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FLOOD PLAIN MANAGEMENT

EXECUTIVE SUMMARY

June 1978



## INTRODUCTION

The concept of flood plain management is based on the public policy that seeks the minimization of flood water damages. Some of Iowa's flood plains, which comprise about 8 percent of the total area of the state or about 2.7 million acres, are presently occupied by uses much more intensive than agriculture or open-space uses--industrial, commercial, transportation, and residential. These latter uses are not compatible with the goal of reducing flood damages. Recognizing that continued use for agricultural crop production (pasture, hay, and row crops) may be economically justified, the other uses more compatible with the goal of reducing flood damages are open spaces, woodlands, wildlife habitat, recreation, and sand and gravel quarry operations. Floods constitute an immeasurable threat to human life, particularly from flash floods occurring in small area watersheds. These problems make it imperative that Iowa continue to strengthen its flood plain management program.



## RESOURCE OVERVIEW

The Code of Iowa defines a flood plain as "the area adjoining the river or stream which has been or may be hereafter covered by flood water." In many valleys with steep side slopes, the flood plain may extend from bluff to bluff.

Flood plains, found in every county of the state, are located along more than 6,000 miles of interior streams, and over 600 miles of border streams.

### Flood Damages in Iowa

Iowa incurs an average of over \$43 million in flood damages each year. Table 6-1 shows the breakdown of average annual flood damages by hydrologic subarea. The Iowa-Cedar subarea suffers 35 percent of all total state damages and 36 percent of all non-agricultural damages. The Western Iowa subarea incurs 18 percent of the total damages and 24 percent of the non-agricultural damages.

These two areas combined sustain well over half the total non-agricultural damages in the state. Based strictly on the subarea percentages, they should carry a high priority in flood plain management programming.



Table 6-1

## Average Annual Flood Damages in Iowa

<u>River Basin</u>	<u>(1000 Acres)</u>	<u>Total Annual Damage Per Acre (\$)</u>	<u>Average Annual Flood Damages<sup>1</sup> (\$1000)</u>		
			<u>Crop &amp; Pasture</u>	<u>Other<sup>2</sup></u>	<u>Total</u>
Western Iowa	1,120	6.88	2,700	5,000	7,700
Southern Iowa	610	8.69	4,300	1,000	5,300
Des Moines	640	8.28	3,000	2,300	5,300
Skunk	330	12.42	2,500	1,600	4,100
Iowa-Cedar	740	19.73	6,500	8,100	14,600
Northeast Iowa	350	17.43	2,300	3,800	6,100
TOTAL	3,790	11.37	21,300	21,800	43,100

<sup>1</sup>Estimated 1977 price level by INRC.

<sup>2</sup>Includes other agricultural land, urban, transportation, and indirect floodwater damages.

Sources: Missouri River Comprehensive Framework Study and Upper Mississippi River Comprehensive Basin Study (Updated to 1977 prices).



Table 6-2 indicates cities in Iowa currently sustaining average annual damages of over \$500,000. West Des Moines, Davenport, and Marengo have structural projects proposed which should greatly reduce their annual damage rate, and construction is underway on a part of Sioux City's structural works that will give partial protection. Clinton and Waterloo, both of which exceed over \$1 million a year in average annual damages, were not included in the table because structural protection works are currently under construction that will substantially eliminate current flood damages.

Realistically, Iowa, with the completion of those projects under construction and currently proposed, has expended all its viable structural alternatives to flood damage reduction from major river flooding in its larger urban areas. Non-structural alternatives will be needed to substantially reduce flood damages in the future, particularly in flash-flood areas along smaller tributary streams.



