

PROCEDURAL MANUAL #77-2  
NATIONAL PARK SERVICE

FLOODPLAIN MANAGEMENT

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## SUMMARY

This manual establishes National Park Service (NPS) procedures for implementing floodplain protection and management actions in units of the National Park System as required by Executive Order 11988, "Floodplain Management," and Director's Order #77-2, "Floodplain Management." It replaces all previous NPS floodplain management guidance and related instructions.

It is NPS policy to preserve floodplain values and minimize potentially hazardous conditions associated with flooding. To implement NPS floodplain policy, proposed actions are classified into one of three action classes. Depending upon the action class, one of three "regulatory floodplains" applies (100-year, 500-year, or Extreme). If a proposed action is found to be in an applicable regulatory floodplain and relocating the action to a non-floodplain site is considered not to be a viable alternative, then flood conditions and associated hazards must be quantified as a basis for management decision making and a formal Statement of Findings (SOF) must be prepared. The SOF must describe the rationale for selection of a floodplain site, disclose the amount of risk associated with the chosen site, and explain flood mitigation plans. The SOF will generally be available for public review and comment by including the SOF in applicable National Environmental Policy Act compliance documentation.

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## DEFINITIONS

**ACTION:** *Any Federal activity, including, but not limited to, acquiring, managing, and disposing of Federal lands and facilities; facilitating human occupation or visitation; providing Federally undertaken, financed, or assisted construction and improvements; and conducting Federal activities and programs affecting land use, including but not limited to, water and related land resources planning, and regulating and licensing activities.*

**ALLUVIAL FAN:** *The land counterpart of a delta; fan assemblage of sediments marking the place where a stream moves from a steep gradient to a flatter gradient and suddenly loses its transporting power. Typical of arid or semiarid climates, but not confined to them.*

**BASE FLOOD:** *That flood which has a one percent or greater chance of occurring in any given year (also known as the 100-year flood). This term is used by the National Flood Insurance Program to indicate the minimum level of flooding to be used by a community in its floodplain management regulations.*

**BASE FLOODPLAIN:** *The 100-year floodplain.*

**CHANNEL:** *A natural or artificial watercourse of perceptible extent with a definite bed and banks to confine and conduct continuously or periodically flowing water.*

**COASTAL HIGH HAZARD AREA:** *The area usually confined to the beach in front of high bluffs or the crest of primary or foredunes, where wave impact is the most significant inducing factor. Also includes those areas subject to tsunamis.*

**CRITICAL ACTION:** *Activities for which even a slight chance of flooding is too great. Examples of critical actions include schools, hospitals, fuel storage facilities, irreplaceable records, museums, and storage of archeological artifacts.*

**EXTREME FLOOD:** *The flood considered to be the largest in magnitude possible at a site. Methods for determining extreme floods for a basin or area of concern include, but are not limited to, Probable Maximum Flood, Q Extreme, and Paleoflood Determinations. The purpose of using these methods is to delineate the area beyond which there is no risk of flooding.*

**EXTREME FLOODPLAIN:** *The area inundated during an extreme flood.*

**FLASH FLOOD:** *The flood that occurs in a short time interval (minutes to hours) following a causative event, and for which there is insufficient time for persons on-site to become aware of the flood and safely evacuate.*

**FLOOD OR FLOODING:** *A general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of inland and/or tidal waters*

*and/or the unusual and rapid accumulation of runoff of surface waters from any source.*

**FLOODPLAIN:** *The lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands and (at a minimum) that area subject to temporary inundation by a regulatory flood.*

**GEOMORPHICALLY ACTIVE ZONES:** *Zones where flood-induced erosion, sediment deposition, or sediment transport processes present a clear hazard to structures or facilities, or present a danger to persons occupying the site. Geomorphically active zones include hillslopes subject to mass-failure if undercut by floods, arroyo banks, eroding river terraces, alluvial fans, and beaches.*

