in spring 2013. The settlement was announced at a press conference at the park on April 24, 2013, attended by then-DCNR Secretary Richard J. Allan. Under the agreement, Consol admitted no liability but agreed to pay \$36 million to replace the dam and give 506 acres of land it owned adjacent to the park to DCNR. In return, Consol would be permitted to drill for natural gas beneath the park, but only from wells outside park boundaries and mine coal it owned in the eastern section of the park, some distance from the lake and dam. In the last two years since the settlement, work toward restoring the lake has begun. However, many people are still waiting for news about when work will start to rebuild the dam. The last word on that came at the announcement of the Ryerson-Mather plan in August of last year when a DCNR official said the department was shooting for the summer of 2017. In response to further inquiries, DCNR has only said it is waiting to receive a dam safety permit from DEP before it can proceed with the project. More recently, in May, a DCNR spokesman indicated the department continues to take measurements to determine whether ground in the area of the dam is stable enough to begin construction. We agree the agency must do all it can to ensure the integrity of the site before it begins building a new dam. We also believe, however, DCNR could be more forthcoming in explaining to the public what the holdup is and why it is waiting so long to say when it might be in a position to move ahead with construction. DCNR has remained committed to restoring the lake from the beginning and we commend the department for that commitment and for working out a solution to the problems it has encountered. But we think it's time to let the public in on the factors that must be taken into account before a new dam can be built, at least so people know a new dam could be in place before another 10 years passes.

~~(Removing the dam is not enough – do more!)~~

Group files suit to halt removal of Ballville Dam

Sierra Club wants additional environmental reviews completed

BY VANESSA McCRAY, BLADE STAFF WRITER, 7/8/16, toledoblade.com

The Sierra Club on Tuesday sought an injunction in U.S. District Court for the Northern District of Ohio to stop the removal of the Ballville Dam near Fremont until more environmental reviews have been completed.

The complaint names as defendants Fremont Mayor Jim Ellis, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, and Army Corps district commander Lt. Col. Karl Jansen.

In its filing, the Sierra Club stated it supports taking down the dam, located in the Sandusky River and owned by the city of Fremont. But, the



environmental group said the plan to remove the dam has failed to “consider and mitigate the environmental harm that the release of the massive quantity of contaminated sediment that has grown behind the dam for over a century will cause downstream to the Sandusky River, Sandusky Bay, and Lake Erie following the dam’s removal.” The Fremont council in November authorized the dam’s demolition. The Sierra Club wants the court to halt acts that would allow the release of built-up sediment behind the dam until a new environmental impact statement is approved.

The dam, built between 1911 and 1913, is located about 1.5 miles upstream of Fremont. The club’s filing described the structure as “one of the largest dams impounding flow in the Lake Erie watershed.” The Ohio Department of Natural Resources has been among the groups to advocate for its removal, which the agency has said will improve the fishery and water quality. City officials have said removing the dam is far less expensive than making needed repairs, which were estimated to cost \$26.9 million. Mr. Ellis could not be immediately reached for comment.

The club contends that sediment behind the dam has absorbed pollutants discharged into the river and “now contains multiple toxic contaminants.” Excessive phosphorus causes algal blooms, and the club argues the environmental review to examine the dam removal does not address the phosphorus contamination or “its future relationship” to Lake Erie algal bloom formations.

(Wonder why they didn’t trap them? Dam safety comes first!)

Dam work bad news for prairie dogs at Willow Creek site in Centennial Urban Drainage officials say the maintenance work was necessary for flood control at "high hazard" site

By Joe Rubino, 07/07/2015, denverpost.com

CENTENNIAL, CO — Flood-control officials say Centennial and other downstream communities are safer now that a prairie dog colony located near the Englewood Dam has been exterminated. The dam, located on the northern end of the Willow Spring Open Space, is a grassy berm first constructed as a flood-control device in the mid-1930s. It is owned and maintained by the Urban Drainage and Flood Control District. The dam helps protect a 9.5-square-mile section of Willow Creek and Little Dry Creek watershed, explained Urban Drainage project manager Rich Borchardt. The dam underwent a state inspection on May 29. Officials identified issues that could compromise its effectiveness during high-flow events, Borchardt said, including numerous prairie dog burrows on the north side. There were also ant hills; woody



vegetation with old, decaying roots; and informal trails that have worn away grasses and formed potential channels for water. Englewood Dam is designated a "high hazard" structure because it protects downstream areas including Centennial, Cherry Hills Village, Englewood and unincorporated Arapahoe County, Borchardt said. Its importance necessitated eliminating the prairie dogs as well as removal of some plants, like yucca, and — in the near future — revegetation work that will sow native grasses on some unapproved paths.

