THE STATE WATER PLAN
VOLUME I, PART I
JANUARY, 1967

RECOMMENDATION

TO THE LEGISLATURE
AND THE GOVERNOR

CONCERNING

FLOOD PREVENTION AND FLOOD DAMAGE REDUCTION

PRESENTED BY THE
NEBRASKA SOIL AND WATER
CONSERVATION COMMISSION

THE TOWN OF VALLEY, NEBRASKA DURING THE PLATTE RIVER FLOOD IN THE SPRING OF 1960

THIS REPORT WAS PREPARED UNDER THE ADMINISTRATIVE DIRECTION OF WARREN FAIRCHILD, EXECUTIVE SECRETARY AND THE TECHNICAL SUPERVISION OF JAMES OWEN, PLANNING SECTION CHIEF.

LEGISLATURE OF NEBRASKA

SEVENTY-SEVENTH SESSION

Legislative Bill 893

Introduced by Committee on Public Works, C. W. Holmquist, 16th District, Chairman; Rudolph C. Kokes, 41st District; Dale L. Payne, 3rd District; Elmer Wallwey, 17th District; Arnold Ruhnke, 31st District; Calista Cooper Hughes, 1st District

Read first time April 24, 1967

Referred to Committee on Government and Military Affairs

Sent to printer April 26, 1967

A BILL

FOR AN ACT relating to flood control; to provide for the regulation of the floodways of watercourses and drainways as prescribed; to define terms; to provide for duties and powers of the Nebraska soil and water conservation commission as prescribed; to provide for a Floodway Obstruction Removal Fund; to declare certain acts unlawful; and to provide for penalties.

Be it enacted by the people of the State of Nebraska

Section 1. It is hereby declared that, because of the loss of lives and property caused by floods in various areas of the state, in the interest of public health, safety, and general welfare, floodway-encroachment lines are to be established along watercourses and drainways, and other appropriate regulations made as to the floodways of watercourses and drainways, in order to miminize the extent of floods and reduce the height and violence thereof insofar as such are caused by any natural or artificial obstruction restricting the capacity of the floodways of the waters of the state.

Sec. 2. As used in this act, unless the context otherwise requires;

(1) A flood of one hundred year frequency shall mean a flood magnitude expected to recur on the average of once every one hundred years, or a flood magnitude which has a one per cent chance of occurring in any given year;

(2) Artificial obstruction shall mean any obstruction which is not a natural obstruction;

(3) Channel shall mean the geographical area within either the natural or artificial banks of a watercourse or drainway;

(4) Commission shall mean the Nebraska soil and water conservation commission;

(5) Commission floodway shall mean a floodway whose limits have been designated and established by order of the commission;

(6) Drainway shall mean any depression two feet or more below the surrounding land serving to give direction to a current of water less than nine months of the year, having a bed and well-defined banks; *Provided*, that in the event of doubt as to if a depression is a watercourse or drainway, it shall be presumed to

be a watercourse;

(7) Flood shall mean the water of any watercourse or drainway which is above the bank or outside the channel and banks of such watercourse or drainway;

(8) Floodway shall mean the channel of a watercourse or drainway and those portions of the flood plain adjoining the channel which are reasonably required to carry and discharge the flood water of any watercourse or drainway;

(9) Floodway-encroachment lines shall mean the lines limiting a commission floodway;

(10) Floodplain shall mean the area adjoining the watercourse or drainway which has been or may hereafter be covered by flood water;

(11) Locate shall mean construct, place, insert, or excavate;

(12) Natural obstruction shall mean any rock, tree, gravel, or analogous natural matter that is an obstruction and has been located within the floodway by a non-human cause;

(13) Obstruction shall mean any dam, wall, wharf, embankment, levee, dike, pile, abutment, projection, excavation, channel rectification, bridge, conduit, culvert, building, wire, fence, rock, gravel, refuse, fill, or other analogous structure or matter in, along, across, or projecting into any floodway which may impede, retard or change the direction of the flow of water, either in itself or by catching or collecting debris carried by such water, or that is placed where the natural flow of the water would carry the same downstream to the damage or detriment of either life or property;

(14) Owner shall mean any person who has dominion over, control of, or title to an obstruction;

(15) Political subdivision of government shall mean any metropolitan city, primary city, first or second class city, incorporated village or county organized and having authority to adopt and enforce land use regulations; and

(16) Watercourse shall mean any depression two feet or more below the surrounding land serving to give direction to a current of water at least nine months of the year, having a bed and well-defined banks; *Provided*, that it shall, upon order of the commission, also include any particular depression which would not otherwise be within the definition of watercourse.

Sec. 3. (1) The commission shall initiate a comprehensive program for the delineation of commission floodways for every watercourse and drainway in the state. It shall make a study relating to the acquiring of flood data, and have authority to enter into arrangements with the United States Geological Survey and United States Army Corps of Engineers and any other state or federal agency for such acquisition.