Table 6-2

Average Annual Damages for Major Flood Prone  
 Cities in Iowa in Excess of \$500,000  
 by River Basins\*

River Basin

Western Iowa	
Council Bluffs . . . . .	\$1,590,000
Sioux City . . . . .	2,780,000
Southern Iowa	
None	
Des Moines	
Des Moines . . . . .	570,000
West Des Moines . . . . .	910,000
Skunk	
None	
Iowa-Cedar	
Cedar Rapids . . . . .	2,560,000
Iowa City . . . . .	500,000
Marengo . . . . .	1,610,000
Northeast	
Davenport . . . . .	990,000
Bettendorf . . . . .	690,000

\*Estimated 1977 price level by INRC.



## RESOURCE CONSIDERATIONS AND PROBLEMS

### Flood Plain Management in Iowa

There are flood plain management programs at both the federal and state levels. Federal efforts include: (1) the U.S. Department of Agriculture's watershed program for soil and water conservation and flood prevention, (2) the Corps of Engineer's flood control projects and other flood-related programs, (3) the U.S. Geological Survey's stream data collection program, (4) the National Flood Insurance Program administered by the Federal Insurance Administration, and (5) the disaster assistance program of the Federal Disaster Assistance Administration.

The state flood plain management program has been carried out primarily by the Iowa Natural Resources Council. The Council reviews proposals relating to flood control and water resources development by federal agencies. This includes coordination of flood plain information studies, usually conducted by the U.S. Army Corps of Engineers and flood insurance programs of the Federal Insurance Administration. The Council is also charged with flood plain regulation as it relates to any development and construction in the flood plain. All construction projects in flood plains are reviewed by the staff and the Council and must meet its criteria.



The Council currently regulates any construction, excavation, etc., in the 100-year flood plain. (See Figure 6-1) and prohibits any construction in the 100-year floodway (that area needed to convey the floodwater at a 100-year flood discharge). Almost all state or federal government flood plain management programs rely on this 100-year flood criterion which basically means that, statistically, in any given year there is a one percent chance of exceeding a flow of that magnitude.

Unfortunately, while the 100-year flood statistic gives the public a sense of security, nature does not always follow probability curves. Iowa is sufficiently large in size compared to the area covered by severe local thunderstorm activity, that almost every year some area of the state experiences a flood having a 200-year to 500-year frequency. Rainfalls of up to 12 inches in 6 hours or less, and 16 inches in 24 hours, have caused most of these floods. This is the real concern in evaluating the flash flood potential and hazard to human activities in the many small tributaries in urban areas.

The Council participates in flood plain management by providing assistance to local communities in developing local flood plain regulations and ordinances that are acceptable to the INRC. Implementing adequate flood plain management regulations by communities is a condition for eligibility for admittance into the federal flood insurance



program. The INRC supports this program as an incentive for developing good flood plain management within cities and counties.

Several other state agencies have flood plain management or data gathering responsibilities. The Iowa department of Soil Conservation works with the U.S. Soil Conservation Service in administering the watershed program. The Iowa Geological Survey and the U.S. Geological Survey are responsible for the collection and dissemination of basic water resources data including information relating to floods and flood plains. The Iowa Conservation Commission has jurisdiction over the bed and banks of meandered streams and administers statutes and programs relating to the state waters, forests, preserves, and stream access areas under its jurisdiction.



## FLOOD DAMAGE REDUCTION ALTERNATIVES

There are two major approaches to reduction of flood damages, namely structural and nonstructural methods.

Structural methods include reservoirs, channel modifications, levees, and floodwalls, etc. Over the past 50 years, the federal government has spent over \$1.5 billion nationally to reduce flood damages, but damages are still increasing rather than decreasing.

Current damages exceed over a half a billion dollars a year and are projected to exceed \$1 billion by the turn of the century unless stringent flood plain zoning and regulation are employed. In too many situations, structural projects have instilled a sense of false security within the public and actually intensified flood plain occupancy with resultant increased flood damages.

The nonstructural approach utilizes techniques such as land use planning, zoning and regulation, and flood plain acquisition. Flood plain occupancy for any uses other than recreation, fish and wildlife habitat, or agricultural purposes is the poorest form of land use. With only eight percent of the total state land in the flood plain, it is both ridiculous and unwise to allow any new major development in those areas.



