

Land and Water Conservation Fund

A Source
of Hope and Help
in the Face of Disaster



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In 1964 Congress created the Land and Water Conservation Fund (LWCF) as a bipartisan commitment to protect natural resources, cultural heritage and to provide recreation opportunities throughout the United States. The funds are generated annually from \$900 million dollars in royalties paid by energy companies from offshore drilling, using proceeds from the development of one resource to fund reinvestment into other public natural resource values. Although LWCF is broadly supported by the public, it has almost never been fully funded, with federal budgets regularly diverting offshore royalties to uses besides conserving land and water.

There are two main programs within LWCF. One is the Federal Land Protection Program, which helps to permanently protect public land such as Colorado's Great Sand Dunes National Park and Preserve. The other is the State Assistance Program, which provides matching grants to help states and local communities protect recreation resources and parks.

The conservation and recreation benefits of these LWCF programs are well-known and well-documented, but the resources LWCF provides to local communities extend beyond providing park lands. LWCF's help in purchasing land after the 1976 Big Thompson Flood in Colorado is more than just a story of land acquisition for outdoor opportunities. It is also a story of hope and closure for 80 families that lost their homes that day. And it is a story of foresight – helping avert millions of dollars of further damage when floods returned to the Big Thompson in 2013.

As described in the case study below, following the catastrophic 1976 Big Thompson Flood Larimer County recognized that simply rebuilding new homes in harm's way within the floodway didn't make sense. In looking for an appropriate way to compensate displaced families while also promoting other public benefits, the County turned to the LWCF as an important part of its solution. With just over \$1 million from LWCF as well as other matching resources, the County acquired 80 key properties along the Big Thompson – helping provide closure and compensation to families who had lost their homes while providing new outdoor recreation opportunities to residents and visitors on 156 acres of land along the river highlighted by four new county parks (Glade Park, Narrows, Forks, and Sleepy Hollow). In the years thereafter, the parks proved popular for sightseers, picnickers and anglers. When disastrous floods returned to the Big Thompson in 2013, the wisdom of the County's actions in using LWCF to help protect a floodplain was made apparent, as an additional \$16 million in estimated property damages were avoided that would have resulted to homes had they been rebuilt on the floodway properties.



LWCF and the Big Thompson Floods: By the Numbers

LWCF dollars invested (1976) in acquisitions:	\$1,012,600
Local matching dollars provided:	\$1,012,600
Home sites purchased in floodplain:	80
Acres acquired:	156
Public angling days/year provided (per county plan):	200,000
Value of home losses averted in 2013:	\$16,000,000

Flooding like that experienced on the Big Thompson and adjacent drainages in 2013 may become even more common in the future due to the effects of a changing climate. Several factors may increase future flood risks. First is simply that a warming climate will have more energy and more stored water in the atmosphere. Climate scientists also project less change in the jet stream – meaning that daily weather conditions will change less – which could result in longer-lasting rain cycles. (The 2013 Colorado floods were characterized as 100-year flood events – but the causative rain event was even rarer, a 1000-year rainstorm). With a warmer climate, rain on snow events are likely to increase at moderate elevations during the winter, further increasing flood risks. These climate-related factors, along with other human-caused risk factors such as increased impermeable surfaces associated with land use changes and urban development, all point to a future with greater flooding. Milly et al. (2002) looked at patterns of major flooding in larger watersheds during the 20th Century – hypothesizing that the intensification of the global water cycle due to climate change would translate into increased flood risks. They found that the frequency of major floods increased substantially during the 20th Century, consistent with results expected based on the climate model – and the model suggests that the trend will continue.

In light of these growing risks, the actions of Larimer County following the 1976 floods show great foresight. The role of LWCF funds in making post-flood acquisitions possible has paid great dividends in reducing flood damages, as well as providing valued public lands for angling and other public recreation.