(2) When sufficient data have been acquired to reasonably locate the floodway of a flood of one hundred year frequency, the commission shall establish, by order, after a public hearing, floodway-encroachment lines for such a floodway within which a political subdivision of government may establish land use regulation. The commission shall furnish such data to officials of the political subdivision of government having jurisdiction over said areas together with a map outlining the areas involved, a copy of this act, adopted rules and regulations of the commission, and suggested minimum standards. The location of the encroachment lines shall be the estimated outer boundary of the floodway of a one hundred year

frequency flood, as determined from the available data. The commission shall record all floodway-encroachment lines established by it in such local office as also records deeds to real property. The commission shall have the power to alter said lines at any later time, if a re-evaluation of the then available flood data warrants it. Notice of any such hearing or order of the commission establishing or altering any such line shall be given by mailing notice thereof to all persons known to be affected thereby and by publishing such notice once each week for two consecutive weeks in a legal newspaper published or of general circulation in the area involved, the last publication of which shall be not less than ten days prior to the date set for the hearing or effective date of such order.

(3) If within one year from the date of transmittal of the flood plain information to officials of the political subdivisions of governement, the political subdivision of government has failed to adopt land use regulations which meet or exceed the minimum standards of the commission, the commission floodway shall be enforced and no artificial obstruction shall be located by any person or allowed to remain by any owner within the floodway-encroachment lines for such a one hundred year flood as established by the commission under subsection 2 of this section, unless specifically authorized by the commission.

Sec. 4. Any artificial obstruction in any commission floodway enforced under subsection 3 of section 3 of this act is hereby declared to be a public nuisance unless a permit has been obtained for such artificial obstruction from the commission.

Sec. 5. It shall be unlawful (1) for a person to locate any artificial obstruction within an

established commission floodway, or (2) for any owner to permit any artificial obstruction to remain within an established commission floodway without a permit from the commission. This act shall not affect any artificial obstruction unless located in the floodway after the effective date of this act and after the commission has enforced a commission floodway under subsection 3 of section 3 of this act; *Provided,* that no person shall make nor shall any owner allow changes or additions to any artificial obstruction within an established commission floodway whether such obstruction is located in the floodway before or after the effective date of this act except upon express written approval of the commission. The Attorney General shall, at the request of the commission, institute proceedings to prosecute any such person as provided in section 12 of this act, or enjoin any obstruction declared to be a public nuisance under section 4 of this act, or both such prosecution and injunction.

Sec. 6. (1) The commission shall have the power to issue permits for the location, continuance, or alteration of obstructions which would otherwise violate or be enjoinable under section 5 of this act. The application for the permit shall contain such information as the commission shall by rule require, including complete maps, plans, profiles, and specifications of the obstruction and watercourse or drainway.

(2) In passing upon such application, the commission shall consider (1) the danger to life and property by water which may be backed up or diverted by such obstruction, (2) the danger that the obstruction will be swept downstream to the injury of others, (3) the availability of alternate locations, (4) the construction or alteration of the obstruction in such a

manner as to lessen the danger, (5) the permanence of the obstruction, (6) the anticipated development in the forseeable future of the area which may be affected by the obstruction, and (7) such other factors as are in harmony with the purpose of this act. The commission may make a part of such permit any conditions it may deem advisable. In order for the permit to continue to remain in force, the obstruction must be maintained so as to comply with the conditions and specifications of the permit.

(3) Permits for obstructions to be located or allowed to remain in the floodway of watercourses must be specifically approved within a reasonable time by the commission; permits for obstructions in the floodways of drainways shall be conclusively deemed to have been granted thirty days after the receipt of such application by the commission, or after such time as the commission shall by rule specify, unless the commission notifies the applicant that the permit is denied.

(4) In all cases where there is an application for a permit for an obstruction to be allowed to remain in the floodway, the commission may, in its discretion, grant a renewable temporary permit good for not more than six months; the granting of such tempory permit shall in no way prejudice the right of the commission to revoke such permit at any time, or to deny an application for a regular permit.

(5) Every application for a permit shall be accompanied by a non-refundable application fee of twenty-five dollars which the State Treasurer shall credit to the Nebraska Soil and Water Conservation Fund.

Sec. 7. The powers and duties of the commission relative to obstructions in a commission floodway

shall include the following:

(1) Where a natural obstruction to a floodway established under subsection 2 of section 3 of this act has been created by fallen trees, silt, debris, and like matter, the commission may, in its discretion, remove the obstruction, in which case the cost of removal shall be borne by the commission;

(2) Where, after investigation, the condition of an artificial obstruction is found to be so dangerous to the public safety as not to permit the giving of notice and hearing as provided for in section 10 of this act to the titleholder of the land affected and to the owner of such obstruction to remove or repair the dangerous condition, the commission may remedy such condition by repair, removal, or otherwise, the cost of which shall be borne by the owner and shall be recoverable in the same manner as debts are now by law recoverable; and

(3) Where, after investigation, notice, and hearing, an order has been issued to the owner of an obstruction for its removal or repair, and the order is not complied with within such reasonable time as may be prescribed, or if the owner cannot be found or determined, the commission may make or cause such removal or repairs to be made, the cost of which shall be borne by the owner and shall be recoverable in the same manner as debts are now by law recoverable.

Sec. 8. The commission, its agents, surveyors, or other employees, may make reasonable entry upon any lands and waters in the state for the purpose of making any investigation, survey, removal, or repair contemplated by this act. An investigation of any natural or artificial obstruction shall be made by the commission either on its own intiative, on the written request of

any three titleholders of land abutting the watercourse or drainway involved, or on the written request of any political subdivision of government.

Sec. 9. This act shall not extend to any obstruction in the floodway of a watercourse or drainway where the drainage area above the same, either within or without the state, is less than one square mile in extent, unless a particular watercourse or drainway is expressly declared to be within the coverage of this act by order of the commission.