"This is an important facility, and if there is any failure of it, there is a risk of a loss of life downstream," Borchardt said. "We've recognized since the September 2013 floods the importance of good infrastructure and that it be maintained well and functions when you need it." John Williams, who lives about a mile from the site, said he saw water on the south side of the dam rise high enough to cover all of the plants there following heavy rains last month, and he understands the efforts to maintain the dam. "I had seen the prairie dogs over there, and I didn't realize the danger," Williams said. Borchardt said water levels rose 14 feet at the dam between June 12 and 15, further demonstrating the need for this "tune up" maintenance. He said Urban Drainage annually removes debris and sediment from the south side of the dam, a marshy area designed to collect and safely release nearly 652 million gallons of water. He said the district tried to poison the local prairie dog population last year, but after the state engineer's visit, the decision was made to fully eliminate the rodents. He said that if the issues were ignored the state could order that the dam be redesigned to hold less water or be completely replaced, work that would cost vastly more money than the \$75,000 the taxpayer-funded district is investing there this year. "It's something that we don't like to do, but we realize the risk of not doing it is a whole lot worse," Borchardt said, adding the district was unable to find a place to relocate the colony last summer. Ronnie Purcella, owner of An Animal and Pest Control Specialist, said his crews dropped pellets for an Environmental Protection Agency-approved fumigant into 250 prairie dog holes and covered them over on June 29. A sign alerting visitors about the work was posted along the Willow Creek Trail, which runs along the north side of the dam. Still, the extermination shocked some neighbors. "With all the development in Colorado, this is really upsetting. This was their home first," said Marlie Nelson, whose parents have lived in the neighborhood for more than 25 years. "They hadn't even built into the side of the dam. How do they just do this?" The open space area is maintained by the South Suburban Parks and Recreation District. While South Suburban hosted a community outreach meeting about the work, it plays no role in the maintenance at the dam, said David Brueggeman, the district's acting director of parks and open space. Borchardt said Urban Drainage will work to get rid of a few of the unofficial "habit trails" that run vertically and diagonally across the dam on both sides throughout 2015 and into 2016. The goal is to have less grass-free spaces for water to run down. He said Urban Drainage will invest another \$75,000 in preventive maintenance in 2016.

(Mmmm, trying to figure out what's so unusual about this?)

Large Cranes Are Protecting Workers At Nolichucky Dam

greenevillesun.com, July 9, 2015

The large crane currently towering over the Nolichucky Dam, NC near the Asheville Highway will be there for at least a couple more months. The equipment is there as part of the Tennessee Valley Authority's safety and maintenance program to "ensure TVA's dams meet today's stringent industry safety standards," spokesman Travis Brickey said Wednesday. Over the next eight weeks, crews will be drilling at the dam. Core samples are being collected for a structural evaluation of the dam, Brickey said. Drilling won't harm the structure, he added.



Crews are using a crane to install a safety netting system "to protect workers performing the drilling from debris that might fall from the old powerhouse," he said. The crane will also be used to lift workers in and out of the area. The Nolichucky Dam, constructed in 1913, contained no safety deficiencies as of June 2014, Brickey told The Greeneville Sun. "TVA operates a vigilant comprehensive dam safety program which monitors any changes in the dam including monthly, 15-month and five-year inspections," Brickey said then. "TVA has not noted any dam safety deficiencies." At 94 feet high and 482 feet long, the dam is a well-recognized landmark for anyone familiar with southern Greene County. It was built originally as a hydropower project, but officials put the 102-year-old structure out of service in 1972 after silt built up near where water crashes over the man-made waterfall. Nearby hiking trails were closed in 2002. The reservoir is now used only as a wildlife management area. While several officials, including former County Mayor Alan Broyles, have pushed for projects at the site, TVA has refused any new developments.



Hydro:

(Now, all we need is rain!)

Renewable energy: Ukiah '70 percent carbon free'

By Sarah Reith, for Ukiah Daily Journal, 07/04/15, ukiahdailyjournal.com

In a typical year, the hydroelectric plant located at the outlet conduit for Coyote Dam, provides 8- to 10 percent of Ukiah's energy needs. Nathan DeHart—Ukiah Daily Journal Mel Grandi is excited about Ukiah's power. He is the city's electrical utility director, and is happy to talk about the carbon-free sources of 65- to 70 percent of that power. In 2008, Gov. Arnold Schwarzenegger signed an executive order that "...all retail sellers of electricity shall serve 33% of their load with renewable energy by 2020." There are different kinds of carbon-free energy, not all of which qualify for California's



Renewable Portfolio Standard. For example, a hydropower facility with a capacity of over 30 megawatts of power is not California Energy Commission certified renewable. Therefore, most of the 250 megawatt hydroelectric project on the north fork of the Stanislaus River cannot be included in the RPS. What does Ukiah have to do with a water project in Calaveras County? The network of dams, reservoirs, tunnel, and powerhouse is owned by the Calaveras County Water District, but managed by the Northern California Power Agency, of which Ukiah is a member.

