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“THE WORST FLOODS IN HISTORY”

FEDERAL GOVERNMENT AND THE FLOODS OF 1944 IN THE ELKHORN RIVER BASIN

TODD KERSTETTER

“Damage by Elkhorn Defies Estimation”

—Headline in the *Fremont (Nebr.) Guide and Tribune*, 13 June 1944

Water has played a critical, even defining, role in the history of the American West. Typically, scarcity determined water's significance. Farmers descended of European stock found too little water in the West to continue their traditional agriculture. Battles linger to this day over water rights for irrigation and urban usage. In a less-examined phenomenon, excess water has shaped the otherwise arid Plains by influencing the relationship between humans

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and their environment. In Nebraska's Elkhorn River Basin, a steady history of flooding led humans to alter the basin in attempts to control or mitigate flooding. Record flooding in 1944 revealed the weaknesses in a series of ad hoc flood control measures taken during previous decades and spurred basin residents to recruit federal aid in an effort to control the Elkhorn once and for all. Although subsequent flood control projects still could not totally prevent flooding on the Elkhorn, 1944 marked the beginning of a new era in the relationship between basin residents and their environment. This reflected a broader trend in American environmental history, that of bringing the phenomenal resources of the federal government to bear upon the countryside.

The Elkhorn Basin experiences floods regularly, almost annually, to this day. One of the earliest written accounts comes from Paul Wilhelm, Duke of Württemberg, who recorded in August 1823 a hurricane-like storm that turned the Elkhorn into a torrent. The river flooded Indian earth lodges abandoned for the

summer. When Americans of European descent began settling in the basin in the 1850s, they located town sites near the river, the better to utilize the Elkhorn's current to power mills. Placing economic assets such as mills and homes within the river's reach—the floodplain, not just the usual banks, must be considered any river's natural domain—paved the way for conflict. During the late 1800s basin residents coped with flooding simply by rebuilding damaged structures, replanting damaged crops, and, in some areas, as at Norfolk, by building levees to protect assets from high water.

The dawn of the twentieth century saw people in several counties form drainage districts, which were private, quasi-governmental organizations dedicated to improving drainage within their jurisdictions. The Elkhorn River Drainage District and the Elkhorn Valley Drainage District each pursued "improvements" to the river, typically straightening curved portions of the channel to facilitate drainage. By 1912 the districts had completed several such projects, which accomplished their objectives but only during rains and floods of limited magnitude.

Between 1910 and 1920, local flood fighters attacked the basin more aggressively. Workers dredged the Elkhorn's final twenty miles and created a new channel. Tributaries such as Logan Creek experienced similar modifications, which in some cases made it impossible to recognize the original channel. Logan Creek, originally 150 miles long, shrank to less than one-half its original length. As a result of those efforts flood damage declined.

Piecemeal modifications continued through the 1930s. Changes ranged from further dredging and channel-straightening projects to small dams. The basin felt the federal government's influence in 1935 as Works Progress Administration laborers finished a dam on the Elkhorn's North Fork at Pierce. The resulting lake provided recreational opportunities in addition to flood control benefits.

Despite efforts to control the Elkhorn, the basin experienced its worst floods ever in 1940.

During the night of 1 June, a cloudburst dumped a foot or more of rain on the north-central basin. Before the week was out, a second storm added more water to the Elkhorn and its tributaries. Government agencies ranging from the University of Nebraska to the Agricultural Adjustment Administration and the Works Progress Administration responded to the flood crisis, as did the American Red Cross. A representative from the US Department of Agriculture visited the basin in July to gather information about flood damages. Although little appears to have been done with the data, it foreshadowed similar efforts that would come four years later with greater consequences. Nonetheless, the first ninety years of permanent European-American settlement in the basin witnessed increasingly complex responses to flooding. People initially acted defensively, building dikes, levees, and floodways to halt rising water and to divert it from buildings and farmland. Over time, as greater technology and assets became available, responses to flooding became more aggressive. Humans altered the river itself as they straightened and dredged the channel. By 1940 even those more determined efforts failed to protect property against what was at that time the worst flooding ever recorded on the Elkhorn. When devastating floods in 1944 surpassed damage records set in 1940, people responded even more aggressively and threatened to remake the entire basin.¹

April showers made the spring of 1944 an especially wet one in the Elkhorn Basin. That month saw the beginning of a thirty-day rainy spell that saturated soils throughout much of the region. Since the destructive flood of 1940, three years free of major flooding seemed to have helped people put wet basements, flooded towns, and washed-out crops out of mind. Available records indicate residents had done little, if anything, to change their relationship with the river and its tributaries since the inundation of 1940. After all, a congressional report issued ten years earlier deemed the Elkhorn unworthy of federal flood control measures because it was neither navigable nor



FIG. 1. Elkhorn River Basin, Nebraska, and 1944 flood sites. Map drawn by Tracy Smith.

an important producer of hydroelectric power. Besides, flooding in the basins of the Platte and its tributaries never amounted to much, according to the report. Given that background and the drought of the 1930s, 1944's rainy spring probably had residents preparing for a typical but unremarkable Elkhorn flood. Instead, they got two exceptional floods. The runoff from two severe rainstorms, exacerbated by the wet spring and saturated soils, produced a pair of floods that would prod the government to change its stereotype of the region and change how the basin's residents interacted with the river.²

On Wednesday, 10 May 1944, rain clouds over the west-central Elkhorn Basin dimmed the afternoon sun. The large storm covered portions of eastern Nebraska and parts of Iowa,

South Dakota, and Minnesota. Rains soaked the upper Elkhorn Basin for nearly two and a half hours. The rains came again on Thursday, drenching the same areas. Ten inches of rain fell at the storm's worst.

