



# ISLAND COUNTY PLANNING & COMMUNITY DEVELOPMENT

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**TO:** Island County Planning Commission  
**FROM:** Island County Department of Planning & Community Development  
**DATE:** May 31<sup>st</sup>, 2005  
**RE:** 2005 Critical Areas Ordinance Update - Frequently Flooded Areas – Summary Report

The attached document is a summary report of the review and evaluation of Frequently Flooded Areas conducted in accordance with RCW 36.70A and satisfies the requirements for the 2005 Island County Critical Areas (CAO) update. Frequently Flooded Areas are one of five elements to the CAO that is currently under review for revisions and updating. Frequently Flooded Areas are following the Track Two (2) schedules for Planning Commission review as described under Ordinance C-????-05. The following document is divided into several chapters that provide background information, general overview of state laws and Growth Board decisions, an explanation of current regulations and implementation practices, overview of Best Available Science, various issues raised by the public and/or department, data analysis, and conclusions and options available for the update process. This issue paper provides all of the necessary information needed during creation of the final report and recommendations to the Board of Island County Commissioners (BICC).

The Planning Commission will hold two public hearings tentatively scheduled to be held during the third week of June, one on Camano Island and the other on Whidbey Island. Deliberations and recommendations will follow in the middle of July, and it is scheduled to go before the Board of Island County Commissioners in late July/early August.

If you have any questions regarding this process or the information contained herein, do not hesitate to contact Planning & Community Development staff. Thank you for your consideration.

Signature: \_\_\_\_\_  
Phil Bakke  
Director of Planning & Community Development

\_\_\_\_\_  
Issue Date

# Island County

## Frequently Flooded Areas

Critical Areas Update

May 2005

*Island County  
Department of Planning & Community Development  
PO BOX 5000  
Coupeville, Washington 98239*

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## 1.0 BACKGROUND INFORMATION

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### Frequently Flooded Areas: <sup>1</sup>

*Definition:* Lands in the floodplain subject to a one percent or greater chance of flooding in any given year; these include, but are not limited to: streams, lakes, coastal areas, and wetlands.

*Designation Criteria:* One hundred year floodplains as listed and mapped by the Federal Emergency Management Agency (FEMA) and the National Flood Insurance Program (NFIP).

### 1.1 BACKGROUND

In contrast to other areas around Puget Sound, Island County does not have major riverine systems common in other counties within the region and therefore does not experience the magnitude or frequency of stream related flooding. Despite this, Island County is not immune to the threat of flooding. This report focuses primarily on coastal flooding issues.

Coastal flooding in Island County can occur during heavy precipitation events coupled with weather systems involving low barometric pressure and high winds. These types of storms can result in higher than predicted tides and flooding of low-lying shoreline properties that may experience waves running up the beach overtop existing shore protection structures such as bulkheads or riprap. Depending on the duration of these storm events, existing structures constructed prior to flood zone standards may be susceptible to damage.

Other less violent types of flooding could include, flooding of surface waters in low-lying areas around lakes, wetlands, and other depressions features also more common during times of heavy precipitation. It should be noted that because of the geographic location of Island County within the ‘rain-shadow’ of the Olympic Mountain annual precipitation are relatively lower than other neighboring areas of Puget Sound.

On a comprehensive planning effort, Island County has adopted and implemented building and land-use regulations that serve to protect life and property from flood damage and to minimize reduction in floodplain area displacement.

Historically, individual residents, community associations, and diking districts have undertaken local flood protection efforts, including drainage infrastructure improvements, installation of tidegates, holding ponds, and shore protection structures such as bulkheads and riprap. Many of these efforts have been taken on an individual basis with only limited coordinated measures for constructed flood protection serving specific regional areas. In a few cases, the County is responsible for the maintenance of these flood control facilities. <sup>2</sup>

The Island County Comprehensive Plan addresses Frequently Flooded Areas directly in three of its chapters of county code: chapter 17.02, chapter 14.02, and chapter 11, and indirectly within chapter 17.05 (Shoreline Master Program). Chapter 1 of this report is intended to provide a general introduction/background to the critical area (Frequently Flooded) review; Chapter 3 provides definition

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<sup>1</sup> Chpt. 3: Island County Comprehensive Plan Land Use Element – Future Land Use (General Overlays and Critical Areas) pg. 107

<sup>2</sup> Chpt. 1: Island County Comprehensive Plan Overview – Major Issues pg. 60

and criteria used in designating areas as “frequently flooded”; and finally Chapter 4 focuses more on technical information identifying goal of the regulation implementation and related current policies.

## 1.2 HISTORY

### *Floodplain Management*

A county wide “Flood Insurance Study” was published for Island County by FEMA on June 1<sup>st</sup>, 1981. Following creation of the flood study and the FEMA generated FIRM-maps, Island County began to implement flood regulations in January of 1982 through adoption of section 14.02.101 ICC. In April of 1991, Island County updated the original flood regulation through adoption of chapter 14.02A – Flood Damage Prevention Ordinance. The 1991 update involved significant changes to the original code by providing policy goals for the flood program, definition of terms, as well as a variance and appeal mechanisms for flood development permits. The 1991 code serves as the basis for the existing code with the exception of a minor change in 1995<sup>3</sup> updating a reference from the original FEMA flood study to a more recent FEMA study. The current ordinance Chapter 14.02A ICC continues to be implemented by the Island County Building Department through review of flood designations depicted on the FEMA supplied FIRM-maps. These maps in some areas of Island County also provide a Base Flood Elevation (BFE) for which many of the regulations are based off.

The original flood study completed in 1981 consisted of a 4-year coordinated effort between the Island County Planning Department, City of Oak Harbor, Town of Coupeville, WA-State Dept. of Ecology, and FEMA. Flood elevations and FIRM-maps for Island County were derived from this report based on the following components: (1) astronomical (predicted) tide, (2) wind data, (3) storm surge (barometric pressure), and (4) wave run-up (beach topography & wave fetch). The study focused on unincorporated areas of Island County not including studies in Oak Harbor, Coupeville, and Langley. Because of a heightened concern with potential for flood damage, the Country Club/Swantown, Crockett Lake, Duguall Bay, Mutiny Bay and Useless Bay were studied in more detail (FEMA report, 1981)<sup>4</sup>.

The flood study described Island County as having “(a) poorly developed stream network...virtually no accumulation of snow pack...moderate temperatures...(and) lying in the rain shadow of the Olympic Mountains, (with) generally less than 20 inches of precipitation annually”. These unique conditions warranted less concern over upland flooding risk and prompted more focus on potential flooding of marine waters and low-lying shoreline properties. A computer model was used that was based on inputs of predicted environmental conditions producing 100-year flood potential in the form of Base Flood Elevations (BFE) and depicting area of risk into one of the three main categories:

**Zone A\*:** Flood Hazard area within 100-year flood zone, waves less than 3’ predicted;

**Zone B:** Areas between Flood Hazard area and 500-year flood zone;

**Zone V\*:** Velocity zone, waves greater than 3’ within 100-year flood zone;

**Zone C:** Areas of minimal flooding.

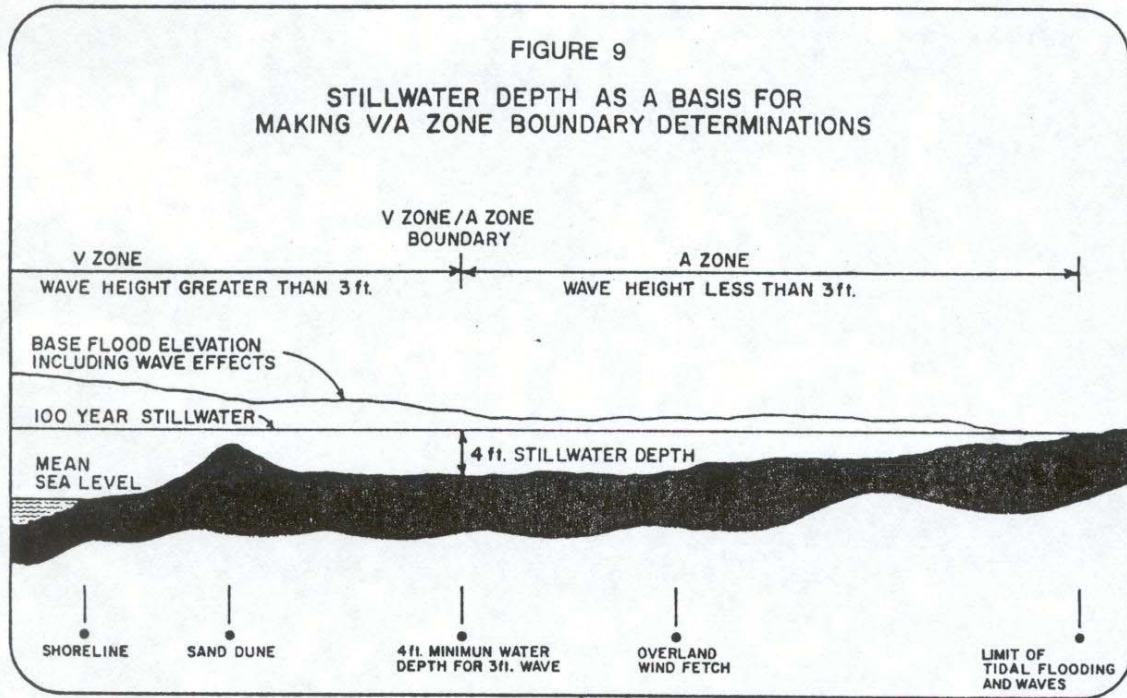
\*Sub-categories identified with more specific explanation.

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<sup>3</sup> Island County ordinance PLG-026-95

<sup>4</sup> Flood Insurance Study for Island County, produced by FEMA (Appendix B)

These FIRM maps are used for regulating new construction/remodels of structures within an identified flood area as well as a reference for flood insurance rates within Island County. The following diagram shows a cross-section of how the FIRM zone is determined:



In 1989, the Washington State Legislature reduced the States authority in local floodplain management, by removing restrictions pertaining to critical facilities and flood protection elevation of one foot above base flood level (DOE letter, 1989) <sup>5</sup>.

Island County adopted the updated “Flood Damage Prevention Ordinance”, chapter 14.02A ICC in April of 1991. As described above this update involved significant changes from the original ordinance providing the following **Statement of Purpose** as guidance:

*“It is the purpose of this ordinance to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designated:*

1. *To protect human life and health;*
2. *To minimize expenditure of public money and costly flood control projects;*
3. *To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;*
4. *To minimize prolonged business interruptions;*

<sup>5</sup> Letter from WA-State Department of Ecology to Island County dated 11-22-1989 with notice of new legislative changes pertaining to Floodplain Management.

5. *To minimize damage to the public facilities and utilities such as water and gas mains, electric telephone and sewer lines, streets and bridges located in area of special flood hazard;*
6. *To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;*
7. *To ensure that potential buyers are notified that property is in an area of special flood hazard; and*
8. *To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.”*

In addition to the added policy, the 1991 update, also provided definition of flood regulation related language as well as implementation duties and responsibilities and a variance process for disputes in required flood standards.

In April of 1991, the Island County Planning Director requested to FEMA that a section of West Beach near Swantown be reclassified from an A-Zone (A2) to a coastal hazard zone (V-zone). This recommendation was based on the Planning Directors interpretation of authority to “use actual flooding events and driftwood lines to define the real life velocity zone boundary” (letter from L. Kwarsick to FEMA dated April 5<sup>th</sup>, 1991 – appendix C). This determination was anticipated to affect 10-vacant lots as well as re-modeling of existing structures by requiring additional development standards, namely pile foundations. The reclassification was appealed by one of the residents who owned property within the affected area; the appeal was heard before the Island County Hearing Examiner (APP 009/91 – Appendix C) who upheld the Planning Directors decision resulting in validation of shoreline portions of West Beach up to West Beach Road designated as a V-zone.

In 1995, FEMA provided Island County with a digital format of the FIRM-maps and an updated flood study titled “Flood Insurance Study – Island County Washington & Incorporated Areas, dated August 16<sup>th</sup>, 1995. This study incorporated the analysis and Base Flood Elevations (BFE) word for word from the 1981 study. The only changes in the 1995 study consisted of amendments to flood designation categories, and incorporation of FIRM-map designations for incorporated Island County (Oak Harbor, Coupeville, and Langley) that previously were independent maps. As a result from republication of the original flood study including the changes described above, Island County made a minor code change in July of 1995<sup>6</sup> updating references to the 1995 flood study as opposed to the original 1981 study. Below is a list and brief description of flood plain designations adopted as part of incorporation of the 1995 FEMA Flood Study:

- Zone A:** General Flood hazard area within 100-year flood zone, no BFE provided;
- Zone AE:** Flood hazard area within the 100-yr flood zone, whole foot BFE identified;
- Zone AH:** 100-yr shallow flooding (ponding, 1’-3’), whole foot BFE identified;
- Zone AO:** 100-yr shallow flooding (sheet flow, 1’-3’), Avg. whole foot depths identified;
- Zone V:** Velocity zone, 100-yr coastal floodplain associated with additional coastal hazards;
- Zone VE:** Same as above, but with BFE identified; and
- Zone X:** Areas protected by levees and outside of the 100-yr floodplain or with flooding < 1’

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<sup>6</sup> Ordinance PLG-026-95

The Island County Planning Director, Vince Moore in December of 1997 submitted a letter to FEMA reclassifying the V-zone portion of West Beach back to the original A2-Zone. The basis for the reclassification was stated as a lack of “*actual field conditions (as) evidence*”, supporting “*wind-driven velocity wave action and therefore did not support classification of the northern portion of the area in the V zone*” (Letter from V. Moore to FEMA, Dec 1997 – Appendix C).