**HIGH HAZARD AREAS:** *Those portions of riverine or coastal floodplains nearest the source of flooding or areas subject to flooding events which are so unexpected, violent, or otherwise devastating that human lives are placed in immediate and grave danger. High Hazard Areas include, but are not limited to, areas subject to flash flooding; areas where floodwaters exert their maximum force; areas behind unsafe or inadequate levees; areas below dams known to be structurally unsound; areas from which escape would be difficult; areas near or on alluvial fans; and coastal high hazard areas.*

**HYDRAULIC AND HYDROLOGIC HAZARDS:** *Hazards to human life or property caused by the conditions of flow (e.g., deep water; high velocities; debris loads) or by the characteristics of flooding (e.g., rate of flood rise; rapidity of response to causative events).*

**MITIGATION:** *Measures that serve to minimize the potential of flooding or the adverse impacts of actions in floodplains. These measures may be used for either present or planned actions. Examples include:*

- *dikes and/or conveyance ditches built to divert and/or carry flood flows away from the site;*

- *dams built to impound flood flows above the site and designed to release the captured waters at a slow, moderate rate which will not result in flooding of the site;*

- *modification of structures to provide sufficient elevation above the flood crest (e.g., placing structures on columns, walls, piles, or piers);*

- *restoration of watershed conditions to eliminate accelerated runoff caused by soil compaction, poor vegetation cover, or the unnatural conveyance of water by roads, ditches, or trails;*

- *closure of the area to the public during seasons which historically produce*

*flood events;*

*- replacement or compensation for lost natural floodplain values;*

*- development of an adequate flood warning system which monitors one or more physical parameters (e.g., rainfall, runoff, streamflow) and provides warning of an impending flood to visitors and park personnel with adequate time to permit evacuation; and*

*- signs, high water indicators, and other information indicating that a site is flood-prone and suggesting appropriate actions in the event of flooding.*

**NATURAL FLOODPLAIN VALUES:** *Attributes of floodplains which contribute to ecosystem quality, including, but not limited to, soils, vegetation, wildlife habitat, dissipation of flood energy, sedimentation processes, and ground water (including riparian ground water) recharge. Periodic disturbance of natural floodplain soils and geomorphic and vegetation attributes by floods also contributes to ecosystem quality.*

**PRACTICABLE:** *Capable of being done within existing constraints. The test of what is practicable depends upon the situation and includes consideration of pertinent factors such as local environmental conditions, cost, or technology.*

**PRELIMINARY FLOODPLAIN ASSESSMENT:** *A subjective, reasoned determination by a qualified professional of the existence of flood potential at a site. Preliminary floodplain assessments are based upon an analysis of site characteristics including hydrology, channel type and capacity, geomorphology, topography, vegetation, climatic data, watershed characteristics, and existing published information.*

**RECURRENCE INTERVAL:** *The average time interval between occurrences of a hydrological event of a given or greater magnitude.*

**REGULATORY FLOODPLAIN:** *The specific floodplain that is subject to regulation by Executive Order 11988 and this procedural manual. For Class I Actions, the Base Floodplain (100-year flood) is the regulatory floodplain; for Class II Actions, the 500-year floodplain is the regulatory floodplain; for Class III Actions, the Extreme floodplain is the regulatory floodplain.*

**RESTORE:** *To re-establish a setting or environment in which the natural functions of the floodplain can again operate.*

**STRUCTURES:** *Walled or roofed buildings, including mobile homes, and gas or liquid storage tanks that are primarily above ground.*

## I. PURPOSE

The purpose of this manual is to establish procedures for use by the NPS in implementing floodplain protection and management actions in units of the National Park System as required by Executive Order 11988, Floodplain Management, and Director's Order #77-2, Floodplain Management.