Much of the water went overland in an abnormally high runoff toward streams and rivers. All streams draining the area registered high stages after the storm, and the North Fork flooded. Livestock farmers reported pigs, hogs, and sheep drowning in the flood. Crop growers were more fortunate. Because the waters receded within two days, the flood damaged only limited amounts of the small grains and alfalfa planted on bottomland.³

The flood hit the city of Norfolk at about 2:30 A.M. when a two-and-a-half-foot tall wall of water from the Elkhorn's North Fork broke



FIG. 2. Large pieces of ice on Highway 32 going west from West Point, Nebraska, in 1960 flood. Ice was left when flood waters dropped after covering west end of town. Flood stage was 16.09 feet at the river bridge—3.09 feet over flood stage. Courtesy of Nebraska State Historical Society. Photograph by William Reinsch, Soil Conservation Service.

over the city's dikes and headed for a dance hall. The flood wave wrenched the 144-foot by 87-foot building from its foundation and carried it intact to the bridge over the North Fork at Third Street and Elm Avenue. According to the owner, previous floods had risen slowly and held to the river's course. The flood washed out five area highway bridges by Saturday, 13 May.⁴

Once out of its banks, the stream flooded an estimated 861 acres in and around Norfolk to depths reaching four feet.⁵ The water reached two to three feet higher than the previous high water mark in the city, transforming the area into a giant lake. While the North Fork flooded the city from the north and east, the Elkhorn rose from its banks to flood the city's south side. Cresting at one and a half feet above flood stage late on Friday, 12 May,

or early on Saturday 13 May, the Elkhorn drove people from their south-side homes as it reached as far west as Second Street.

Receding waters revealed the flood's handiwork. The business district and a large residential area—176 city blocks total—were hit by the waters of either the Elkhorn or the North Fork. High water damaged 177 businesses and 459 homes and forced between 300 and 400 people to leave their homes, about 100 of them by boat. The flood interrupted telephone, power, and railroad services and left a heavy deposit of mud and slime.

Commercial losses included disrupted rail service, lost inventory, and grocers suffered from an embargo placed upon the sale of any goods touched by flood waters—an effort to prevent an epidemic of floodborne diseases. Vegetables normally eaten raw, such as let-

tuce, were to be destroyed. So, too, were canned and bottled goods. Authorities filed charges on Monday, 15 May, against a merchant who sold contaminated bottled and canned goods. Other food, such as corn or beans, that would be boiled before consumption were exempt from the embargo. Merchants who sold goods other than food lost business as they closed for up to ten days to clean debris from their flooded stores.⁶

Although the May flood surpassed previous marks in the upper basin, where old-timers said water reached about a foot higher than the previous high water mark, the lower basin also felt the flood's effects. It hit West Point on Sunday, 14 May. Early that morning the Elkhorn began rising at about six inches per hour as it reached into the city park and Cuming County fairgrounds. The high water, which reached within eighteen inches of the record height set by the 1940 flood in West Point, disrupted traffic on Highway 275 and caused delays in rail traffic for several days.⁷

One month to the day after the May storm hit, rains again drenched eastern Nebraska and parts of southeastern South Dakota, western Iowa, Kansas, and Minnesota. A heavy thunderstorm centered over the headwaters of Maple and Pebble Creeks in the lower Elkhorn Basin dumped as much as fifteen inches of rain. Within six hours, an average of twelve inches of precipitation fell at the storm's center.⁸

As in May, soils could not absorb the runoff produced by the intense storm. The swollen Elkhorn covered an area about fifty miles long by twenty miles wide in the lower basin. Tributary flooding inundated an additional 61,000 acres. A gauging station recorded a peak four times the station's previous record high. The surging Elkhorn raised the Platte River to flood stage from its confluence with the Elkhorn to its mouth and added enough water to a moderately high Missouri River to cause severe flooding from the mouth of the Platte to St. Joseph, Missouri. With early flood damage estimates for the basin reaching into the millions of dollars, residents in the lower basin

called the June 1944 flood the "worst flood in history."⁹

As the flood receded, increasingly accurate damage reports became available. A Red Cross survey in Dodge County placed primary blame on the Elkhorn for floods that hit 92,480 of Dodge County's 341,779 acres—slightly less than 27 percent of the county's area. That land held about 25 percent of the county's corn crop. The flood destroyed seven homes, damaged 743 more, and destroyed 121 barns and outbuildings, damaging another 354. The flood wrecked 1,500 miles of fencing, twenty-five pieces of farm machinery, and 1,000 additional pieces of farm machinery were damaged. Almost 161 businesses, churches, and schools also sustained flood damage. Livestock also suffered heavily. Estimates placed Dodge County's losses at fifteen horses and mules, 456 head of cattle, 1,800 hogs and pigs, 225 sheep, and 120,000 poultry. Receding floodwaters scattered thousands of animal corpses, so not only their loss but also their disposal added to the flood's costs.¹⁰

