CRITICAL AREAS

INTEGRATION OF BEST AVAILABLE SCIENCE

University of Washington Presentation
November 15, 2007

Cathy Beam, AICP
Principal Environmental Planner

CityofRedmond
WASHINGTON

Designation and Protection of Critical Areas

- First mandate of the Growth Management Act
- First formal step for two reasons:
  - Exclude critical areas from urban growth designation; and
  - Prevent irreversible environmental harm while Comprehensive Plans and implementing regulations are being prepared.

Best Available Science (BAS)

- Legislature added new section to GMA in 1995 to ensure jurisdictions use reliable scientific information. (RCW 36.70A.172(1).
  - "…counties and cities shall include the best available science in developing policies and development regulations to protect the functions and values of critical areas."
  - Give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries.

BAS Rule

- Office of Community Development adopted administrative rule guidance in 2000 to assist jurisdictions in determining what is BAS, where to obtain it, how to include it, and what to do in the absence of available scientific information.
- BAS Rule: WAC 365-195-900 thru 925

Five Types of Critical Areas

- Fish and Wildlife Habitat Conservation Areas
- Wetlands
- Frequently Flooded Areas
- Critical Aquifer Recharge Areas
- Geologically Hazardous Areas

Critical Areas Must be Protected

- All appropriate critical areas must be designated and mapped.
- Must adopt development regulations to protect designated critical areas.
- Regulations must contain appropriate and specific criteria and standards to ensure their protection.

Functions and Values Must be Protected

- Generally means to preserve their structure, value, and functions.
- Required standard of protection is to prevent adverse impacts, or at the very minimum, to mitigate adverse impacts.
- Attain no net loss of the structure, values, and functions of the natural systems constituting the protected critical areas.

Functions and Values

Beneficial roles served by critical areas:

- Water quality protection and enhancement;
- Fish and wildlife habitat;
- Food chain support;
- Flood storage, conveyance, and attenuation;
- Ground water recharge and discharge;
- Erosion control;
- Protection from hazards;
- Historic, archaeological and aesthetic value protection; and
- Recreation.

Relationship to Land Use Designations

- Critical areas regulations overlay all other land uses and are to preclude land uses and developments incompatible with the preservation of critical areas.

Fish and Wildlife Habitat Conservation Areas

- Protected primarily to preserve and maintain their ecological functions.

- These areas include:
  - Areas with which endangered, threatened, or sensitive species have a primary association;
  - Habitats for species of local importance;
  - Small ponds and their submerged aquatic beds;
  - Waters of the state; and
  - Areas for critical habitat connectivity.

FWHCA Ecological Functions

- Maintain species diversity and genetic diversity
- Provide opportunities for food, cover, nesting, breeding, and movement for fish and wildlife
- Help maintain air and water quality
- Control erosion
- Serve as areas for recreation, education, scientific study, and aesthetic appreciation
- Provide for neighborhood separation and visual diversity with urban areas

Riparian Functions

- Producing and delivering LWD and SWD
- Shoreline protection and habitat formation
- Removing sediments and dissolved chemicals from water
- Moderating water temperature
- Habitat for terrestrial animals
- Providing proper nutrients sources for aquatic life
- Light patterning