## II. POLICY

It is NPS policy to recognize and manage for the preservation of floodplain values, to minimize potentially hazardous conditions associated with flooding, and to comply with the NPS Organic Act and all other federal laws and Executive orders related to the management of activities in flood-prone areas (including coastal flood-prone areas). Specifically, it is the policy of the NPS to:

- Protect and preserve the natural resources and functions of floodplains;
- Avoid the long- and short-term environmental effects associated with the occupancy and modification of floodplains; and
- Avoid direct and indirect support of floodplain development and actions that could adversely affect the natural resources and functions of floodplains or increase flood risks.
- Restore, when practicable, natural floodplain values previously affected by land use activities within floodplains.

When it is not practicable to locate or relocate development or incompatible human activities to a site outside and not affecting the floodplain, the Service will:

- Prepare and approve a Statement of Findings, in accordance with procedures described in Procedural Manual 77-2: Floodplain Management; and
- Take all reasonable actions to minimize the impact to the natural resources of floodplains; and
- Use non-structural measures as much as practicable to reduce hazards to human life and property; and
- Ensure that structures and facilities are designed to be consistent with the intent of the standards and criteria of the National Flood Insurance Program (44 CFR Part 60).

### III. OBJECTIVES

The objectives of this manual are to:

- Define the regulatory floodplain and the information required to delineate regulatory floodplains,
- Define the information required to evaluate hazards associated with the modification or occupation of floodplains, and
- Provide requirements for managing activities which result in the modification or occupation of floodplains, or which result in impacts to floodplain values.

### IV. RELATIONSHIPS TO OTHER REQUIREMENTS

This manual is consistent with all substantive requirements of Executive Order 11988, Floodplain Management (herein referred to as "the Executive Order"), as interpreted and explained in the U.S. Water Resources Council (WRC) Floodplain Management Guidelines (43 FR 6030). NPS compliance with the Executive Order is mandatory. This procedural manual adopts the requirements of the Executive Order, as interpreted and explained in the WRC guidelines, and follows the WRC guidelines except where they are superseded by the Department of the Interior Manual (Chapter 1, Part 520). This procedural manual also addresses activities and responsibilities that occur in flood-prone areas not specifically addressed in the Executive Order, WRC guidelines, or Department Manual (e.g., flash flood-prone zones; geomorphically active zones).

This procedural manual should be used in conjunction with Director's Order 12, "Conservation Planning, Environmental Impact Analysis, and Decision Making," and the DO-12 Handbook. The DO-12 Handbook contains basic information for NPS compliance with the requirements of the National Environmental Policy Act (NEPA) and other information on impact assessment and resource conservation.

Documents prepared in accordance with this procedural manual will be combined with or appended to the appropriate environmental documents prepared in compliance with NEPA, the Departmental Manual, and DO-12. Wetlands compliance can be combined with floodplain compliance when the two issues are related.

The Standards and Criteria of the National Flood Insurance Program (44 CFR 60) pertain specifically to the procedures in this manual. Those Standards and Criteria apply to the protection of structures and facilities from flood hazards and the protection of existing development from the effects of new development. They pertain to siting and design criteria for residential and non-residential structures, utility systems, and other structures. Unless these standards are demonstrably

inappropriate for a given type of structure or facility, they will apply to all NPS planning, assessment, and design activities for actions in the regulatory floodplain.

## V. SCOPE

### A. *Applicability*

This procedural manual applies to all NPS proposed actions, including the direct and indirect support of floodplain development and channel modifications, that could adversely affect the natural resources and functions of floodplains or increase flood risks. If the cost of obtaining precise floodplain information is prohibitive, the NPS will assume the project is within a regulatory floodplain unless the site can be determined beyond reasonable doubt to be outside the floodplain.

This procedural manual will apply to actions implemented prior to the Executive Order (May 28, 1980), including existing developments, when those actions are the subject of regularly occurring updates of official NPS planning documents. This procedural manual also applies to roads and to actions that are functionally dependent upon locations in proximity to water and for which non-floodplain sites are never a practicable alternative. Examples of actions functionally dependent upon water include: marinas, docks, piers, water intake facilities, sewage outfalls, bridges, flood control facilities, water monitoring stations, drainage ditches, debris removal, outdoor water sports facilities, boardwalks to interpret wetlands, and similar water-dependent actions.