Amid the death and destruction, some fauna thrived in the flood's aftermath. Seedcorn beetles, which feed on the hearts of seedcorn kernels, multiplied in the moist conditions. Infestation reports first surfaced about ten days after the flood. A farmer who planted fifty acres of corn one Thursday evening lost most of that field to the beetles by the following morning. Extension agents urged farmers to pack the soil firmly in their cornfields to discourage the burrowing pests. In addition to obvious damage, this kind of collateral damage escalated the flood's impact on the basin.¹¹

Nebraskans outside the basin also felt the effects of the flood when they tried to use its transportation networks. Fremont, separated from Omaha by the Elkhorn, could rely on only one road, Highway 77, to carry traffic out of the city, and no trains entered or left on the morning of 12 June. The June freshet disrupted service on the Chicago and Northwestern Railroad in the basin. Repair crews would need two weeks to restore most service, although



FIG. 3. The Elkhorn River flood damage on the J. L. Blair property, seven miles northwest of Battle Creek, Madison County, Nebraska, in March 1960 flood. Courtesy of Nebraska State Historical Society. Photography by V. Van, Soil Conservation Service.

disruptions lingered for months on some lines.¹²

Human psyches suffered, too. Robert Leisy, a sixty-one-year-old farmer whose land south of Wisner flooded in June, shot and killed himself on the 14th of that month. Although impossible to attribute directly to the flood, it was speculated that, with all of the other problems in his life, the damage to his farm by the flood may have provided the proverbial “last straw” that led him to take his life.¹³

The massive, varied devastation wrought by 1944’s record-breaking flood elicited the most comprehensive and concerted responses from residents, government agencies, and charitable organizations yet. Within ten days of the May flood, the Norfolk Drainage Board, acting on orders from the Corps of Engineers, began repairs on the dike ruptured on 12 May. The Red Cross fed, clothed, and housed families flooded from their homes. While still completing relief work from the May flood, the

Red Cross aided victims of the June flood. At its Fremont headquarters, the Red Cross daily prepared 4,500 meals, which it distributed to relief centers in the basin. Units of the Nebraska National Guard rushed into the field shortly after the flood hit on Sunday, June 14. Other civic groups such as the American Legion and Auxiliary and fire departments also joined the relief effort. One village, Hooper, organized an impromptu "lost and found" on an empty lot. Authorities encouraged people to bring items that had washed onto their property to the lot where, authorities hoped, the owners would claim them.¹⁴ At the county level, officials juggled budgets and raised taxes to pour money into road and bridge repairs. The state aided flooded farmers by suggesting replanting strategies and canvassing the state to obtain seed. Federal government responses included a flood warning system courtesy of the US Weather Bureau.¹⁵

The most important federal response, however, came in reassessing its evaluation of the Elkhorn Basin. Led by the US Army Corps of Engineers, a number of local, state, and federal agencies, in cooperation with residents, researched and analyzed flooding and flood damage in the Elkhorn Basin. Washington's view of the basin had taken shape during the late 1920s. In the *308 Report on the Platte River*—one of about 200 such reports on US streams prepared as called for in the Rivers and Harbors Act of 1927—the government concluded the Platte Basin, including the Elkhorn, did not suffer destructive flooding. Although the Flood Control Act of 1936 saw the government assume responsibility for controlling flooding on rivers, which, when flooded menaced national welfare through loss of life, erosion, or impaired transportation and commerce, the *308 Report* caused the government to overlook the Elkhorn.¹⁶ The postmortem investigation of the 1944 floods would change this assessment.

The political climate in 1944 also favored reviewing the Elkhorn's status. That summer found Congress embroiled in the Missouri Basin Project, better known as the Pick-Sloan

Plan, which called for reclamation and flood control projects throughout the Missouri Basin, which included the Elkhorn. Severe flooding on the Missouri River in 1943 prompted the House Flood Control Committee to ask the Corps of Engineers to review the Missouri River for flood control options. The corps assigned Colonel Lewis A. Pick, then division engineer of the corps' Missouri River office in Omaha, to the task. Pick composed a response that employed multiple-purpose dams to control flooding and provide possible irrigation and power production. This broke with the corps' traditional duty of working on navigation projects. W. G. Sloan, an engineer in the Department of Interior's Bureau of Reclamation, had also been working on a development plan for the Missouri. Congress received the plans, Pick's emphasizing flood control, Sloan's emphasizing irrigation and hydroelectric power production, in February and May 1944, respectively. As the Elkhorn flooded in 1944, Congress studied the two plans, which it would eventually fuse.¹⁷ The time seemed ripe to produce a new relationship between the Elkhorn and the people living in its basin.