As administrators of the National Flood Insurance Program (NFIP), FEMA conducts Community Assistance Visits (CAV) on a 3-5 year cycle visiting local jurisdictions for inspection/investigation and evaluation of how the Flood Protection Program is being implemented. FEMA instigated a formal CAV in early 1998, the results of which are summarized in a letter from FEMA to the Island County Commissioners dated February 23<sup>rd</sup>, 1998. The specifics of the 1998 CAV are described in more depth in chapter 4. One of the items disputed by FEMA in the 1998 CAV, was the reclassification of West Beach back to an A-zone from the V-zone designation applied by Island County in 1991. FEMA claimed that the Planning Director has the authority to make determinations as to whether a parcel of structure is located within a floodplain, but does not have the authority to change a flood-zone designation without submittal of a formal Letter of Map Revision (LOMR) (FEMA, 1998 CAV-letter). Island County responded by citing the authority granted within chapter 14.02A.040 C.5 titled “**Interpretation of FIRM Boundaries**”, which provides guidance and grants authority for the Planning Director to interpret between mapped and actual boundaries when the location is either not clear or disputed. Furthermore, Island County pointed out that FEMA did not require the formal LOMR or further empirical data when Island County originally reclassified the West Beach area from an A-zone to the V-zone in 1991 and that the authority granted in the County’s Flood Protection Ordinance would need to be amended if FEMA wished to contest the County’s authority. Requirements listed in the 1998 CAV were ultimately satisfied and accepted by FEMA in 1999.

FEMA completed a more recent CAV in September of 2004, for which some minor changes from the existing language in the code were suggested by FEMA, but qualified as not significant enough to hold-up closure of the 2004 CAV. (See chapter 3 for further discussion on the 2004 CAV)

### ***Tsunami***

Tsunami events can have an obvious and dramatic impact in areas susceptible to flooding. Tsunami’s are discussed in this topic paper, as well as the Geologically Hazardous Areas topic paper as both critical areas are affected by their occurrence.

Local Native American stories provide anecdotal records of past tsunamis within Island County, most notably the Snohomish people describe a large landslide and subsequent tsunami originating at Camano Head and the ultimate damage and disaster resulting from the wave traveling across Saratoga Passage to a neighboring village at Hat Island.

Koshimura et al (2002), validated observed tsunami sand deposits derived from a ‘Seattle Fault’ type crustal earthquake 1100 years ago 1.9-meters above present Mean Sea Level (MSL) within Cultus Bay on South Whidbey Island.

Tsunami deposits have also been discovered on the west side of Whidbey Island adjacent to the Straits of Juan de Fuca, these deposits are assumed to be derived from a tsunami generated from a Cascadia Subduction zone event off the coast of Washington State. It is not known exactly when the last tsunami hit the west side of Whidbey Island, but the Cascadia Subduction zone event is predicted to have an average occurrence frequency of 500-540 years (Walsh et al 2005).

## **2.0 LAWS & GROWTH BOARD DECISIONS**

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State laws and decisions of the Growth Management Hearings Board of Western Washington have been the framework for the regulations and policies regarding Frequently Flooded Areas as a critical area in Island County. The following is a list of laws and decisions that have provided some guidance over the years related to management of Frequently Flooded Areas.

### **2.1 GROWTH MANAGEMENT HEARINGS BOARD**

This quasi-judicial panel reviews local actions when a “Petition for Review” is filed – initiating what is informally called a “case.” The Board interprets GMA provisions, clarifying ambiguities and reconciling disagreements. It is the board’s role, to determine if the local policy action complies with the goals and requirements of the GMA. (Good start, Keith will be adding to this)

### **3.0 EXISTING LOCAL ORDINANCES & IMPLEMENTATION**

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#### **3.1 COMPREHENSIVE PLAN**

Island County’s Comprehensive Plan was adopted in September of 1998. Annual review and updates to the Comprehensive Plan are listed within Island County Code. The Comprehensive Plan addresses Frequently Flooded Areas in three chapters of the Land Use Element.

**Chapter 1, Overview – Major Issues:** This section provides background information on critical areas in Island County with mention of frequently flooded areas. It also provides background information regarding policy and regular preventative activities that take place to mitigate against possible flooding hazards. It makes reference to the Flood Damage Prevention Ordinance <sup>7</sup>, which will be discussed in further detail later in this document; and stormwater detention regulations <sup>8</sup>.

***Frequently Flooded Areas - IC-Comprehensive Plan, page 60:***

*While lacking the major river systems that occur in mainland western Washington where dramatic flooding has captured national attention) Island County is not immune to flood threats. Flooding generally occurs in the winter during intense storms, combined with high tides. Wind-generated waves frequently run up the beach and overtop many shore protection structures, damaging structures along the shoreline and flooding inland areas. Wave-tossed driftwood can threaten safety and property. Flooding less violent and severe, but perhaps more frequent, occurs around lakes and other low-lying areas during and following heavy precipitation. Development, creation of impervious surfaces, channeling of surface water flows, and loss of wetlands and extensive forest vegetative cover have increased the rate of runoff, decreasing the capacity of upland areas to retain moisture and exacerbating flood problems.*

*Individual residents, community associations, and diking districts have undertaken local flood protection efforts, including drainage improvements, tide gates, holding ponds, and shore protection structures such as bulkheads and rip-rap. Some of these facilities are maintained by the County.*

*The County has adopted a Flood Damage Prevention Ordinance (Chapter 14.02A ICC) which provides construction standards for frequently flooded areas, and stormwater regulations with required detention (Chapter 11.01 ICC).*

**B. Chapter 3, Future Land Use – General Overlays & Critical Areas:** This section provides a working definition of “Frequently Flooded Areas” and provides the designation criterion that is used in designating areas that are frequently flooded.

***Frequently Flooded Areas - IC-Comprehensive Plan, page 107:***

*Definition:*

*Lands in the floodplain subject to a one percent or greater chance of flooding in any given year; these areas include, but are not limited to, streams, lakes, coastal areas, and wetlands.*

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<sup>7</sup> Chapter 14.02A Island County Code

<sup>8</sup> Chapter 11.01 Island County Code

Designation Criteria:

*100-year floodplains as listed and mapped by the Federal Emergency Management Agency and the National Flood Insurance Program.*

**C. Chapter 4, Goals and Policies – General Land Use Policies:** This section has two parts. The first outlines the main goal of regulations pertaining to Frequently Flooded Areas. The second is a list of implementing policies:

*Frequently Flooded Areas - IC-Comprehensive Plan, page 140:*

Goal:

*To protect the public health, safety and welfare, and to minimize public and private losses due to flood conditions in frequently flooded areas.*

Policies:

- A. *Reduce the potential for physical injury and damage to public and private property from flooding by minimizing impacts of upstream land uses.*
  1. *Protect natural water storage areas and drainage systems, including wetlands, streams and lakes, to reduce downstream flooding.*
  2. *Ensure new development above identified thresholds minimizes additional runoff by limiting impervious surfaces, unnecessary grading and compaction of soils, and preserving areas of undisturbed vegetation.*
  3. *Ensure new development above identified thresholds is accompanied by appropriate stormwater facilities, such as detention ponds, infiltration facilities, and other measures to maintain rates of runoff at pre-development levels.*
  4. *Impose standards for construction in frequently flooded areas to minimize the potential for physical injury and property damage.*
- B. *Maps, site-specific studies, and information collected by other agencies available for public review will be made readily accessible to potential and existing landowners, interested citizens, and development interests to aid in the protection of these areas.*
- C. *When a violation of the policies and regulations of this area is identified, the enforcement action and severity of any penalty will be proportional to the nature and circumstances of the violation and the damage or risk to private and public resources.*
- D. *Development regulations shall be implemented in addition to those associated with the underlying land use designation.*
- E. *Regulations for frequently flooded areas are contained in the ICC 17.02.*

The Island County Comprehensive Plan provides policy that is intended to be implemented through development regulations/ordinances that provide more specific criteria and guidance. For Frequently Flooded Areas and proposed development within floodplains, implementing regulation can be found within four main ordinances, (1) Critical Areas Ordinance – chapter 17.02, (2) Flood Damage Prevention Ordinance – chapter 14.02A, (3) Land Development Standards – chapter 11, and (4) Shoreline Master Program – chapter 17.05 ICC.

### 3.2 CRITICAL AREAS ORDINANCE

This ordinance is a part of the Island County Zoning Ordinance. The following is the content of the Critical Areas Ordinance referring to Frequently Flooded Areas:

#### *ICC 17.02.040 Critical Areas*

**A. Purpose.** This section establishes general requirements and regulations for the protection of critical areas pursuant to the Growth Management Act, which shall apply throughout this Title.

**B. Applicability.** This section shall apply to all properties, which are designated as critical areas by Island County. Designated critical areas are:

4. Frequently Flooded Areas or Floodplains. Frequently flooded areas, also referred herein to as floodplains, are regulated pursuant to the Flood Damage Prevention Ordinance, Chapter 14.02A ICC.

The Island County Critical Areas Ordinance addresses Frequently Flooded Areas within Chapter 17.02 ICC by simply providing a definition and reference to the Flood Damage Prevention Ordinance, Chapter 14.02 ICC.

### 3.3 FLOOD DAMAGE PREVENTION ORDINANCE

The Island County Flood Damage Prevention ordinance is a part of Island County Code, Chapter 14.02, in Building and Construction. This ordinance contains the majority of rules and specific regulations regarding Frequently Flooded Areas. Chapter 14.02A provides references to both the Critical Areas Ordinance (chapter 17.02 ICC) and Stormwater/Land Development Standards (chapter 11 ICC). The following sections headings provide development standards and guidance for implementation of the Island County flood protection program:

#### **Sections:**

**14.02A.010 Statutory Authorization, Findings of Fact, Purpose and Objectives**

**14.02A.020 Definitions**

**14.02A.030 General Provisions**

**14.02A.040 Administration**

**14.02A.050 Provisions for Flood Hazard Reduction**

The current ordinance begins with a **Statement of Purpose** listed below. As part of this review of implementation of the Island County Flood Damage Prevention ordinance, comments pertaining to implementation and compliance with the stated goals have been added:

#### **Statement of Purpose –chapter 14.02A.010:**

*“It is the purpose of this ordinance to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designated:*

1. *To protect human life and health;*

The current Flood Damage Prevention Ordinance chapter 14.02A has been determined to be in compliance with the National Flood Insurance Program as determined by FEMA in both a 1998 and 2004 Community Assistance Visit (CAV). Further, upon some minor changes to existing language within the current ordinance, FEMA has determined the code to be in compliance with the FEMA/WA-State Model Ordinance (FEMA letter R. Ike, 2004 – Appendix F).

2. *To minimize expenditure of public money and costly flood control projects;*

The flood prevention standards described in chapter 14.02A are intended to reduce the need for larger scale flood control projects by requiring proven flood prevention standards in a consistent manner to all individual structures proposed within known flood plains.

3. *To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;*

FEMA Flood Studies in Island County (1981 & 1995) have concluded that potential flood threats in Island are mainly located in the coastal environments. Although according to the FEMA (Island County) Flood Studies, we have only seen one 100-year coastal flood, being the December 15<sup>th</sup>, 1977 record breaking high tide that has a 180-year interval of occurrence; many important lessons were learned from this event including identification of geographic areas of more concern throughout Island County.

4. *To minimize prolonged business interruptions;*

As stated above (3), Island Counties concerns lie in the shoreline properties with the potential for coastal flooding. Of less concern are areas subject to periodic flooding related to uncontrolled stormwater. One of the fundamental reasons for this perspective is that overall rainfall in Island County is relatively lower than neighboring communities, coupled with the fact that Island County's future land-use zoning does not allow higher density uses outside of incorporated areas. However, some existing platted areas do have a higher potential for drainage and flooding problems. This concern has been addressed through implementation of chapter 11 – Land Development Standards, by designating areas of drainage or flooding concern as Critical Drainage Areas (CDA). CDA's promote 'low-impact development' through innovative drainage techniques that encourage infiltration of drainage as opposed to surface stormwater infrastructure. Continued support of this program should reduce the potential for flooding in existing higher density areas, thus reducing the risk of associated business interruptions.