While non-floodplain locations may not be a practicable alternative for these types of activities, minimization of impacts to the natural resources of floodplains remains an important requirement.

### B. *Excepted Actions*

This procedural manual does not apply to historic or archaeological structures, sites, or artifacts whose location is integral to their significance.

This procedure does not apply to certain park functions that are often located near water for the enjoyment of visitors but require little physical development and do not involve overnight occupation. Examples include:

- Picnic facilities, scenic overlooks, foot trails, and small associated daytime parking facilities in non-high hazard areas provided that the impacts of these facilities on floodplain values are minimized;
- Isolated backcountry sites, natural or undeveloped sites along trails or roads, survey and study sites, or other similar activities; and

- Emergency actions essential to protecting property and public health, provided that emergency actions are limited to the minimum required and that all possible steps are taken to mitigate the short and long term adverse impacts of these actions on floodplain values.

## VI. PROCEDURES

### *A. Introduction*

The general procedure for implementation of NPS floodplain policy is depicted in Figure 1. To implement this policy, a proposed action is to be classified into one of three classes. A Statement of Findings will be prepared if the proposed action falls within the regulatory floodplain applicable to that class of actions. A preliminary floodplain assessment is conducted to determine if the proposed action has a chance of being located in the applicable regulatory floodplain. If there is no chance that the proposed action will be located in the applicable regulatory floodplain, there are no further requirements of this procedural manual.

If there is a chance that the proposed action will be in the applicable regulatory floodplain, then that floodplain must be determined. If it is determined, based on that delineation, that the proposed action will be located in the applicable regulatory floodplain, then additional actions are required as set out in this procedural manual. Flood conditions and associated hazards must be quantified; appropriate actions (an alternative site, or effective mitigation and/or warning and/or evacuation planning) must be taken to manage floodplain conditions and flood hazards; and a formal Statement of Findings must be prepared.

Each of the following sections specifically relates to an item on Figure 1.

### *B. Determine the Action Class*

A determination must be made as to which class the proposed action falls into:

Class I Actions include location or construction of administrative, residential, warehouse, and maintenance buildings; non-excepted parking lots; or other man-made features which by their nature entice or require individuals to occupy the site, are prone to flood damage, or result in impacts to natural floodplain values. Class I Actions are subject to the floodplain policies and procedures if they lie within the **100-year floodplain** (the Base Floodplain).

Class II Actions include any activity for which even a slight chance of flooding is too great. Class II Actions are subject to the floodplain policies and procedures if they lie within the **500-year floodplain**. Examples of Class II Actions are the location or construction of:

- Schools, hospitals, clinics, or other facilities occupied by people with physical or medical limitations;
- Emergency services;
- Fuel storage facilities, 40,000 gallons per day or larger sewage treatment plants, and storage of toxic or water-reactive materials, including hazardous materials; and
- Irreplaceable records, museums, and storage of archeological artifacts.

Class III Actions include Class I or Class II Actions in high hazard areas, which include coastal high hazard areas and areas subject to flash flooding. In high hazard areas, picnic facilities, scenic overlooks, foot trails, and associated day-time parking facilities may be placed within the 100-year floodplain, but these facilities must contain signs informing visitors of flood risk and suggested actions in the event of flooding. Consideration should be given to providing additional levels of flood protection. For other activities, Class III Actions are subject to the floodplain policies and procedures if they lie within the **extreme floodplain**.