On 21 June 1944 the House Committee on Flood Control ordered a survey of the Elkhorn Basin to determine if conditions justified federally financed flood control measures. Beginning with a pair of flood damage hearings, on 29 August at Norfolk and on 30 August at Fremont, the corps reviewed the conclusions of the *308 Report*, evaluating the Elkhorn's flooding through firsthand consultation with local residents.¹⁸

In preparation for the hearings, several towns held organizational meetings to discuss the flood's damages and to explore options for preventing or limiting future damages by the Elkhorn and its tributaries. On 23 June, Hooper held one of the earliest such meetings, attended by forty to fifty people representing the county extension department, the Agricultural Adjustment Administration, bankers, newspapers, the Red Cross, the Farm Security Administration, and the Reconstruction

Finance Corporation. The gathering included mayors or other city officials of every Dodge County town, except North Bend, who met to discuss flood issues.¹⁹ With this kind of preparation, they hoped to make a strong case for assistance.

Testimony at the Norfolk hearing indicated flood damages came to more than double the damages suffered in the 1940 flood. The 1944 floods caused especially heavy losses because they happened so late in the growing season that some farmland had to go unused. In most earlier floods, farmers replanted successfully after waters receded. Russell Young, a farmer from Tilden with thirty-four acres of bottomland, testified that it "produces real good every year," but that "we never had anything this year at all." Young went on to tell the corps that the floods occurred often and "every one seems to be getting a little worse." A consensus of the farmers surveyed for the hearing agreed that floods had been getting progressively worse during their years on the Elkhorn.²⁰

Overall, those testifying believed that the Elkhorn and its tributaries should be straightened and widened and that reservoirs should be built at tributaries' headwaters to slow the flow of water into the main stem during flood situations. Generally speaking, laymen, mostly farmers, advocated local channel modifications and levees while those with technical training advocated similar responses on a basinwide scale. Testimony given the next day in Fremont from lower basin residents echoed that of their upstream neighbors. They recommended the corps straighten and widen the Elkhorn's channel and build dikes and levees to protect low areas. The crowd realized, however, that it would be virtually impossible to prevent a disaster similar to the floods caused by the intense flash rains of June 1944. In some cases, they acknowledged, nature just could not be contained.²¹ However, it could, perhaps, be managed so that floods would not be as devastating.

Members of the local media agreed. Days after the hearings, the *Fremont Guide and Tri-*

bune editorialized that localized control projects were not the answer. Local protection projects might successfully save one town from the ravages of a flood, but that town's dikes and levees would merely divert the water to another location, which, if left unprotected, would suffer more than it would have otherwise. According to the *Guide and Tribune*, the Elkhorn needed a comprehensive, basinwide management plan.²²

Before engineers began their survey, Congressman Karl Stefan of Norfolk warned his constituents that the federal government did not have funds available for extensive flood control on the Elkhorn. Stefan promised to visit the flooded locales with an engineer from the corps' Omaha district and that an official army survey would be made. From the survey, Stefan told members of the West Point Community Club, individual towns would be able to draw suggestions for local flood protection projects. But Congress, he told them, had little money available except to finance minor construction work such as "a small dike here and a bit of revetment there."²³

Nonetheless, the government apparently listened to the advice given at the Norfolk and Fremont hearings. In the following years, the Corps of Engineers surveyed the entire basin, conducting an inspection of existing protection projects and the sites of all specific improvements suggested in testimony at the hearings. Portions of the basin, including the upper reaches of the Elkhorn, the upper reaches of the North Fork, and the upper portions of Cedar, Logan, Union, Humbug, Plum, Pebble, Maple, Rawhide, and Bell Creeks, merited no flood control measures in the eyes of the corps. Some of these areas simply did not flood, or did not flood often enough or seriously enough to warrant expensive modifications. In other areas, serious flood damages occurred only during the 1944 floods. In some of these places, notably in areas whose elevations placed them above possible flood damage from streams, damages resulted from the intense nature of the rainstorms and from overland runoff rather than from streams overflowing their banks.²⁴



FIG. 4. Bridge across Elkhorn River near J.L. Blair property, 2.5 miles east and 1 mile north of Battle Creek, Nebraska, in March 1960 flood. Courtesy of Nebraska State Historical Society. Photograph by V. Van, Soil Conservation Service.

Using information gathered from the hearings and surveys, the corps drafted four comprehensive improvement plans, which included a number of local protection projects that could be undertaken individually. Comprehensive Plan A called for improvements to the Elkhorn and its tributaries that would protect against floods of the magnitude of a "super flood" comparable to the 1944 inundation from Neligh to the river's mouth. Levees and channel modifications would provide the means for protection along both the Elkhorn and its tributaries. Plan B aimed at flood protection along the Elkhorn and its tributaries from Norfolk to the river's mouth against floods about half the magnitude of the 1944 flood by using levees and channel modifications to eliminate large and objectionable bends. Essentially the same as Plan A, Plan B would merely provide protection against floods of

lesser magnitude and would not include the area from Neligh to Norfolk. Plan C contained the same details as Plan A but with the addition of a flood control reservoir. Plan D called for a larger, multipurpose reservoir that would allow for not only flood control but also for hydroelectric power generation and irrigation.²⁵

The corps also suggested a series of twelve local flood protection projects that could be undertaken by cities or towns in partnership with the federal government. These projects, which were excerpts from the comprehensive plans, would allow residents to protect strategic portions of the floodplain, usually towns, and avoid the prohibitive expense of improving the entire length of the river. Areas recommended for projects included the North Fork at Pierce and Norfolk; Giles, Buffalo, Battle, and Meskenthine Creeks; and the