5. *To minimize damage to the public facilities and utilities such as water and gas mains, electric telephone and sewer lines, streets and bridges located in area of special flood hazard;*

Island County is a rural area lacking a lot of the infrastructure common in other more urban settings. Regardless, proposals for new **Critical Facilities** as defined in chapter 14.02A are restrictive, first requiring avoidance of the limits of the flood plain followed by an analysis of alternative sites. Finally if the facility absolutely has to be constructed within a flood plain, then the lowest floor must be constructed 3-feet above BFE and the entire building must include **Flood Proofing**.

6. *To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;*

The current Critical Areas Review process as well as the FEMA CAV evaluations is intended to strengthen the definition of "sound use" as ensured through implementation of current regulation within flood plains (i.e. chapter 14.02A, 17.02, 11.03, and 17.05).

7. *To ensure that potential buyers are notified that property is in an area of special flood hazard; and*

Island County has on file and available to the public FEMA FIRM maps as well as maintenance of a 'Land-Use' database listing FIRM designations for individual parcels upon request.

8. *To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions."*

As explained above, the Island County Flood Damage ordinance provides specific standards for which compliance is required for any development within designated flood hazard areas. The program places the onus on individuals to increase overall county wide flood protection as opposed to a more wide scale flood control project.

Chapter 14.02 ICC, Flood Damage Prevention Ordinance is administered by the Island County Building Department and speaks specifically to protection of structures constructed within a designated flood area from future flood damage.

### ***FEMA – Community Assistance Visits (CAV)***

As part of administering the National Flood Insurance Program, FEMA monitors local implementation of Flood Prevention Programs through periodic evaluations called Community Assistance Visits (CAV). The CAV's consist of multiple visits by FEMA field checking floodplain areas throughout the county and identification of either compliance with current regulations or non-compliance. FEMA then creates a summary report that is explained to county staff, identifying deficiencies in implementation of the local flood protection ordinance. Significant non-compliance can result in probation periods or ultimately non-certification of the County's Flood Protection program resulting in suspension of flood insurance and disaster assistance for residents of Island County. Probation periods are typically handled through surcharges on individual flood insurance policies until the programmatic deficiencies are resolved to FEMA's satisfaction. The results of both the 1998 and 2004 FEMA CAV's are summarized below:

### ***1998 FEMA – CAV***

The results of the 1998 FEMA CAV were summarized in a letter to the Board of Island County Commissioner in late February of 1998. The letter consisted of a request for additional information pertaining to: 19-new structures identified during the field visit to the County, West Beach implementation of Flood Standards, evaluation of sub-grade garages, and programmatic comments on issuance of flood standard variances and flood port openings. The letter served as notice of FEMA determination that the County was not in compliance with the minimum standards of the National Flood Insurance Program, and would be placed on probation. The result of the County being put on probation was that a \$50 surcharge would be added to any new or renewals of flood insurance premiums sold within the County (FEMA letter C. Steele, 2-23-1998 Appendix E).

The county responded to FEMA CAV in April of 1998, satisfying FEMA's requests for additional information on the 19-structures identified in CAV-letter. This information was gathered and submitted to FEMA's satisfaction between the spring of 1998 and fall 1999.

The issue raised by FEMA in regard to the County's authority to reclassify the FIRM designation at West Beach was also resolved in 1999 - see history in chapter 1 for more details on this issue.

As stated in the CAV-letter from FEMA, Island County had issued five variances to requirements of the County's Flood Prevention Ordinance (chapter 14.02A) since 1991. The FEMA letter stated that "...variances should only be granted if the requirements of the flood ordinance would create an exceptional hardship to the applicant", summarizing that the County was to lineate in utilizing the variance process adding that "...the vast majority of communities in the NFIP (National Flood Insurance Program) have never issued a single variance to their flood ordinance". Through negotiations in resolving the CAV issues, the County agreed to be more

diligent in the future in only using the variance process for extreme or unique cases. Further the County and FEMA agreed upon more specific permit review protocols were the County would route future variance requests to FEMA for comment prior to issuance of the permit. FEMA would in turn provide the County with comment and justification for either denying the request or granting it in rare/unique circumstances.

Ultimately all of the issues raised by FEMA in the 1998 CAV were resolved and the probation was lifted by FEMA in January of 1999 (FEMA letter D. de Courcy, 1999 – Appendix E).

### **2004 FEMA – CAV**

FEMA in a letter dated September 29<sup>th</sup>, 2004 to Island County summarized the results of the recent CAV visit to the County. Within the letter 18-sites were identified for which additional information was requested. In addition to information that was requested, FEMA provided comments on the current Island County Flood Damage Prevention ordinance suggesting some minor changes in the existing language to achieve compliance with the FEMA/WA-State Model Ordinance (FEMA letter R. Ike, 2004 – Appendix F).

## **3.4 CHAPTER 11.03 ICC – STORMWATER & SURFACE WATER ORDINANCE:**

Chapter 11 (Land Development Standards) provides regulations pertaining to drainage and stormwater management providing a **Declaration of Purpose**<sup>9</sup>:

### ***ICC 11.03.010 Declaration of Purpose***

*The purpose of this chapter is to regulate and control drainage or stormwater to safeguard the public health, safety, and general welfare. The objectives of this chapter are as follows (emphasis added):*

- A. *To promote sound, practical, and economic development practices and construction procedures which minimize impacts to the county's waters;*
- B. *To minimize degradation of water quality and to control the sedimentation of streams, rivers, lakes, wetlands, and other surface water;*
- C. *To control stormwater runoff originating on developing land;*
- D. *To preserve the suitability of water for recreation and fishing;*
- E. *To preserve and protect aquatic habitat;*
- F. *To maintain the quality of the County's water resources;*
- G. *To minimize adverse effects caused by alterations in surface water or ground water quality, quantities, locations, and flow patterns;*
- H. *To maintain the safety of county roads and right-of-way;*
- I. *To protect public safety by reducing slope instability and landslides; and*
- J. *To minimize net loss of the county's wetlands by maintaining hydrologic continuity with other aquatic resources.*

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<sup>9</sup> Section 11.03.010 Island County Code

Through adoption of **Critical Drainage Areas (CDA)**, Island County provides regulations intended to reduce the potential for cumulative flooding, drainage, and/or erosion/sedimentation impacts in areas deemed relatively more sensitive throughout the County. The mechanism for implementing the **Statement of Purpose**, the Board of Island County Commissioners have been granted the authority to designation areas as **Critical Drainage Areas**, pursuant to compliance with the following criteria<sup>10</sup>:

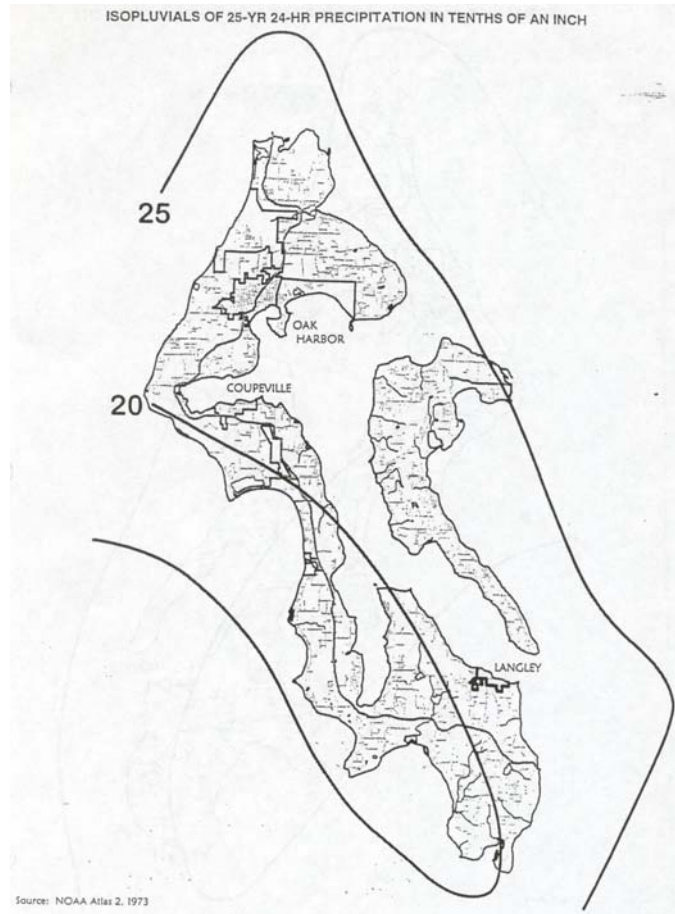
- A. *Areas sensitive to the effects of construction or development as evidenced by severe flooding, drainage, and/or erosion/sedimentation conditions, which have resulted or will result from the cumulative impacts of development and urbanization; or*
- B. *Areas that discharge to a receiving water that has a documented water quality problem and has been designated a water quality sensitive area as defined herein; or*
- C. *Areas where the need for additional stormwater control measures have been identified through a basin plan, watershed ranking process, or through Growth Management Act planning.*

On September 28, 1998 the Board of Island County Commissioners adopted Resolution C-121-98 in the matter of designating specific critical drainage areas. 18 CDAs were designated, 13 of which were designated as a result of identified flooding problems. Exhibit A of Resolution C-121-98 identifies problem sites, problem types and problem causes. Some flooding problems have identified engineering solutions which, if completed, may result in the CDA designation being removed. Likewise, additional CDA designations may be added as problems are identified.

The CDA standards encourage infiltration (low-impact development) or other means of control to surface water flows. CDA's are typically located in areas of either poor drainage/soils or existing platted areas with relatively higher residential densities. Professionally designed stormwater conveyance systems pursuant to chapter 11 ICC must be designed with the capacity for a 25-year, 24-hour storm as shown in the isopluvial below:

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<sup>10</sup> Section 11.03.080 Island County Code



### 3.5 CHAPTER 17.05 ICC – SHORELINE MASTER PROGRAM:

With an acknowledged focus on coastal flooding within the County, the Island County Shoreline Master Program (SMP) addresses development within shoreline floodplains. Within the Island County SMP **Landfills**<sup>11</sup> are a use defined as:

*The placement of soil, sand, rock, gravel, existing sediment or other material (excluding solid waste) to create new land, tideland or bottom land area along the shoreline below OHWM, or on wetland or upland areas in order to raise elevation.*

The Island County SMP provides both policy and specific development standards into one document. **Landfills** are referred to in the following policy language within the SMP:

*L. Landfill (emphasis added)*

- 1. Sanitary landfills and the disposal of solid waste should be prohibited within the shoreline jurisdiction.*
- 2. Shoreline fills or cuts should be designed and located so that significant damage to existing ecological values or natural resources or alteration of local currents will not*

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<sup>11</sup> Island County Shoreline Master Program page 3-50

occur, resulting in the creation of a hazard to adjacent property, life, and natural resource systems.

3. *Fill materials should be of such quality that they will not cause undue degradation of water quality.*
4. *Priority should be given to landfills for water-dependent uses and for public uses. In evaluating fill projects and in designating areas appropriate for fill, such factors as total water surface reduction, navigation restriction, impediment to water flow and circulation, reduction of water quality, and destruction of habitat should be considered.*
5. *Filling in flood plain areas shall not be allowed if reduction of flood water storage capacity might endanger other areas.*
6. *Where permitted, landfills should be the minimum necessary to provide for the proposed use and should be permitted only when tied to a specific development proposal that is permitted by this master program.*

**Landfills** pursuant to the SMP use table<sup>12</sup> are a ‘permitted’ use on most shoreline properties within the county subject to the following development standards listed in section 17.05.150 (emphasis added):

17.05.150 B (1): *Landfill shall be permitted only in the following circumstances:*

- a) *If seaward of the OHWM, only in conjunction with Water-Dependent Uses approved pursuant to this Chapter; or*
  - b) *If landward of the OHWM, only in conjunction with Water-Oriented Uses approved pursuant to this Chapter; or*
  - c) *For lots created prior to this Chapter and are located within Floodplains, Landfill shall be limited to the minimum necessary to meet Floodplain standards.*
  - d) *For lots created prior to this Chapter and located within regulated wetlands, only if it is necessary to achieve reasonable use and then only the absolute minimum amount of fill.*
  - e) *Landfill that is exempted pursuant to ICC 17.05.060©(2).*
  - f) *Landfill for purposes identified in ICC 17.05.060(C)(2) that exceeds the 250 cubic yard exemption threshold.*
2. *Landfill shall be prohibited in estuaries, tidelands, marshes, ponds, swamps or similar water-retention areas, except for the minimum necessary to provide for the reasonable use of a property in accordance with “reasonable use exceptions and exemptions”, as specified in Chapter 17.02 ICC.*
  3. *Sanitary landfill sites within any area subject to the jurisdiction of the Shoreline Management Act are strictly prohibited.*

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<sup>12</sup> Island County Shoreline Master Program section 17.05.070 page 3-62

4. *Landfill shall be deposited so as not to block the normal recharge of groundwater supplies, and in a manner that does not degrade quantity and quality of groundwater.*
5. *Fill material shall be of a quality, and so placed and contained, as to not cause water quality degradation. Junk, garbage, and other potentially hazardous materials shall not be used as fill material.*
6. *Applications which include landfilling as a project element shall include the following information:*
  - a) *physical, chemical and biological character of landfill material;*
  - b) *source of landfill material;*
  - c) *method of placement and compaction; and*
  - d) *method of perimeter erosion control.*

As stated above, the Island County SMP does administer a threshold of 250 cubic yards of fill as an ‘exempt’ use. Projects proposing **landfill** in excess of the threshold in areas within shoreline jurisdiction (200’ upland of Ordinary High Water Mark) do require a shoreline Substantial Development Permit. Alternatively, projects proposing fill under the threshold are routed for review and comment to the Shoreline Planner for compliance with the above section of code.