*C. Determine the Regulatory Floodplain*

Action Class	Regulatory Floodplain	Chance of Flooding during One Year	Chance of Flooding during Fifty Years
Class I	100-year (Base Floodplain)	1%	39%
Class II	500-year	0.2%	10%
Class III	Extreme Flood	0%	0%

*D. Perform Preliminary Floodplain Assessment*

A preliminary floodplain assessment can be made as part of a general floodplain inventory or on a case-by-case basis. Flood-prone areas subject to or potentially subject to Class I, II, or III Actions should be inventoried and assessed during the preparation of the Resource Base Inventory preceding the General Management Plan or other planning documents. The preliminary assessment can be accomplished using existing floodplain delineations or by conducting a site assessment using qualified hydrologists, engineers, planners, or scientists. Where existing floodplain delineations are not available, the preliminary assessment should be based upon an analysis of such factors as vegetation, topography, soils, geomorphic features and processes, stream type, watershed characteristics, and other factors. The objective is to determine if there is any chance that the site might be flood-prone. If, based

upon the preliminary floodplain assessment, it can be determined that there is no chance that the site is subject to flooding, then there are no further requirements under this procedural manual.

The preliminary assessment should also include associated hydrologic factors such as the rate of flood water rise, duration of flooding, likely sediment and debris loads, potential pollution hazards, and hazards associated with ice and/or debris jams. Geologic and geomorphic stability also should be evaluated, including the potential for sediment deposition, bank erosion and channel realignments, alluvial fan processes, mudslides, and other contingencies. In the case of coastal sites, areas susceptible to high tides, storm waves, tsunamis, beach erosion, and other factors should be described and evaluated.

#### *E. Delineate the Regulatory Floodplain*

If the proposed action is determined to be in a potentially flood-prone site, the regulatory floodplain that corresponds to the applicable Action Class should be delineated on a map of sufficient scale to meet all planning needs. Or, if a map is unavailable, some determination of regulatory flood elevation relative to the proposed action should be made. The delineated floodplain should correspond to the elevation, on the land's surface, and location of the maximum extent of inundation by the regulatory flood. Flood magnitudes (e.g., 100-year; 500-year) should be determined by commonly accepted flow-frequency analysis procedures, regional hydrologic analysis procedures, or hydrologic modeling procedures. The extreme flood magnitude should be determined by any one of several accepted extreme flood procedures. The elevation of the regulatory flood should be determined using commonly accepted procedures, implemented by qualified professionals. All methods should be properly referenced.

#### *F. Develop Information on Flood Conditions and Hazards*

In addition to delineating the regulatory floodplain, floodplain management decisions are to be based upon information on the hydrologic and geomorphic processes and hazards associated with the location of the proposed activity. Flood hazard information should be developed and should include an analysis of flooding frequency at the proposed activity site, the probability of flooding over the planned project life, and the hydraulic attributes associated with the regulatory flood at the proposed activity site (flood depth and velocity). Further descriptions and evaluations of the hydrologic factors outlined in Section VI D will be made to fully assess hazards of those contingencies.

#### *G. Design Actions to Manage Flood Conditions*

After determining the Action Class and Regulatory Floodplain and evaluating hydrologic, hydraulic, and geomorphic hazards associated with the site of the proposed action, it is necessary to take effective actions to protect floodplain natural

and cultural resources, and mitigate flood hazards to human life and property. Those actions will include selection of an alternative (non-floodplain) site, structural or other forms of mitigation, and/or flood warning and evacuation plans. The following guidance is provided in developing appropriate floodplain management actions.

#### Alternative site determinations

Non-flood-prone sites should be identified and evaluated for all proposed actions when it is determined that the action will occur in a regulatory floodplain. If practicable alternative sites are identified, it is NPS policy as set forth in DO #77-2, the Executive Order, and this procedural manual to give preference to locating, or relocating, the proposed action at an alternative site outside and not affecting the regulatory floodplain. In the event that an alternative site outside and not affecting the regulatory floodplain is selected, no further requirements under this manual apply. When pre-existing actions are relocated from a regulatory floodplain to an alternative site, restoration of floodplain values should be factored into the relocation action.

