EMERGENCY WETLAND RESERVE PROGRAM: SUCCESSES AND FRUSTRATIONS

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Introduction

The Soil Conservation Service (SCS) is currently involved in implementing a new approach to addressing the recovery from a major flood disaster. This approach, the Emergency Wetland Reserve Program (EWRP), is a voluntary program that gives landowners an option to restoring their damaged cropland and levee systems by offering to pay them to set the land aside for restoration as a wetland. Congress authorized and instructed the U.S. Department of Agriculture (USDA) to use some of the $60 million in emergency funds they provided the agency to implement this process in August 1993 under the Emergency Supplemental Appropriations for Relief from the Major, Widespread Flooding in the Midwest Act of 1993, P.L. No. 103-75, 107 Stat. 739 (1993). The first EWRP signup resulted in an expenditure of over $17 million for 25,000 acres. A second signup began April 1, 1994, and will continue until December 30, 1994. Funding for this second signup comes from the $340 million in emergency funds authorized by Congress in February 1994, to further address disaster recovery, including the protection of floodplain storage/wetland restoration in the Midwest, under the Emergency Supplemental Appropriations, P.L. No. 103-211, 108 Stat. 3 (1994). The actual amount spent from this second allocation for EWRP will depend on the interest in this latest signup and whether USDA implements an environmental easement program.

Partnerships/Cooperation

The program has been most successful in locations where many different interest groups and landowners have worked together to implement the program. The Louisa 8 Levee District in Iowa and the Frost Island Levee District near St. Francisville, Missouri, are two examples in which multiple landowners needed to have their concerns addressed before EWRP could be implemented. This meant recognizing the overall need of the group and applying the program to address the entire impacted area, not just each individual landowner. Those portions of the area that could meet the requirements of the program were offered the opportunity to join the program. In Missouri, over 75% of the land enrolled in EWRP from the first signup involved working with a group of landowners so that the levees did not have to be rebuilt. When the

SCS program could not meet all of the concerns of the local landowners, other interest groups including the Fish and Wildlife Service (FWS), local state agencies, and various special interest groups, worked with SCS and the landowners to ensure implementation of EWRP. Everyone worked toward a situation where the levees would not be replaced and as much of the land as possible would be restored to a wetland/flood water storage area. At least 10 such group implementations are included in the applications selected from the first signup.

Eligibility and Priority Criteria

The interim rule for the EWRP was published in the *Federal Register* November 29, 1993 (U.S. Department of Agriculture, 1993). This rule included a listing of items to be considered in determining the eligibility of a particular site and what the individual states were to include when establishing a priority ranking process. Some of the items included in the eligibility discussion were:

- The land had to have been flooded during the Midwest floods of 1993.
- The fair market value of the restored land must be less than the cost of restoring the land and repairing levees/channels.
- The land must have historically been a wetland and likely to have its wetland value restored with minimal costs.
- The land must have been cropped in at least one of the five previous crop years.

Items identified to be in the priority-setting process were:

- Floodway expansion.
- Protection and enhancement of habitat for migratory birds and wildlife and contribution to the recovery of threatened and endangered species.
- Proximity to other protected wetlands.
- Level of wetland hydrologic conditions that could potentially be restored.
- Wetland functions and values.

- Likelihood of successful wetland restoration.
- Cost of restoration and easement purchases.

Impact to Date

The first EWRP signup closed December 30, 1993, with 498 applications received for consideration. The applications covered approximately 43,600 acres of land impacted by the flood. Early evaluations determined that almost 80% of the applications met the minimum requirements of the program. The FWS and SCS personnel evaluated each site to determine eligibility, define the area that could be included in the easement offer, and determine the characteristics of the site that impacted the priority assigned to the site. These data were reviewed at the SCS state offices and a priority was assigned each application. Once the distribution of funds was known, each state offered the program to the highest priority sites and others were notified that their application could not be covered with the initial $17 million allocated for EWRP. About 250 applications were selected from the first signup, covering about 25,000 acres. More than 12,000 acres of the 25,000 acres was land that previously was protected by levees and now the levees will not be rebuilt. In other places, through the use of this program landowners have reconstructed the levees, but farther from the river than they were before the flood.