Elkhorn at West Point, Scribner, Hooper, Winslow, Waterloo, and in an area above the river's mouth. Some projects involved levees and channel diversions or modifications. For example, the town of Pierce would be protected against floods equal to the magnitude of the town's worst flood by a two-mile-long levee on the south, east, and north sides of town. In addition, about 1,700 feet of the North Fork's channel would be enlarged and relocated south of the town's park to handle flows that would normally overwhelm the capacity of the Pierce Dam. The dam's spillway and downstream channel would also be modified to improve their drainage abilities.²⁶

Most of the local protection projects consisted simply of minimal channel modifications and levees to be built around cities as a bulwark against high water. Such would be the case for agricultural areas along the North Fork from Pierce to its mouth. The North Fork's channel would be widened in places and straightened where "objectionable" bends constrained flow.²⁷

Some waterways, such as Giles Creek, earned more aggressive recommendations from the corps. The corps suggested blocking the original channel west of Tilden and sending Giles into a levee-enclosed diversion channel about 9,700 feet long that would empty into the Elkhorn. An especially steep gradient through the town of Stanton earned Meskenthine Creek, too, a recommendation for aggressive treatment from the corps. Since the channel's steep fall created the potential for flood flows of destructive velocity, the corps proposed to line the channel with concrete where it flowed through the city and surround the concrete channel with six-foot-high levees.²⁸

While straightening and enlarging the channels of the Elkhorn and its tributaries found wide support among residents, engineers found that implementing such improvements basinwide would be economically infeasible. In making that decision, the corps relied upon estimates of past and future flood damages on the Elkhorn and its tributaries. Estimates of past

annual damages by multiples. The corps predicted an increase in the severity of flood damage through an increase in the frequency and magnitude of flooding, an increase in floodplain development and the attendant higher potential for damage, or a combination thereof. The figures show that much of the Elkhorn's flood prone-segment—from Neligh to the mouth—was rural, making basinwide improvement inefficient. Furthermore, the corps speculated that flood-proofing such regions would not encourage enough development of those areas to merit the expense of protecting them. Although the rural areas held rich agricultural land and would incur high future flood damages, the corps deemed flood damages in those stretches too diffuse to justify the cost of basinwide flood control measures. But near towns and cities, flood control measures would provide the most concentrated benefits for the least expense.²⁹

Addressing the proposed plans purely in terms of flood control, the comprehensive plans seemed to offer the best approach to minimizing flood damages along the Elkhorn. The logistics of drainage, runoff, and flooding within a river basin system would indicate that a piecemeal approach would fail or create problems in some areas as they are solved in others. The history of the Elkhorn's drainage districts confirms that. Successful reduction of flood damages along Logan Creek came from modifying nearly the entire length of the creek and maintaining the improvements over time. In areas where only portions of streams were modified or where modifications were allowed to deteriorate, such as those along Rawhide Creek, results were less successful. Also, the demise of some drainage districts in a quagmire of litigation showed that saving one location from flooding often meant harming another with increased runoff.

Furthermore, flood studies show that a stream's floodplain should be treated as a complete unit. Engineers now operate under the assumption that building within the floodplain increases flooding. Visualizing the floodplain as a paper cup aids in understanding this concept. Under normal conditions the river flows

within its banks, or the analogous paper cup is about half full of water. When the river floods, it fills its floodplain, going to the top of its natural channel, or the paper cup fills to the rim. But building in the floodplain displaces the river's normal flow, forcing floodwater out of the floodplain. Using the paper cup analogy, building in the flood plain has the same effect as if a person holding the cup squeezed it, thus forcing excess water to spill over the sides.³⁰ That analogy illustrates the virtue of comprehensively isolating a river's floodplain, the true limits of the stream's channel, for the purposes of flood control.

Environmentally speaking, treating the entire floodplain as a unit also makes sense. As the preceding discussion shows, encroachment into a stream's floodplain forces flood flows higher than they would normally reach. Thus, humans not only subjected their structures in the flood plain to water damage but also extended damage to structures that otherwise would have been beyond the natural floodplain. Aside from vacating the floodplain, which would appear to be out of the question given the amount of time and money invested in it, limiting human intrusion and giving the river its berth is a reasonable course.

But politics and economics complicated the world into which the corps' recommendations came. People had already intruded into the floodplain and for nearly a century had become ever more firmly entrenched and committed to remaining on the floodplain. To implement the comprehensive plans would require cooperation from a myriad of local governments to gain rights-of-way and, in the cases of Plans C and D, uprooting two towns in toto. Implementation would also require allocating exorbitant sums of money for comparatively insignificant returns. The total cost of constructing Plan A would be \$34,366,500; of Plan B, \$29,198,800; of Plan C, \$76,138,900; of Plan D, \$84,478,200. Once constructed, the economic benefits of these projects would be exceeded by their maintenance costs.³¹

Given the complications associated with the comprehensive plans, local protection projects became the most economically and

politically attractive avenue to minimize flood damage. These projects were comparatively inexpensive and, in most cases, provided estimated annual flood control benefits greater than their annual maintenance costs. Most important, these projects concentrated on small areas and protected concentrations of wealth and people—municipalities.³²