Just as LWCF funds played an important role following the 1976 floods, it is also supporting recovery following the 2013 flooding. LWCF funds were awarded to Colorado Parks and Wildlife, which in turn disburses funds to local governments through an annual grant cycle administered by the Colorado State Trail Program. The Town of Lyons, hit hard by flooding coming down the North and South forks of St Vrain Creek, was recently selected by Colorado Parks and Wildlife to receive LWCF funds.

The level of damage caused in Lyons was enormous. In the early hours of September 12, 2013, stream flows in town crested above 19,500 CFS - compared to the normal St Vrain average flow in September of only 67 CFS. The town sustained flood damages totaling nearly \$50 million - a staggering amount for a community that normally operates on an annual budget of less than \$1 million.

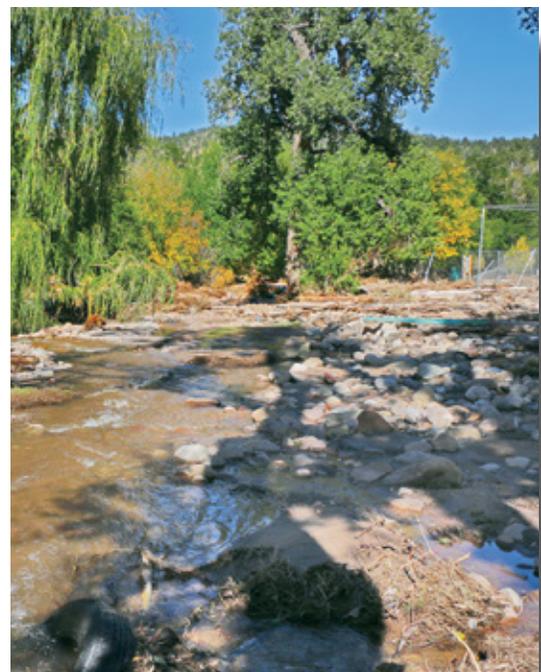


The Town's park system was decimated. Out of 80 acres of community parkland, 39 acres were severely impacted. Unfortunately, those 39 acres housed most of the major park facilities including the popular St Vrain Corridor Trail. Given the immense challenges facing Lyons as it rebuilds, the need for support from partners such as LWCF is major.

Leveraged with other grants and matching funds, the LWCF award will help Lyons to rebuild and extend its St Vrain Corridor Trail, which was destroyed in the 2013 floods. The nearly 1.7 mile trail will provide recreational access along the St Vrain through Lyons and offer connections to regional trails to Boulder and to Longmont. The restoration efforts are important not only to quality of life for residents, but in supporting the community's recreation economy: Lyons' parks can draw some 2000 people on a typical summer weekend.

LWCF funds are making a real difference for Lyons. "Everything up to this point has been emergency and temporary measures," said Lyons Park & Recreation Director David Cosgrove. "These funds are critical in our flood recovery efforts; now we can move forward on permanent structures that will bring folks back."

Lyons is an important part of an ongoing story for LWCF. In Colorado alone, the LWCF State Assistance Program has awarded almost 1,000 projects through Colorado Parks and Wildlife, totaling approximately \$58 million. For the 90 percent of Coloradans who participate in outdoor recreation, LWCF improves their quality of life. For communities facing the added strain of flood recovery, LWCF has been a much-needed source of help - and hope.



St Vrain Corridor Trail, Bohn Park before and after 2013 floods. (Town of Lyons)

Case Study: LWCF Acquisitions in the Big Thompson Canyon

The Big Thompson Flood - 1976

The Big Thompson Canyon is one of Colorado's truly special places and has long been important for the people who call Colorado home. The 25 mile stretch of Highway 34 through the narrow canyon connecting Estes Park and Loveland is surrounded by 500 foot tall cliffs on either side, while the Big Thompson River races parallel to the road. Water is captured above the canyon by Olympus Dam before it is released through the canyon's fine walls. In earlier times, the Utes would spend their winters in this valley hidden in