Indirectly, landfill in coastal floodplains is regulated by chapter 17.05.090.B (6):

*Shoreline development shall not be allowed to cause significant erosion, accretion, and/or avulsion along shorelines.*

### **3.6 DRAFT - ISLAND COUNTY HAZARD MITIGATION PLAN:**

The Disaster Mitigation Act (DMA) of 2000 requires that the Federal Emergency Management Agency (FEMA) review and approve a Hazard Mitigation Plan (HMP) created by local jurisdictions. The Island County Department of Emergency Services (IC-DES) has created a draft of the the HMP, which is currently being reviewed by FEMA. The Island County HMP evaluates and prioritizes a communities exposure to all of the following hazards: (1) Drought, (2) Earthquake, (3) Flood, (4) Landslide, (5) Severe Storm, (6) Tsunami, (7) Volcano and, (8) Wildland Fire. The intention of the plan is to propose appropriate mitigation based on the comprehensive hazards assessment to reduce the risks within the community and ultimately resulting in reduction in federal disaster relief for hazards that maybe able to be avoided.

### **3.7 CHAPTER 16.14 ICC – SEPA:**

The Washington State Environmental Policy Act (SEPA) became law within the State in 1968 and is intended to provide a process to analyze potential environmental impacts of development. SEPA can be triggered within Island County for any activity on “lands covered by water” as well as some shoreline permits, land-division proposals or projects involving timber harvest and/or clearing & grading. Projects involving SEPA require an applicant to conclusively disclose elements of their proposal within a SEPA-checklist, which consists of a standard 15+ page form with questions under 16 different Environmental Elements. Upon receipt of a project proposal involving SEPA, the County (as lead agency) is responsible for posting notice of the project for public comment and issuance of a “threshold determination”. Threshold determinations either consist of “non-significance”, “mitigated non-significance”, or a determination of ‘significant’ environmental impact, requiring further review of a proposal through an Environmental Impact Statement.

Acknowledgement of the 100-year floodplain is requested within the SEPA-checklist under the “Water” element. SEPA would not be triggered solely because a project is located within a regulated floodplain, there are established limits to development activities or types of permits that will require submittal of a SEPA checklist. However, the County’s threshold determination is appealable, meaning that if a party felt like the County’s review of a proposal within a floodplain was incomplete and or resulting oversight or erroneous conclusions, that person could appeal the SEPA determination to a higher authority.

## 4.0 TSUNAMI:

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### 4.1 TSUNAMI REVIEW

Preuss & Heberstreit (1998) provide a good summary of both primary and secondary causes of tsunami damage resulting from the 1964 Alaska earthquake stating that:

*“Primary causes were from the direct water forces, including hydrodynamic forces, buoyancy, and hydrostatic pressures, and from loss of ground support through subsidence, compaction, erosion, liquefaction, and (or) sand transport. Secondary causes of the damage were from direct water forces acting on land uses, including impacts from floating debris (logs, buildings, vehicles, boats), fire and contamination of land and water from oil, fuel, and other stored materials. Most of the damage was due to secondary impact of the tsunami”.*

The report also discussed the affect of offshore topography (bathymetry) in providing a natural protective barrier to incoming waves. The report concentrated on predicting hazard areas as a result of a large subduction related earthquake in the Juan de Fuca plate. Predicted seafloor uplift was used in concert with actual seafloor topography (bathymetry) to model wave propagation patterns. The model was used to help identify areas along the Pacific Coast where tsunami’s maybe more likely to form, concluding that *“...extreme wave heights would be found on the coastal areas within the uplift zone. Also the elevations would tend to decline (although not uniformly) north and south of the immediate area of the uplift”.* These conclusions lead to looking at Grays Harbor as an area with a higher potential for a tsunami resulting from a southern Cascadia subduction zone earthquake.

This report is unique in that it not only looked at potential flood hazards from a tsunami, but it also considered the interconnection of other physical and biological potential impacts. The report discussed four main categories of hazards associated with tsunamis:

1. **Flooding:** low-lying areas subject to inundation. This area could extend further upland than the 100-year Floodplain boundary depending on the scale of tsunami, offshore topography (bathymetry), astronomical tidal sequence and barometric pressure. Within the Greys Harbor analysis, the influence of the Chehalis River was predicted to have the potential to be a major issue if a tsunami event was accompanied by an intense weather system with high rain fall and high stream flows resulting in a higher potential for inundation of flood waters to the surrounding community;
2. **Subsidence:** or settling of soils based on geologic composition and ground shaking associated with an earthquake could result in both damage to structures and potentially a higher risk to flooding with low-lying coastal areas that are typically composed of soils susceptible to subsidence.
3. **Battering:** or physical damage caused during a flood or tsunami event resulting from impacts to people’s safety and/or upland structures from floating debris (boats, logs, vehicles, etc).
4. **Hazardous Waste/Pollution:** either failures to infrastructure (i.e. gas line rupture) or leakage of stored hazardous waste that has the potential to either air or water borne pollution.

#### ***Local Tsunami Study:***

Washington State Department of Natural Resources (WA-DNR) in cooperation with the National Oceanic & Atmospheric Association (NOAA) provided a map depicting predicted flood inundation areas within Anacortes and Whidbey Island as a result of a tsunami from a Cascadia subduction zone earthquake, as described in Preuss & Heberstreit (1998) for the Washington Coast and Greys Harbor community (Walsh et al 2005). The map predicts depth of inundation as well as the velocity of flood waters in inundated areas. **Depth** of inundation is broken down into three ranges:

1. **0-0.5 meters:** knee height inundation to an average sized person;
2. **0.5-2.0 meters:** knee to head height of an average person;
3. **> 2.0 meters:** over head height of an average person.

**Velocity** of flood waters are shown on the map within the following ranges:

1. **0-1.5 meters/second:** speed at which it would be difficult to stand;
2. **1.5-5 meters/second:** modest running pace;
3. **> 5 meters/second:** approximately 40 miles per hour.

A majority of northwest Whidbey Island (area exposed to Cascadia tsunami) is high bank waterfront property with a mixture of large lot (5-acre) residential or agriculture land-use. Specific areas of concern based on this tsunami model mainly consists of low-lying properties in the Swantown area off West Beach Road with predicted flood depths of greater than 2-meters and a velocity of greater than 5 meters/second.

Lastly, the recent discovery of the Seattle fault, has prompted discussion on possible tsunamis generated from a Seattle fault earthquake event and the subsequent hazards to surrounding communities. Walsh et al (2003) modeled a tsunami from the Seattle fault estimating upland inundation areas adjacent to Elliot Bay. This model did not assess inundation or hazards to areas outside of Elliot Bay. However Koshimura et al (2002) verified previous modeling done for a historic 'Seattle Fault' event 1100 years ago with evidence of sand deposits 1.9-meters above current day Mean Sea Level (MSL) within Cultus Bay on South Whidbey Island. This model was unique in that sea-level rise (+1 meter in the last 1100-years) and more precise bathymetry were used to add validity to previous studies which did not focus on upland inundation.

### ***Applicability to Island County:***

As previously stated the Walsh et al. (2005) map is based on a Cascadia subduction zone earthquake, which as noted on the map has been proven to have happened before by the evidence of tsunami deposits on both Whidbey Island and Discovery Bay (Port Townsend). However, also noted in the map is the fact that variation in atmospheric conditions (affecting tidal elevations) and/or inaccuracies in topographical information on land and the seafloor can result in significantly varied results.

In reference to Greys Harbor study (Preuss & Heberstreit 1998) subsidence in Island County could potentially result in significant changes to inundation areas identified in the Walsh et al. (2005) map. Island County does have a large number of low-lying shoreline areas that were platted prior to current regulations with soil compositions subject to liquefaction and subsidence, a more detailed analysis of geotechnical hazards on these lots will be provided under the Geologically Hazardous Areas issue paper as part of the County's critical areas review. Because the west side of Whidbey within the tsunami zone described by Walsh et al. (2005) can be characterized as a 'high-energy' marine shoreline adjacent to the Straits of Juan de Fuca and a majority of the residential lots are protected by high shoreline slopes, issues

with flooding and battering (damage from floating debris i.e. boats, logs etc.) are not as large of a concern in these areas. Storage of hazardous wastes and associated spills during tsunami events will be addressed within the Island County Hazard Mitigation Plan, which is currently being drafted for submittal to FEMA and addresses hazards and mitigation options pertaining to tsunamis.

## 5.0 SYNOPSIS OF BEST AVAILABLE SCIENCE

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This section provides information regarding Best Available Science (BAS) and resources suggested for review by the Washington State Office of Community Trade and Economic Development (CTED). Many of the publications cited within CTED's list are related to either urban stormwater issues or floodplain management adjacent to large river systems. As described in chapter 1, Island County is a rural area lacking significant urban densities and/or fresh water riverine systems that commonly are associated with potential for flood hazards or essential habitat degradation. Alternatively, literature specific to coastal flood hazards have been reviewed for consistency with existing flood plain management regulations in Island County.

As part of Island County's Critical Areas Ordinance review for Growth Management consistency, issues related to habitat fragmentation, wetland degradation and wildlife protection in flood plains will be addressed within subsequent (1) Wetland or (2) Fish & Wildlife Habitat Conservation Area issue papers and BAS literature review.

### 5.1 CTED LISTED - BAS

1. Federal Emergency Management Agency. Flood Insurance Rate Maps (FIRM).

*Island County has participated in the FEMA FIRM-program since 1982 (see history chapter 1), through regulation for flood damage prevention through reference to the FEMA FIRM-maps with identified FIRM designations for reference to applicable development standards listed in chapter 14.02A ICC. Island County has maintained consistency with the FEMA Firm....*

#### **Guidance:**

1. Bolton, S. and Shellberg, J. 2001. Ecological issues in floodplains and riparian corridors. Center for Streamside Studies, University of Washington. 150 pp.

*This report concentrates on ecological issues within stream based floodplains. Discussion centers around stream form, manipulation (both physical & biological), and the potential ecological impacts of these actions. As described above, Island County has not been characterized with significant stream system hydrology with the potential for damage by flood hazards. Habitat, wildlife as well as other ecological impacts to stream and wetland riparian areas within floodplains in Island County are being addressed within individual Wetland and Fish & Wildlife Habitat Conservation Area issue papers to be created through the County's Critical Areas Ordinance update.*

2. Washington Department of Ecology. 1991. Comprehensive planning for flood hazard management. Publication #91-44. 106 pp.

*This publication is intended to act as a guide in developing a Comprehensive Flood Hazard Management Plan (CFHMP) which would consist of a program created by local governments were traditional flood hazard programs (FEMA-National Flood Insurance Program) would be coordinated with other land-use or environmental regulations (Shoreline Master Program, Stormwater regulations, Zoning Ordinance, etc.). This publication was produced around the same time period as when Washington State adopted the Growth Management Act, which has*

*essentially ensured the same result in that jurisdictions under GMA are mandated to identify and implement regulation in a coordinated manner.*

3. Federal Emergency Management Agency. 1999. Executive summary: Riverine erosion hazard areas, mapping feasibility study. Technical Services Division, Hazard Study Branch. 11 pp.

*This publication concentrates solely on riverine hazards from a national perspective and is not relevant to Island County conditions..*

### ***Increased Impervious Surfaces and Stormwater***

*Island County's rural landscape provides an environment not common, nor similar to many urban municipalities threatened by either cumulative decline of surface water storage or seasonal flooding related to increased impervious surfaces and higher density development. Current zoning regulations in Island County restrict creation of new lots within the dominant "Rural" zoning classification to a minimum lot size of 5-acres. Existing platted areas within the county are afforded a higher residential density, however the County has the authority to rely on additional development standards to control runoff. These Critical Drainage Areas (CDA) standards are found within chapter 11 ICC, (Land Development Standards) CDA's have been defined to deal with potentially sensitive drainage areas characterized by either 'existing' higher density areas within the county or soils/topography contributing to drainage problems.*

1. Arnold, C. L. and Gibbons, C. J. 1996. Impervious surface coverage: The emergence of a key environmental indicator. Journal of the American Planning Association, vol. 62, no. 2, pp. 243-258.