Congress passed a second emergency funding bill in February 1994 (P.L. 103-211), that included over $340 million for the SCS to use in addressing disasters across the United States. The intent of SCS is to ensure that as many of these funds as possible are made available for EWRP or a similar program to offer the landowner the option of returning the damaged cropland to its natural state, usually a wetland, instead of intensive crop production. The EWRP program requires that the land enrolled in the program be restored to a wetland. Many of the areas of severe damage in Missouri and some of the areas in Iowa and Illinois had too much sand deposited to meet the wetland restoration requirement. Therefore, we are currently working within the USDA to see if we can develop an environmental easement program that is acceptable to multiple interest groups as well as landowners.

Definitions/Restraints

The implementation of this program has been an educational process for both our own agency personnel and our partners. We are still defining and documenting the program's expectations and the meaning of different terms. P.L. 103-75, passed August 12, 1993, authorized the use of emergency supplemental appropriations for EWRP with the following wording:

> . . . Provided further, that if the Secretary determines that the cost of land and levee restoration exceeds the fair market value of an affected cropland, the Secretary may use sufficient amounts from the funds provided under this head to accept bids from willing sellers to enroll such cropland inundated by the Midwest floods of 1993 in any of the affected States in the Wetlands Reserve Program as authorized by subchapter C of chapter 1 of subtitle D of title XII of the Food Security Act of 1985. . . .

P.L. 103-211, covering emergency supplemental appropriations, passed February 12, 1994, included almost the exact same wording.

Many questions have surfaced as USDA/SCS addresses the implementation of this new program.

- Which agency in the USDA is to implement it? The Emergency Watershed Protection Program, named in the appropriations bill, is managed by the SCS, while the Wetlands Reserve Program (WRP) is directed by the Agricultural Stabilization and Conservation Service (ASCS). Discussions at the USDA occurred for over 60 days on this issue and finally in October 1993, it was decided that SCS would be the one to develop the rules and manage the Emergency Wetland Reserve Program.

- What exactly is meant by the term fair market value? Is that the value of the land as it exists the day after the flood, as it existed the day before the flood, or the value it will have when it is restored by the landowners using both their own funds and government assistance? This term applies to two phases of the program as it is being implemented. The first is to decide if the land is eligible for consideration for enrollment in the program and the second is to help determine what a fair easement value is for the land.

- Should the program be implemented by having the landowners submit bids for inclusion of their land or should some type of fair easement value be established for the different areas in the state and the landowners offered that value if they enroll? It was decided that the fastest way to implement would be through the easement offer format (U.S. Department of Agriculture, 1994). Therefore, when landowners express interest in the program, they know the value they will receive for granting a perpetual easement on their land. This greatly speeded up the acceptance/planning process when compared to the bid process

used in the pilot Wetland Reserve Program implementation in 1992-1993.

- Was it the intent of Congress that only those lands that could be restored to wetland conditions be included in the program? By using the term Wetland Reserve Program in the bill, the SCS/ASCS/FWS have attached to EWRP almost all of the rules/restrictions in the Wetland Reserve Program. Therefore, many of the areas that were covered with sand during the flood are not eligible to be enrolled in the program. In these cases, the farmer only has two options: accept the fact that land is useless and will never provide income, or spend a lot of funds to recover the land and rebuild the levees. It is hoped that we can address these areas by implementing some kind of environmental reserve program that will allow the landowner an option to restore the cropland and rebuild the damaged levees and channels.

- Should this land be kept in private ownership, or should the SCS work with other partners to use funds from the emergency appropriations to help purchase the land with a federal or state agency taking over ownership and management of the land? Here the SCS has determined that since Congress referred to the Wetland Reserve Program in the emergency funding bill, USDA/SCS was to implement EWRP using easements, perpetual if possible. The current owner will still have limited use of the land and can control access it.