Sec. 10. The commission may issue such orders and rules as are necessary to implement the provisions of this act. If an order is issued to the owner of an artificial obstruction for its removal or repair, such order shall not become effective less than ten days after a hearing is held relating to such order; *Provided,* such hearing need not be held for an order issued pursuant to subdivision 2 of section 7 of this act. In addition to any requirement imposed by subsection 3 of section 3 of this act, where any order is issued which affects with particularity the land adjacent to any watercourse or drainway, notice of the contents of such order and of any required hearing shall be mailed by the commission to the titleholder of such land not less than ten days before the effective date of such order, or, if there is a required hearing, to the titleholder of such land and to the owner of the obstruction not less than ten days before the date of such hearing; *Provided,* that such notice need not be given for an order issued pursuant to subdivision 2 of section 7 of this act, nor to the owner of the obstruction for an order issued pursuant to subdivision 3 of section 7 of this act if the owner cannot be found or determined. All orders and rules issued by the

commission shall be on file at the offices of the commission and in the office of the county clerk of each county affected by such order or rule. Any person aggrieved by any order of the commission issued under this act may appeal from such order to a court of competent jurisdiction within thirty days after its effective date. In the event such an appeal is taken, enforcement of such order shall be stayed pending the outcome of such appeal. Service of notice of the appeal shall be made upon the executive secretary of the commission.

Sec. 11. The State Treasurer is hereby directed to create and establish the Floodway Obstruction Removal Fund and to credit to said fund for the removal of natural obstructions as provided in subdivision 1 of section 7 of this act, such money as shall be specifically appropriated or reappropriated during any biennium by the Legislature. The Nebraska soil and water conservation commission may allocate money from the Floodway Obstruction Removal Fund for purposes provided in subdivision 1 of section 7 of this act subject to the approval of the Executive Board of the Legislature.

Sec. 12. Any person who violates section 5 of this act shall be guilty of a misdemeanor and shall, upon conviction thereof, be fined not more than one hundred dollars, or by imprisonment in the county jail for not more than ten days, or both such fine and imprisonment. Each day's continuance of a violation shall be deemed a separate and distinct offense.

Sec. 13. (1) the granting of a permit under the provisions of this act shall in no way affect any other type of approval required by any other statute or ordinance of the state, of any political subdivision

of the state, or of the United States, but shall be construed as an added requirement; *Provided,* that if a political subdivision of government enacts and enforces land use regulations which meet or exceed the minimum standards of the commission, the commission's recommendations in regard to artificial obstructions shall be advisory only. The grant or denial of a permit shall not have any effect on any remedy of any person at law or in equity; *Provided,* that where it is shown that there is a wrongful failure to comply with this act, there shall be a rebuttable presumption that the obstruction was the proximate cuase of the flooding of the land of any person bringing suit.

(2) No permit for the construction of any structure to be located within a commission floodway shall be granted by any political subdivision of the state unless the applicant has first obtained the permit required by this act, or until the commission acknowledges that such structure would not be an obstruction within the meaning of this act.

(3) No action for damages sustained because of injury caused by an obstruction for which a permit has been granted under this act shall be brought against the state, the commission, a member of the commission, or its employees or agents. No provision of this act shall be construed as interfering in any way with the right of the United States to regulate interstate commerce or the navigable waters of the United States.

Sec. 14. The use of any one of the remedies or powers given to the commission herein shall not constitute a bar to the exercise of any other remedy or power given by this act.

Sec. 15. If any section in this act or any part of any section is declared invalid or unconstitutional,

such declaration in invalidity shall not affect the validity of the remaining portions thereof.

PROGRAMS:

SOIL & WATER CONSERVATION
WATERSHED PROTECTION
FLOOD CONTROL
RIVER BASIN INVESTIGATIONS
FLOOD PLAIN STUDIES

January 3, 1967

Thousands of acres of Nebraska's fertile lands are ravished yearly by water. It is all too common to read the accounts of death, suffering and economic loss caused by floods. However, until the day that man can control nature, he must expect the river to occasionally assert its right to the valley bottoms. The reduction of these flood losses must be a primary objective of Nebraska's State Water Plan.

Many tools are known to the technicians which can aid in the prevention and control of floods as well as the reduction of flood damages. The State has the power to determine which tools shall be provided for this purpose. The State and its political subdivisions cannot fail to vigorously prosecute the flood control objective if they are to become full partners in the development and control of our resources.

The following material is provided for the use of the Governor and the Legislature. Specific recommendations are included which would help achieve the objective. Some of the measures may be controversial and exacting, however, the innate purpose of a state-wide plan is to boldly point out the path of progress for the public good without regard to special interests or inadequate but popular suggestions. It is with conviction in this purpose that I urge the study and full adoption of the recommendations contained in this report.

Sincerely yours,

Robert M Bell

Robert Bell, Chairman
Nebraska Soil & Water
Conservation Commission

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STATE WATER PLAN

Neb. Rev. Stat. § 2-1507 (8) (Supp. 1965) directs the Nebraska Soil and Water Conservation Commission to "plan, develop, and encourage the implementing of a comprehensive program of resource development, conservation, and utilization for the soil and water resources of this State in cooperation with other local, state and federal agencies and organizations."

The plan as it develops will consist in part of studies of each of the different aspects of water resources development. The purpose is to present to the Legislature and the Governor recommendations for action to achieve particular goals. These recommendations will include action to meet goals by changes in organization of government, funding and policies. Alternatives to physical development may sometimes offer the most suitable solution to problems and in cases will be recommended.