In some cases, the local protection approach made cooperation easy to obtain when the corps presented its recommendations to basin residents at Fremont and Norfolk in November 1946 and in subsequent meetings with local officials. Various city and county councils endorsed most of the local plans, which meant committing to provide land, rights-of-way, and easements at no cost to the federal government, releasing the federal government from liability stemming from damages due to the construction work, agreeing to make necessary alterations to highways and bridges affected by the projects, and agreeing to maintain the projects after their completion.³³

Yet in other cases, the decision by local governments not to participate in the recommended project indicated that more than economics was involved. For example, the projects recommended for Buffalo Creek, Scribner, Hooper, and Winslow offered some of the most favorable cost-benefit ratios. The village board of Meadow Grove rejected the Buffalo Creek project because it could not obtain waivers from landowners along the creek who believed they might be injured if the project were completed. The reluctance of Meadow Grove's citizens to agree to the plan might come from their opinion that their flood troubles stemmed from highway and railroad embankments interfering with Buffalo Creek's drainage. At the Norfolk flood damage hearing, Meadow Grove's mayor, Leonard Sanne, asked for a ditch to be cut through the embankments to allow water to drain on its natural course. With an apparently simple solution at hand, people in Meadow Grove likely thought the corps' proposal too elaborate. Scribner's city council simply felt its project was undesirable. Hooper's village board rejected the project slated for its jurisdiction because it feared high maintenance

costs and legal tangles that might result from the project's construction. Winslow sent the issue to its citizens, who rejected it because of its expense and the feeling that the project was unnecessary.³⁴

Curbing flood damage in a piecemeal fashion through local protection projects is less desirable for the environment than a comprehensive approach. It treats the floodplain neither as a unit nor a natural part of the river. This approach is inconsistent because it protects some areas of greater human wealth, yet leaves open to further injury areas of lesser human wealth. For the same reasons, it does not bode well for the natural mechanisms of the river and riparian lands and systems because water is artificially channeled in some places and not in others. Norfolk's city engineer, H. H. Tracy, put it nicely when he testified at Norfolk that "in channel straightening there is no place in any one locality to commence work or to stop, as the entire river is a series of convolutions across county after county."³⁵

While economically and politically expedient, the local solutions epitomized the environmentally unsound, shortsighted use of technology condemned by historian Donald Worster. In his book *Dust Bowl: The Southern Plains in the 1930s*, Worster criticized inappropriately applied agricultural technology for exacerbating the Plains' natural drought cycle during the 1930s to create the Dust Bowl. The "ecological insensitivity of our culture," as Worster put it, was also at work in the development of the Elkhorn Basin. To make matters worse, cultural insensitivity to the environment, at work from the beginning, may have been heightened by the involvement of the federal bureaucracies, which Worster describes as "innately anti-ecological" because they were "too insulated from the results of their actions to learn, to adjust, to harmonize."³⁶

In his recent study of California's rivers and how they have been changed by human activity, with a focus on flood control projects, Jeffrey F. Mount³⁷ echoes these conclusions. During the same era the Elkhorn underwent piecemeal flood control modifications, a num-

ber of California rivers experienced similar treatments resulting from social and political processes very like those that occurred in Nebraska. This reflected the fact that although the Corps of Engineers has often stated a desire to develop basin-based solutions to flood control and other river modifications, it has instead often pursued piecemeal approaches. Mount found that piecemeal approaches in California provided short-term local solutions, but created long-term basin-wide problems, including long-term costs that could have been avoided by adopting a basin based plan. He suggests that basin based solutions also adopt what might be termed gentler approaches. For instance, levees might be built farther from the river channel than has been the case so the river might continue to develop its natural equilibrium with the landscape. In the long run, he concludes, working with a river's natural processes this way reduces impact on the watershed and flood-related costs.

Of the twelve local protection projects recommended by the corps, only six, those at Norfolk, Pierce, Giles Creek, Battle Creek, West Point, and Waterloo, met the dual criteria of cost-effectiveness and local support that would lead the corps to recommend to Congress that it assist residents in curbing floods and flood damage in the Elkhorn Basin, which the corps did in submitting its findings to the House of Representatives. Of these six projects, all or portions of five were eventually built. Construction began on the Norfolk project in May 1966 and was completed in December 1968, the Pierce project was under construction from September 1963 to May 1964, West Point from June 1963 to June 1964, and Waterloo from May 1966 to April 1967. The levees proposed for the Battle Creek project were abandoned in favor of 800 feet of riprap, completed in March 1973 along both banks of the creek to protect the embankments for the bridge on State Route 121. The federal government abandoned the Giles Creek project in November 1977. All or portions of two other local protection projects designed by the corps, but not recommended for construction, were later built: channel modifications to Buffalo

Creek at Meadow Grove were completed in May 1973, and a levee around most of Hooper was finished in November 1966. Other corps projects in the basin include a stone embankment to protect a bridge abutment on the Elkhorn River near Norfolk (completed May 1973), channel enlargements to Union and Taylor Creeks near Madison (completed May 1966), levees along Middle Fork Maple Creek near Clarkson (completed but date not available), a bank stabilization project on Logan Creek near Bancroft (completed February 1972), and a 120-foot riprap on the Elkhorn's right bank to protect the Q Street bridge abutment near Gretna (completed in February 1972).³⁸