The NCPA is responsible for selling project-generated power back to the grid, which benefits its members. NCPA is a non-profit Joint Action Agency founded in 1968 so small municipal utilities and public entities in the region could purchase power wholesale or even buy or build plants. Joint action does not preclude members entering into contracts with other power suppliers, or generating their own power, as Ukiah does with its small hydropower plant at Lake Mendocino. According to Grandi and Jim O'Brian, senior electrical technician at the Mendocino Hydroelectric Plant, the full capacity of the facility, with 400 cubic feet of water per second pouring through both generators at 60 pounds per square inch, is 3.5 megawatts. However, the powerhouse, built in 1985, was constructed to accommodate a 36-foot increase in the height of Coyote Valley Dam, and only runs at full capacity a few weeks out of the year, when flows are high.

Because Sonoma County Water Agency has a controlling interest in the dam and the reservoir, water outflow depends on downstream requirements. This varies weekly, but early in June, about 96 cubic feet of water per second was coming through unit 2, generating .5 megawatt of power. Unit 2 is the larger generator, with a capacity of 2.5 megawatts. Maintenance scheduled for this year includes painting and resealing the tainter valves and normal control system testing. "The repairs and maintenance will be in the neighborhood of \$265,000," says Grandi. In a normal year, the plant provides 8- to 10 percent of Ukiah's energy needs, at a savings of \$400,000 to \$500,000. According to Grandi, "That's dependent on the price of energy, but it has gone as high as \$700,000." Another 40 percent of Ukiah's electricity comes down out of the hills—or, more specifically, geothermal plants at The Geysers, the largest geothermal complex in the world. NCPA runs two plants off of Ridge Road, which meanders between Lake and Sonoma counties, closer to Middletown than Healdsburg but still tucked away in the Mayacamas Mountains. Geothermal energy is obtained by drilling into porous magma that is saturated with water, and extracting the steam. This can lead to subsidence as the reservoir is depleted, so in 1997, NCPA partnered with the Lake County Sanitation District to renew the geothermal reservoir with treated effluent. Approximately 8 million gallons of water per day is pumped through 26 miles of pipeline, using solar-powered pumps.

Enhanced geothermal systems involve pumping water into less permeable rock to cause rock layers to slip, cool rapidly, and contract, creating fractures that allow steam to escape. The Union of Concerned Scientists estimates that these systems "have life-cycle global warming emissions of approximately 0.2 pounds of carbon dioxide equivalent per kilowatt-hour." This can be compared to 0.6-2 pounds of carbon dioxide per kilowatt-hour for natural gas-generated electricity, and 1.4-3.6 pounds of carbon dioxide per kilowatt-hour for coal-generated power. According to the Geothermal Technologies Office of the U.S. Department of Energy, "The first successful demonstration of EGS Technology" was made at The Geysers, from October 2011 to March 2012. EGS may lead to an increase in microseismic events, or those smaller than magnitude 3.0. According to data provided by Calpine, another company operating geothermal power plants at The Geysers site, there were 1,535 of these events during the demonstration period, the largest of which was magnitude 2.69. Ukiah also derives up to 5 megawatts of power from the Lodi Energy Center, a 44-acre hybrid facility that came online in late 2012. At the LEC, a 300 megawatt combined-cycle system generates electricity with two turbines, one gas and one steam. As the gas-fired turbine is generating electricity, it puts off heat, which creates steam. This steam is used by the second turbine to generate more electricity. The process can get started in about 22 minutes, which reduces greenhouse emissions. Another reason speed is essential is that many renewable energy sources, especially wind and solar, start and stop suddenly. The purpose of the LEC is to maintain grid reliability, when other abundant but not always steady sources are not generating power. Treated wastewater from the next-door White Slough Pollution Control Facility is used to cool the plant. It is not entirely carbon-free. According to NCPA literature, "The LEC will emit about 800 pounds of carbon dioxide per megawatt-hour, versus more than 1,000 pounds per megawatt-hour of carbon dioxide from a traditional gas-fired system, and more than 2,200 pounds per megawatt-hour from an efficient coal-fired plant." According to Grandi, "Ukiah is very fortunate...we have a good diversity of renewables, both locally and throughout California, and because of that we're 70 percent carbon free and about 50 percent CEC (California Energy Commission) qualified renewables." In January, Gov. Brown declared a goal of raising California's use of renewable energy to 50 percent by 2030. "We're meeting those requirements today," Grandi said.

(Hydro has a tough regulatory path!)

Hydropower in Alaska and Fish and Game

By Monte Miller, adfg.alaska.gov, 7/4/15

It was a typical type of spring day in Southeast Alaska, overcast with a hint of rain, but with the promise of a busy summer ahead. It was early May and I was in Elfin Cove to tour a potential hydroelectric development near town. This small project is being investigated under a Federal

Energy Regulatory Commission (FERC) Preliminary Permit as a possible alternative power source. Like many Alaskan communities, Elfin Cove currently depends on a diesel electric generation plant for electricity production.

Why are communities like Elfin Cove investigating alternative energy sources? Usually it is based on energy cost, energy dependability and diversity, the potential for community diversity through new and developing business ventures, and in some cases community safety. Costs to produce electricity are high due to the remoteness of this community, the seasonal load fluctuations from summer increases in population due to several fishing lodges, and the cost of diesel fuel. And not just the price per gallon - in many Alaska towns and villages, the purchase, shipping, and storage of diesel fuel is problematic. Many communities depend on seasonal barge or tanker schedules to get diesel shipped to their destination. There is no ability to “shop” for the best price to reduce costs to the consumers. The potential environmental dangers of shipment and storage of large quantities of fuels must also be recognized.