The principal items of flood prevention, irrigation, pollution, etc. will be treated individually as much as possible to simplify understanding of the sometimes complex technical relationships which exist. However, all parts of the state water plan are parts of one whole and each recommendation, when and if implemented, will move Nebraska closer to unified development and administration of its water resources. The Commission feels the goal served by this recommendation which is the minimization of loss of life and property caused by flooding and the actions proposed are sufficiently independent as to be desirable and compatible with such other recommendations as may be later made.

FLOOD DAMAGE REDUCTION

The prevention of floods has been a dream of man since time began. Only by the prevention of floods can our villages and cities be secure and our fertile valleys be farmed. Before people came to settle there were few flood damages. The river carved its valleys and the nomadic peoples moved to higher lands. Today, however, these valleys are thickly populated with both people and their works of improvement.

The federal government, referring to the "general welfare" clause of the Constitution, allocated in excess of $7,000,000,000 between 1936 and 1962 for flood prevention. Yet, the damages each year were greater than the year before. One might assume from this that at the present rate of construction of flood protection works the effort would never be complete. This is true only if we fail now to provide for the future. Of the increase in flood damages, 45 percent has been attributed to the increase in property values, 25 percent to an increase in the amount of flooding and 30 percent to an increase in building and other uses of flood hazard lands.

Flood damage reduction can only be achieved where a total program is completed which includes among others:

1. Soil and water conservation treatment on the uplands
2. Detention structures on tributaries
3. Main stem structures storing large amounts of flood water
4. Channel improvements
5. Proper land use in flood hazard areas to reduce damages where other means of control are not utilized or not sufficient
6. Effective emergency action

If any of these types of control or prevention are lacking, then the solution is incomplete for in a comprehensive approach, each flood control tool complements the other.

FLOOD PREVENTION BY LAND USE REGULATION

Total control of flood waters by impoundments is often assumed by the layman to be the only method of flood prevention. However, this viewpoint is not tenable from an economic viewpoint. There are other alternatives which in cases offer more equitable and sounder solutions. Land use regulation is one such alternative.

Land use regulation for prevention of flood costs is the practice of designating those areas which are susceptible to flooding and limiting their uses to those which will not be seriously damaged or present a hazard to life if flooded.

Land use regulation is one part of a complete program of flood prevention and one which can be put into effect quickly, inexpensively and yield great benefits. The damage done by a single flood to a locality could possibly exceed the required state allocation for flood control for many years. Land use regulation by its nature is a forward looking program which will not rectify past errors but can help prevent future mistakes.

The purposes of land use regulation are to:

1. Prevent loss of life
2. Prevent the installation of structures which limit the channel capacity and increase flood heights
3. Prevent excessive property damage
4. Protect the public health
5. Reduce public expenditures for emergency operations, evacuation, restoration, etc.
6. Discourage the victimization of unwary land and home buyers by uninformed or unscrupulous sellers
7. Prevent damage to industries, transportation and utility systems, etc.

8. Remove the impediment to community growth created by a history of flooding

9. Prevent further unwise expansion and development in unprotected flood plains, thus reducing future expenditures for expensive protective measures such as reservoirs, levees, etc.

The control of floods is one of the severest challenges given to man, but it can be done!

Brig. General Herbert D. Vogel, Chairman, Board of Directors, Tennessee Valley Authority, spoke of the role of land use regulations in transmitting a special report on flooding to the President and the Congress in 1959. He expressed this philosophy:

> *"Communities throughout the Nation are engaged in a new contest with their rivers and they are losing. They will continue to lose unless steps are taken to provide a new perspective--and a new channel of action--with respect to floods.*
>
> *The problem arises from the basic fact that there are some floods which cannot be prevented and many cities that cannot be fully protected economically with artificial works such as dams and levees. Coupled with this fact is the rapid growth of urban communities, creating new pressures to utilize inviting but hazardous flood plains for subdivisions, shopping centers, commercial establishments, and other improvements. This mushrooming trend is creating new flood damage potential faster than construction works can add to existing protection."*

Mr. Gilbert F. White, a recognized authority in the field of resource development, in summing up the proceedings of the First National Conference on Flood Plain Regulations and Insurance stated:

> *"Those who know the facts no longer see the problem as one to be solved by engineering alone or by engineering combined with upstream land management. They see it as engineering plus community planning in the broad sense. The measures for flood damage reduction may include changes in buildings, improved flood forecasting, zoning ordinances, subdivision regulations, and building codes, supplemented by insurance. This is a major change in attitude. Moreover, it is recognized that this is not exclusively a Federal responsibility; it is a cooperative problem."*

A task force of experts assembled by the American Society of Civil Engineers stated in the introduction to their report concerning flood control:

"Physical protection of many flood hazard areas is essential and must continue to be vigorously pursued. Many flood-prone areas, however, are undeveloped or have not yet reached the state of development which would justify the construction of flood control works. Even in those watersheds where the construction of protection works is warranted, complete protection of all flood plains can seldom, if ever, be economically provided. Therefore, a new look must be taken at the entire flood situation, and all additional tools utilized to the fullest in a comprehensive attack, not only to hold the line, but to gain and eventually solve our major flood problems. To alleviate flood losses it is necessary to recognize the flood damage situation and to utilize additional measures such as flood plain regulations, flood forecasting, temporary evacuation, permanent evacuation, flood proofing and possibly flood insurance."