The most comprehensive, intensively researched response to flooding in the basin's history, then, did not attempt to dominate the river. Rather, it limited action to defending areas of concentrated capital where local interests would support the response. In light of the benefits of a comprehensive and coordinated flood control plan, the hit-and-miss democratic application of the corps' recommendations makes the response seem haphazard. Responses applied according to economic and political expedience limited manipulation of riparian lands but failed to treat the floodplain as a whole. In the short run, that may have been the best result for the river system and may have inadvertently prevented further bureaucratic ecological insensitivity of the type Worster criticized. In the long run, it left the floodplain open to uncoordinated development inconsistent with the floodplain and vulnerable to the cultural insensitivity about which Worster wrote. It would be years before government agencies would adopt a comprehensive approach to floodplain planning.³⁹ Until that happened, the people got what they asked for. Whether the basin got what it needed remains to be seen.

NOTES

1. For a survey of Elkhorn flood history and efforts to control the river through 1940, see Todd M. Kerstetter, "Up the River: Flooding and Human Response in Nebraska's Elkhorn River Basin,

Through the Floods of 1944" (master's thesis, University of Nebraska, 1992), and Todd M. Kerstetter, "Flooding in the Elkhorn Basin, 1823-1940," *Nebraska History* 76 (winter 1995): 176-87.

2. US House of Representatives, *Platte River, Colo., Wyo., and Nebr.*, 73d Cong., 2d sess., 1934, H. Doc. 197, serial 9826, pp. 359-62.

3. US House of Representatives, *Elkhorn River and Tributaries, Nebraska*, 81st Cong., 1st sess., 1949, H. Doc. 215, serial 11324, p. 15; US Army Corps of Engineers, Omaha District, *Supplement to Detailed Project Report: Flood Protection Project, Pebble Creek and Elkhorn River at Scribner, Nebraska* (Omaha: US Army Corps of Engineers, 1991), p. 5; US Engineer Office, *Interim Report on Flood Control for the City of Norfolk, Elkhorn River Basin, Nebraska* (Omaha: US Engineer Office, 1946), p. 15; "Creek Near City Helped Cause Flood," *Norfolk (Nebr.) Daily News*, 16 May 1944; "Elkhorn Valley Hit by Floods, Norfolk Stores Suffer Damage," *Neligh (Nebr.) Leader*, 17 May 1944.

4. "Flood Leaves 300 to 400 Homeless," *Norfolk Daily News*, 13 May 1944.

5. US Engineer, *Flood Control for Norfolk* (note 3 above), p. 15.

6. "Warnings Are Issued about Water, Food," *Norfolk Daily News*, 15 May 1944; "City Is Making Rapid Strides Toward Recovery," *ibid.*, 15 May 1944.

7. "Flood Waters Damage Much Farm Property," *Stanton (Nebr.) Register*, 18 May 1944; "Flood Waters Do Not Reach 1940 Level at West Point," *Norfolk Daily News*, 15 May 1944; "Flood Waters May Next Hit at Arlington," *ibid.*; "Flood Damages West Part of Town," *West Point (Nebr.) Republican*, 18 May 1944.

8. US House, *Elkhorn River and Tributaries* (note 3 above), p. 15; US Army Corps of Engineers, Omaha District, *Flood Protection Project: Pebble Creek and Elkhorn River at Scribner, Nebraska; Supplement to Detailed Project Report* (Omaha: US Army Corps of Engineers, 1991), p. 5.

9. *Ibid.*, pp. 15, 20-21; "Elkhorn, Tributaries Hit Area with 'Worst Flood' in History," *Fremont (Nebr.) Guide and Tribune*, 12 June 1944; "Scribner, Howells and Hooper Badly Flooded," *Norfolk Daily News*, 12 June 1944; "Damage Placed at Millions of Dollars," *ibid.*, 12 June 1944.

10. "Flood Inundates 92,480 Acres, Damages 750 Homes in County," *Fremont Guide and Tribune*, 17 June 1944; "Seek Outside Aid for Flood Cleanup," *ibid.*, 24 June 1944; "Red Cross Will Give Financial Help to Needy," *ibid.*, 15 June 1944; "Hooper Could Use Volunteer Workers to Remove Debris," *ibid.*, 18 June 1944.

11. "Seed Corn Beetles Form New Threat to County Crop," *ibid.*, 24 June 1944.

12. "Elkhorn . . . 'Worst Flood' in History," *ibid.*, 12 June 1944; "Scribner . . . Flooded," *Norfolk Daily*

News, 12 June 1944; "Rebuilding of Oakdale Line to Begin Soon," *ibid.*, 9 September 1944.

13. "Wisner Farmer, Flooded Out, Kills Himself," *Fremont Guide and Tribune*, 14 June 1944.

14. "Guard Mustered Out Following Week of Duty in Flood Area," *ibid.*, 17 June 1944; "Dike Repair Work on Northfork Is Ordered," *Norfolk Daily News*, 20 May 1944; "Red Cross Opens Rehabilitation Headquarters," *ibid.*, 15 May 1944; "800 Typhoid Shots Have Been Given," *ibid.*; "Red Cross Helps More People Here in Past Week Than Ever in History," *ibid.*, 22 May 1944; "Scribner... Flooded," *ibid.*, 12 June 1944; "Elkhorn... 'Worst Flood' in History," *Fremont Guide and Tribune*, 12 June 1944; "Maple Creek Takes Heavy Property Toll," *ibid.*, 13 June 1944; "Residents Estimate Scribner Cleanup Will Take Weeks," *ibid.*, 18 June 1944; "Hooper... Hit by... Flood Waters," *Hooper (Nebr.) Sentinel*, 15 June 1944; "Special Flood Notice," *ibid.*, 22 June 1944.