Salmon Creek Dam, near Juneau. Built in 1915-1917. In many parts of Alaska that there are opportunities for hydroelectric development that have a minimal effect on salmon. Many developments use watersheds above a salmon passage barrier to produce electricity. Those projects take water from a lake or stream above the barrier and return it to the stream at a point where there will be little or no effect on salmon. Photo: M.D. Miller 6-5-2012

At the time of my visit, electrical customers of Elfin Cove were paying 78 cents per kilowatt hour (kWh) for electricity. For comparison, Alaska Electric Light and Power (AEL&P) customers in Juneau pay 9.82 cents per kWh from June through October, and 11.94 cents per kWh during the peak winter months. AEL&P has commercial rates as low as 5.73 cents per kWh for large commercial ratepayers during the non-peak season.

The Elfin Cove proposed project is one of many hydropower and hydrokinetic projects being investigated in Alaska. We are lucky in many parts of Alaska that there are opportunities for hydroelectric development that have a minimal effect on anadromous resources (salmon). Many developments utilize watersheds above a salmon passage barrier to produce electricity. Those projects take water from a lake or stream above the barrier and return it to the stream at a point where there will be little or no effect on salmon. Projects licensed by FERC and currently under construction include Allison Creek near Valdez, Gartina Creek near Hoonah, and Upper Reynolds Creek on Prince of Wales Island. An increase of project capacity was recently completed at the Blue Lake Dam near Sitka. This project included a rebuilt powerhouse with increased capacity made possible by increasing the height of the existing dam.

Hydrokinetic power is derived from moving water sources. This can be in an open river which is called riverine hydrokinetic, ocean wave hydrokinetic, or tidal action hydrokinetic. Current investigations into hydrokinetic power in Alaska include:

Riverine: Igiugig Village Council, Kvichak River, under investigation for potential, and Whitestone (FERC licensed) near Delta; Wave: Yakutat Wave Energy Project at Yakutat; Tidal: Turnagain Arm Tidal Electric, proposed for Turnagain Arm between the Kenai Peninsula and Fire Island. Currently there are thirty FERC licensed Hydropower Projects and one FERC Licensed Hydrokinetic Project in Alaska. Three existing FERC projects are seeking license amendments to increase water storage capacity to help with energy load distribution in times of high energy demand. Another four proposed projects have filed for FERC licenses, and sixteen other proposed FERC regulated projects are being investigated. There are also several existing and proposed hydropower development projects which do not require FERC licensing.

Within our department, investigation and monitoring of FERC Hydropower Projects is assigned to the Statewide Aquatic Resources Unit (SARCU) within the Division of Sport Fish, Research and Technical Services Section. Non-FERC projects are investigated and monitored by the Division of Habitat. Part of what we do on FERC projects is to seek and coordinate ADF&G input from all divisions on potential project effects, resource identification and periodicity (when a fish is likely to be found in the area), potential studies necessary for ADF&G to determine streamflow needs for the fish, and various filings with FERC designed to adequately protect resources. Sometimes we must seek to balance resource needs and community needs. The Fish and Game Act requires Alaska Department of Fish and Game to "...manage, protect, maintain, improve, and extend the fish, game, and aquatic plant resources of the state in the interest of the economy, and general well-being of the state" (AS16.05.020). We assist developers and their consultants to coordinate activities, provide resource information and contacts with divisional area management biologists, review proposals, develop studies, review results, and then make recommendations to FERC on conditions designed to be included in the license. Conditions may include required instream flow releases, streamgauge requirements, a bear safety plan to protect humans and bears, plans for hazardous substance uses (fuels), and post construction biotic monitoring to evaluate potential effects of a project.



Allison Creek. View is looking downstream below the canyon area. Lots of alder and devils club! Valdez is seen in the background. Photo: M.D. Miller 9-24, 2010



Allison Creek Hydropower Project near Valdez. Construction of Powerhouse and Penstock. Photo: M.D. Miller Taken Sept. 15, 2014.

For communities like Elfin Cove, energy costs rise with each fuel delivery. Once a project is evaluated for energy potential, and to determine if costs will pencil out to benefit the ratepayers, the question of how and where to fund a project must be answered. In Elfin Cove, the community electric utility is developing plans and evaluating the projects potential. They are working with agencies to determine the viability of pursuing the project further. This community may be unique in that there is also an identified high energy tidal hydrokinetic site identified near the community. This site has the interest of consultants representing equipment developers desiring to test their inventions in real environments. The utility must determine what is best to

pursue, both financially and in dependability. *Monte D. Miller is the ADF&G FERC Hydropower Coordinator, based in Anchorage. Born and raised in the territory of Alaska, Mr. Miller started with ADF&G in 1971 as a Fish and Game Technician working for what was then Game Division. He was an original employee with FRED, building and working at the Starrigavan Saltwater Rearing Facility at Sitka in 1972. Work for the department included Fish Culturist at the Fire Lake and Fort*

Richardson Hatcheries, then assigned to a new large production hatchery in Cold Bay where he was a Fish Culturist, Assistant Manager, and Manager. Work then took him to the Columbia River where he worked in tribal government for 13 years studying hydropower effects and developing fisheries enhancement projects. He has occupied his current position since September 2010.