In August, 1966, President Johnson transmitted to the Speaker of the House of Representatives, a report by the task force on federal flood control policy titled A UNIFIED NATIONAL PROGRAM FOR MANAGING FLOOD LOSSES (House Document 465) and stated in his letter:

"The Federal interest in this matter is beyond doubt. The Federal effort to cope with the problem will be unsparing. But I cannot over emphasize that very great responsibility for success of the program rests upon State and local governments, and upon individual property owners in hazard areas. The key to resolving the problem lies, above all else, in the intelligent planning for and State and local regulation of use of lands exposed to flood hazard."

The respective roles of Nebraska state and local governments in the preparation and utilization of land use regulations as one element in the control of flood damages have not yet been clearly set out.

PRESENT STATUS AND NEED FOR LAND USE REGULATIONS

At the present time, counties and cities of the different classes have various authorities given by the Legislature to impose land use regulations for the protection and benefit of those in their areas of jurisdiction. Highly technical procedures are required to develop sound land use regulations based on a rational understanding of flood hazards which exist and the proper provision for the risk involved. Counties and cities do not ordinarily have staffs available to them which are able to provide this service nor would it be feasible in most cases for them to employ such staffs on a short term basis.

Some assistance is currently provided by various federal agencies. Studies to provide technical information can presently be made by the U.S. Army Corps of Engineers and the U.S. Geological Survey subject to their own administrative and technical regulations. Information concerning these studies are included in another section of the Recommendation. Existing legislation as contained in Neb. Rev. Stat. § 2-1507 (Supp. 1965) does not clearly state the role of the Nebraska Soil and Water Conservation Commission concerning the coordination of state, local and federal activities in this field. This state level coordination is advantageous in avoiding local entanglement with the sometimes complicated and little understood administrative and technical procedures of the federal agencies. The gap between a summary of technical data and effective local action may require additional technical assistance.

Little use has been made in the past of the local authority to zone for protection from floods. This can be attributed to a lack of cognizance on the part of local authorities of both their powers to regulate land use and the desirability of their utilization. Present legislation does not

forcefully bring to the local authorities attention, their power and the assistances available in the use of these powers. The tendency of land use regulations to expose the true value of an area by recognizing the flood hazard discourages land speculation and generates strong opposition to such regulations. Local authorities have had difficulties in withstanding such pressure. The provision for ultimate responsibility at the state level would enable more uniform application of land use regulations. Many local communities may even be hostile to the adoption of land use regulations on the premise that it is an infringement on the right of an individual to exercise free choice in the use of his property. This view neglects the harmful effects that improper land use may have on adjoining or neighboring property. It also overlooks the vast amount of general tax dollars expended annually in flood fighting, flood relief, and structural flood control. Since streams may pass through many areas of differing local jurisdiction, a coordinated approach is required to obtain information and equitable regulation.

NEBRASKA SOIL AND WATER CONSERVATION COMMISSION POLICY

FLOOD PLAIN REGULATION

The State of Nebraska needs a comprehensive program for reducing flood losses. Flood control and watershed projects have been successful in many areas of the state and they must continue and be accelerated. In addition, programs are required to regulate and promote sound and economic development of the flood plain.

Ironically, flood losses are increasing each year though new watershed and flood control projects are being installed on the land. This is the result of unwise and uneconomic uses of existing flood plains. Local and state government in Nebraska, in cooperation with the federal government, needs to take the leadership in drafting, applying and enforcing land use regulation in our flood plains to insure wise and proper use of these areas of flood hazard. Such programs would be in the interest of the health, safety and general welfare of the people of the state.

Authority

The Nebraska Soil and Water Conservation Commission has been designated by the Legislature, as contained in Neb. Rev. Stat. § 2-1504 (10) (Supp. 1965) as the state agency responsible for flood prevention in Nebraska. In addition, Neb. Rev. Stat. § 2-1507 (10) (Supp. 1965) authorized the Commission to assist local governmental organizations in securing, planning and developing information on flood plains to be used in developing regulations and ordinances on proper use of flood plain areas. Flood control, to be successful must utilize a comprehensive approach including land treatment, detention and impoundment structures, levees, channel improvements, storm sewers, and land use regulations to reduce the potential flood damages.

Acknowledgement

The Nebraska Soil and Water Conservation Commission acknowledges that:

1. Comprehensive programs of flood control, including conventional flood control structures and flood plain regulations are needed to minimize flood damages in Nebraska.

2. Primary responsibility for adopting flood plain regulations and ordinances rests with such local units of government such as municipalities and county governing boards.

Objectives

The objectives of policy adopted by the Nebraska Soil and Water Conservation Commission shall be to:

1. Prevent the installation of structures which will limit the channel capacity and increase flood heights thereby becoming a nuisance and danger to neighboring landowners;

2. Protect unwary land and home buyers against victimization brought about by purchase of property in a high flood hazard area;

3. Reduce public expenditure for emergency operation, evacuation, and restoration;

4. Prevent loss of life, property damage, and protect the public health;

5. Minimize development which in future years will require expensive, protective measures such as reservoirs and levees;

6. Remove the impediment to community growth which a history of flooding creates;

7. Recommend techniques for flood proofing of existing improvements in flood plain areas; and

8. Encourage prudent development of flood plain areas to include parks, greenbelts, and such other improvements as land fills and channel rectifica-

tions where such improvements and uses are an integral and desirable component for development of the area.