- How detailed an evaluation is needed to determine the reclamation costs of the cropland and levees to ensure that the reclamation costs do exceed the fair market value? This is one of the first criteria the application must meet before the site can be considered for EWRP. This question has caused concern because not every impacted state calculated the costs using identical procedures. As discussed earlier, it took USDA about 60 days to decide who would implement and an additional 45 days to publish the guidelines and rules. During this time, all SCS offices were being pressured by landowners as to whether their land was or was not eligible for consideration for EWRP. When the interim rule was published, the signup began almost immediately and SCS offices used the best procedure available to determine eligibility.

Conclusions

This program is in its infancy and appears to do a good job of addressing many issues. In the long term, it will save the expenditure of future disaster funds by removing the land from intensive crop production. In the short

term, it provides the landowner an option to commit considerable capital and time to recover the cropland or enroll in LWRP. All of the land enrolled in EWRP will provide long-term floodplain storage and other environmental benefits associated with the riverine wetland landscape.

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NEW DEVELOPMENT IN DEEP FLOODPLAINS IS BAD PUBLIC POLICY: THE NATOMAS BASIN EXAMPLE[1]

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The Public Policy Issue

The flood protection programs of the U.S. Army Corps of Engineers (Corps) and the National Flood Insurance Program (NFIP), administered by the Federal Emergency Management Agency (FEMA), work together to *increase* the number of people and buildings at risk of catastrophic flooding. This increased risk is caused by encouraging more people to live and more buildings to be constructed in deep floodplains, such as Natomas Basin. This result is caused by the Corps building flood control structures, like levees and dams, creating a false sense of safety. Once a floodplain is considered "protected" from the 100-year flood by such structures, then urban development can proceed without any NFIP restrictions.

The NFIP compounds this false sense of safety by making flood insurance available to people who move into the "protected" floodplain, but not requiring flood insurance. The NFIP encourages floodplain development by offering the federal government's "seal of approval" that floodplains are safe for development. This paper argues that to knowingly encourage floodplain development that increases the risk to public health and safety is bad public policy.

The Physical Location

Formed by the confluence of the Sacramento River and American River, the Sacramento floodplain contains 116,000 acres (181 square miles). A portion of this floodplain, known as Natomas Basin, was formed by constructing over 41 miles of levees. This 55,000-acre human-made basin was created in 1914 to "reclaim" wetlands and floodplain lands for agriculture. Water marks its boundaries. Some 20.6 miles of canals plus another 20.6 miles of the Sacramento and American Rivers encircle the Basin. Approximately 7,300 acres

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[1]This is a summary of a 20-page public policy issue paper. If you want the complete paper, please write the author at 4135 Eagles Nest, Auburn, CA 95603, or call (916) 889-9025, or fax: 916-823-5844.

(13%) of the land is in urban use and the remaining 47,600 acres (87%) is agricultural and vacant land available for development (U.S. Army Corps of Engineers, 1991). Flood depths range from 8 to 23 feet.

Increasing the Risk to Public Health and Safety

Natomas Basin was considered "protected" from the 100-year flood by 41 miles of encircling levees. Like elsewhere in America, urban development was proposed to replace farming in Sacramento's floodplain. When officials of Sacramento City and Sacramento County decided to approve urban development, it made sense at the time. Natomas Basin is flat land and a 15-to-30-minute drive to downtown Sacramento. Since the level of flood protection met the minimum federal standards, urban development proceeded.

In February 1986, record-breaking rainfall in Northern California caused the Sacramento and American rivers to reach new record high flows. The Natomas Basin levees held, but weaknesses were found. Urban development stopped because the FEMA 100-year flood control standard was no longer met. Once that standard is restored, urban development can continue on the vacant and agricultural land totaling 47,600 acres (74 square miles) in Natomas Basin—an area *larger* than the District of Columbia (69 square miles).

