



Dispatches From The Wild, Weird World Of Humanity And Its Biosphere

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Mexico: Monarchs' Firs and *Xochimilco* Wetlands



As previously mentioned in this newsletter, a Mexican research team is taking the initiative to equip monarch butterflies to survive climate change. In the key overwintering site of Mexico's [Monarch Butterfly Biosphere Reserve](#), Dr. Cuauhtémoc Sáenz-Romero and his team are conducting assisted migration of oyamel firs, the

butterflies' favored shelter tree. The trees are already under threat from drought and bark beetles at warming lower elevations, so the team is fostering their seeds and planting resulting seedlings ([pictured](#)) at higher elevations likely to be hospitable in the future, as well as simply restoring some degraded lands at lower altitudes. With practices like protective "nurse bushes," they've achieved enviable survival rates [as high as 92 percent!](#) This kind of proactive conservation is still somewhat controversial, but many (included this writer) believe it's sorely needed to help species survive the Anthropocene. "What are we going to do?" [said Dr. Sáenz-Romero](#). "Sit back and wait under the belief that nature is intelligent and will regenerate on its own? Or accept that we live in a changing world, [which is] pretty degraded, and that much of what is said in ecology books no longer applies?" Early signs are good that this fascinating work means that there will be safe-haven trees for monarchs in Mexico for decades to come!

And the incredible [Xochimilco wetlands](#) of

southern Mexico City, home to miles of Aztec-era canals and an ancient [chinampa](#) system of floating multi-species farms, is [also nurturing highly innovative ecological problem-solving](#). Fertilizer runoff and wastewater from treatment plants is causing nitrogen and phosphorus



overload in Xochimilco, and thence toxic algal blooms that deplete oxygen in the water, threatening local species like the incredible [axolotl salamander](#). Amazingly, local biotechnology professor Refugio Rodríguez Vázquez is developing a low-cost, small-panel solar-powered "[nanobubble](#)" creator, a simple machine that sucks up water from the wetlands, blows millions of microscopic air bubbles into it, and then returns the newly oxygenated water. Since [the prototypes have worked very well](#) and the theory is sound, she's hoping to install them on the fleet of over 1,000 *trajinera* boats ([pictured, an example](#)) that ferry tourists around Xochimilco, turning them into roving oxygenators. There's a long way to go, but this is an extraordinary example of "guerrilla eco-tech" with potential to help save an astonishing bio-cultural landscape!



United States: Infrastructure Bill Funding at Work

With funds from the already-passed bipartisan Infrastructure Investment and Jobs Act, the Department of Transportation under Secretary Buttigieg has announced plans to make available [\\$27 billion in funding to repair and modernize America's bridges](#), with special emphasis on making them resilient to future climate disasters. This is the largest federal investment in bridges such the construction of the Interstate Highway System in the 1950s, and should help keep infrastructure functioning in a climactically violent age.

And the U.S. Forest Service, housed within the Department of Agriculture, has put together a \$50 billion, 10-year plan (although it's not all funded yet!) to aggressively thin national forests in wildfire hotspots, in the hope of protecting communities on the wildland-urban



interface. The infrastructure bill has already allotted \$3 billion over the next five years to get this work started, and will begin this year on regions where wildfires have already grown to community-destroying levels, like California's Sierra Nevada and Colorado's Front Range. "You're going to have

forest fires. The question is how catastrophic do those fires have to be," said U.S. Secretary of Agriculture Tom Vilsack. "The time to act is now if we want to ultimately over time change the trajectory of these fires." This kind of proactive fuel-reduction forest management draws on [historically highly successful Native American land-use practices](#), and a test last year in Oregon found forest thinning to be highly effective at creating "firebreaks" to defend against the huge Bootleg Fire. ([Pictured, aerial photo from the Oregon trials: the thinned area is the brown stripe between the burned black forest and the protected green forest](#)). The federal government should continue to move forward expeditiously with this proactive wildfire management to protect the ecosystems and communities of the American West!

The Interior, Energy, and Agriculture Departments are also starting the [process of using \\$4.7 billion allotted by the infrastructure bill to clean up "orphan" oil and gas wells](#), abandoned by their previous users. This is a multifaced good thing, since orphan wells contribute to climate change by spewing methane, harm local public health by spewing other nasty pollutants (like [carcinogenic benzene](#)) into groundwater, and the cleanup process will provide jobs to well-savvy former fossil fuel workers in the rural communities that need them most. "Capping unplugged oil and gas wells is a win-win, helping to revitalize rural economies and providing opportunity to the fossil fuel workers who have powered our nation for over a century to land skills-matched jobs that will protect the health of their communities," [said](#) U.S. Energy Secretary Jennifer Granholm ([pictured](#)). (Interestingly, now that there's federal funding on the table to clean them up, states are starting to report [much higher numbers of abandoned oil and gas wells on their territory](#), having previously not had the funding, inclination, or incentive to conduct a proper count. Oklahoma officially reported that it had 2,799 abandoned wells in 2021, but 17,865 in 2021.).



In sum, even as the environmental community waits anxiously to see the result of ongoing Congressional negotiations over climate action investments, considerable progress is being made with already-passed-into-law funds! The

infrastructure bill is really an understated victory for America's environment and people, one that will be paying dividends for generations to come.



Mexico: Illuminated Gillnets



[Gillnets](#) are one of the most commonly used pieces of fishing equipment in the world, but they're also an ecological nightmare, known for trapping and entangling a wide array of "bycatch" ranging from sea turtles to marine mammals to seabirds to sharks, skates, and rays (i.e. [elasmobranchs](#)). Now, a Wildlife Conservation Society (WCS) and NOAA research

project, taking place in the waters off Baja California Sur, [might have found a fix](#)-and it benefits fishers into the bargain. The researchers simply attached cheap, green, waterproof LED lights to fishers' gillnets every ten feet (see image above). After testing over 10,000 meters' worth of control and illuminated gillnets, they found that this decreased total bycatch by 63%, including decreasing elasmobranch bycatch by 95% and Humboldt squid bycatch by 81%, without decreasing catch rates of the target fish. (Both elasmobranchs and Humboldt squid [have large and/or highly developed eyes](#), so the illuminated nets likely drive them off without disturbing other fish as much). Critically, the presence of the lights also helped the fishers retrieve and disentangle their gillnets, reducing the time needed to do so by 57%. This provides a clear economic incentive to use this technology, beyond simple concern for marine wildlife. In sum, the researchers have found an excellent way of helping humans and wildlife coexist better, with just a simple new application of existing technology. WCS is now investigating how best to roll out this "win-win" solution in high-bycatch key conservation areas around the world!



The Weekly Anthropocene

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