August 2, 1976 - A section of road ripped apart by waters of the flooded big Thompson river. (Steve Larson/The Denver September 18, 2013. (Andy Cross/Denver Post)

the cliffs from the weather and from enemies. The tall narrow walls and outcroppings made perfect hideouts. Today, the canyon draws anglers looking to enjoy one of Colorado's outstanding wild trout fisheries and other tourists traveling from the plains to the peaks of Rocky Mountain National Park. While the steep cliffs may have

provided protection for the Utes and offer modern-day tourists spectacular views, these walls create a slim channel for the river to flow which proved to be an essential ingredient to a devastating disaster.

On July 31 1976, there were 2,500-3,000 people living in or visiting the canyon daily. There were 1,400 houses that had been built in the canyon at that time. About 9,000 automobiles traveled on Highway 34 through the canyon on a typical summer day. Prior to this day, the canyon had flooded 12 times that were documented; however despite the danger of floods, the Big Thompson Canyon was heavily settled with extensive development in the floodplain. Residents of the canyon were drawn to the mighty river for its beauty, great fishing, and varied recreation opportunities. The average flow on a typical late July day was about 165 cubic feet per second. It would have only taken a couple inches of rain for the Big Thompson to be bank full, but the amount of rain that fell that night was record breaking. At around 6:30 the rain started to fall and the clouds stopped moving, settling right above the Big Thompson Canyon with heavy rain continuing for four hours. The storm produced a remarkable 12 inches of rain in that short time, bringing the river 19 feet above its normal level and sending water racing down the canyon at an average of 31,000 cubic feet per second. The water carried with it anything and everything that was in its path.

Intense rainfall settling over one location and surging through the canyon below resulted in one of the most memorable disasters in Colorado's history. On that evening the Big Thompson River claimed 418 homes, 52 business, 145 lives and caused about \$35,500,000 worth of damage (in 1976 dollars – compares to \$145 million today). Reverend Philip Dunford of Westminster United Presbyterian Church in Fort Collins said this about the disaster, "Someday, the Big Thompson Canyon scar, filled with our hurt, pain and suffering, will grow back."

Rebuilding in the Aftermath

That process of growing back started immediately, and there was a lot of mess to clean up. Local, State, and Federal agencies were all working to create a path moving forward for the people who were impacted by the storm. The US Army Corps of Engineers was tasked with the clean-up; it cost them \$1,041,000 to remove 320,450 cubic yards of debris. The City of Loveland had \$2,100,000 in damages including a hydroelectric plant and city facilities. Most of the fish had been washed down river but they were replaced with fish stocked from a nearby hatchery. Vegetation had been uprooted but grass seed was scattered and over 4,000 trees replanted. The Disaster Relief Act passed in 1974 provided money to replace Highway 34 at a cost of \$10,000,000. The Department of Housing & Urban Development financed \$1,421,000 to construct housing and also provided low interest loans to low income survivors. 160 families were given food stamps after the floods to get back on their feet. The Small Business Administration provided financing for second homes and businesses and received 71 applications for this financing option. But for many, rebuilding wasn't even a viable option. The health department condemned houses that were more than 50% damaged and while home owners could challenge that ruling, in most cases there was too much damage to be repaired.



August 2, 1976 - Big Thompson River Canyon. (Steve Larson/The Denver Post)

As resources flowed in and repairs began, a major question became: should they rebuild in the same places? And if the residents in the canyon did not rebuild on their private property, then what would happen to it and how would they be compensated? Larry Timm, the then-Larimer County Planner summed up the situation pretty well, "We're all of the opinion that we don't want that kind of a disaster to occur again. The only reason this was a disaster was that people lived there."

In December of 1976 the Larimer County Commissioners, with guidance from the Federal Insurance Administration, proposed a zoning ordinance that was later passed, prohibiting construction within the 100 year floodway level. After developing maps for this area, about 80 people discovered that because of this ordinance they would not be able to rebuild on their property. "The logic behind the ordinance was apparent, but the loss of property was, as one resident said, 'Pouring Salt on the wound.'" (McComb, pg. 96) The County next set out to determine how these properties could be wisely used and how landowners could be effectively compensated.