Policy

The policy of the Nebraska Soil and Water Conservation Commission shall be to:

1. Assist local units of government in securing necessary information for drafting proper regulations for use of flood plain areas and to encourage these local units of government to apply and enforce desirable regulations for use of flood plain areas.

2. Draft minimum acceptable regulations for areas of flood hazard. Such regulations to be based on the best historical and technical information available. Enforcement of such minimum standards by the state should be authorized only when local units of government fail to act.

3. Request assistance of federal agencies having responsibility and technical proficiency in this field.

4. Adopt flood plain regulations that are not arbitrary or confiscatory, nor work undue hardships and economic losses on owners of land and existing improvements in a flood plain hazard area. Properly drafted regulations do not depress the value of the property in a flood plain area. Such regulations simply recognize the flood hazard and authorize wise use in relationship to the hazard. It is the flood hazard that depresses the value of land and property in flood plains--not the properly drafted regulation or ordinance.

5. Let the larger public interest govern in conflicts between public and private interests.

6. Recognize the need for supplementing flood control projects with flood plain regulations, and consider the need for such regulations in granting full approval of any project deriving benefits from flood control in Nebraska.

COMMUNITIES REQUIRING ACTION

To ascertain the need for land use regulation in controlling flood damages, an analysis was made of past damages to urban areas in Nebraska. Communities were ranked as to their need for a study. This rating is based on recorded histories of flooding and evidence of future urban expansion in unprotected flood plains.

The historical flood damage records from the Corps of Engineers were used as the indicator of susceptibility to flooding. Probable future population growth based on past and present census figures was used as the indicator of probable new flood plain development. The limitations of these assumptions are fully realized, however, and more precise analysis including field inspections will be required before recommendation of any specific regulations by the Commission.

Damages shown in the tables were updated in 1965 dollars to provide a common base upon which to compare damages in various municipalities. The flood damage figures utilized were from the Corps of Engineers and were for the period between 1940 and 1965 only since most figures prior to 1940 were too fragmentary for use. Therefore, the 25 year base period from 1940 to 1965 was chosen for comparison of total damages. The U.S. Department of Commerce composite index was used to update damages.

Future population trends in Nebraska were assumed to follow the same general trend that has been apparent for the past 25 years. Therefore, the best available indication of growth on the flood plains was considered to be the town's change in population between 1940 and 1960. A secondary indicator of growth considered was proximity to large urban centers which could result in future growth as a satellite community. A listing of

possible satellite communities for major cities appears on the summary sheet. At the present time, it appears that only the city of Omaha has any real satellite communities, however, expansion around major cities in the future was considered probable.

The 43 communities shown on the priority list exhibit both growth potential and past flood damages. In eleven of these communities the potential growth depended upon becoming a satellite community and these towns were placed near the bottom of the priority list.

Twenty-eight towns having both an increasing population and a previous flood damage were ranked from one to twenty-eight with the highest damaged town being number one. These towns were ranked again from one to twenty-eight with the town having the greatest population increase ranked number one. These two individual rankings were then added together to give a total ranking. The town with the least total ranking was placed number one on the priority list. Number two on the priority list had the second lowest total ranking, etc.

In making this priority list consideration was given to local flood protection projects. To compensate for local flood protection projects the damage figures were reduced by the amount shown in parentheses in the tabulation before they were ranked according to highest damages--(see priority 4, Norfolk)

Existing flood plain information studies in no way affected the priority given a town. At the present time the flood plain information studies completed have not been fully utilized to prepare adequate land use regulations. Lincoln, Omaha, Grand Island, and Papillion have such studies either underway or completed.

There are probably many other ways that priorities could have been established, however, the first seven towns on the list have had flood protection projects of one kind or another started or completed indicating that the flood problems have already been recognized as significant in these areas.

Field study, expression of local interest, availability of local topographic mapping and other factors will cause some changes in this priority list. However, this examination does establish that there are communities that need help in controlling flood damages.

The values shown for the damages should not be construed as representing the total cost of floods. Those figures are based only on information which was readily available from the Corps of Engineers' records. The Corps of Engineers does not collect damage data from all floods nor do they collect all damages from any one flood. Furthermore, to the extent that they are collected, damage estimates include only the direct, easily observable damages and not the total cost to the state's economy.

Other communities such as Fairbury, Crete, York, Waterloo, DeWitt, Niobrara, Hebron, Millard, Fullerton, St. Edward to name only a few are prone to flood damage but not included due to lack of data concerning past flood damages.