If proper land management techniques were employed, there would be few flood damage problems. Unfortunately, in the past, major flood plain development occurred in our large urban centers. It would be extremely difficult and costly to evacuate the flood plain in those areas, but the use of a viable flood plain management program could preclude any future development in the flood plain with its resultant potential loss of life and property.

### Structural Problems

#### Channel Modification

Very few of Iowa's flood plain lands or streams have been left in a natural state. Channelization alone has affected about half of the state's stream miles. The reason for a majority of the channel changes is to gain more cropland and to increase efficiency in farming. Meandering streams often take up much of a farmer's potentially tillable land in the flood plain, or prevent him from planting an area in straight rows.

There are many problems which result from changing the natural meander of a river, including flooding upstream, if pilot cutoff channels are utilized, channel degradation and flooding downstream from the accelerated flow if effective channel capacity is provided, and the loss of the storage capacity of the meander bends.



The effect of channelization on the fish and wildlife habitat of the stream is devastating. The most obvious impact is the actual elimination of natural habitat caused by reducing the stream's length. The gradient and speed of the straightened stream increases, scouring the waterbed and increasing the movement of streambed material. This eliminates the diversity needed for fish habitat and destroys many of the aquatic organisms on which the fish feed.

At any rate, most channel alterations made in Iowa do not provide a high degree of flood protection, but rather are designed to reclaim flood plain lands and improve local drainage for farming.

The stringent new rules adopted by the Council in May, and effective in July, 1978, will help alleviate major channel modification problems in Iowa.

#### Dam Regulation

Several recent major dam disasters in the United States have accentuated the need for a substantial nationwide dam inspection and regulation program.

In Iowa, the dam regulation authority has been assigned to the Iowa Natural Resources Council. Since 1957, all structures impounding over 18 acre-feet of permanent storage, having a total storage of more than 25 acre-feet, or having a drainage area of 5,000 acres or more have required approval.



In urban areas, any water-retention structure over 6 feet in height requires Council approval under Chapter 455A. Under Chapter 469, milldams are also regulated by the Council.

In January, 1978, the U.S. Army Corps of Engineers initiated a cooperative dam safety inspection program with the Council on the 27 structures in the state that have the highest damage potential. The program also included verification and updating of the statewide inventory of all major dams.

Although the Council has reviewed the design of all dams constructed after 1977, there is a considerable number of prestatutory structures upon which engineering analysis has not been performed.

Currently, the only recourse in enforcing proper maintenance and construction on prestatutory structures is to demonstrate public nuisance (major danger to life and property). Preventative maintenance is precluded on structures, other than milldams covered by Chapter 469, Code of Iowa.

There is a dire need to totally rewrite the statute concerning dam construction and safety. Not only is clarification needed of abatement procedures on high-hazard structures, but statutory provisions for required preventative maintenance also is necessary.

A major rewriting of all dam safety statutes should be a priority item in the next general assembly. Logically,



provisions in Chapter 455A and 469 should be incorporated into a new single section of 455A.

### Levees

The use of levees to protect flood plain lands from flood flows is an ancient technique which is quite common today. However, levees frequently create obstructions to the passage of flood flows, diverting flows and increasing flood depths to the point where additional flood damages are incurred on other flood plain lands. The uncontrolled proliferation of levees, especially agricultural levees, can increase, rather than lessen, flooding and damages.

All flood plain construction projects must be reviewed and approved by the Iowa Natural Resources Council prior to construction. This regulation includes levees, floodwalls, and similar or related structures for the protection of flood plain lands from flooding. By following the levee design guidelines established by the Council, individual levee projects should fit together to form a uniform system and not cause undue additional flood damage on other properties.

The rapid growth in numbers of agricultural levees has caused problems in coordination among levees in a common reach of a river. A comprehensive study to identify the nature and extent of agricultural levees in Iowa would



provide the information needed to develop an orderly approach to controlling flood plain lands by levees, and determine their effects on the rights of other landowners.

