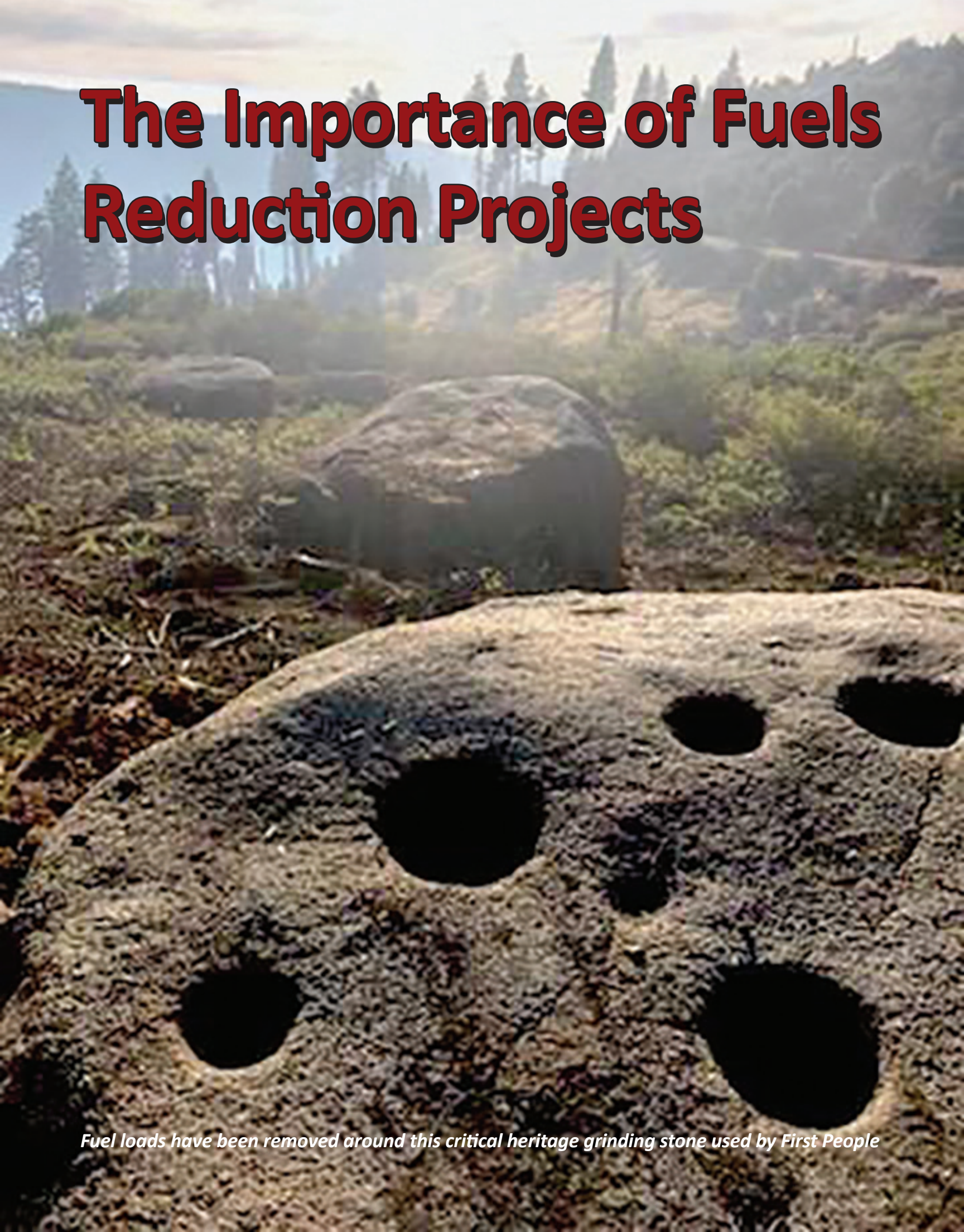


The Importance of Fuels Reduction Projects



Fuel loads have been removed around this critical heritage grinding stone used by First People



Project site before fuels hand treatment

If you live in California, you have most likely lived under the threat of a wildfire or know someone who has. For a variety of reasons, wildfire is now an ever-present concern.

How did we get here?