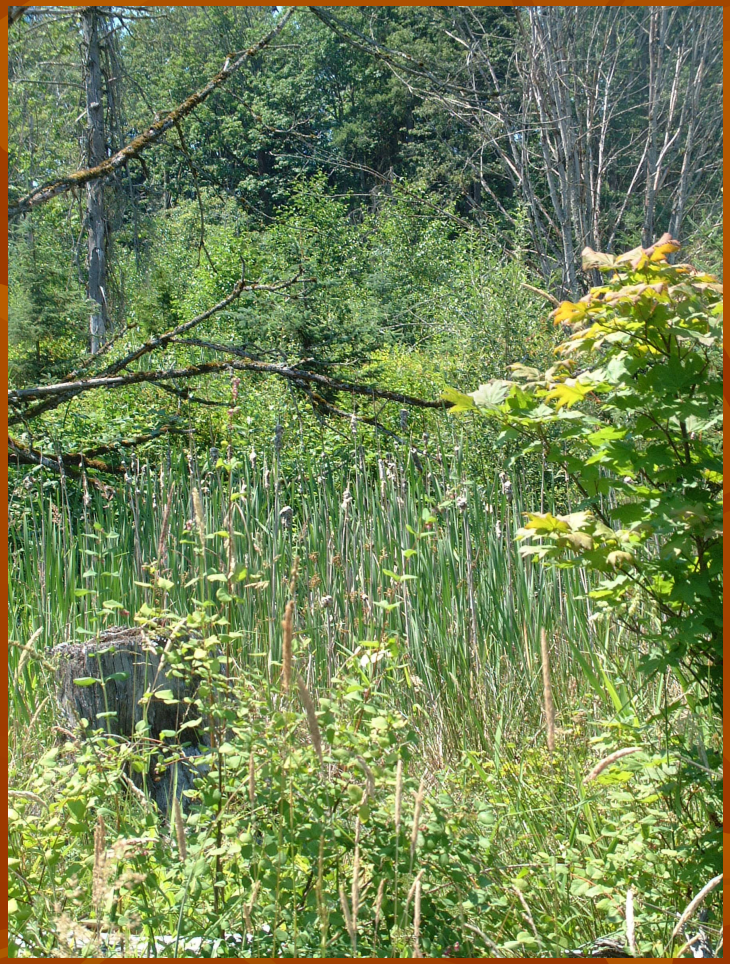
FWHCA Key Protection Strategies

- Species protection
- Habitat protection
- Create system of connected habitat
- Landscape scale approaches
  - Stream buffers
  - Minimize impervious surfaces
  - Forest retention policies
  - Stormwater detention with quality control
  - Prohibit construction on steep slopes
  - Protect wetlands

Wetlands

- Protected primarily to preserve and maintain their ecological functions.

"Wetlands are areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions."



Wetland Ecological Functions

- Wildlife and fisheries habitat
- Water quality protection (nutrient absorption)
- Flood protection (attenuation)
- Shoreline stabilization
- Stream flow
- Groundwater recharge and discharge
- Values: open space, recreation, education, and scientific study

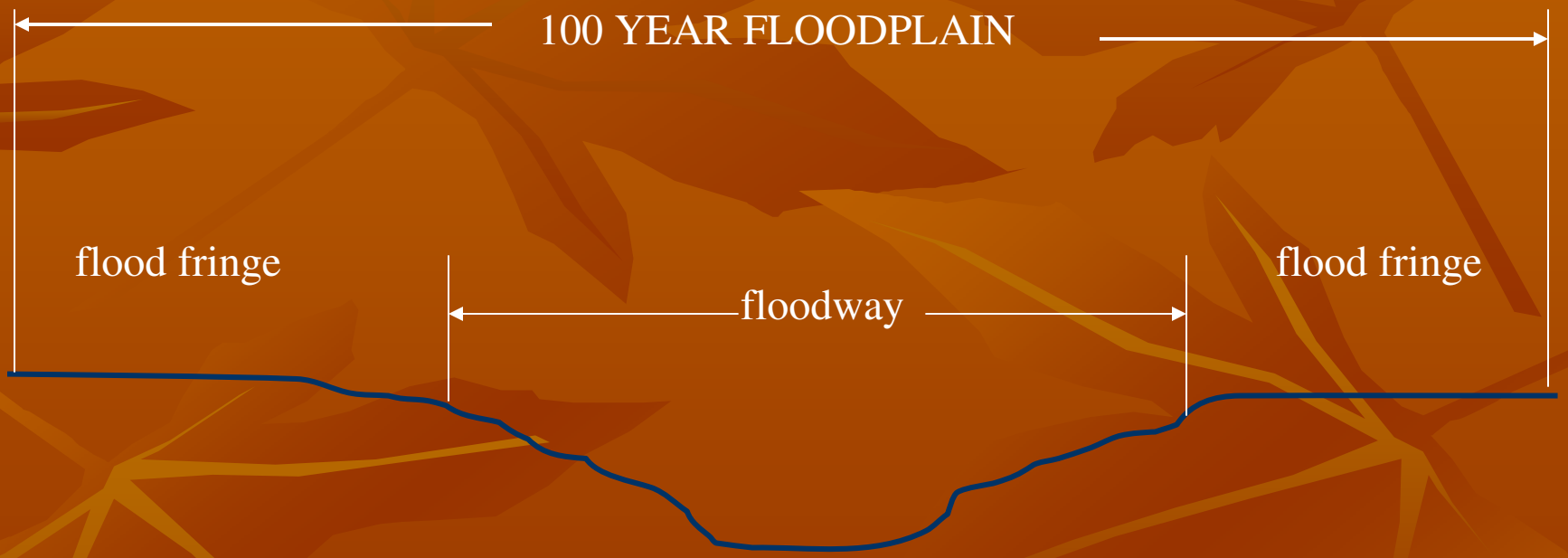
Wetland Protection Strategies

- Mitigation Sequencing
  - Avoid
  - Minimize
  - Rectify
  - Reduce or eliminate over time
  - Compensate
  - Monitor
- Buffers
- Permanent Protection Measures

Frequently Flooded Areas

- Protected to preserve ecological and hydrologic functions of floodplains.
- Protected to prevent loss of property and human life caused by inappropriate development in floodplains.