What are the possible consequences from further urban development in Natomas Basin? In its report on Sacramento flood hazards, the Corps of Engineers identified the flaw in all the flood control alternatives examined for protecting Sacramento: *All flood control alternatives increase the risk to public health and safety. Why? More people and buildings will be exposed to flooding due to further urban development* (U.S. Army Corps of Engineers, 1991).

Proposed urban development plans by local governments would add over 170,000 people and over $13 billion of new buildings and their contents in Natomas Basin. What magnitude of human and economic disaster will befall the Sacramento area when a flood inundates a fully urbanized Natomas Basin? To answer this question let's compare the Great Midwest Flood of 1993 to a future flood in Natomas Basin with 200,000 people living in 93,000 homes and over $15 billion worth of structures and contents. Table 1 shows the comparison.

The comparison is striking. In the Midwest, the flood damage and destruction of $12 to $15 billion was spread over 31,250 square miles beside rivers stretching hundreds of miles. In Natomas Basin, the estimated destruction of $8 to $10 billion is concentrated in 86 square miles. Crop damage is half of the Midwest damages because flooding occurred during the growing and planting season. Property damage is the entire source of damages in Natomas Basin. Twice as many homes would be damaged in Natomas Basin (93,000) as in the

***Table 1.** Comparing the Great Midwest Flood of 1993 to a future flood of an urbanized Natomas Basin.*

	Great Midwest Flood of 1993*	Future Flood Urbanized Natomas Basin
Deaths	48	20 to 900
People Evacuated	100,000	200,000
Homes Damaged	45,000	93,000
Total Damages	$12 to $15 billion	$8 to $10 billion
Property Damage	$6 to $7 billion	$8 to $10 billion
Crop Damage	$6 to $8 billion	0
Square Miles Flooded	31,250	86

* (*Sacramento Bee*, 1993) Actual and estimated as of Friday, August 6, 1993.

Midwest (45,000 as of August 6). The potential for loss of life is dramatic: 20 to 900 people for Natomas Basin (Sacramento Department of Planning and Development, 1993). Why would we knowingly create a catastrophe?

Severity of Flood Destruction

Why does flooding in Natomas Basin cause so much destruction? Described as a bathtub without a drain, the physical features of Natomas Basin cause deep flooding of long duration. These features are:

- River and canal levels are higher than the ground level inside Natomas Basin, during flood events.
- Rivers and canals surround Natomas Basin.
- Levees surround Natomas Basin on all sides.
- Levees are 15 to 20 feet higher than the inside land area (forming the bathtub walls).
- Natomas Basin has no drain.

These physical features result in:

- Flood waters filling Natomas Basin whenever levees fail.
- Flood duration of 30 days.
- Flood depths of 8 to 23 feet (U.S. Army Corps of Engineers, 1991).

Together, flood depth and duration have a significant impact on property damage in Natomas Basin. The Corps estimated over 31,000 people and 13,730 structures called Natomas Basin home in 1990. The value of the structures and contents estimated at $2.4 billion would suffer flood damage estimated at $1.6 billion, which is over 67% of the market value. The Corps also estimated damages to all types of buildings and contents would reach 100% where flood depths exceed 13 feet (U.S. Army Corps of Engineers, 1991). For single-story residential buildings, flood depths of 8 feet cause 100% damage to the structure and contents (Sacramento Department of Planning and Development, 1993). A total of 91% of the land area (or 50,000 acres) could flood to depths exceeding 8 feet. Approximately 59% of Natomas Basin's land area (or 32,450 acres) could flood to depths exceeding 13 feet and 32% (or 17,600 acres) could flood to depths of 8 to 13 feet. Even if a higher level of flood control is provided, the depth and duration of flooding in Natomas Basin is the same. Severity of flooding is the same no matter the frequency, or probability, of flood (U.S. Army Corps of Engineers, 1991).