Historically, Californian Native American tribes were the First People who managed California’s land. They adapted to lightning strike fires and/or used tribal ecological knowledge (TEK) to apply prescribed fire onto the landscape on a rotational basis. However, land management and ideology changed hands, which led to nearly 100 years of fire suppression as the new forest management strategy.

Past management vs current impacts

Using fire suppression as a past forest management strategy has allowed our forests to become overstocked with trees and other vegetation. In particular, non-fire adapted vegetation has thrived due to the lack of fire and is consuming a lot of water.

In layman’s terms, there are too many straws drinking water from the proverbial cup.

On top of that, the thriving non-native vegetation does not filter water efficiently to allow water to percolate and restore the landscape’s underlying hydrology system. The forest also has lower resilience to climate change, drought, insect infestations such as bark beetle, and other threats.

Current management

The latest forest management strategy continues to evolve and includes TEK and tribal partners more holistically in the planning and decision making of these lands. In 2021, the White House

provided the first memorandum to have federal scientific and policy processes integrate TEK, which is defined as “a body of observations, oral and written knowledge, practices, and beliefs that promotes environmental sustainability and the responsible stewardship of natural resources through relationships between humans and environmental systems. It is applied to phenomena across biological, physical, cultural and spiritual systems.”

Forest management has also shifted to a landscape-scale and resilient ecosystem that focuses on native vegetation, returning water back to the system, reducing fuel loads and overstocked forests, and openness to working with a variety of partners. For these multitude of reasons, fuels reduction projects are a critical tool in the toolbox to help restore our forests to a more resilient and healthier forest and watershed ecosystem, which is also beneficial to habitat dependent wildlife.





Project site post-treatment

What is CDA doing?

CDA is working primarily in fire-dependent landscapes that used to have regular fire burn intervals of at least every eight years. We develop cutting-edge innovative forest management techniques, lead forest resilience projects using the latest science, and continue to push the boundaries of conventional forest management alongside our tribal, local, state, and federal partners.

Fuels treatment in Eldorado National Forest

CDA was awarded a fuels reduction grant in Eldorado National Forest. Working alongside our Eldorado National Forest partner, the Forest Service prioritized the sites of most importance to receive this fuels reduction treatment. Under the grant, we were only required to complete 31 acres of fuels treatment in critical California (CA) spotted owl, five sensitive plant populations, and heritage archaeology sites. Hand thinning fuels reduction treatment occurred due to the delicateness of all of the treatment sites.

If you know CDA, we of course went above and beyond this, and performed 39 acres or nearly eight acres of additional treatment. We performed an additional two acres of fuels treatment in critical California spotted owl habitat and overall, restored 12 acres of their habitat. The CA spotted owl is a federally Threatened species under the Endangered Species Act and the Northern spotted owl is a Threatened species under the California Fish and Game Commission. The CA spotted owl population has decreased due to habitat condition changes due to drought, wildfire, and habitat invasion of barred owl. Therefore, this fuels reduction project in the CA spotted owl habitat is crucial to improving their population and limited habitat.

CDA also treated an additional five acres for a total of 25 acres across 9 to 10 historic heritage archaeology sites. Reducing fuel loads around heritage sites also reduces the likelihood of catastrophic damage to heritage sites used by First People to grind acorns or other food. Ground acorn or acorn was then be stored and made into mush or soup. Grinding was an intensive process that allowed women to sing and tell stories that were then passed on and learned by the children playing nearby. These important sites are cultural milestones in California's history and for the First People.

What's next?

There will always be limited resources in forest and watershed restoration work. There are more acres and landscapes that need restoration treatment than available time, finances, restoration contractors, and staff can provide. CDA looks forward to partnering with our tribal, local, state, and federal landowner partners to prioritize which California landscapes would receive the best bang for our fuels reduction and watershed and forest restoration buck.

Keep an eye out for the CDA restoration crew as we continue to expand throughout California, aka our great forested backyard.