(Every little bit counts.)

PUD approved to proceed with two small hydroelectricity projects

By Dan Catchpole, Herald Writer, July 6, 2015, heraldnet.com

EVERETT, WA — Federal energy regulators have given a green light to Snohomish County Public Utility District to build two small hydroelectric projects in the Snoqualmie Valley. Work on the sites could start later this summer, followed by major construction next year, said Scott Spahr, a PUD manager who oversees all engineering work on the district's energy generating facilities. "In essence, we have all the permits to begin work," he said. The projects are estimated to cost a combined \$52 million, and should be finished and generating electricity by 2017, he said. During winter storms and spring months, the Calligan Creek and Hancock Creek projects will each create about 6 megawatts — enough energy for about 10,000 homes. They won't produce energy during much of the summer, when the streams will be too low, according to the PUD's license applications filed in 2013 with the Federal Energy Regulatory Commission. The Hancock project is estimated to cost \$28 million, while Calligan is expected to run \$24 million. Both creeks flow into the North Fork of the Snoqualmie River near the I-90 corridor in east King County. The projects are run-of-the-river hydroelectric facilities, meaning the river isn't dammed. Instead, water is diverted through a pipe to generating turbines and back to the stream. The peak amount of energy will be less than 1 percent of the PUD's overall power load, Spahr said. The amount of energy generation is not worth the environmental effects, critics say.

Several conservation groups commented on the projects during the FERC review process. The PUD has not proven that these projects are necessary, said Rick McGuire, vice president of the Alpine Lakes Protection Society. The group advocates for conservation programs in the Cascades in Washington. "All the good hydro sites have already been taken," he said. These PUD hydro projects "are really scraping the bottom of the barrel." McGuire and other critics say the PUD's generation estimates are best-case scenarios. The actual contribution will be smaller, and will come at the same time dams across the Pacific Northwest are churning out electricity. "The PUD has not proven its case that these projects are needed," he said. "There's no electricity shortage." The district looked at sites from four counties — King, Snohomish, Skagit and Whatcom counties — before settling on Calligan and Hancock. They were chosen, in part, because there would be low environmental effect, Spahr said. The projects are among several small-scale hydroelectric facilities that the PUD has built or is developing. The district buys about 80 percent of its energy from the Bonneville Power Administration, which runs several dams on the Columbia River.

PUD-owned hydro facilities produce about 5 percent of the utility's energy needs. The district is developing small-scale hydro as part of its climate-change policy, which emphasizes using renewable resources. However, the projects will not be displacing any carbon-producing energy production. Hydroelectric is not considered renewable under Washington's renewable energy mandate, which voters passed in 2006. Initiative 937 requires utilities get at least 15 percent of their energy from wind, solar and other renewable sources. The PUD is already meeting that benchmark, said Neil Neroutsos, a district spokesman.

(If hydro caused the problem, hydro to fix the problem)

Ada County And Hydropower Company Promise Boise River Restoration Project

By FRANKIE BARNHILL • 7/6/15, boisestatepublicradio.org

The Boise River is going to be the first focus of a new environmental oversight group in Ada County. Frankie Barnhill. After it became clear that a power outage and failed alarm system at the Barber Dam caused the Boise River to flow nearly dry for eight hours on February 4, Marie Callaway Kellner of the Idaho Conservation League began asking for action. Ada County owns the dam and leases it to Enel Green Power, an international hydropower company. Along with members of other environmental groups, Callaway Kellner wants to see the county and Enel take responsibility for the accident by paying for a project to help the river's ecology. Now, Callaway Kellner is one step closer to seeing that happen.

"To me it feels like a very big shift in only just a couple of weeks," says Callaway Kellner. "We now have Enel and the county jointly saying 'yes, we want to fund a project that is the benefit of the river and the fishery.'" Ada County has put together an oversight group made up of environmental advocates like Callaway Kellner, as well as biologists from Idaho Fish and Game. Ada County and Enel have agreed to split the cost of a river restoration project the oversight group will choose this summer. Callaway Kellner says she's happy to see action on the issue, and hopes to see a project get underway this winter.

(Doesn't look like a hydro site – does it?)

JOSHUA TREE: Plan aims to turn desert water to electricity

Developer wants to use old Kaiser Steel mine pits to generate electricity; opponents say it threatens groundwater supply.