*As stated above, existing zoning regulations restrict creation of parcels less than 5-acres in the majority of areas within the county. The county has the authority through designation of an area as a "Critical Drainage Area" (chapter 11 ICC) resulting in drainage standards promoting 'low-impact development' and implementation of stormwater within site boundaries.*

2. Booth, Derek B. and Jackson, Rhett. 1997. Urbanization of aquatic systems: Degradation thresholds, stormwater detection, and the limits of mitigation. Journal of the American Water Resources Association, vol. 33, #5, pp. 1077-1090.

*Fragmentation of wildlife corridors will be evaluated as part of review of both the 'Wetland' and 'Fish & Wildlife Habitat Conservation Area' sections of the Island County Critical Areas Ordinance review.*

3. Horner, Richard R. 1999. Regional study supports natural land cover protection as leading best management practice for maintaining stream ecological integrity. Conference paper. Comprehensive Stormwater and Aquatic Ecosystem Management, First South Pacific Conference, Auckland, New Zealand. February 22-26, 1999. ISBN 1-877134-18-X. Vol. 1, pp. 233-247.
4. May, Christopher W., Welch, E. B., Horner, R. R., Karr, J. R., and Mar, B. W. 1997. Quality indices for urbanization effects on Puget Sound lowland streams. University of Washington, Civil Engineering Department, Water Resources Series, Technical Report No. 154.

*Further, impacts to streams will be evaluated within the current review of the existing Critical Areas Ordinance under the current Fish & Wildlife Habitat Conservation Area section of the ordinance.*

5. Schueler, T. R. 1994. The importance of imperviousness. *Watershed Protection Techniques*, vol. 1, no. 3, pp. 100-111.

*As stated above, existing zoning regulations restrict creation of parcels less than 5-acres in the majority of areas within the county. The county has the authority through designation of an area as a "Critical Drainage Area" (chapter 11 ICC) resulting in drainage standards promoting 'low-impact development' and implementation of stormwater within site boundaries.*

6. Washington Department of Ecology. 2001. Stormwater management manual for Western Washington. Vols. I-V.

*Island County currently has a stormwater section of code within chapter 11.02 ICC. Future changes to this section of code will be based on local circumstances and application of development standards that are appropriate for Island County development. As previously stated, Island County because of its rural characteristics, down zoning in 1998, and the ability to utilize the Critical Drainage Areas standards listed in chapter 11, support a history of minimal drainage or stormwater related flood problems within the county.,*

## **Climate Change**

1. Canning, D. J. 2001. Climate variability, climate change, and sea level rise in Puget Sound: Possibilities for the future. Puget Sound Action Team. Puget Sound Research, 2001 Proceedings.

*This report provides more specific predictions for future sea level rise within Puget Sound based on climate change both short-term (El Nino) and long-term (predicted), as well as geologic changes in the form of both Uplift (rise) and Subsidence (lowering) of tectonic plates. Based on mapped geologic features, the degree of vertical movement is dramatically variable within Puget Sound generally characterized by greater subsidence in South Puget Sound resulting in heightened concern over future sea-level rise. The report suggests that a risk-assessment system should be created for potential impacts of sea level rise similar to what is used for flood plain management.*

*Four sites within Puget Sound were assessed with long-term sea level rise scenarios factoring both atmospheric and geologic changes to predict sea level changes for Neah Bay (Straits of Juan de Fuca), Friday Harbor (San Juan Islands/North Puget Sound), Seattle (Central Puget Sound), and Tacoma (South Puget Sound). The 100-year prediction for sea level rise was highest in South Puget Sound (Tacoma +1-meter) and lowest within the Straits of Juan de Fuca (.25-meter). Most relevant to Island County are predictions generated for Friday Harbor, which anticipate approximately .5-meter of sea level rise over 100-years as noted above, this prediction could be significantly affected by climatic (i.e. El Nino) changes.*

2. Craig, D. 1993. Preliminary assessment of the sea level rise in Olympia, Washington: Technical and policy implications. Policy and Program Development Division, Olympia Public Works Department.

*As indicated in Puget Sound sea level studies (Canning 2001), South Puget Sound is much more susceptible to significant sea level changes based largely on plate tectonics and the regional geology.*

## **Tsunami**

*Most of these documents regarding tsunami hazard areas are site specific and can be useful in critical area designation. Tsunami maps were designated to assist with emergency evacuation planning efforts.*

1. Preuss, J. and Hebenstreit, G. T. 1998. Integrated tsunami-hazard assessment for a coastal community, Grays Harbor, Washington. In Rogers, A. M., Walsh, T. J., Kockelman, W. J., and Priest, G. R., editors. Assessing earthquake hazards and reducing risk in the Pacific Northwest. U.S. Geological Survey Professional Paper 1560, v. 2, pp. 517-536.

*See comments and references under the tsunami section.*

2. Walsh, T. J., Caruthers, C. G., Heinitz, A. C., Myers, E. P., III, Baptista, A. M., Erdakos, G. B., and Kamphaus, R. A. 2000. Tsunami hazard map of the Southern Washington coast – modeled tsunami inundation from a Cascadia subduction zone earthquake. Division of Geology and Earth Resources, Washington Department of Natural Resources. Geologic Map GM-49, 1 sheet, scale 1:100,000, p. 12.

*See reference below of local study.*

3. Walsh, T. J., Titov, V.V., Venturato, A.J., Mofjeld, H. O., Gonzalez, F.I., 2005. Tsunami hazard map for Anacortes - Whidbey Island Area Washington: Modeled tsunami inundation from a Cascadia subduction zone earthquake. Division of Geology and Earth Resources, Washington Department of Natural Resources & National Oceanic & Atmospheric Administration, Pacific Marine Laboratories. Geologic Hazard Map # OFR 2005-1 1 sheet, scale 1:62,500, [http://www.dnr.wa.gov/geology/pubs/pubs\\_ol.htm](http://www.dnr.wa.gov/geology/pubs/pubs_ol.htm)
4. T. J. Walsh, V. V. Titov, A. J. Venturato, H. O. Mofjeld, and F. I. Gonzalez. 2003. Tsunami hazard map of the Elliott Bay area, Seattle, Washington—Modeled tsunami inundation from a Seattle fault earthquake, Division of Geology and Earth Resources, Washington Department of Natural Resources & National Oceanic & Atmospheric Administration, Pacific Marine Laboratories. Geologic Hazard Map #ORF 2003-14, 1 plate, scale 1:50,000.

## 6.0 ISSUES & DATA ANALYSIS:

### 6.1 DATA COLLECTION & PROGRAM EVALUATION:

As part of this review, Island County referenced many historical records providing invaluable information pertaining to success and failures in implementation of flood plain management in the County since 1982.

In 1991 the Washington State Department of Ecology produced a guidebook titled “Comprehensive Planning for Flood Hazard Management”, as a tool to assist local governments in creation of a comprehensive flood management program (CFHMP). Statewide previous flood management programs focused on “flood hazard management” (structural standards for protection of structures) and “flood control (levees, dikes, bank armoring), the comprehensive flood management program was intended to balance both these approaches as well as including non-structural solutions. The guidebook provides a framework for incorporating multiple land-use ordinances including (1) Shoreline Master Program, (2) Critical Areas Ordinance, (3) Stormwater Management Plans (4) SEPA review, (5) Land-Division Ordinances into floodplain management rather than relying only on the FEMA Flood Insurance Program to manage activities within regulated floodplains (DOE 1991).

The enactment of the Washington State Growth Management Act in 1990 and the subsequent amendments of 1991 forced a more coordinated approach ensuring that the myriad of local ordinances approached flood hazard management in a unified and consistent manner. In 1997 and 1998 the County reviewed and updated its Shoreline Master Program, Critical Areas Ordinance, Stormwater Management Plan, Land Division Ordinance and SEPA Ordinance as a single consolidated package. Policy plans and ordinances were reviewed relative to one another and updated at the same time so as to ensure consistency between each other.

Through adoption of the Island County Comprehensive Plan and implementing ordinances, the county does manage activities within regulated flood plains through multiple sections of county code. Currently, Island County staff rely on the following sections of code in reviewing proposals within regulated floodplains:

#### APPLICABLE ISLAND COUNTY REGULATION TO FLOOD PLAIN MANAGEMENT

<b>Floodplain Issue:</b>	<b>Island County Code:</b>
Health – Safety - Protection	14.02A: Flood Damage Protection Ord.
Floodwaters - Displacement	17.05: Shoreline Master Program
Stormwater - Drainage	11.03: Land Development Standards
Habitat – Wildlife:	17.02: Critical Areas Ord.
Land Use - Density:	16.14 & 17.03: Land-Division & Use

In addition to the above referenced code and described in chapter 3 (Implementation), the Island County Building Department administers the counties Flood Protection Ordinance in compliance with FEMA’s National Flood Insurance Program, which locally is based off the FEMA Flood Insurance Study for

Island County producing FEMA Flood Insurance Rate Maps (FIRM), that are referenced for all development within regulated floodplains.

FEMA's CAV's in 1998 and 2004 have provided Island County with specific programmatic evaluation of the existing flood hazard program. Issues raised within these reviews have resulted in either administrative/implementation changes or specific code changes. Review of comprehensive floodplain management through the Critical Areas Ordinance<sup>13</sup> is intended to be captured within this issue paper by evaluating coordination of multiple sections of county code referenced or triggered during development within regulated floodplains.

## 6.2 IDENTIFICATION OF ISSUES:

In review of Island County's floodplain management program certain issues were identified as either perceived gaps in regulation, or programmatic difficulties based on historical permit experience.

### 1. Compliance with Washington State/FEMA Model Floodplain Hazards ordinance:

Within the 2004 FEMA CAV letter to Island County (FEMA letter R. Ike, 2004 – Appendix F), lists a series of recommendations for minor changes to existing language to make the Island County Flood Protection Ordinance<sup>14</sup> compliant with the Washington State/FEMA model ordinance. The suggestions are distinguished by adding a definition (basements) that “must be included”, “existing definitions that should be amended”, and “optional” changes for clarification.

### 2. Landfill within floodplains to raise structure to meet BFE:

The Island County Flood Protection Ordinance requires that in certain flood designations, habitable areas be raised at or above the Base Flood Elevation (BFE). Typically, people propose to import fill in order to raise the building area to meet the BFE requirements. In most regulated flood zones with the exception of “V-zones” fill is typically added to the pre-construction grade both inside and outside the foundation to raise structure to BFE and also raise the yard elevation closer to the elevation of the first floor of the structure to reduce visual impact of a high building foundation. This type of activity can have significant impacts on small lots in areas where some structures may have been constructed prior to flood protection standards at a lower elevation (more subject to flooding) than neighboring structures lots. The net affect can be that the displacement of flood waters is essentially pushed onto lower lying lots from “Flood proofed” lots increasing the potential from flood damage to these structures. The Flood Protection ordinance does not specifically require fill (either inside or outside of the foundation) to raise the structure, however this is the typical method of meeting the flood elevation standards, further fill is more of an aesthetic need to reduce the appearance of high foundations on flood proofed structures.

As discussed in chapter 3.5 the Island County Shoreline Master Program (SMP) provides general language to limit landfill within flood prone areas. The limitations listed within the SMP are intended to mitigate hazards to adjacent properties as well as not reduce flood water storage or capacity. Within the riverine environment many jurisdictions limit development and fill so that existing flood capacity on lot by lot bases is preserved. Common engineering methodologies exist within the riverine areas to establish potential displacement impacts for which appropriate mitigation or project

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<sup>13</sup> Chapter 17.02 ICC – Island County Critical Areas Ordinance

<sup>14</sup> Chapter 14.02A ICC – Island County Flood Protection Ordinance

revisions can be recommended. Unfortunately, common methods for calculating impacts on marine floodplains do not exist (C. Steele personal communication 2005). Without a reliable method for calculating potential impacts resulting from landfill within marine floodplains it is tough for review staff to determine the point at which a proposed landfill would endanger neighboring parcels by increasing potential flood hazards.