One problem area currently of concern to the Council is the Skunk River basin. A pilot study on the South Skunk River which provides information of this sort could help the INRC evaluate the costs, benefits, and public acceptance of the studies, and determine whether studies should be expanded to other Iowa streams.

#### Management Problems

##### Stormwater Detention

Construction projects in municipalities aggravate flood problems by covering land with impervious materials, increasing stormwater runoff. Some cities are developing or have adopted stormwater detention ordinances that require a developer or landowner to develop stormwater detention basins or systems that will ensure that runoff after construction is no greater than before construction. This detention system can consist of ponding areas in parking lots, effective grading, and seeding within the development. Cities should be required to adopt such ordinances to help reduce flood impact on others by new developments, and to control floodwaters in large storms. The INRC should develop model ordinances and perform basic engineering for a uniform statewide approach to stormwater detention.



## Require Identification of Flood Plain Property

Numerous individuals have purchased property that is subject to flooding without being aware of the problem. There is no requirement to "tag" a piece of property located on a flood plain as being "flood prone". Only after a sad flood experience do the owners realize the folly of their purchase.

A solution to this would be to tag the contract of sale, and all instruments for conveying flood plain property, with notice that the property is in the flood plain and may be subject to flooding.

## Authorization of Construction

One nonstructural approach to flood plain management is the currently-legislated regulation of construction in the flood plain by the INRC. This control is hampered by inadequate enforcement mechanisms. Even when a flood plain violation is successfully prosecuted, Chapter 455A provides for a maximum fine of \$100 for unauthorized construction. This doesn't provide much of an incentive for compliance. Raising the fine for unauthorized construction to \$1,000 may provide this incentive.

Another approach to restricting development in the flood plains could be to make building contractors, as well as landowners, liable for construction in the flood plain. This could curtail construction projects, as contractors would not want to be liable for building a nonconforming structure in the flood plain.



House File 2212, passed in the 67th General Assembly, originally contained provisions for a \$1,000 civil penalty for water rights and flood plain violations, along with contractor liability for unauthorized construction in the flood plain. Unfortunately, these provisions were deleted in final passage. Such legislation is imperative to the effective operation of the Flood Plain Regulation Program.

#### Flood Plain Information Studies

Part of the problem in determining proper management for Iowa's flood plains is the lack of information about each river basin and about the economic, social, and environmental impact of flooding on the urban area. Before effective flood plain planning and management can be undertaken, comprehensive flood plain information studies must be completed.

The traditional flood plain information studies identify Iowa's flood hazards by computing flood levels along streams, and have not attempted to collect other information that cities and counties must consider in making flood plain land use decisions. Expanded flood plain information studies would identify existing land use, wildlife, social, economic, and environmental conditions of the entire basin, providing cities with a data base for analyzing the impact of development and changing uses in the basin. These studies are needed most in basins with large urban areas where there is significant potential for development or change. Section 206 of Public Law 86-645, Flood Control Act of 1960, authorizes the U.S. Army Corps of Engineers to initiate these expanded flood



studies. Two such studies are presently in progress in the state, and more emphasis should be placed in this area. A definite time schedule and priority listing should be key elements of a positive flood information program.

#### Land Acquisition

Another alternative available in flood plain management is the acquisition of flood plain lands by some unit of government--local, county, state, or federal. Such purchases make possible the prohibition of uses that are not compatible with the flood plain environs.

Since 1966, an excess of \$7.7 million has been spent by the U.S. Bureau of Outdoor Recreation for the acquisition of some 46,000 acres in Iowa through their Recreation Land and Water Conservation Fund. In the past five years, the State Conservation Commission has acquired some 10,000 acres of open space land through its Open Space Acquisition Program. In both cases, substantial amounts of flood plain land were acquired, primarily in rural areas.

A flood plain land acquisition program could be an alternative to the construction of reservoirs, levees, etc. Additional federal and state funds could be allocated to accelerate such acquisition programs.