Help from the Land and Water Conservation Fund

Although the county commissioners knew that the zoning changes for the floodplain were in the best interest for the property owners and the county, they also knew it would be costly. Where was the money going to come from? Governor Richard Lamm turned to the experiences of Rapid City, SD in a previous flood. In Rapid City they cleared the flood plain by preventing re-building in the floodplain and purchasing property with federal money. One key source for some of this funding was the Land and Water Conservation Fund, which requires a 1:1 funding match from the State or other local funding sources.

Momentum was building to compensate property owners for their losses and secure the floodplain from future development, and the loose pieces began to fall into place. First came a \$21 million package the county commissioners presented to the state legislature that included funds for land acquisitions, relocation and home rehabilitations, soil conservation and bridges. Some of these dollars were used as match for Land and Water Conservation Fund support. Republican Senator Fred Anderson, the President of the Colorado Senate and Loveland resident, also introduced legislation to obtain another \$862,000 to help match the federal money for land acquisitions. Another major hurdle was cleared when US Representative James Johnson (R-4th CD) and US Senator Floyd Haskell (D) worked with Congress to allow valuation of land based on pre-flood value instead of compensating owners only for post-flood values. If this definition had not been changed then the residents of the Big Thompson Valley would have only been paid about 10% of their original property value.

The County then turned to the Land and Water Conservation Fund, receiving \$1,012,600 for land acquisitions – matched by \$731,000 from the Colorado State General Fund, \$131,600 from Larimer County, and \$150,000 from the Four Corners Regional Commission. Without the federal assistance through LWCF, the local governments could not have found the funds to acquire and protect the floodplain parcels and to compensate the 80 private land owners for their pre-flood land value. By June of 1977 the negotiations and purchase of the lands were complete. “Although frustrated by the delay, a sample of landowners appeared satisfied. Some still wanted to go back, but all agreed they had received a fair price for their land.” (McComb, 97).

Apart from helping landowners who had suffered extreme losses and hardship, the LWCF monies brought into public ownership 156 acres of land between Estes Park and Loveland that was adjacent to the Big Thompson River/U.S. Highway 34 and the North Fork Big Thompson River/Highway 43. The LWCF agreement states that the property was acquired for future development of outdoor recreation facilities and scenic areas for the general public to use. These acquisitions resulted in a 15 mile county park and floodway.





The LWCF Agreement also said that the facility development on these acquired properties must be maintained and:

- 1) To appear inviting and attractive to the public, and shall be open to the general public at reasonable hours of the day and times of the year;
- 2) With proper sanitation facilities and safety features;
- 3) In a reasonable state of repair so as to prevent undue deterioration.

While there was funding to acquire the properties it was unknown who or how the properties would be maintained. The agreements clearly stated that the acquisitions were for recreation and public access purposes. With proposed uses of the lands as natural open space areas and for passive and active daytime, outdoor recreation, the county developed a plan to

- enhance the scenic corridor and provide roadside rests for travelers - averaging 465,375 cars per year,
- provide picnic areas for tourists and residents for burgeoning Larimer County (5% yearly growth),
- provide public fishing access for average of 200,000 person- days of fishing annually,
- establish a park-to-park trail system, from inner city park in Loveland and Loveland's existing mountain park, and
- establish an information signboard commemorating the flood and identifying geological and hydrological hazards and safety precautions in mountainous terrain.

At the heart of these efforts were four county parks that were created within the floodplain: Glade Park, Narrows, Forks, and Sleepy Hollow. These parks provided public river access for fishing, as well as opportunities for picnicking and enjoyment of the scenic canyon for County residents and visitors alike. The Parks have long been popular seasonal facilities, open April through October with no entrance fees. With

help from LWCF, Larimer County has been able to achieve the goal of preventing future damage to personal property, keeping people safe, while providing public outdoor recreation benefits along the river corridor.