3. Method for determining Base Flood Elevation (BFE) in unnumbered A-zones:

Un-numbered “A-zones” labeled within the FEMA Flood Study for Island County are defined as areas where specific flood studies have not been done to produce a known Base Flood Elevation (BFE). FEMA through implementation of the National Flood Insurance Program does not regulate un-numbered “A-zones”, however the Island County Building Department has assigned a BFE for proposals located within an un-numbered “A-zone”. The Building Department has used two methods for determining BFE in these situations consisting of: (1) Using a BFE from a surrounding area, or (2) Establishing BFE as 2-feet above the existing grade on-site. Either method maybe more accurate depending on the situations/site characteristics with the appropriate BFE being dependent on the bathymetry (underwater contour) immediately off-shore of the subject parcel. In general, the steeper (bathymetry) beach is, the higher the flood hazard to structures within the floodplain is. The reason for this is that a beach with a shallow grade will result in waves breaking further off-shore than a relatively steeper (bathymetry) beach. Island County does not have the detailed bathymetry data that would be required to produce a flood study providing more detail to the un-numbered “A-zones”

4. Stormwater retention/ treatment and/or floodplain capacity on small coastal lots?

Many of the existing lots located within regulated marine floodplains are characterized by low bank relatively small lots where proposed houses are constructed at minimum setbacks with very little extra area on the lot in order to achieve ‘reasonable use’. Island County’s current stormwater ordinance chapter 11, provides standards for construction in designated “Critical Drainage Areas”, requiring stormwater infrastructure to ensure that all runoff is treated ‘on-site’ and is not pushed onto neighboring lots. These standards are not intended for and do not address detention of potential marine flood waters.

**6.3 PUBLIC COMMENTS:**

To be added after public comment is received.

**6.4 AGENCY COMMENTS:**

To be added after agency comment is received.

## **7.0 SUMMARY - RECOMMENDATIONS:**

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### **7.1 RECOMMENDATIONS FOR FLOODPLAIN HAZARDS:**

#### ***Outreach:***

Since adoption of the first “Flood Damage Protection” ordinance by Island County in 1982, the county has coordinated other sections of code to more comprehensively manage flood plains within the county. The challenge facing the county is not what regulations need to be created, but how to best coordinate existing policies to balance reasonable use within designated flood plains. Under current Island County regulations, proposed activities within a regulated flood plain could potentially be reviewed for consistency between more than 5 chapters of county code. Many of the differing chapters have specific purposes or goals, however each development situation is unique in some way, shape or form. Thus, one chapter of county code may be more applicable to some proposal than others. Island County has produced an information bulletin for Floodplains (Island County DIB #519 attached as Exhibit G). DIB 519 provides a lot of information on standards specific to the Flood Prevention Ordinance<sup>15</sup>, which as explained earlier (chapter 3) is intended to protect structures. In an effort to bring broader public understanding of the County’s more comprehensive management of floodplains, the bulletin could be rewritten to acknowledge other relevant sections of code such as the Shoreline Master Program or Stormwater ordinance.

#### ***Code Changes:***

As suggested in the 2004 CAV summary provided to Island County from FEMA, it is suggested that the identified code changes to chapter 14.02A the Island County Flood Prevention Ordinance to comply with the Washington State/FEMA model flood protection ordinance should be adopted (FEMA letter R. Ike, 2004 – Appendix F).

#### ***Cumulative Impacts:***

Canning (2001) have provided estimated sea level rise within specific sites in Puget Sound based both climatic and geologic changes. Although sea level rise is more dramatic within South Puget Sound, Island County will over the next 100-years experience an increase in the level of marine waters. This long-term increase could be accelerated locally based on climatic changes such as an El Nino effect, but the main point is that the potential for flooding within marine floodplains can be expected to continue to be an issue in the future,

As explained in chapter 6, the Island County Shoreline Master Program<sup>16</sup> provides standards in reference to landfills within regulated floodplains, but the review staff lack a clear methodology for evaluating when a proposed landfill could increase overall flood hazards to neighboring parcels. With this said, it is assumed that the concerns associated with landfill in regulated floodplains are mainly associated with relatively smaller lots and the potential for cumulative ecological impacts as well as an increased risk of flood hazards to low lying lots within a shoreline community. Island County has adopted policy language that requires the amount of fill be limited to the minimum necessary for the given project. While the Department of Ecology, FEMA, neighboring jurisdictions and available scientific literature provide ample methods for determining the appropriate amount of

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<sup>15</sup> Chapter 14.02A ICC – Island County Flood Prevention Ordinance

<sup>16</sup> Chapter 17.05 ICC – Island County Shoreline Master Program

fill in riverine environments, no such guidance is available for making such determinations in coastal areas. Research of neighboring jurisdictions concludes that cumulative impacts of filling in coastal environments is not a consideration nor a concern. Requests for guidance from state and federal agencies has failed to yield any potential methods for considering cumulative impact of placing fill in coastal areas. Alternatives that are available range from disallowing fill in all areas susceptible to flooding, which would result in all new construction that is supported by pier and post, to allowing fill in unlimited quantities since there is no scientific evidence that suggests any negative impacts. It is staff's recommendation that the current policy be maintained which requires the applicant to demonstrate that the amount of fill proposed is the minimum necessary in order to achieve reasonable use of the property.

## **7.1 RECOMMENDATIONS FOR TSUNAMI HAZARDS:**

Island County is susceptible to potential tsunami hazards at both Cultus Bay (Koshimura et al 2002) and Northwest Whidbey Island (Walsh et al 2005). Hazards typically associated with tsunami's have a higher potential for damage in low lying port or urban areas (Preuss et al 1998). Specific inundation areas discussed in chapter 4 in both North Whidbey<sup>17</sup> and South Whidbey Island<sup>18</sup> can be largely dependent on both climatic (El Nino) and atmospheric (predicted tide level) conditions.

Detailed bathymetric data would be necessary to further refine tsunami inundation potential level. It maybe unrealistic to gather the necessary data (bathymetry) to run additional tsunami modeling in an effort to conclude building standards or restricted areas of development in relation to tsunami hazards. Regardless, the Island County Department of Emergency Management Services has produced a *DRAFT - Hazard Mitigation Plan* (HMP) which is intended to coordinate both outreach/education for tsunami hazards as well as protocols for notice to areas that are anticipated to be impacted. It is recommended that efforts to finalize and implement the Hazard Mitigation Plan for Island County be fully supported as the fundamental mechanism of tsunami mitigation.

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<sup>17</sup> Cascadia subduction zone tsunami with greater than 2-meter inundation in the Swantown area of West Beach (Walsh et al 2005)

<sup>18</sup> Seattle Fault tsunami with historical records of 1.9-meter above MSL inundation in Cultus Bay (Kosimura et al 2002)

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Washington State/FEMA Flood Damage Prevention Ordinance

## **APPENDIX A: CHAPTER 14.02A – ISLAND COUNTY FLOOD PREVENTION ORDINANCE**

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14.02A.010 Statutory Authorization, Findings of Fact, Purpose and Objectives

14.02A.020 Definitions

14.02A.030 General Provisions

14.02A.040 Administration

14.02A.050 Provisions for Flood Hazard Reduction

### **14.02A.010 Statutory Authorization, Findings of Fact, Purpose and Objectives**

**A. Statutory Authorization.** The Legislature of the State of Washington has delegated the responsibility to local governmental units to adopt regulations designed to promote the public health, safety and general welfare of its citizenry. Therefore, the County of Island, Washington does ordain as follows:

#### **B. Findings of Fact.**

1. The flood hazard areas of Island County are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief and impairment of the tax base, all of which adversely affect the public health, safety and general welfare.
2. These flood losses are caused by the cumulative effect of obstructions in areas of special flood hazards, which increase flood heights and velocities, and when inadequately anchored, damage uses in other areas. Uses that are inadequately flood-proofed, elevated or otherwise protected from flood damage also contribute to the flood loss.

**C. Statement of Purpose.** It is the purpose of this ordinance to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

1. To protect human life and health;
2. To minimize expenditure of public money and costly flood control projects;
3. To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
4. To minimize prolonged business interruptions;
5. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;
6. To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;
7. To ensure that potential buyers are notified that property is in an area of special flood hazard; and
8. To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

**D. Methods of Reducing Flood Losses.** In order to accomplish its purpose, this ordinance includes methods and provisions for:

1. Restricting or prohibiting uses which are dangerous to health, safety and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;
2. Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
3. Controlling the alteration of natural flood plains, stream channels and natural protective barriers, which help accommodate or channel flood waters;
4. Controlling filling, grading and other development which may increase flood damage; and
5. Preventing or regulating the construction of flood barriers which will unnaturally divert flood waters or may increase flood hazards in other areas.

(Ord. C-74-91 [PLG-019-91], April 1, 1991, vol. 32, p. 290)

#### **14.02A.020 Definitions**

Unless specifically defined below, words or phrases used in this ordinance shall be interpreted so as to give them the meaning they have in common usage and to give this ordinance it's most reasonable application.

**Appeal:** A request for a review of the interpretation of any provision of this ordinance.

**Area of Shallow Flooding:** A designated AO or AH Zone on the Flood Insurance Rate Map (FIRM). The base flood depths range from one to three feet; a clearly defined channel does not exist; the path of flooding is unpredictable and indeterminate; and, velocity flow may be evident. AO is characterized as sheet flow and AH indicates ponding.

**Area of Special Flood Hazard:** The land in the flood plain within a community subject to a one percent or greater chance of flooding in any given year. Designation on maps always includes the letters A or V.

**Breakaway Wall:** A wall that is not a part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces, without causing damage to the elevated portion of the building or supporting foundation system.

**Coastal High Hazard Area:** The area subject to high velocity waters, including but not limited to, storm surge or tsunamis. The area is designated on the FIRM as Zone V1-V30, VE or V.

**Critical Facility:** A facility for which even a slight chance of flooding might be too great. Critical facilities include, but are not limited to schools, nursing homes, hospitals, police, fire and emergency response installations, installations which produce, use or store hazardous materials or hazardous waste.

**Development:** Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials located within the area of special flood hazard.

**Existing Mobile/Manufactured Home Park or Subdivision:** A mobile/manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the mobile/manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed before the effective date of the floodplain management regulations adopted by Island County.

**Expansion to an Existing Mobile/Manufactured Home Park or Subdivision:** The preparation of additional sites by the construction of facilities for servicing the lots on which the mobile/manufactured homes are to be affixed (including the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads).

**Flood or Flooding:** A general and temporary condition of partial or complete inundation of normally dry land areas from:

- (1) the overflow of inland or tidal waters and/or
- (2) the unusual and rapid accumulation of runoff of surface waters from any source

**Flood Insurance Rate Map (FIRM):** The official map on which the Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to Island County.

**Flood Insurance Study:** The official report provided by the Federal Insurance Administration that includes flood profiles, the Flood Boundary-Floodway Map and the water surface elevation of the base flood.

**Floodway:** The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.

**Historic Structure:** Any structure that is:

- (1) Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
- (2) Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;
- (3) Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of Interior; or
- (4) Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:
  - (a) By an approved state program as determined by the Secretary of the Interior or
  - (b) Directly by the Secretary of the Interior in states without approved programs.

**Lowest Floor:** The bottom edge of the lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage, in an area other than a basement area, is not considered a building's lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of this ordinance found at Section 14.02A.050.B.1.b).

**Mobile/Manufactured Home:** A structure, built to federal Department of Housing and Urban Development (HUD) standards (or which bears an insignia indicating it has passed either a State systems inspection or a State alteration/fire safety inspection), on a permanent chassis and designed and constructed to be transportable in one or more sections for use as a dwelling, with or without a permanent foundation, when connected to the required utilities. A commercial coach, recreational vehicle or motor home, or a modular home (built to Uniform Building Code standards), shall not be considered a mobile/manufactured home.

**Mobile/Manufactured Home Park or Subdivision:** A parcel (or contiguous parcels) of land divided into two or more mobile/manufactured home lots for rent or sale. A tract of land under the ownership or management of one person, firm or corporation where two or more spaces are provided solely for the placement of mobile/manufactured homes for residential purposes. A mobile/manufactured home park shall not include mobile/manufactured home PRDs or subdivisions, recreational vehicle parks or the

placement of mobile/manufactured homes as authorized through a Temporary Use Permit.

**New Construction:** Structures for which the start of construction commenced on or after the effective date of this ordinance, an initial FIRM or after December 31, 1974, whichever is later, and includes any subsequent improvements to such structures. For flood plain management purposes, new construction means structures for which the start of construction commenced on or after the effective date of a flood plain management regulation adopted by Island County and includes any subsequent improvements to such structures.

**New Mobile/Manufactured Home Park or Subdivision:** A mobile/manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the mobile/manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of floodplain management regulations adopted by Island County.

**Recreational Vehicle:** Any over-the-road trailer, pickup camper or other wheeled mobile unit, with or without motive power, which is designed or converted for temporary human occupancy and licensed or eligible to be licensed as either a motor home, recreational trailer, camper, or other mobile unit by the State of Washington, Department of Licensing, or similar units eligible to be licensed by another state. Recreational vehicles are not dwelling units.

**Start of Construction:** Includes substantial improvement and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition placement or other improvement was within one-hundred eighty (180) days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns or any work beyond the stage of excavation; or the placement of a mobile/manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers or foundation or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

**Structure:** In accordance with the Uniform Building Code (UBC), that which is built or constructed, an edifice or a building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner, including a gas or liquid storage tank that is principally above ground.

**Substantial Damage:** Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed fifty percent (50%) of the assessed value of the structure before the damage occurred.