BY JANET ZIMMERMAN / STAFF WRITER, July 7, 2015, pe.com

The former iron ore mine that once was going to be converted into a huge landfill is now proposed as the site of a desert hydroelectric plant. A defunct iron ore mine near Joshua Tree National Park, a site once considered for the world's largest landfill, has sold for \$25 million to a company that wants to develop a hydroelectric project there. The \$1.4 billion Eagle Mountain Pumped Storage Project near Desert Center, north of Interstate 10, would draw water from three wells on surrounding property and pump it 15 miles to lined reservoirs in two vacant pits at the old Kaiser Steel mine. At night, when electricity is cheaper and readily available, water would be pumped to an upper reservoir, the developer said. When demand for power peaks during the day, the water would be sent to the downhill reservoir, passing through turbines to create power and supply it to the state's electrical grid.



Plans for Eagle Mountain have been propelled by a national push for renewable energy. Another proposed pumped storage project, at Lake Elsinore, has faltered in recent years. The Eagle Mountain proposal has rankled some residents around Desert Center, a 200-person town made up of the Desert Sunlight solar project, farms, mobile home parks and a mini-mart. The outpost once thrived because of the mine, about 12 miles away, but has been on a downhill slide since operations ceased in 1982. Desert Center neighbors and environmentalists who oppose the project are considering legal action, said Seth Shteir, California desert field representative for the National Parks Conservation Association in Joshua Tree. They say such an operation would deplete the aquifer in the surrounding Chuckwalla Valley, leak toxic substances from old mining operations into the groundwater and draw predatory animals that would feed on the desert tortoise, a threatened species. Some have campaigned to have 30,000 acres of the mine site designated as part of the national park. "The idea of this type of project in the California desert with huge evaporative water losses during a time when we're experiencing one of the worst

droughts in California history doesn't make sense," Shteir said. The state Department of Water Resources estimates that 15 million acre-feet of water are stored in the aquifer. One acre-foot of water is enough to serve two families for a year. Filling the plant would require about 24,000 acre-feet of water – nearly 8 billion gallons – over three to four years, said Steve Lowe, president of Santa Monica-based Eagle Crest Energy Co., the developer. The withdrawals would cause the water table to drop 6 feet within a mile of the wells, and it would take about three years to replenish, he said.

Desert Center jojoba farmer Donna Charpied said the drop will be much more significant, based on her experience with her neighbor, the Desert Sunlight solar project. During the 31/2-year construction of the solar plant, which used about 1,500 acre-feet of water per year, Charpied said quarterly well tests showed a 1-foot drop in her wells. After it is filled, Eagle Mountain would require about 1,800 acre-feet of water per year to make up for losses to evaporation and seepage, Lowe said. The company plans to install recovery wells that would capture lost water and pump it back to the reservoirs. Company officials said the project would help meet renewable energy goals by generating 1,300 megawatts of electricity during peak hours, enough to power nearly 1 million homes at any given time.

"This project would save ratepayers money and help California meet its renewable energy goals in an environmentally friendly manner that protects water resources and wildlife, creates hundreds of jobs and infuses the local economy with millions of dollars," Eagle Crest CEO Doug Devine said. Eagle Mountain was licensed by the Federal Energy Regulatory Commission last year and has been approved by state water quality officials. A right-of-way application is pending with the Bureau of Land management for a transmission line and water pipeline, Lowe said.

The company also has an application filed with the California Independent System Operator to connect to the state's electrical grid. There are no purchase agreements for the power, he said. The progress on Eagle Mountain could help advance another pumped storage project at Lake Elsinore, said Megan Matson, a partner with Table Rock Capital, the San Francisco company that has taken over the Lake Elsinore Advanced Pump Storage project from Nevada Hydro. That project was coupled with a 500-kilovolt transmission line through the Cleveland National Forest when it was rejected by the California Public Utilities Commission in 2012. Table Rock has renamed it SoCal Integrated Pumped Storage, SCIPS, and abandoned the transmission line for a generation tie line, which has less of a regulatory burden, to connect to the grid. The \$1 billion development is expected to be up and running in 2019, Matson said. Eagle Mountain's sale to Eagle Crest by CIL&D, formerly Kaiser Ventures, was announced last week and includes 9,500 acres and mining claims. CIL&D retains the railroad and the right to sell iron ore tailings and rock from the property. CIL&D officials did not return phone calls seeking comment. Kaiser Ventures declared bankruptcy in 2011, ending a 25-year effort to convert the former mine into a landfill that would have received rail deliveries of up to 20,000 tons of trash per day from communities in Los Angeles County. Kaiser Ventures' subsidiary, Mine Reclamation, had spent almost \$85 million to permit and defend the landfill project against challenges by critics, who said the dump would create odors and noise and light pollution, harm threatened species and damage national park tourism.

(Upgrading the generating units.)

Feds close to wrapping up \$40M replacement of dam turbines

By Felicia Fonseca, Associated Press, July 8, 2015, m.deseretnews.com

PAGE, Ariz. — The U.S. Bureau of Reclamation is wrapping up a project to replace the giant turbines that produce electricity at Glen Canyon Dam.