Urban flood plains might be acquired in redevelopment phases. Redevelopment and renewal programs are available through the U.S. Department of Housing and Urban Development



(HUD) grants; in addition, permanent evacuation of flood plains can be achieved through HUD programs and certain authorities of the U.S. Army Corps of Engineers.

An alternative to actual acquisition would be providing owners of flood plain lands certain tax incentives for use of their land for woodland or open space areas, or for continuing selected agricultural uses in urban areas. These incentives could include revocation of part or all of the tax assessment or a greatly reduced land valuation procedure.

#### Flood Warning System

Where construction has placed life and property in the flood plain, and where there is inadequate structural protection, the final management recourse is provision of flood warning systems. These systems must continue thereafter unless and until a less intensive use is achieved.

At present, nine areas in Iowa participate in a Flash Flood Warning Network operated by the U.S. Weather Service, and many areas which have severe flooding potentials have no such protection. The warning system, coupled with extensive flood monitoring, should be expanded to cover all major flood prone urban areas of the state, and to non-urban areas where floods threaten life and property. Table 6-3 lists those urban areas with populations in excess of 25,000 that have a recognized high potential for flash flooding.



Table 6-3. Iowa Communities of Over 25,000 Population With High Potential for Flash Flooding

City	Streams	Included in Iowa Flash Flood Warning Network
Ames	Squaw Creek and Skunk River	Yes
Cedar Rapids	Prairie, Indian, and Dry Creeks	Yes
Council Bluffs	Indian and Mosquito Creeks	No
Davenport	Duck and Goose Creeks	No
Des Moines	Four Mile and Walnut Creeks	Yes
Fort Dodge	Lizard and Soldier Creeks	Yes
Iowa City	Ralston Creek	No
Marshalltown	Anson Creek and Iowa River	Yes
Mason City	Willow Creek and Winnebago River	Yes
Ottumwa	Jefferson Park Watershed	No
Sioux City	Perry Creek	No
Waterloo-Cedar Falls	Black Hawk and Dry Run Creeks	Yes



## CONCLUSIONS AND RECOMMENDATIONS

### Flood Plain Occupancy

#### Conclusion

Flood plain occupancy for purposes other than agriculture, woodlands, open space, recreation, and fish and wildlife habitat is extremely poor land use. Experience has shown that loss of life and property far overshadows the benefits of the profit incentive. Only eight percent of the total land area in the state is in the flood plain but there is an inordinate amount of pressure toward development for other than the aforementioned best uses. Any use more intensive than those listed above must be prohibited. The 100-year flood criterion currently utilized by the INRC and the federal government remains inadequate as a criterion for the long-range protection of life and property.

#### Recommendations

Legislation must be drafted banning any new development in the INRC regional flood plain for residential, commercial, and industrial uses. The regional flood plain is the area that would be inundated by the INRC regional flood, defined as a large flood representative of floods which have been observed on streams and rivers located in Iowa, excluding extremely rare events. Such a flood would exceed the 100-year flood in magnitude.



Legislation should be drafted requiring the formal notification of any prospective buyer of existing flood plain development that said property is in the flood plain and is subject to flooding. Such legislation should place liability squarely on the seller and realtor for any damages incurred from sale of flood plain property without formal notification of the buyer.

Legislation should be adopted giving tax incentives to owners of INRC regional flood plain properties for maintaining those properties in their natural state (open space, wildlife habitat, woodlands, etc.).

#### Flood Control Structures: Interior Streams

#### Conclusion

For 50 years, the country has been attempting to reduce flood damages by structural measures. Such measures have been sorely inadequate in reducing flood damages. In fact, annual flood damages from improper development of flood plains are increasing each year, despite the expenditures for flood protection. Much of this damage is encouraged by a false sense of security incurred from these structural measures since they actually encourage unwise use of flood plain areas. Flood plain zoning and flood plain acquisition are alternative solutions to reduction of flood damages in areas already developed, or almost so. In new areas, just urbanizing, they are far better solutions than structural



measures. Managing a community's or county's flood plain and stream networks should be equally important as is the maintenance of its transportation, water, and sewer systems.