#### Mitigation

Measures may be applied to proposed actions to provide for their location in the regulatory floodplain when it is documented in a Statement of Findings that practicable alternative locations are not available and the importance of the location clearly outweighs the policies set forth in Section II of this procedural manual. Generally the mitigation should provide protection up to the level of the applicable regulatory floodplain.

Mitigation measures may also be applied if other substantive management considerations exist which clearly favor locating an action in a regulatory floodplain.

Mitigation may consist of any combination of seasonal closure, structural flood protection measures, specific actions to minimize impacts to floodplain natural resource values, effective flood warning, and flood evacuation.

Structural flood protection measures must be professionally engineered to effectively manage flood hazards as quantified according to Section VI-F of this procedural manual. Effective structural flood proofing is very difficult to achieve for geomorphically unstable sites such as alluvial fans and active beach zones.

Flood warning and evacuation planning must be designed and determined to be adequate to manage flood hazards as quantified according to Section VI-F of this procedural manual. Effective flood warning and evacuation planning is very difficult to achieve for flash flood-prone, high hazard locations.

Some mitigation measures may result in the modification of floodplains to such an extent that the elevation of the regulatory flood will be affected. In these situations, additional hydraulic analyses may be required to quantify flood hazards under

mitigated conditions.

## **VII. STATEMENT OF FINDINGS (SOF)**

### *A. Introduction*

A Statement of Findings (SOF) must be prepared if a proposed action is found to be within a regulatory floodplain. Generally, the SOF will be included in the appropriate environmental compliance documents prepared for the proposed action as required by the National Environmental Policy Act (NEPA) and NPS-12, "Conservation Planning, Environmental Impact Analysis, and Decision Making."

If an Environmental Assessment (EA) is prepared and it is determined on the basis of the EA that there will be no significant impacts, then a Finding of No Significant Impact (FONSI) will be prepared for and signed by the Regional Director. In such cases, the SOF may be combined as a separately identifiable document with the EA and signed concurrently with the FONSI.

If an Environmental Impact Statement (EIS) will be prepared, then a Notice of Intent will be published in the Federal Register. The SOF may be combined as a separately identifiable document with the EIS and signed concurrently with the Record of Decision for the EIS. In cases where the Record of Decision for the EIS is signed by someone other than the Regional Director, the floodplain SOF must first be signed by the Regional Director.

The public review period for the SOF will coincide with that of the NEPA document. Upon approval, the SOF will be sent to the appropriate agencies and appropriate state review offices as determined by NPS-12.

Actions categorically excluded from NEPA compliance as provided for in 516 DM and NPS-12 must be evaluated according to the procedures in this manual to ensure compliance with the Floodplain Management Executive Order.

Campgrounds and associated sanitary facilities are subject to the requirements of Director's Order 77-2 and this manual. In the case of campgrounds in non-high hazard floodplains, the requirement of first attempting to locate an action outside of the regulatory floodplain may be relaxed to permit the use of aesthetically desirable locations near water. This is because the risk to humans from flooding is very low where flooding is predictable and happens over a period of hours or days. Therefore, when an evaluation of alternative sites has indicated that there is no aesthetically comparable, flood-safe location, campgrounds can be located in non-high-hazard regulatory floodplains without further justification. Campgrounds may be located in high hazard areas only when it has been determined that there is no practicable, flood-safe, alternative location available.

All campgrounds located in regulatory floodplains must be documented in a Statement of Findings, which clearly explains the rationale for site selection, how impacts to floodplain natural resources are or will be minimized, and how flood hazard mitigation will be achieved. In general, campground infrastructure should be designed to the 100-year standard. Protection to humans must be to the highest level possible. The preferred means of mitigating hazard to humans is by the use of non-structural methods including seasonal closure and warning/evacuation. Warning and evacuation is difficult in high hazard environments and must be realistically assessed before being adopted as the chosen mitigation method. While generally discouraged, structural protection utilizing floodwalls, levees, etc. may be considered when there is a compelling reason for placing/retaining a campground in a high hazard location and when environmental evaluation indicates that this is an acceptable approach.