When the eighth one goes online later this year, energy production from the dam near the Arizona-Utah border is expected to increase by 3 percent, said Rick Clayton, of the bureau's Upper Colorado Region power office. The dam produces an average 4.3 million megawatt hours of energy per year, enough to power about 600,000 average households. "It's a fairly small increase, but it's a benefit for the next 40 years," Clayton said. The turbines were replaced one at a time after a contract was awarded in 2004, at a cost of \$40 million, Clayton said.



Getting the turbines to the dam is no small feat.

The 63-ton stainless steel turbines outweigh the old ones by nearly 20 tons and measure 16 feet in diameter. They were fabricated in Brazil and then shipped to the United States before arriving at the dam via train and semi-trailer. Each turbine was taken through a fairly tight 2-mile access tunnel at the dam that was blasted from the canyon wall when the dam was built so that excavated rocks could be dumped at the Colorado River. A crane lifted the turbines into place. Energy is produced when water flows into eight penstocks that deliver it to the turbines that spin inside a pressurized case. When the water is released from the dam, the energy is captured and sent to an electrical switchyard on the rim of Glen Canyon. It gets sent to Colorado, Nebraska, Arizona, New Mexico, Utah and Wyoming. Visitors don't see the new turbines during tours of Glen Canyon Dam but they can view the generators they sit in through a window at the end of the tour. An old rusted turbine that was first to be replaced greets visitors as they step onto the quarter-mile concrete dam. Tour guide Duane Berrier, a retired electrical engineer at the dam, said most visitors have a special interest in water or electrical projects. They come to Page from all over the world, he said. "It's an impressive thing for anyone to see," he said.

The amount of energy generated from the dam can vary greatly based on level of water in Lake Powell, the country's second largest man-made reservoir following Lake Mead in Nevada. In 2014, the dam generated 3.1 million megawatt hours of energy. It saw its highest power generation ever in 1984 and 1985, with production around 8.8 million megawatt hours each of those years. Hydropower peaks in July, August, December and January, but the power plant rarely runs at full capacity. Clayton said the water scheduled to be released from the dam, an average 8.2 million acre feet per year, has been manageable with less than eight units operating. At least one unit has been down during most of the high-flow experiments that the Bureau of Reclamation conducts to build up sandbars along the Colorado River through the Grand Canyon. "We would like to have them all available," Clayton said. "It will be good once we finish this milestone."

(Never too old for a face lift.)

Renovated Proctor dam doubles up the power

By Dan Colton | July 10, 2015, rutlandherald.com

PROCTOR, VT — Green Mountain Power has completed \$15 million in renovations at its hydroelectric plant in Proctor, enabling it to double power production there. The 112-year-old facility on Otter Creek was taken over from Vermont Marble Co. in 2011. The increased power generation makes it the largest of GMP's 32 hydro stations. Renovations began in 2012 with construction of an access bridge. Until then, personnel relied on ramps, stairs and a railcar lift system to bring in equipment. The \$15 million renovation project largely revamped the plant's interior machinery and layout, said Geno Balestra, production coordinator for GMP. When the utility company took control of the property, he said, only one of the five generators was on line. "So virtually what we did is, we replaced three of them with new units," Balestra said. "Then the end unit we call Number One, that was put in 1938, we actually removed it, rebuilt it, installed it — so now that's generating, too."



According to GMP, the plant can generate up to 10 megawatts of electricity. That is enough to power 5,300 homes. Dorothy Schnure, GMP spokeswoman, said in-state hydro power is the cheapest renewable electricity for ratepayers. "It is hugely beneficial, and really we're getting more electricity out of the same resource," she said. Inside the 1903 marble plant Thursday, modern computers blinked and machinery whizzed away. Machinery inside extended between the upper and lower levels, humming as water dropped about 100 feet in elevation, feeding into the turbines with 48 pounds per square inch, Balestra said. It was easy to spot the newer generators, smaller and sleeker than the older units. An automated computer system monitored the plant's workings, compiling a readout on a control screen. Balestra said the entire operation can be controlled by one worker at a remote location. "Our new operations center is on Post Road, so from there they can completely control the station," he said. Balestra said generators and turbines take turns operating to avoid unnecessary wear and tear. On Thursday, three of the five hydro generators were running, generating 3.7 megawatts of electricity. The other two units were on standby. Bill Champine, Proctor Select Board chairman, said the extra electrical power will support the town moving forward. "We're trying to bring our town back," he said of the Proctor Prosperity Plan. "We'll have upgraded power, so with upgraded development, we'll have plenty of power here." Champine said a recreation area will be installed at the bottom of the dam falls, with an eventual bike and pedestrian path to connect the area with the Proctor Marble Museum. It is all pending a scoping study and grant from the Vermont Agency of Transportation. "The finished completions (at the hydro dam) will help the town a lot," Champine said.



Water:

(Precious water releases.)

Why are they flooding the Grand Canyon?

Melissa Breyer. Science / Conservation, July 6, 2015, treehugger.com

The U.S. Department of the Interior has taken to releasing massive amounts of the Colorado River from dams, here's why.