#### Recommendations

The State of Iowa should initiate a policy that structural methods of flood control should be undertaken only after nonstructural methods (zoning, acquisition, etc.) have been demonstrated as unfeasible or impractical solutions to flood damage reduction.

The state should only condone structural flood control measures if rigid mandatory local flood plain zoning is assured on the project.

All counties and major urban areas should be required by legislation to adopt strict flood plain zoning and subsequent enforcement, subject to approval by the INRC.

#### Flood Control Structures: Border Rivers

#### Conclusions

In the past, the U.S. Army Corps of Engineers has had a tendency to construct projects in a piecemeal manner, particularly on the Mississippi and Missouri Rivers; thus, they provide varying degrees of protection from project to project without taking into consideration the entire flood flow regime of the river. Increased flood stages, increased velocity of flow, and increased damages at points not



protected from flooding, as well as environmental and water quality considerations should be addressed. In some areas, 50-year protection is provided; other areas are protected to the 200-year level. Any structural solution must be weighed against its effect on the total river flood flow regime.

#### Recommendation

The State of Iowa must insist that any major federal structural flood control project must be viewed in its total effect on flood flow alteration throughout the entire river basin. Our major streams must be studied in total as to effects of any structural flood control measures. The state should require that the border rivers in particular be studied and proper flood flow modeling developed to ascertain adverse effects from individual structural projects. Iowa cannot tolerate the current federal practice of piecemealing structural projects.

#### Fish and Wildlife Habitat

#### Conclusion

Recreation, fish and wildlife habitat preservation, and related open space uses, are the best land uses for many flood plain areas. Most of the remaining timber and wildlife habitat is found in the river valleys and their flood plains. These resources are constantly being diminished; therefore, acquisition of flood plains for their protection and preservation is critical.



## Recommendation

The Iowa Conservation Commission should place acquisition of flood plain lands as the number one priority in its Heritage, Conservation, and Recreation Service land acquisition program. An alternative is to create a floodway acquisition program as an additional responsibility for the INRC.

Acquisition of flood plain lands should be weighed as a viable alternative to any structural flood damage reduction measure.

## Urban Flood Problems

### Conclusion

Urban flooding problems are aggravated by increased runoff from new developments resulting from covering of large land areas with impervious surfaces. As more and more shopping centers, apartment house complexes, parking lots, streets and highways, etc. are being developed yearly, the problem is intensifying. A stormwater management program in major urban areas is imperative. Other areas of the nation have been quite successful in reducing stormwater damages in this manner.

### Recommendation

Legislation should be adopted requiring all municipalities over 5,000 population to adopt stormwater management ordinances



which limit stormwater discharges and runoff after development to the level prior to said development. Such ordinances should be subject to approval by the INRC, and would require onsite retention of the increased amount of runoff. The INRC should be responsible for establishing uniform, statewide criteria to manage the program. Financial assistance to accomplish the required studies should be considered by the General Assembly.

#### Flash Flood Warning Network

##### Conclusion

At present, only nine areas of the state participate in the Flash Flood Warning Network of the U.S. National Weather Service. Many other areas of the state have serious potential for dangerous flash flooding. In some instances, the communities are unaware that the threat exists.

##### Recommendation

A concerted effort must be made to incorporate into the Flash Flood Warning Network every major flash flood prone urban area, or any other area where lack of warning would create serious hazards to life and property. Additional coordination with the National Weather Service is recommended.



## Federal Flood Insurance

### Conclusion

The Federal Flood Insurance program has been extremely helpful in promotion of flood plain studies and local ordinances. This program plus the U.S. Army Corps of Engineers' flood plain studies have made a major dent in problems of identifying flood hazard areas. However, Iowa still has a long way to go in accomplishing studies of major flood prone areas. The flood plain study program must be intensified to accomplish identification of all major urban flood prone areas as soon as practically possible.