Accountability for Development Consequences

Who will be held accountable for the consequences of further urban development in Natomas Basin? In the minds of land speculators, developers, and the local government officials of Sacramento City, Sacramento County, and Sutter County, further urban development is the "manifest destiny" of Natomas Basin.

After 100-year flood protection is restored to Natomas Basin, FEMA through the NFIP will give its "seal of approval." Development will continue. To local promoters and decisionmakers, this means the flood risk has been determined by FEMA to be acceptable to the federal government. FEMA's acceptance allows the flood risk caused by approving further development to be shifted from land speculators, developers, and local government officials to federal taxpayers. The land speculators and developers make their $5 to $10 billion of profits and leave the disaster cleanup bills for federal taxpayers to pay.

The accountability for decisions will only occur when institutions and individuals making decisions are held accountable for the resulting consequences. Without such ultimate accountability for their actions, land speculators

and developers will pressure and encourage local government officials to allow further development in Natomas Basin. Continuing to shift the accountability for development consequences to the federal government, and ultimately federal taxpayers, is bad public policy.

Correcting the Problem

How can the accountability for local land use decisions be left with the decisionmakers? The answer is found in the Coastal Barrier Resources Act (COBRA) enacted in 1982. COBRA prohibits new development in designated coastal barrier areas from receiving flood insurance and other federal financial assistance. By removing the federal encouragement to development (i.e., flood insurance, disaster assistance, and loans), land speculators, developers, and local government officials are held totally accountable for the consequences of their land use decisions. Development is still allowed in the floodplain, but the federal government does not provide financial assistance nor does it provide flood insurance (Federal Emergency Management Agency, 1989). All the risks and profits remain with those land speculators, developers, and local government officials who are willing to invest their money in floodplain development. The buck stops at the local level, where it belongs.

Conclusion

The basic public policy issue is whether or not the federal government should increase the risk to public health and safety by encouraging additional urban development in deep floodplains, such as Natomas Basin. The arguments against encouraging further development are based upon these values:

- Government should reduce risk and protect the public health and safety, not increase such risks.

- Government should spend limited tax dollars protecting public health and safety, not waste it on projects increasing the risk to people and property.

- Predicting and controlling the forces of nature are subject to unacceptable error and mistake, not an activity government should depend upon for protecting public health and safety.

- The accountability for the consequences resulting from decisions should remain with the decisionmakers responsible, not transferred to others.

- Each generation should evaluate the short- and long-term impacts of its actions, not create deficits and billion-dollar blank checks payable by future generations for future flood disasters.

- Tax dollars should benefit the larger public good, not produce windfall profits for a few land speculators and developers.

Urban development in Natomas Basin is a prime example of federal policy gone wrong. Encouraging further urban development in deep floodplains is bad public policy. The Great Midwest Flood of 1993 shows the folly of continuing business as usual. Saying, "it has always been done this way" is no excuse for continuing the practice. Now is the time to make fundamental changes.

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FOREST PRACTICES AND THEIR EFFECTS ON FLOODPLAIN ANALYSIS

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Introduction

Unlike many other papers of this kind, I will not try to point out the affects that forestation, or more properly, deforestation has on rainfall/runoff. The main purpose of this paper is to state a preliminary policy of the Federal Emergency Management Agency (FEMA) when we are approached by client groups that wish to study the effects of deforestation practices on rainfall/runoff.

From time to time, questions are raised at local community meetings regarding the effects of logging practices in basins. A variety of questions arise with respect to water quality, sedimentation, and water quantity. Generally, local constituents cannot believe the 100-year designation on our maps and tend to look for reasonable ideas for the floodplains being so wide and the elevations being so high.

Discussion

In the Northwest, logging has especially come under increased scrutiny. It is easy to see large areas of watersheds denuded, and subsequently conclude that this is the reason for higher flows and, therefore, increased floodplain widths.