15. Cuming County, Nebraska, Board of Supervisors, *County Board Proceedings*, 10 August 1944, 8:276-7; "Gross Says Corn Up, Not Covered with Mud, May Live if Drained Quickly," *Fremont Guide and Tribune*, 14 June 1944; US Army Corps of Engineers, Omaha District, *Review Report on Improvement for Flood Control and Allied Purposes, Elkhorn River and Its Tributaries, Nebraska* (Omaha: War Department, 1947), p. 98.

16. US House, *Platte River* (note 2 above), pp. 359-62; Marian E. Ridgeway, *The Missouri Basin's Pick-Sloan Plan: A Case Study in Congressional Policy Determination*, Illinois Studies in the Social Sciences, vol. 35 (Urbana: University of Illinois Press, 1955), p. 35; *Flood Control Act of 1936*, US Code, vol. 49, p. 1, secs. 1-3, pp. 1570-71 (1936).

17. Ridgeway, *ibid.*, pp. 3-16; Michael L. Lawson, *Dammed Indians: The Pick-Sloan Plan and the Missouri River Sioux, 1944-1980* (Norman: University of Oklahoma Press, 1982), pp. 11-15.

18. US House, *Elkhorn River and Tributaries* (note 3 above), p. 2; Corps of Engineers, *Review Report* (note 15 above), p. 22; "Freeman Is Told of Flood Damage," *Fremont (Nebr.) Guide and Tribune*, 30 August 1944.

19. "Meeting is Held Flood Problems," *Hooper Sentinel*, 29 June 1944.

20. Corps of Engineers, *Review Report* (note 15 above), pp. 28, 32, 35-36.

21. *ibid.*, p. 280; "Freeman... Told of... Damage," *Fremont Guide and Tribune*, 30 August 1944.

22. "Sponging Up the Elkhorn," *ibid.*, 1 September 1944.

23. "No Funds Available for Elkhorn Work," *West Point Republican*, 13 July 1944.

24. US House, *Elkhorn River and Tributaries* (note 3 above), pp. 34, 54-55.

25. Corps of Engineers, *Review Report* (note 15 above), pp. 58, 68, 71-73.

26. US House, *Elkhorn River and Tributaries* (note 3 above), pp. 48-54; Corps of Engineers, *ibid.*, p. 59.

27. Corps of Engineers, *ibid.*, p. 62.

28. *Ibid.*, pp. 63-64, 66.

29. US House, *Elkhorn River and Tributaries* (note 3 above), pp. 74, 98, 101, 104.

30. Brian P. Dunnigan, Head, Flood Plain Management, Nebraska Natural Resources Commission, interview with the author, Lincoln, Nebr., 11 February 1992.

31. Corps of Engineers, *Review Report* (note 15 above), pp. 67, 69, 71, 73, 99-100. According to the *Review Report*, the costs and benefits of the comprehensive plans for flood control on the Elkhorn River are as follows:

Plan	Cost (\$)	Annual charges (\$)	Annual benefits (\$)	Cost-benefit ratio
A	34,366,500	1,541,066	710,660	1:0.46
B	29,198,800	1,300,726	561,450	1:0.43
C	76,138,900	3,327,912	697,760	1:0.21
D	84,478,200	3,740,946	923,310	1:0.25

32. For cost-benefit ratios, see Corps of Engineers, *Review Report* (note 15 above), pp. 101-2.

33. US House, *Elkhorn River and Tributaries* (note 3 above), pp. 59-60, 67.

34. *Ibid.*, pp. 59-60; Corps of Engineers, *Review Report* (note 15 above), p. 136.

35. Corps of Engineers, *ibid.*, p. 149.

36. Donald Worster, *Dust Bowl: The Southern Plains in the 1930s* (New York: Oxford University Press, 1979), p. 4; Donald Worster, *Rivers of Empire: Water, Aridity, and the Growth of the American West* (New York: Pantheon Books, 1985), p. 332.

37. Mount, Jeffrey F. *California Rivers and Streams: The Conflict Between Fluvial Process and Land Use* (Berkeley: University of California Press, 1995), pp. 197, 309-310.

38. Corps of Engineers, *Review Report* (note 15 above), p. 101; Corps of Engineers, Omaha District, *Project Maps, Omaha District: Status of River and Harbor and Flood Control Projects* (Omaha: Corps of Engineers, 1983), pp. 71-72, 73-77, 80, 83-84, 86-87, 89.

39. Nebraska Natural Resources Commission, *Flood Plain Study: Elkhorn River*, vol. 1, *Cuming County, Nebraska* (Lincoln: Nebraska Natural Resources Commission, 1987), p. 1. The 1983 Nebraska Flood Plain Management Act directed the Nebraska Natural Resources Commission to make maps to develop or support floodplain regulation by local governments.