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How to Eat an Elephant: A Story of Dynamic Conservation Partnerships



'You cannot eat an elephant all at once, but you can eat one piece at a time until its gone' - African Proverb

With federally initiated tasks of expanding restoration on lands and marine habitat in the U.S., wildlife conservation organizations now have a more important job than ever before. In April of 2022, the America the Beautiful Challenge was launched and included the Thirty-By-Thirty (30x30) initiative charging the Secretaries of the Departments of the Interior, Agriculture, and Commerce along with the Chair of the White House Council on Environmental Quality (CEQ) with the goal of conserving millions of acres of forested lands and restoring at least 30 percent of our lands and waters by 2030. Considering there are over 720 million acres of U.S. land and waters, this leaves state, federal, private, farm, and ranch landowners a daunting task – the proverbial elephant that is conservation.

Over the past 8 years, CDA has worked to develop its habitat restoration program. When comparing the year-over-year progression of work, CDA has exponentially grown from supporting great work on a few thousand acres to putting millions of acres of wildlife-driven habitat restoration into an agreement and thousands of acres yearly on the ground throughout the state of California. We continue to value the support and contributions we receive from our state and federal partners, private landowners, and the multitude of funders that support the vision of CDA projects. One of the big puzzle pieces to be highlighted is the dynamic partnerships of wildlife conservation non-profits that share an imperative goal: working together to create an all-encompassing, positive impact on our wildlife, habitat, and land. To date, CDA has partnered with many organizations including National Wild Turkey Federation, Rocky Mountain Elk Foundation, Mule Deer Foundation, Cal Trout, and other non-profits that have teamed up to do this much-needed work.

Of the many collaborative projects CDA is currently working on, one partnership to note is with the National Wild Turkey Federation (NWTf) on the Timber Transport project, a Keystone Agreement between the NWTf and the USDA Forest Service that includes over 6,000 acres of restoration in the Klamath National Forest. Once the groundwork and timber harvest is complete, forest products will be transported by railcar as the second component of this multi-faceted approach to forest restoration. The logs must first be transported to Gilchrist Forest Products in Gilchrist, Oregon, where they will undergo debarking to eliminate bark beetles. The debarked logs will be inspected and then transported to a railyard in Klamath Falls, Oregon, where they will receive another inspection before being loaded onto railcars

for transportation to Wyoming. The purpose of this is to shore up an at-risk community whose industry may shut down without an adequate supply chain. Without product, the area faces the possibility of being another statistic within the industry. Through multiple collaborative meetings with NWTf, USDA Forest Service, and California Deer Association, CDA began work in late March within the Antelope Fire burn scar as part of a 2,746-acre timber removal project in the Klamath National Forest in northern California. Along with the timber harvest, the project includes 1,605 acres of brush mowing and juniper felling, 592 acres of juniper reduction, 264 acres of plantation thinning, and 866 acres of mastication for fuel reduction and wildlife habitat enhancement work in the forest. The goal of the work being completed ranges from the protection of wildlife from future wildfires to increased water quality and quantity as well as increased benefits for deer, elk, and other species native to the area, to name a few.

"It's fantastic to be a part of such an incredible partnership that is driven to get this much-needed work done," said Dale MacDougall, California Deer Association State Project Director. "From the leadership and support from the USFS, both nationally and regionally, to the inviting nature and strength of the NWTf family, along with industry partners, the energy has been incredible. There are so many folks committed to carrying part of this workload, and all have done an incredible job in doing so. This is a perfect example of partners sharing a vision for large-scale restoration for the benefit of wildlife, forest health, communities, and humans."

Very seldom do collaborative partnerships come together in a single conversation. They are strategically built over time through effort, planning, and, not only the vigor to take on, but the commitment to complete a shared goal – this is exactly what makes partnerships between conservation organizations so impactful. Dynamic partnerships like that of CDA and NWTf work to interlock pieces of a gigantic puzzle, and by working together, can complete the big picture efficiently. If the goal is to restore millions of acres across the United States, you must eat the proverbial elephant one bite at a time...nothing is stopping dedicated folks from filling all the seats at the dinner table.



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Beatles & Forest Health

A Look Under the Bark

Western forests (including Alaska) cover more than 360 million acres across vast and often rugged terrain ranging from large, fast-growing trees along the Pacific coast to high-altitude tree lines where tree sizes, such as bristle cone and whitebark pine, are smaller and grow much slower. The interspersed of western forests with shrub-steppe habitats, mountain meadows, streams, meadows, and aspens provides important habitat for a rich diversity of wildlife species ranging from songbirds to large ungulates such as elk and deer.