In early 1993, King County, Washington, initiated a flood study on the Raging River near the Snoqualmie-Fall City area of the county. King County totally funded this study, and its purpose was to identify flood hazards in an area that is currently identified as an Approximate A zone. The limits of the study extended from the confluence of the Snoqualmie River to the downstream detail limits of an existing Flood Insurance Study, near Interstate 90, a distance of about 6.5 miles. Since the study was to tie into an existing detailed study area and was to be placed on a FEMA map as a revision, the study would need to be coordinated with our office.

During the initial stages of the county contract, the consultant for the county identified an interesting phenomenon in his hydrologic analysis. The statistical analysis of existing gage records reflected significantly higher discharges in the period from 1975 to the present than from the early gage records, from 1946 to the 1974. For the basin of the Raging River, coinciden-

tally, logging practices began in 1969, increased steadily and reached a steady deforestation rate in 1975 and have continued at that rate ever since.

The latter statistical analysis, the one from 1975 to the present, identifies 100-year flows 250% higher than the analysis for the first 29 years of record. Clearly, since the latter analysis 100-year flows were over 100% higher than the existing FEMA 100-year flows, we were very interested in the statistics.

King County is the premier community in the Northwest when it comes to sound floodplain management and innovative thinking that results in lower flood losses. Naturally, the county looked at the statistics and was alarmed with the higher flows. The reasoning behind their concern was simple. The was no expectation of changing the forestation practices, so would not the risk be more conservatively identified by using the later gage records, the higher flows? The county asked for a meeting with our office to discuss this issue.

Since one of the objectives of the study was to have our maps formally revised, the county had to have concurrence from our office on the final discharges. After deliberations among the county, the regional office of FEMA, and FEMA headquarters, the following is the essence of our preliminary policy regarding forest practices on gaged streams.

"The period of record (1969–1991 or 1975–1991) reflecting the current logging activities in the watershed, which is far shorter that the entire gage record, should not by itself be used to determine the 100-year discharge. Using a long, uninterrupted period of gage record to perform a statistical analysis is the most appropriate method of estimating the 100-year discharge. However, a basic requirement for this type of analysis is that conditions within the watershed during the period of gage are similar and that record data are consistent. Whether logging within the watershed would affect the discharge depends mainly on the amount and location of the logging activities.

"The entire gage record should be used to perform the statistical analysis to determine the 100-year discharge. However, adjustments will have to be made to the gage records of the before-logging period so that they are consistent with existing conditions of intensive logging activities. This can be done by first examining the gage records and several storm events to determine if the increase in discharges is indeed the result of logging in the watershed. If comparisons show that the amount of runoff is consistently higher for the selected storm events after logging than corresponding events before logging, this indicates that the increase in runoff is due to logging. The storm events selected should be comparable mainly in the amount of rainfall and antecedent moisture conditions. If such a comparison shows that the increase in runoff is a result of the increase in logging, then the effect of logging could be approximated by establishing a correlation between rainfall and peak flows during the before-logging and after-logging periods. After this correlation is established, the before-logging discharges can be multiplied by an adjustment

factor to make them consistent with the more recent records. However, we recommend that the U.S. Forest Service be consulted for determining adjustments to flow. After all necessary adjustments have been made, a Log-Pearson Type III (LP 3) analysis can be performed for the entire gage record to determine the 100-year discharge."

We prefer that the gage record be used in the statistical analysis to compute the 100-year discharge. However, if the county does not want to use the gage record, we suggest using either one of the following computer modeling techniques: A single-event computer model, such as the U.S. Army Corps of Engineers HEC-1, calibrated using events that took place after logging; or a continuous streamflow model calibrated using the after-logging period record. After the model parameters are calibrated, rainfall data can be used in the continuous simulation model to generate peak flows for the before-logging period. An LP 3 analysis then can be performed for the entire record, which includes the before-logging simulated flows and the after-logging recorded flows.

Since the gaging site at this particular stream is located some distance away from the study area, standard prorating techniques must be used to establish the correct discharge values.