The Colorado River should reach the sea, that's what it wants to do. It wants to start in the Rocky Mountains and wind its way 1,450 miles along the Arizona-California border into the Mexican delta, irrigating farmland and nourishing loads of wildlife and flora along the way before emptying itself into the Gulf of California. That's what it did up until 1998. But then, gradually, ouch.

The mighty Colorado continues to take top honors in American Rivers' annual ranking of America's most endangered rivers. The conservation groups notes, "A century of water management policies and practices that have promoted wasteful water use have put the river at a critical crossroads." Demand on the river's water simply exceeds its supply, to the point that it no longer reaches the sea. Instead, it dribbles into nothingness somewhere in the desert of the Southwest.

As Jonathan Waterman wrote in The New York Times:

Now dozens of animal species are endangered; the culture of the native Cocopah (the People of the River) has been devastated; the fishing industry, once sustained by shrimp and other creatures that depend on a mixture of seawater and freshwater, has withered.



The river's sad story began in 1922 with the Colorado River Compact, an agreement among seven western states to divvy up its bounty. Mexico was allotted 10 percent of the flow. Almost a century later and a study by the U.S. Department of Interior's Bureau of Reclamation finds that the entire river and its tributaries are siphoned off to meet the needs of 40 million Americans living in Arizona, California, Colorado, New Mexico, Nevada, Utah, and Wyoming. Along with hydrating 5.5 million acres of land, it also helps power much of the electricity that comes from hydro-power plants. **Did I say ouch? Ouch.** And while the main river's 15 dams (and hundreds more on tributaries) hydrate people and supply power for millions, they also stymie ecosystems. One feature which has been notably suffering is the river's sandbars and beaches which are disappearing due to a lack of sediment; sediment which is held in dams along with the river's water. These features used to provide habitat for fish and protect archeological sites.

But then came the "high-flow experiment," (HFE as the U.S. Department of the Interior calls it), a plan to release some of the sediment which the dams are retaining by means of controlled flooding. This met resistance from the power companies because it meant lost revenue; but the importance was deemed necessary and the first trial release occurred in 1996. And they have continued. In one flood in November of 2013 flood from the Glen Canyon Dam, 34,100 cubic feet per second was released for 96 hours. The rush of water took almost a week to course down the canyon. **Now, a team of researchers have detailed the success of HFE in a study, saying that indeed, the plan is working.** "The releases appear to be achieving the desired effect. Many sandbars have increased in size following each controlled flood," the study authors note, "and the cumulative results of the first three releases [from the Glen Canyon Dam] suggest that sandbar declines may be reversed if controlled floods can be implemented frequently enough."

However, now we have a drought and the idea of releasing that much water is difficult; the releases are decreasing as the dam engineers hold back water. Climate change has also been altering seasonal thunderstorm activity, notes Smithsonian. Still, the researchers are carefully optimistic, saying, "Although long-term success cannot be predicted, the early results of HFE attempts to maintain the Grand Canyon's sandbars show promise." Now if only they could manage to get the river back to the sea, where the delta and estuaries along the way could use some promise of their own.



Environment:

(Hydro and salmon.)

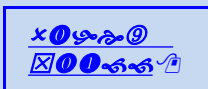
PG&E hydroelectric operations help threatened salmon survive

By Stephanie Barnes, Jul 07 2015, krcrtv.com

BUTTE COUNTY, Calif. - Soaring over Butte County, you can see PG&E's hydroelectric operations that run into and along Butte Creek. The operations provide energy to the electric company's grid plus an added bonus of bringing water to Butte Creek. "On top of Butte Creek flows, we're providing an additional 37 percent of flow into Butte Creek," Catalina Reyes, Senior Aquatic Biologist for PG&E explained. "So you could just imagine subtracting 37 percent from that flow and it'd be worse than it is." For years, PG&E has provided anywhere from 20 to 40 percent of the water to the creek. The water comes from the cooler west branch of the Feather River, meaning better conditions for species in the water, like threatened spring-run Chinook salmon, not to mention a significant aid in the state drought, Reyes said.



"The drought causes an issue because there's limited flows and so these pools that they're in naturally tend to heat up so with limited flow, they're going to be exposed to higher temperatures," Reyes explained. "We run these facilities and we try to do it in a way that minimizes impact while still being able to provide the customers the energy that they need." As far as the threatened salmon go, Fish and Wildlife said they are better than they would be without their PG&E partners. Fish and Wildlife Spokesman Andrew Hughan said the salmon die off naturally. At the end of May, nearly 300 spring-run Chinook salmon died in Butte Creek, following PG&E repair work. Hughan said with or without the repairs, the deaths were to be expected. "There's all of this cold water that comes out of the energy plant and comes out of the hydroelectric plant there that is going to good use," Hughan said. "It's got a direct relationship into saving an endangered species which we think is a great thing." Butte Creek is one of only three bodies of water to hold wild populations of the central valley spring-run Chinook salmon. This emphasizes the importance of maintaining the population. The other two are Deer and Mill Creeks.



Other Stuff:



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