**Substantial Improvement:** Any repair, reconstruction, rehabilitation, addition, or other improvement of a structure where the cost of the reconstruction, rehabilitation, addition or other improvement to the structure exceeds fifty percent (50%) of the market value of the structure before the start of construction or the improvement.

The term substantial improvement does not, however, include either:

- (1) any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions; or
- (2) any alteration of a historic structure, provided that the alteration will not preclude the structures continued designation as a historic structure.

**Variance:** A grant of relief from the requirements of this ordinance which permits construction in a manner that would otherwise be prohibited by this ordinance.

**Water Dependent:** A structure for commerce or industry which cannot exist in any other location and is dependent on the water by reason of the intrinsic nature of its operations.

(Ord. C-74-91 [PLG-019-91], April 1, 1991, vol. 32, p. 290; amended Ord. C-66-98, PLG-006-98, June 8, 1998, vol. 42, p. 217)

#### **14.02A.030 General Provisions**

**A. Lands to Which this Ordinance Applies.** This ordinance shall apply to all areas of special flood hazards within the jurisdiction of Island County.

**B. Basis for Establishing the Areas of Special Flood Hazard.** The areas of special flood hazard identified by the Federal Insurance Administration in a scientific and engineering report entitled .The Flood Insurance Study for Island County, Washington, Unincorporated Areas,. dated August 16, 1995, with accompanying Flood Insurance Maps is hereby adopted by reference and declared to be a part of this ordinance. The Flood Insurance Study is on file at Island County Permit Center.

**C. Penalties for Noncompliance.** No structure or land shall hereafter be constructed, located, extended, converted or altered without full compliance with the terms of this ordinance and other applicable regulations. Violation of the provisions of this ordinance by failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with conditions) shall constitute a misdemeanor. Any person who violates this ordinance or fails to comply with any of its requirements shall upon conviction thereof be fined not to exceed one thousand dollars (\$1,000) or imprisoned for not more than ninety (90) days, or both, for each violation, and in addition shall pay all costs and expenses involved in the case. Nothing herein contained shall prevent Island County from taking such other lawful action as is necessary to prevent or remedy any violation.

**D. Abrogation and Greater Restrictions.** This ordinance is not intended to repeal, abrogate or impair any existing easements, covenants or deed restrictions. Island County does not enforce private easements, covenants, or deed restrictions.

**E. Interpretation.** In the interpretation and application of this ordinance, all provisions shall be:

1. Considered as minimum requirements;
2. Liberally construed in favor of the governing body; and,
3. Deemed neither to limit nor repeal any other powers granted under State statutes.

**F. Warning and Disclaimer of Liability.** The degree of flood protection required by this ordinance is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This ordinance does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flood damages. This ordinance shall not create liability on the part of Island County, any officer or employee thereof, or the Federal Insurance Administration, for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made hereunder.

(Ord. C-74-91 [PLG-019-91], April 1, 1991, vol. 32, p. 290; amended by Ord. PLG-026-95, August 14, 1995, vol. 38, p. 438)

#### **14.02A.040 Administration**

**A. Establishment of Development Permit.**

1. **Development Permit Required.** A development permit shall be obtained before construction or development begins within any area of special flood hazard established in Section 14.02A.030.B. The permit shall be for all structures including manufactured homes, as set forth in the DEFINITIONS and for all development including fill and other activities, also as set forth in the DEFINITIONS.
2. **Application for Development Permit.** Application for a development permit shall be made on forms furnished by the Island County Permit Center and may include but not be limited to; plans in duplicate drawn to scale showing the nature, location, dimensions and elevations of the area in question; existing or proposed structures, fill, storage of materials, drainage facilities and the location of the foregoing. Specifically, the following information is required:
  - a) Elevation in relation to mean sea level, of the bottom edge of the lowest floor (including basement) of all structures;
  - b) Elevation in relation to mean sea level to which any structure has been flood-proofed;
  - c) Certification by a registered professional engineer or architect that the floodproofing methods for any nonresidential structure meet the flood proofing criteria in Section 14.02A.050.B.2; and
  - d) Description of the extent to which a watercourse will be altered or relocated as a result of proposed development if applicable.

**B. Designation of Authority.** The Building Official and Planning Director are hereby appointed to administer and implement this ordinance by reviewing development permit applications in accordance with its provisions.

**C. Duties and Responsibilities of the Building Official, Planning Director and Permit Center.** Duties of the Building Official, Planning Director and Permit Center shall include, but not be limited to:

**1. Permit Review.**

- a) Review all development permits to determine that the permit requirements of this ordinance have been satisfied.
- b) Review all development permits to determine that all necessary permits have been obtained from those Federal, State or local governmental agencies from which prior approval is required.
- c) Review all development permits to determine if the proposed development is located in the floodway. If located in the floodway, assure that the provisions of Section 14.02A.050.C are met.
- d) The fee for a development permit shall be fifty dollars (\$50.00) to defray the costs of inspection, review and the maintenance of records.

**2. Use of Other Base Flood Data.** When base flood elevation data has not been provided in accordance with Section 14.02A.030.B, Basis for Establishing the Areas of Special Flood Hazard, the Building Official shall obtain, review and reasonably utilize any base flood elevation and floodway data available from a Federal, State or other source, in order to administer Sections 14.02A.050.B, Specific Standards, and 14.02A.050.C, Floodways.

**3. Information to be Obtained and Maintained.**

- a) Where base flood elevation data is provided through the Flood Insurance Study or required as in Section 14.02A.040.C.2, obtain and record the actual (as-built) elevation (in relation to mean sea level) of the bottom edge of the lowest floor, including basement, of all new or substantially improved structures, and whether or not the structure contains a basement.

- b) For all new or substantially improved flood-proofed structures:
  - (i) Verify and record the actual elevation (in relation to mean sea level), and
  - (ii) Maintain the flood proofing certifications required in Section 14.02A.040.A.2.c).
- c) Maintain for public inspection all records pertaining to the provisions of this ordinance.

**4. Alteration of Watercourses.**

- a) Notify adjacent communities and the Washington State Department of Ecology prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Insurance Administration.
- b) Require that maintenance is provided within the altered or relocated portion of said watercourse so that the flood carrying capacity is not diminished.

**5. Interpretation of FIRM Boundaries.** The Planning Director shall make interpretations where needed, as to exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions). The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in Section 14.02A.040.D.

**D. Variances and Appeals.**

**1. Procedures.**

- a) The Hearing Examiner shall act upon applications for variances from the requirements of this ordinance pursuant to Section 16.13.100.A.4 ICC and to the terms and conditions of this section.
- b) The Hearing Examiner shall hear and decide appeals when it is alleged there is an error in any requirement, decision or determination made by the Building Official or Planning Director in the enforcement or administration of this ordinance pursuant to Section 16.13.100.A.4 ICC.
- c) Those aggrieved by the decision of the Hearing Examiner may seek judicial review by the Island County Superior Court, as provided in Section 16.19.170 ICC.
- d) In passing upon such applications, the Hearing Examiner shall consider all technical evaluations, all relevant factors, standards specified in other sections of this ordinance, and whichever of the following are relevant:
  - (i) The danger that materials may be swept onto other lands to the injury of others;
  - (ii) The danger to life and property due to flooding or erosion damage;
  - (iii) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
  - (iv) The importance of the services provided by the proposed facility to the community;
  - (v) The necessity to the facility of a waterfront location, where applicable;
  - (vi) The availability of alternative locations for the proposed use which are not subject to flooding or erosion damage;
  - (vii) The compatibility of the proposed use with existing and anticipated development;
  - (viii) The relationship of the proposed use to the comprehensive plan and flood plain management program for that area;

- (ix) The safety of access to the property in times of flood for ordinary and emergency vehicles;
  - (x) The expected heights, velocity, duration, rate of rise and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site; and,
  - (xi) The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical and water systems and streets and bridges.
- e) Upon consideration of the factors of Section 14.02A.040.D.1.d) and the purposes of this ordinance, the Hearing Examiner may attach such conditions to the granting of variances as it deems necessary to further the purposes of this ordinance.
- f) The Hearing Examiner shall maintain the records of all appeal actions and report any variances to the Federal Insurance Administration upon request.

## **2. Conditions for Variances.**

- a) Generally, the only condition under which a variance from the elevation standard may be issued is for new construction and substantial improvements to be erected on a lot of one-half (1/2) acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing items (i-xi) in Section 14.02A.040.D.1.d) have been fully considered. As the lot size increases the technical justification required for issuing a variance increases.
- b) Variances may be issued for the repair or rehabilitation of historic structures upon a determination that:
- (i) the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure and
  - (ii) the variance is the minimum necessary to preserve the historic character and design of the structure.
- c) Variances shall not be issued within a designated floodway if any increase in flood levels during the base flood discharge would result.
- d) Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.
- e) Variances shall only be issued upon:
- (i) A showing of good and sufficient cause;
  - (ii) A determination that failure to grant the variance would result in exceptional hardship to the applicant;
  - (iii) A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public as identified in Section 14.02A.040.D.1.d), or conflict with existing local laws or ordinances.
- f) Variances as interpreted in the National Flood Insurance Program are based on the general zoning law principle that they pertain to a physical piece of property; they are not personal in nature and do not pertain to the structure, its inhabitants, economic or financial circumstances. They primarily address small lots in densely populated residential neighborhoods. As such, variances from the flood elevations should be quite rare.

- g) Variances may be issued for nonresidential and accessory buildings that don't exceed ten percent (10%) of the value of the principal structure in very limited circumstances to allow a lesser degree of flood proofing than watertight or dry-flood proofing, where it can be determined that such action will have low damage potential, complies with all other variance criteria except 14.02A.040.D.2.a), and otherwise complies with Sections 14.02A.050.A.1 and 14.02A.050.A.2 of the General Standards.
- h) Any applicant to whom a variance is granted shall be given written notice that the structure will be permitted to be built with a lowest floor elevation below the base flood elevation and that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced lowest floor elevation. Furthermore the applicant shall, before the issuance of the development or building permit, file for record against the title of the property a disclosure statement to notify subsequent property owners of the variance.

(Ord. C-74-91 [PLG-019-91], April 1, 1991, vol. 32, p. 290)

### **14.02A.050 Provisions for Flood Hazard Reduction**

A. **General Standards.** In all areas of special flood hazards, the following standards are required:

#### **1. Anchoring.**

- a) All new construction and substantial improvements shall be anchored to prevent flotation, collapse or lateral movement of the structure.
- b) All manufactured homes must likewise be anchored to prevent flotation, collapse or lateral movement and shall be installed using methods and practices that minimize flood damage. Anchoring methods may include, but are not limited to, use of over-the-top or frame ties to ground anchors (Reference FEMA's Manufactured Home Installation in Flood Hazard Areas. guidebook for additional techniques).

#### **2. Construction Materials and Methods.**

- a) All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.
- b) All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.
- c) Electrical, heating, ventilation, plumbing and air-conditioning equipment and other service facilities shall be designed and/or otherwise elevated or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

#### **3. Utilities and Utility Franchises.**

- a) All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system;
- b) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharge from the systems into flood waters; and
- c) On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

#### **4. Subdivision Proposals.**

- a) All subdivision proposals shall be consistent with the need to minimize flood damage;

- b) All subdivision proposals shall have public or private utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage;
- c) All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage; and
- d) Where base flood elevation data has not been provided or is not available from another authoritative source, it shall be generated by the applicant for subdivision proposals and other proposed developments which contain at least fifty (50) lots or five (5) acres (whichever is less). The base flood elevation data shall be delineated on the submitted plans.

5. **Review of Building Permits.** Where elevation data is not available either through the Flood Insurance Study or from another authoritative source (Section 14.02A.040.C.2.), applications for building permits shall be reviewed to assure that proposed construction will be reasonably safe from flooding. The test of reasonableness is a local judgment and includes use of historical data, high water marks, photographs of past flooding, etc., where available.

**B. Specific Standards.** In all areas of special flood hazards where base flood elevation data has been provided as set forth in Section 14.02A.030.B., Basis for Establishing the Areas of Special Flood Hazard or Section 14.02A.040.C.2, Use of Other Base Flood Data, the following provisions are required:

**1. Residential Construction.**

- a) New construction and substantial improvement of any residential structure shall have the bottom edge of the lowest floor, including basement, elevated at or above the base flood elevation.
- b) Fully enclosed areas below the lowest floor that are usable solely for parking of vehicles, building access or storage in an area other than a basement and which are subject to flooding are prohibited, or shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria:
  - (i) A minimum of two (2) openings having a total net area of not less than one (1) square inch for every square foot of enclosed area subject to flooding shall be provided.
  - (ii) The bottom of all openings shall be no higher than one (1) foot above grade.
  - (iii) Openings may be equipped with screens, louvers or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

2. **Nonresidential Construction.** New construction and substantial improvement of any commercial, industrial or other nonresidential structure shall either have the bottom edge of the lowest floor, including basement, elevated at or above the level of the base flood elevation; or, together with attendant utility and sanitary facilities shall:

- a) Be flood-proofed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water;
- b) Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy;
- c) Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this subsection based on their development and/or review of the structural

design, specifications and plans. Such certifications shall be provided to the official as set forth in Section 14.02A.040.C.3.b).