The Federal Flood Insurance programs still utilizes the 100-year flood as its primary criteria. As stated previously, the INRC does not feel this criteria is rigid enough and it should be broadened to the INRC regional flood level of protection.

### Recommendation

The State of Iowa should press for an acceleration of flood plain information studies in all major urban areas not yet investigated.

The state should also demand that all federal agencies gear their programs to discourage any development in the INRC regional flood plain.



## Agricultural Levees and Channel Modification

### Conclusion

Any agricultural levee or stream channel modification has an impact on the entire stream flood flow regime. Heretofore, all such projects have been reviewed on the basis of their localized effects to immediate surrounding properties. The cumulative effect of such individual projects on the entire stream system have not been studied. It is almost certain that a piecemealing of structural projects throughout a basin will intensify damages as flows progress downstream. A basinwide flood plain model would assure better and more equitable regulation of structural projects by enabling the INRC to assess the basinwide effects of any structural proposal.

### Recommendation

The INRC should be funded to conduct a pilot study of the cumulative effects of structural alteration of stream flows with the ultimate goal being development of a computer modeling system which could be applied to all major streams under intensive pressure for structural allocation for crop protection. Due to the extensive amount of levee work on the Skunk River, it would be a prime study candidate. It is recommended that this be a high priority item in the INRC flood plain management program in the next biennium.



## Penalties for Violations

### Conclusion

Flood plain enforcement is currently hampered by the very low maximum fine of \$100 for flood plain construction violations. A penalty of this magnitude is hardly a deterrent to a prospective violator. In some cases, contractors have reportedly encouraged or misled landowners to violate flood plain restrictions. To adequately regulate the flood plain, the INRC needs penalties of enough magnitude to deter prospective flood plain violators.

The House version of H.F. 2212, which passed the 67th session of the General Assembly, contained provisions for a civil penalty of \$1,000 and \$100 per day thereafter for violations of flood plain regulations, and made contractors, builders, and tenants, etc., equally liable for unauthorized flood plain construction. Unfortunately, these provisions were deleted in final passage.

### Recommendation

The legislation previously contained in H.F. 2212 pertaining to instituting a \$1,000 civil penalty and contractor liability should be a priority legislation for the next session of the General Assembly.



## Dam Safety

### Conclusion

Although the Iowa Natural Resources Council has regulated all major structures (other than milldams covered by Chapter 469) since 1957, there are numerous prestatutory dams on which little or no information is known. Remedial action on these prestatutory structures is possible only under public nuisance provisions when eminent danger can be demonstrated. Recent major dam failures nationwide, with their resultant loss of life and property, accentuate the imperative need for adequate legislative controls on all phases of dam construction, maintenance, and hazardous structure abatement.

### Recommendation

Legislation should be enacted combining the dam regulation provisions of Chapters 455A and 469 into a single dam safety section of 455A. This clarifying legislation should contain provisions for Council authority to:

- (1) Order the immediate draining or breaching of any impoundment or dam found to be unsafe.
- (2) Order the owner to conduct engineering studies where the safety of a dam is questionable or design modifications where the existing structure is inadequate, and to construct those modifications.



- (3) Order preparation of or changes in the operation, management, or maintenance plans or practices of the dam.

In addition, Council rules concerning dams should be strengthened to provide more stringent engineering design criteria, thus, assuring more adequate protection of life and property.

#### Expanded Flood Plain Information

##### Conclusion

Expanded flood plain information studies, which identify the existing uses and conditions of the entire river basin, would provide a tool for local governments for analyzing the impacts of flood plain management decisions and provide data for state agencies for developing adequate and effective flood plain management policies.

##### Recommendation

Iowa should encourage acceleration of expanded flood plain information studies by the Corps of Engineers in those basins with significant potential for development or change. State support of the USGS streamflow monitoring program should be strengthened.



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