### *B. Content*

The SOF will provide precise reasoning as to why the proposed site was selected and why less flood-prone alternative sites were rejected. The SOF will include an accurate and complete description of the flood hazard assumed by implementation of the proposed action without mitigation in accordance with Section VI-F of this Procedural manual. In the case where alternative sites are also flood-prone, an analysis of the comparative flood risk between alternative sites will be provided. The SOF will describe the environmental impacts associated with the proposed action or reference the NEPA document providing this information. The SOF will include a thorough description of mitigation measures chosen to achieve compliance with DO #77-2, the Executive Order, and this procedural manual, and will provide sufficient information to evaluate the effectiveness of the proposed mitigation in managing identified flood hazards. If flood warning and evacuation are planned, both warning and evacuation times should be determined. In the event that risk to property or human life cannot be eliminated in high hazard areas, even by complying with this procedural manual, a clear statement of this situation is required in the SOF.

An outline illustrating the content and organization of an SOF is provided in Section VII. D.

### *C. Approval Process*

An approved Floodplain Statement of Findings must include a cover sheet signed by the Park Superintendent, recommending the activity. The Superintendent's recommendation endorses the proposed/existing action and the mitigation techniques described in the SOF.

The cover sheet will also include concurrence by the Chief of the Water Resources Division (or other qualified, professional, NPS hydrologist). The Chief, Water Resources Division, (or other NPS hydrologist) assures technical adequacy of floodplain analyses, Servicewide consistency in implementation of Director's Order

77-2, and consistency with NPS protocols and standards as presented in this procedural manual.

The SOF will also include an approval line on the cover sheet signed by the Regional Director. The Regional Director is responsible for approval of the SOF, indicating agreement with the proposed/existing action described in the SOF and sufficient consideration of compliance requirements and safety-related factors. At the discretion of the Regional Director, an NPS Compliance and/or Safety Officer(s) may surname the SOF prior to approval (signature) by the Regional Director. In the case where an SOF is prepared in association with an EIS Record of Decision (ROD) and someone other than the Regional Director signs the ROD, the SOF is first signed by the Regional Director and then by the ROD official.

#### *D. Outline for a Floodplain Statement of Findings*

Each Statement of Findings will include the following:

- Cover Sheet with “Recommended” line to be signed by Superintendent; “Certification of Technical Adequacy and Servicewide Consistency” line to be signed by Chief, Water Resources Division or other qualified, professional, NPS Hydrologist; and “Approved” line to be signed by the Regional Director.
- Introduction
  - A. Brief description of the proposed action
  - B. Brief site description
  - C. General characterization of floodplain values and of the nature of flooding and associated floodplain processes in the area
- Justification for Use of the Floodplain
  - A. Description of why the proposed action must be located in the Floodplain
  - B. Investigation of alternative sites
- Description of Site-Specific Flood Risk
  - A. Recurrence interval of flooding at the site
  - B. Hydraulics of flooding at the site (depths, velocities)
  - C. Time required for flooding to occur (amount of warning time possible)
  - D. Opportunity for evacuation of site in the event of flooding
  - E. Geomorphic considerations (erosion, sediment deposition, channel adjustments)

- Description and explanation of flood mitigation plans, including:
  - A. Measures to reduce hazards to human life and property to the regulatory floodplain level, while minimizing the impact to the natural resources of the floodplain, including the use of non-structural measures as much as practicable; and,
  - B. Acknowledgement that structures and facilities are designed to be consistent with the intent of the standards and criteria of the National Flood Insurance Program (44 CFR Part 60).
- Summary