Floods Return to the Big Thompson



(US Department of Defense)

Fast forward to September 10, 2013. The Big Thompson Canyon experienced rain similar to the flood of 1976 – not quite as intense of rains in a localized area, but more rainfall in total over a larger area and longer time. Lands draining into the canyon received as much as 20 inches of rain (ncdc.noaa.gov). The result, though, was all too familiar for residents who remembered the floods 37 years before.

Stories of destruction started surfacing once the rain stopped. Highway 34 had been ripped apart just as it had in 1976,



(US Department of Defense)

because it was built back the same way.

Some of the houses that were swept

away in 2013 were homes that were rebuilt in the same locations that they had been destroyed in 1976.

The prediction of future flooding came to pass – but the 100+ year flood returned less than 40 years later.

Damages reached far beyond the Big Thompson, with floods also devastating areas in the St Vrain and Boulder Creek watersheds, extending into the Poudre and downstream along the South Platte.



The enormous losses from the 2013 flooding are difficult to comprehend. Some 1,500 homes were destroyed – representing about \$300 million in losses. Another 17,500 houses were significantly damaged but not destroyed and will cost \$350 million to repair. Living expenses for displaced families and individuals are estimated at \$150 million with over 10,000 people displaced from their homes. There is also an estimated \$1 billion loss to commercial and governmental property and related expenses.



A home lies in ruin after it's foundation was washed away. (US Department of Defense)

If not for the actions of Larimer County following the 1976 flood, using support from LWCF, the losses could have been even greater. Just as US Highway 34 suffered severe damage after being rebuilt largely as it had been before the 1976 floods, had the 80 properties purchased in creating parks and a “floodway”



Residents survey damage as flood waters recede. (US Department of Defense)

been redeveloped following the flood then another \$16 million of damage would have been experienced during the 2013 floods (based on 2013 replacement cost figures of \$200,000 per household). By having the foresight in 1976 to keep these properties as open recreational lands where the floodplain could function as a floodplain, Larimer County

Colorado National Guard units evacuate residents from rising flood waters. (US Department of Defense)



avoided home damages that otherwise would have added to the tally of destruction in 2013.

Looking to the future, Larimer County is in the process of creating a master recreation plan for the Big Thompson Canyon. This planning is a continuation of efforts started before the flood – though its direction may shift in light of the new challenges created by 2013's floods, which have forced at least temporary closure of the County's parks along the river and Highway 34. While potential land acquisition post-2013-floods is more likely to rely on the Federal Emergency Management Agency's Hazard Mitigation Grant program, local governments can continue to use Land and Water Conservation Fund funds for appropriate projects and acquisitions.

Conclusion

The case studies of the Big Thompson and Lyons flood events in Colorado underscore several points:

- With the growing uncertainties and risks associated with flood, fires and climate change, the Land and Water Conservation Fund offers communities a valuable planning tool to minimize disaster risk and



losses while preserving natural resources and recreational opportunities such as angling and boating.

- Far-sighted planning that restores floodplains and takes homes out of harm's way pays significant economic dividends – in the case of the Big Thompson flood of 2013, the County's use of LWCF to retire homesites and protect the floodplain avoided some \$16 million in estimated property damage that would have occurred had the homes been rebuilt after the disastrous flood of 1976.



- Many communities in Colorado and across the West depend on tourism and the recreation dollars that flow from nearby rivers and streams – and as in the case of Lyons, the LWCF helps these communities get back on their feet when natural disasters strike and disrupt the roads, infrastructure and natural resources that support their local outdoor economies.

Congress is in the process of reauthorizing the LWCF, and bipartisan voices

are calling for full funding of the program. These case studies show why the LWCF program is indeed a wise investment that pays off in disaster mitigation and enhanced public access to our nation's parks and outdoor recreation.

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