FLOOD PLAIN ZONING PRIORITY LIST - MUNICIPALITIES OVER A POPULATION OF 1000

PRIORITY	TOWN	DAMAGE[1]	1940-1960 POPULATION GROWTH	POPULATION 1960/1940	POTENTIAL SATELLITE OF	COMMENTS
1	Lincoln	$ 8,031,000	46,537	1.57		Flood Plain Study Salt Valley Watershed (75%)[2]
2	Omaha	260,000	77,754	1.35		Flood Plain Study
3	Columbus	630,000	4,844	1.64		Damage may be low
4	Norfolk	12,200,000	3,150	1.30		L.F.P. (95%)[2]
5	Beatrice	1,026,700	1,249	1.12		L.F.P. is under study
6.	Grand Island	23,800	6,612	1.34		Flood Plain Study
7	Papillion	97,400	1,472	2.93	Omaha	Flood Plain Study
8	Fremont	6,100	7,872	1.67		Damage may be too low
9	Sidney	14,700	4,616	2.36		
10	Schuyler	615,000	288	1.10		
11	Valley	370,500	467	1.48	Omaha	
12	Wahoo	69,700	962	1.36	Lincoln	
13	Broken Bow	355,300	514	1.17		
14	Cozad	54,300	1,028	1.43		
15	Scribner	826,100	117	1.13		
16	Ashland	304,200	280	1.16		

Priority List - Municipalities over a population of 1,000 (con't)

PRIORITY	TOWN	DAMAGE [1]	1940-1960 POPULATION GROWTH	POPULATION 1960/1940	POTENTIAL SATELLITE OF	COMMENTS
17	Ralston	$ 5,400	2,143	3.57	Omaha	
18	Lexington	6,600	1,884	1.52		
19	West Point	446,000	411	1.16		L.F.P. (90%)
20	So. Sioux City	200	2,644	1.58		
21	Milford	9,300	703	1.93	Lincoln	
22	Louisville	36,900	217	1.22		
23	Gibbon	28,500	247	1.30		
24	O'Neill	900	649	1.26		
25	Ord	9,100	173	1.08		
26	Waterloo	270,000	135	1.35		
27	Wilber	11,700	3	1.01		
28	Plainview	700	56	1.04		
29	Stanton	64,800			Norfolk	
30	Pierce	264,400			Norfolk	L.F.P. (95%)
31	Madison	71,600			Norfolk	L.F.P. (91%)

Priority List - Municipalities under a population of 1,000 (con't)

PRIORITY	TOWN	DAMAGE	1940-1960 POPULATION GROWTH	POPULATION 1960/1940	POTENTIAL SATELLITE OF	COMMENTS
32	Arlington	18,500	171	1.30	Omaha	
33	Beemer	45,100	82	1.14		
34	Verdigre	22,000	28	1.05		
35	Overton	3,300	32	1.07		
36	Meadow Grove	71,500			Norfolk	
37	Pleasanton	67,000			Kearney	
38	Battle Creek	64,800			Norfolk	
39	Firth	47,500			Lincoln	
40	Platte Center	31,100			Columbus	
41	Roca	21,500			Lincoln	
42	Fort Crook	3,100			Omaha	
43	Hoskins	400			Norfolk	

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1. DAMAGE: Figures are dollar damages between 1940 and 1965 expressed in 1965 dollars.

2. L.F.P.: Is a local flocd protection project. The figure in parentheses is average annual damage prevented/average annual damage.

TYPES OF INFORMATION AVAILABLE

Information is readily available concerning some major floods of history. Field surveys to determine the limits of inundation are made by both the U.S. Geological Survey and the Corps of Engineers. Additional information on past floods may be obtained from newspaper accounts, interviews with area residents and permanent high water marks. This information is not uniformly available throughout the state and the events for which it is available vary in magnitude.

Any regulations considered should be based to the extent possible on historical data. However, there are techniques by which the effect of storms different from those experienced may be accurately forecast. Historical data is studied and water surface elevations are determined both as special studies of both the U.S. Geological Survey and the Corps of Engineers. The Corps of Engineers and the Bureau of Reclamation also have flood information available as a part of past studies carried out for various purposes.

The information is available to enable implementation of regulations for many areas. The need exists, however, to gather this information together, prepare it in a uniform fashion, and distribute it to appropriate state and local officials.

Where no suitable information is available, the U.S. Geological Survey and the Corps of Engineers may undertake a special study. Current federal policy requires non-federal interests to provide certain basic data which may delay needed studies if the local sponsor lacks either the funds, staff or competence to comply.

TYPICAL LAND USE REGULATIONS

The following are examples of the types of regulations that can be utilized to reduce flood damages. They are only examples, however, and are not suggested to become the "minimum acceptable". Any set of "minimum acceptable standards" would necessarily be subject to change to deal with the different conditions of each area.

Zoning Ordinances

Primary Floodways

Within the primary floodway as shown on (appropriate map), the following regulations shall apply:

1. Uses Permitted:

    a. Crop farming, truck gardening, livestock grazing, tree farming and similar agricultural uses.

    b. Public parks, recreation areas and facilities including boat ramps, docks, parking areas, picnic tables and fireplaces, private and commercial recreational developments and facilities and camp grounds provided that rest room facilities be approved by the local Health Department.

    c. Temporary storage uses by permit (not including flammable or dangerous liquids such as petroleum, chlorine, etc.) All equipment and materials to be contained or secured so as not to pose dangers by becoming floating debris.

    d. Permanent animal occupancy such as stables, kennels, etc.

    e. Commercial excavation of natural materials (by permit).

    f. Other more or less open space uses as may be determined proper by the Commission with a view toward existing local and regional conditions.

2. Uses and Improvements Prohibited:

    a. No building or structure shall be constructed, altered, extended or moved into the primary floodway.

    b. No landfill or dumping shall be permitted in the primary floodway except as part of approved flood control works.

c. No permanent storage of materials or equipment.

d. The accumulation of floatable debris is prohibited.

Secondary Floodways

Within the secondary floodway as shown on (appropriate map) the following uses shall apply.