Frequently Flooded Areas



FFA Ecological Functions

- Move large volume of water and debris downstream
- Store water during storm events
- Transport sediments and nutrients
- Move and distribute large woody debris
- Provide aquatic and riparian habitat
- Provide connectivity between river, riparian soils and vegetation

FFA Protection Strategies

- Regulate building in the floodplain
- Provide compensatory floodplain storage
- Prohibit increases in flood elevations
- Reconnect side channels and wetlands, establishing backwater areas
- Future conditions floodplain

Critical Aquifer Recharge Areas

- Protected to maintain the quality of potable underground water supplies.
- Areas include:
  - Sole source aquifer recharge areas and wellhead protection areas designated under the federal Safe Drinking Water Act;
  - Areas established for special protection under a state or local groundwater management program; and
  - Other aquifer areas providing drinking water vulnerable to contamination.

Critical Aquifer Recharge Areas

- Aquifer: water-bearing strata
- Risk of Contamination
  - Hydrologic susceptibility
    - Ground/soils
    - Water table
  - Contaminant loading potential
    - Potential contaminant materials
    - Chemical composition
    - Handling
- Vulnerability

CARA Functions

- Provide sources of potable water
- Provide areas for replenishment of groundwater resources

CARA Protection Strategies

- Regulatory – prevent contamination
  - Prohibit uses that pose a significant threat
  - Assessment evaluation for permitted uses
    - Secondary containment
    - Operations
    - Best Management Practices
- Non-Regulatory – public education and outreach
- Inspection and Compliance programs

Geologically Hazardous Areas

- Protected primarily to prevent loss of property and human life caused by inappropriate development and development in inappropriate areas.
- These areas include:
  - Erosion hazards;
  - Landslide hazards; and
  - Seismic hazards.

Erosion Hazard Areas

- Lands and areas underlain by soils with severe or very severe rill erosion.
- Severity of erosion dependent upon:
  - Grain size ↓ grain size ↑ erosion
  - Soil cohesion
  - Slope gradient ↑ steepness ↑ erosion
  - Rainfall frequency and intensity
  - Surface composition and permeability

Landslide Hazard Areas

- Areas of historic failures
- Areas combining slopes ≥ 15%, springs or seepage, & permeable overlying impermeable
- Slopes parallel to planes of weakness in subsurface materials
- Unstable areas due to stream incision and erosion
- 40% slopes or steeper with a vertical relief of 10 feet or more

Landslide Causes

- Rainfall
  - Permeability
  - Lateral flow
- Vegetation Removal
  - Rapid runoff
  - Soil saturation
  - Energy dissipation
  - Water absorption
  - Tensile strength

Seismic Hazard Areas

- Areas subject to severe risk or damage as a result of earthquake induced ground shaking, slope failure, settlement (cohesionless soils), soil liquefaction (loose saturated soils), or surface faulting.
- Severe risk = structural damage

GHA Functions

- Natural erosion and landsliding provides sand, gravel, cobbles, and boulders to streams.
- Large woody debris recruitment from landslides.
  - Adds nutrients to aquatic area
  - Provides shelter from predators
  - Provides some shade
  - Helps stabilize stream channels

GHA Protection Strategies

- Prohibit inappropriate development
- Use Best Management Practices (BMPs)
- Implement a Temporary Erosion and Sedimentation Control (TESC) plan
- Establish buffers
- Earthquake resistant design and construction

Planner's Role

Take the scientific information and translate it into policies and regulations that meet the jurisdiction's goals.

Example: City of Redmond

- 1992 SAO
- 2005 CAO – Update
  - Process
    - Literature review
    - BAS summary papers
    - Goal: No net loss of ecological functions
    - Policies and regulations
  - Outcome
    - Stronger environmental regulations
    - Better environmental management

Swinomish Case

- Swinomish Indian Tribal Community v. WWGMHB
- Challenge to Skagit County's critical areas regulations
- "No harm" standard to anadromous fish habitat
- WA Supreme Court
  - GMA mandates protection, not enhancement
  - Record evidence to warrant deviation

Shoreline Management Act

- Recognize and protect the state-wide interest over local interest;
- No net loss of shoreline ecological functions;
- Result in long –term over short-term benefit;
- Increase public access to publicly-owned areas of the shoreline;
- Increase recreational opportunities for the public in the shoreline; and
- Provide for any other element deemed appropriate or necessary.