- d) Nonresidential structures that are elevated, not flood-proofed, must meet the same standards for space below the lowest floor as described in 14.02A.050.B.1.b).
- e) Applicants flood proofing nonresidential buildings shall be notified that flood insurance premiums will be based on rates that are one (1) foot below the flood-proofed level (e.g. a building flood-proofed to one (1) foot above the base flood level will be rated as at the base flood level).

3. **Critical Facility.** Construction of new critical facilities shall be, to the extent possible, located outside the limits of the base flood plain. Construction of new critical facilities shall be permissible within the base flood plain if no feasible alternative site is available. Critical facilities constructed within the base flood plain shall have the lowest floor elevated to three (3) feet or more above the level of the base flood elevation at the site. Flood proofing and sealing measures must be taken to ensure that toxic substances will not be displaced by or released into flood waters. Access routes elevated to or above the level of the base flood plain shall be provided to all critical facilities to the extent possible.

4. **Manufactured Homes.**

- a) Require that manufactured homes that are placed or substantially improved within Zones A1-30, AH, and AE on the FIRM on sites:
  - (i) outside of a manufactured home park or subdivision,
  - (ii) in a new manufactured Home Park or subdivision,
  - (iii) in an expansion to an existing manufactured home park or subdivision, or
  - (iv) in an existing manufactured home park or subdivision on which a manufactured home has incurred substantial damage as the result of a flood, elevated on a permanent foundation such that the bottom edge of the lowest floor of the manufactured home is elevated to or above the Base Flood Elevation and be securely anchored to an adequately anchored foundation system to resist flotation collapse and lateral movement in accordance with the provisions of Section 14.02A.050.A.1.b).
- b) Require that manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or subdivision within Zones A1-30, AH, and AE on the FIRM that are not subject to the provisions of paragraph 14.02A.050.B.4 be elevated so that either:
  - (i) the bottom edge of the lowest floor of the manufactured home is at or above the base flood elevation, or
  - (ii) the manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than thirty-six (36) inches in height above grade and be securely anchored to an adequately anchored foundation system to resist flotation, collapse, and lateral movement.

5. **Recreational Vehicles.** Require that recreational vehicles placed on sites within Zones A1-30, AH, and AE on the FIRM either:

- a) be on the site for fewer than one-hundred-eighty (180) consecutive days,
- b) be fully licensed and ready for highway use, or

- c) meet the permit requirements of paragraph 14.02A.040.A.1 and the elevation and anchoring requirements for .manufactured homes. in paragraph 14.02A.050.B.4. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions.

**C. Floodways.** Located within areas of special flood hazard established in Section 14.02A.030.B are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of flood waters which carry debris, potential projectiles and erosion potential, the following provisions apply:

1. Prohibit encroachments, including fill, new construction, substantial improvements and other development unless certification by a registered professional engineer, surveyor or architect is provided demonstrating that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.
2. Construction or reconstruction of residential structures is prohibited within designated floodways, except for:
  - a) repairs, reconstruction or improvements to a structure which do not increase the ground floor area; and
  - b) repairs, reconstruction or improvements to a structure, the cost of which does not exceed fifty percent (50%) of the assessed value of the structure either,
    - (i) before the repair, reconstruction, or repair is started, or
    - (ii) if the structure has been damaged, and is being restored, before the damage occurred. Work done on structures to comply with existing health, sanitary or safety codes or to structures identified as historic places shall not be included in the fifty percent (50%) determination.
3. If Section 14.02A.050.C.1 is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions of Section 14.02A.050, Provisions for Flood Hazard Reduction.

**D. Wetlands Management.** All developments shall be reviewed to determine whether the proposal would limit or disrupt the ability of a wetland to alleviate flooding impacts. The following process should be implemented:

1. Review proposals for development within base flood plains for their possible impacts on wetlands located within the flood plain.
2. Ensure that development activities in or around wetlands do not negatively affect public safety, health and welfare by disrupting the wetlands. ability to reduce flood and storm drainage.

**E. Standards for Shallow Flooding Areas (AO Zones).** Shallow flooding areas appear on FIRM's as AO zones with depth designations. The base flood depths in these zones range from one (1) to three (3) feet above ground where a clearly defined channel does not exist, or where the path of flooding is unpredictable and where velocity flow may be evident. Such flooding is usually characterized as sheet flow. In these areas, the following provisions apply:

1. New construction and substantial improvements of residential structures within AO zones shall have the bottom edge of the lowest floor (including basement) elevated above the highest grade adjacent to the building, one (1) foot or more above the depth number specified on the FIRM (at least two [2] feet if no depth number is specified).

2. New construction and substantial improvements of nonresidential structures within AO zones shall either:
  - a) have the bottom edge of the lowest floor (including basement) elevated above the highest adjacent grade of the building site, one foot or more above the depth number specified on the FIRM (at least two feet if no depth number is specified); or
  - b) together with attendant utility and sanitary facilities, be completely flood proofed to or above that level so that any space below that level is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. If this method is used, compliance shall be certified by a registered professional engineer or architect as in Section 14.02A.050.B.2.c).
3. Require adequate drainage paths around structures on slopes to guide floodwaters around and away from proposed structures.

**F. Coastal High Hazard Areas.** Located within areas of special flood hazard established in Section 14.02A.030.B are Coastal High Hazard Areas, designated as Zones V1-V30, VE and/or V. These areas have special flood hazards associated with high velocity waters from surges and, therefore, in addition to meeting all provisions of this ordinance, the following provisions shall also apply:

1. All new allowable construction and substantial improvements in Zones V1-V30 and VE (V if base flood elevation data is available) shall be elevated on pilings and columns so that:
  - a) The bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated one (1) foot or more above the base flood level; and
  - b) The pile or column foundation and structure attached thereto is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components. Wind and water loading values shall each have a one (1) percent chance of being equaled or exceeded in any given year (100-year mean recurrence interval); water loading values used shall be those associated with the base flood. Wind loading values used shall be those required by applicable State or local building standards. A registered professional engineer or architect shall develop or review the structural design, specifications and plans for the construction and shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the provisions of a) and b) of this section.
2. Obtain the elevation (in relation to mean sea level) of the bottom of the lowest structural member of the lowest floor (excluding pilings and columns) of all new and substantially improved structures in Zones V1-30 and VE, and whether or not such structures contain a basement. The local Permit Center shall maintain a record of all such information.
3. All new construction shall be located landward of the mean high tide.
4. Provide that all new construction and substantial improvements have the space below the lowest floor either free of obstruction or constructed with nonsupporting breakaway walls, open wood lattice-work, or insect screening intended to collapse under wind and water loads without causing collapse, displacement or other structural damage to the elevated portion of the building or supporting foundation system. For the purpose of this section, a breakaway wall shall have a design safe loading resistance of not less than ten (10) and no more than twenty (20) pounds per square foot. Use of breakaway walls which exceed a design safe loading resistance of twenty (20) pounds per square foot (either by design or when so required by local or State codes) may be permitted only if a registered professional engineer or architect certifies that the designs proposed meet the following conditions:

- a) Breakaway wall collapse shall result from a water load less than that which would occur during the base flood; and
  - b) The elevated portion of the building and supporting foundation system shall not be subject to collapse, displacement or other structural damage due to the effects of wind and water loads acting simultaneously on all building components (structural and nonstructural). Maximum wind and water loading values to be used in this determination shall each have a one (1) percent chance of being equaled or exceeded in any given year (100-year mean recurrence interval). Water loading values used shall be those associated with the base flood. Wind loading values used shall be those required by applicable State or local building standards.
5. If breakaway walls are utilized, such enclosed space shall be useable solely for parking of vehicles, building access or storage. Such space shall not be used for human habitation.
  6. Require that manufactured homes placed or substantially improved within Zones V1-30, V, and VE on the FIRM on sites:
    - a) outside of a manufactured home park or subdivision,
    - b) in a new manufactured home park or subdivision,
    - c) in an expansion to an existing manufactured home park or subdivision, or
    - d) in an existing manufactured home park or subdivision on which a manufactured home has incurred substantial damage as the result of a flood, meet the standards of paragraphs 14.02A.050.F.1 through 9 and that manufactured homes placed or substantially improved on other sites in an existing manufactured home park or subdivision within Zones V1-30, V, and VE on the FIRM meet the requirements of paragraph 14.02A.050.C.4.b).
  7. Require that recreational vehicles placed on sites within Zones V1-30, V, and VE on the FIRM either:
    - a) be on the site for fewer than one-hundred-eighty (180) consecutive days,
    - b) be fully licensed and ready for highway use, or
    - c) meet the requirements in paragraphs 14.02A.040.A.1 and 14.02A.050.F.1 through 9.

A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions.

8. Prohibit the use of fill for structural support of buildings.

9. Prohibit man-made alteration of sand dunes which would increase potential flood damage.

(Ord. C-74-91 [PLG-019-91], April 1, 1991, vol. 32, p. 290)

**APPENDIX B: FEMA FLOOD INSURANCE STUDY – ISLAND COUNTY**

- SEE ATTACHED REPORT -

## **APPENDIX C: ISLAND COUNTY FIRM DESIGNATION CHANGE – WEST BEACH AREA**

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- 1) Letter dated April 4<sup>th</sup>, 1991 from Island County Planning Director Larry Kwarsick to FEMA regarding reclassification of the FIRM boundary at West Beach (Swantown);
- 2) **Appeal 09/91** – Alan Jackson
  - a) Memo dated April 10<sup>th</sup>, 1991 from Island County Planning Director Larry Kwarsick to the Property Owners of Patton Sunset Beach community;
  - b) Letter dated April 30<sup>th</sup>, 1991 from Island County Shoreline Planner, Michael Morton (Island County) to resident Evan Reese about flood boundary changes;
  - c) Memo dated September 9<sup>th</sup>, 1991 from Island County Assistant Planning Director Alice Lee to the Island County Hearing Examiner;
  - d) Memo dated September 18<sup>th</sup>, 1991 from Island County Engineer, Roy Allen to Island County Hearing Examiner – Appeal 09/91 Alan Jackson;
  - e) Summary notes Island County Hearing Examiner, dated January 16, 1992 – Appeal 09/91 Alan Jackson;
- 3) Letter dated December 3<sup>rd</sup>, 1997 from Island County Planning Director Vince Moore to FEMA regarding V-zone designation re-evaluation of the FIRM boundary at West Beach (Swantown);
- 4) Letter dated October 10<sup>th</sup>, 1998 from FEMA Project Engineer, Eugene Zeizel to Island County Commissioner Mac McDowell, finalizing the designation of West Beach (Swantown) to an AE-Zone.

**APPENDIX D: FEMA UPDATED FLOOD INSURANCE STUDY – ISLAND COUNTY**

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- SEE ATTACHED REPORT -

## **APPENDIX E: 1998 FEMA CAV – ISLAND COUNTY**

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- 1) Letter dated February 23<sup>rd</sup>, 1998 from FEMA Mitigation Division Director Chuck Steele to Island County with findings of the 1998 Community Assistance Visit (CAV);
- 2) Letter dated April 29<sup>th</sup> 1998 from Island County Commissioner Mac McDowell to FEMA in response to the findings listed within the CAV;
- 3) Letter dated May 14<sup>th</sup>, 1998 from FEMA representative Patrick Massey to Island County requesting additional information pertaining to the CAV;
- 4) Letter dated July 28<sup>th</sup>, 1998 from FEMA representative Charles Steele to Island County requesting additional information pertaining to the CAV;
- 5) Letter dated August 5<sup>th</sup>, 1998 from Island County Planning Director Vince Moore to FEMA, regarding the CAV and the designation of West Beach (Swantown);
- 6) Letter dated September 25<sup>th</sup>, 1998 from Island County Commissioner Mac McDowell to US Senator Slate Gorton and Congressman Jack Metcalf requesting assistance pertaining to FEMA's requirements for the 1998 CAV;
- 7) Response dated March 23<sup>rd</sup>, 1999 from FEMA to Senator Slate Gorton, concerning the Island County CAV;
- 8) Letter dated January 25<sup>th</sup>, 1999 from FEMA Regional Director, David de Courcy to Island County terminating Island Counties pending probation;
- 9) Letter dated February 18<sup>th</sup>, 2000 from Permit Review Manager, Kelly Whitney to residents James & Rose Morgan clarifying Island County's floodplain program status.



**APPENDIX F: 2000 FEMA CAV – ISLAND COUNTY**

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- 1) Letter dated September 29<sup>th</sup>, 2004 from FEMA Floodplain Management Specialist Ryan Ike to Island County with findings of the 2004 Community Assistance Visit (CAV);



**APPENDIX G: ISLAND COUNTY DIB #519 – FLOODPLAINS**

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