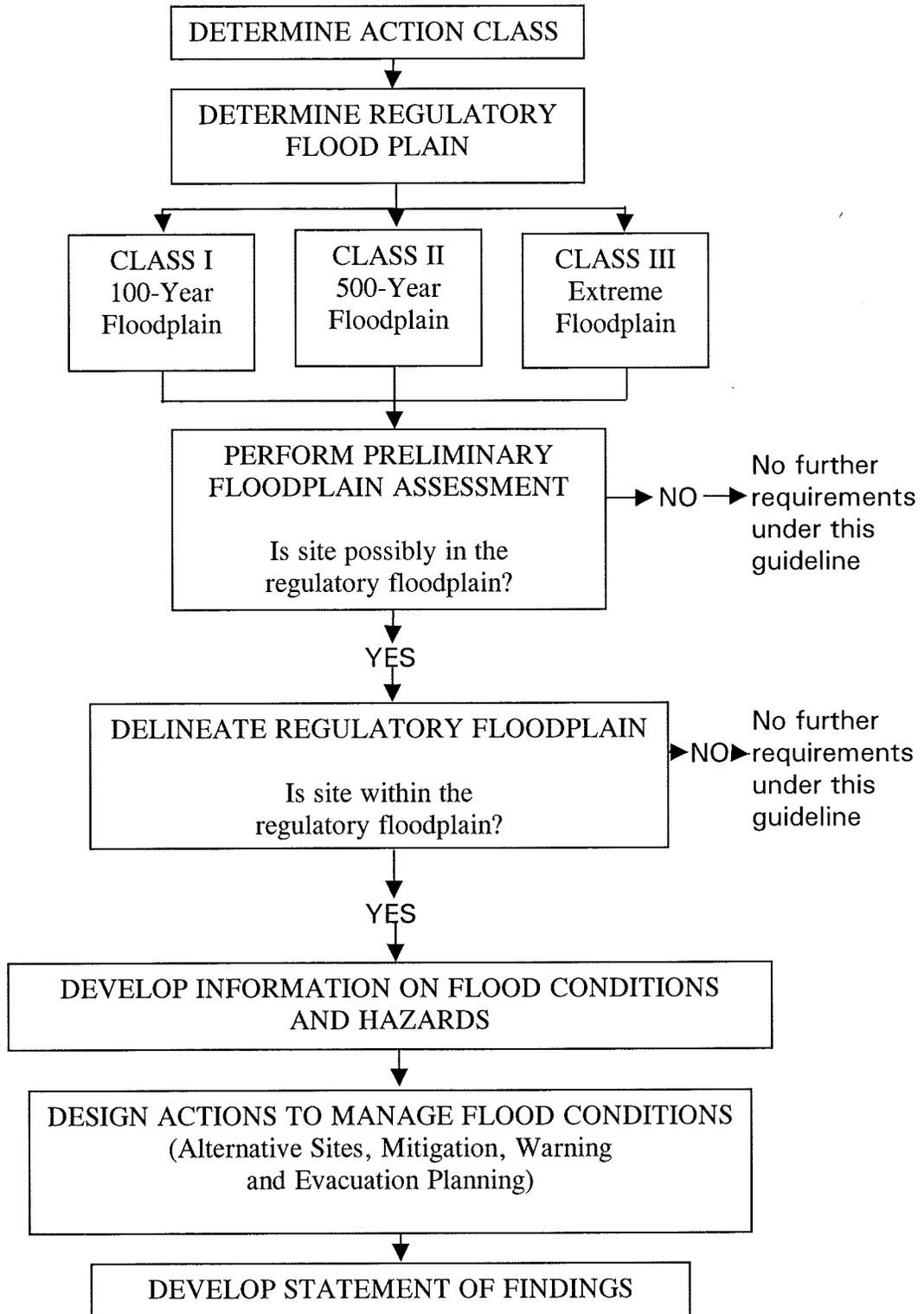


Figure 1. Outline for Implementing the National Park Service Floodplain Management Procedural Manual