1. Uses Permitted:

a. All uses permissible in the primary floodway.

b. Buildings necessary for the uses permitted in the primary floodway if constructed in accordance with the appropriate building codes.

c. Residential, public and commercial uses providing construction is in accordance with appropriate building codes and 75 percent of any land under separate ownership is maintained free of structures which would impede flood flows and at least 25 percent of land under separate ownership is above the elevation of the outer limit of the secondary floodway.

d. Landfill is permitted in the secondary floodway to meet criteria set out in this section.

e. Commercial and public uses which do not meet (b) or (c) but which provide adequate protection by levees, or other acceptable flood proofing methods (by permit).

Building Codes

For those uses requiring approval and compliance with floodway building codes or the issuance of permits the following shall apply:

Foundations: Exterior walls below grade and the cellar floors of all buildings enclosing habitable or occupiable rooms or spaces below grade shall be made watertight, and when necessary shall be reinforced to withstand water pressure equal to that produced by a water level equal to the elevation of the outer boundary of the secondary floodway. The basement walls of the buildings in the residential use groups and the

walls of all habitable and occupiable rooms and spaces below grade shall be protected with not less than a one-coat application of approved waterproofing paint, or a one-half (½) inch pargeting coat of portland cement motar or other approved damp-proof covering.

Sills shall be anchored to the foundation walls at intervals not exceeding six feet by anchors equivalent to bolts not less than one-half (½) inch in diameter with proper washers embedded at least seven inches in the foundation.

All structures, improvements, equipment, etc. shall be either of a weight to resist floatation or be attached to a base to form a fixed unit that will resist floatation in waters of the same elevation as the outer limits of the secondary floodway.

Girders resting on foundation walls or piers shall be anchored thereto.

Columns and posts shall be securely anchored to their foundation and the members they support.

Subdivision Regulations

Lands lying in a designated secondary floodway are not deemed suitable for subdivision unless the following provisions are complied with:

a. Street surfaces shall lie above the elevation of the outer limit of the secondary floodway.

b. Each lot must have 25 percent of its area above the elevation of the outer boundary of the secondary floodway.

c. The lower floor of any residence, excluding basements, must be higher than the outer boundary of the secondary floodway.

d. Not more than 75 percent of the portion of any lot lying below the elevation of the outer boundary of the secondary flood plain shall be occupied by improvements.

e. The final plat of land proposed for subdivision must clearly show any part of the proposed subdivision that lies within a designated floodway.

ALTERNATIVE METHODS OF ACHIEVING THE GOAL

Land use regulations are only one method of achieving the reduction of flood damages. The method proposed is regulatory in nature. Other general methods are suggested and commented on below:

Structural Control

Past attempts to control floods has centered largely about the use of reservoirs, levees, channel improvements and other structural methods. While these remain indispensable tools whose use should be maintained and accelerated; when used alone, they have several shortcomings including:

1. Not all areas may be protected due to technical problems.
2. Areas not sufficiently developed may sustain low to moderate damages for long periods before economic feasibility of structural protection can be shown.
3. Provision of a particular level of protection without additional controls encourages further development negating the damage reduction capability of the structure.
4. Structures have a limited although long life. Development based upon flood protection due to impoundment will require additional protection as reservoir capacities decrease.

Control by Land Acquisition

Flood prone lands could be regulated effectively by state purchase of either title or easements. Easements would necessitate undetermined and continuing future expenditures for the maintenance of control. Purchase of lands followed by disposal with restrictive covenants attached would be costly. It does offer a sound approach when it serves an additional purpose such as acquisition of recreational lands.

RECOMMENDATIONS FOR ACTION

By the Governor

1. Cause the Division of Nebraska Resources (Department of Agriculture) to recognize flood information studies as a necessary part of community planning. The Division administers federal funds under the Housing and Urban Development Act which are used to fund community studies.

2. Cause the Director of Banking to periodically distribute available information concerning flood hazard areas to lending institutions operating in Nebraska.

3. Insure the cooperation of the Department of Roads and the Soil and Water Conservation Commission on highway structures, so that these bridges and road fills do not constitute channel encroachment and that full advantage is taken of opportunities to incorporate flood storage impoundments behind road fill embankments.

4. Cause the Tax Commissioner to study and counsel county assessors on the use of scientific and realistic appraisal of flood plain areas to discourage unwise development of flood hazard lands and to recognize lower real value of such lands as compared to non-floodable property.

5. Insure that no department responsible to the Governor encourages unwise development of flood hazard lands by provision of state funds, approval of federal expenditures, or by failing to exercise descretionary authorities.

By the Legislature

1. Spell out the functions of the Nebraska Soil and Water Conservation Commission as relates to the coordination of federal, state and local participation in gathering flood information.

2. Retain authority at the state level to invoke proper land use regulations in the absence of appropriate local action.

3. Provide for the enforcement of adopted land use regulations.

4. Provide funds for the necessary hydrologic studies and implementation of assigned agency responsibilities.

5. Provide for the posting of flood hazard areas.

6. Direct the Game, Forestation and Parks Commission to place a clear priority on the proper use of flood hazard lands in both land acquisition programs and local grants.

7. Insure that the State will in no way encourage unwise development of flood hazard lands by provision of state funds, approval of federal expenditures, or by failing to exercise descretionary authorities.

8. Require that all State lands if and when disposed, have future uses appropriately restricted if a flood hazard exists.

9. Specify the powers of all cities and counties to adopt and enforce land use regulations.