Benefits for Humans and Wildlife

Western forests are extensively managed and harvested to supply wood for home construction and other purposes. In many areas of the West, forestry and the timber industry is a major economic driver. Forests and their interspersed grasslands and meadows provide opportunities for livestock grazing and are often a key component of family ranching operations. These forests and diverse ecosystems also contribute greatly to wildlife, water supply, and quality, as well as air quality. Western forests also provide opportunities for camping, photography, hiking, hunting, fishing, and many other popular outdoor recreational activities.

Threats from Climate Change

Ever-shifting climate conditions have a huge impact on western forests and forest health. Warmer winter temperatures are contributing to dryer conditions and with these dryer conditions come several inherent issues such as stressed and under-hydrated vegetation, unnaturally large fires, and severe outbreaks of bark beetles and diseases that thrive on a distressed forest system. An example of these combined effects is apparent in many forests across the west, such as the Sierras in California where we are seeing large losses in lodgepole pine stands around Mammoth, and in Colorado where nearly half of Colorado's 660,000 acres of lodge pole pine forests were infested by mountain pine beetles in the past few years. Eastern Washington State lost millions of ponderosas and lodge pole pine trees in the last decade as well, huge ecosystems put at risk due to forest conditions. Outbreaks have also occurred in Alaska, Arizona, California, Idaho, Montana, New Mexico, Oregon, and Wyoming.

These tree-killing insect epidemics combined with forest densities well beyond sustainable capacities set the stage for catastrophic wildfires, especially in combination with the higher temperatures caused by dryer climate conditions, leading to lower soil moisture. Moderate fire is natural and helpful in many ecosystems, but catastrophic, drought-fueled fire with abundant fuel from large acreages of dead trees can destroy vast expanses of wildlife habitat, put human lives at risk, destroy soil composition and stability, let alone cause extensive property damage. In the Western United States, scientists have documented a six-fold increase in the area burned over the past two decades, as well as the degree of severity at which it burns which they attribute partially to climate conditions. These forest fires exacerbate the

climate change problem because the burning of forests releases extreme amounts of carbon dioxide into the atmosphere. The economic costs of tree die-offs and catastrophic fires associated with climate change are almost beyond reckoning. To put it into perspective, damage to homes and property from wildfires totaled \$3.2 billion during the 1990s. In 2021 alone, fire suppression and damages exceeded an estimated \$275 Billion billion to fight forest fires (throughout the U.S.).

While loggers have in some places turned to harvested trees killed by insect epidemics, large forest fires lead to the loss of income and jobs in the logging industry. Continued warming and more severe droughts associated with climate change will only further increase the risks and costs of catastrophic wildfires. Catastrophic fires are especially damaging when they destroy the fertile detritus layer of soils, leaving only highly erodible mineral soils. Reduced vegetative cover, increased erosion, and higher stream temperatures are harmful to cold-water species such as trout.

Conservation Investments

Minimizing the impact of shifting climate and overstocked forests will continue to require extensive financial investment in a variety of management actions. The beetle outbreaks aided by climate change have created challenges for forest managers who must now incorporate new ecological, economic, and social issues into forest management plans.

Forest managers need to research and implement new methods of suppressing large beetle outbreaks to avoid extensive loss of mature trees. They will also need to study methods of reducing fuel loads and fire risks without detriment to natural ecological cycles. This may require extensive increases in prescribed (controlled) burning, timber stand thinning, selective logging, and other techniques to increase forest health and reduce fire risk. The cost of additional firefighting alone will be enormous. Already costing billions annually, investing in additional forest treatments that help manage fire risks and restore ecosystems, while protecting high-value resources in the forest will be essential for minimizing an increase in fire risk associated with a hotter and dryer climate. Investing in green forest treatment is a much better approach than constantly trying to play catchup while working in post-fire restoration efforts. Proactive forest management will put us in a position to protect those high-value and fire-resistant resources such as aspen stands, meadows, riparian areas, and healthy vegetation needed to sustain a healthy ecosystem. These properly functioning forested ecosystems can thrive with an aggressive treatment regime and prolonged maintenance including prescribed fire and retreatments. We all need to invest in good stewardship, as we all benefit from clean water, healthy air, thriving wildlife populations, and a healthy forest. CDA continues to remain on the forefront of these restoration efforts and is driven to continue this effort to combine forest health, rangeland restoration, and clean water projects across the landscape in order to leave a legacy for generations to come.

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BDA: An Excuse to Play in The Water



Well, with summer upon us, hot weather being the norm in Sunny California, many of us look for any reason to play in the water, even the CDA Project Team. CDA, along with some of our partners, have learned to take advantage of a cool summer project on a hot day - BDA installations. You may not be familiar with terms such as Zuni Pools, One Rock Structures, or BDAs. That being the case, let us jump into this together.

A Beaver Dam Analog (BDA) is a man-made structure designed to mimic the form and function of a natural beaver dam. BDAs can also be used to increase the probability of successful beaver translocation by creating immediate deep-water habitat that reduces the risk of predation. In general, the design and installation of BDA complexes is a simple, cost-effective, non-intrusive approach to stream restoration that can influence a suite of hydraulic, geomorphic, and hydrologic processes to achieve a range of common restoration goals, not just Beaver relocation. While recipes are helpful when you prepare a new venison dish or meal the first few times, with experience you become more comfortable adapting the recipe to make it your own (never forget the mesquite charcoal). You can substitute ingredients to better match what you might have available in the cupboard (i.e. onsite) and find efficiencies and improvements that work better in your situation.

The photo shows how we were building some BDAs (not all) in a particular setting, for a particular purpose and with access to plenty of willows to weave between the aspen posts. That simple photo has since appeared in numerous grant applications, though not yet made its way into 'engineer' designed restoration manuals. Lost in those engineered translations has been some of the common sense that any good cook knows. For example, willow weave is not always essential! You can do underwater basket weaving with many different woody materials (so use what is available). However, the important thing is

***Near - surface water helps aspen
and willow grow thereby benefiting
deer & other wildlife.***

that these things achieve their desired goals, which are to reduce streambank erosion/incising and restoration of the hydrologic function of meadow systems. Beaver don't build dams with fence posts, and we don't always need to either. We often use materials at hand, larger willow, small aspen (usually 3' or less in diameter) thinned from stands that have been deemed too dense, and juniper to name just a few organic material sources. Smaller structural elements work well such as willows, conifer boughs, and small aspen limbs, along with a good mud packing. These BDAs are not required to remain structurally sound for many years; often their purpose has been accomplished within the first two

or three years. Streambank erosion, incising, and channel cut are often greatly reduced within just a few years of constructing the BDA, also reducing flows allowing stream beds to stabilize and refill to a more functional elevation. We have played with building postless BDAs (particularly in smaller streams with lower peak stream powers) and they have worked remarkably well too. A bit of advice for the do-it-yourselfer out there looking for some “cool” project time. Two of the most common mistakes in using BDAs are:

1. Focusing too much on the individual structure design. It’s about the collective benefit of many BDAs in a stretch of stream restoration. An Example is our CDA Warner Meadows Project. We put 39 BDAs in two large at-risk meadow systems: the area showed incredible gains in a very short time and the meadow expanded to its historic boundaries in the first year. Hydrological function seemed to reconnect throughout the whole meadow ecosystem.

2. Overbuild BDAs trying to make them too stable (e.g., like an engineered structure). The relative importance of individual dams is lowered when you have several BDAs within a targeted restoration area. Placing a primary dam (a larger dam that can support a lodge and often spreads out on to floodplain) strategically within a complex, and then using secondary dams to extend forage access (for beaver), and step down big head drops in smaller steps (by backwater flooding to the base of a taller dam) is far more important. Backwater helps support the upstream structure while reducing high-flow currents below. Plus, some failure of individual BDAs is good!



By increasing near surface water - shallow interwoven rooting plants such as aspen and willow grow increasing food and fawning habitat for deer.

Some of the best Instream habitats we've found are associated with failed beaver dams and beaver dam analogs. Meadows, riparian zones, and meandering streams, when functioning properly, are some of the most beneficial elements in our ecosystem. Often these areas are vitally important for wildlife, instream invertebrate, and a sundry of migratory species that use these areas for sustenance, bedding, and stopovers. Restoring these high-value resources is of great reward and indeed some “cool” summer work for sure. Team CDA looks forward to seeing you on the mountain soon, and maybe in the stream as well.



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