

CRITICAL AREAS

Bear Creek Neighborhood Citizens Academy
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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.

Five Types of Critical Areas

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

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.

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

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

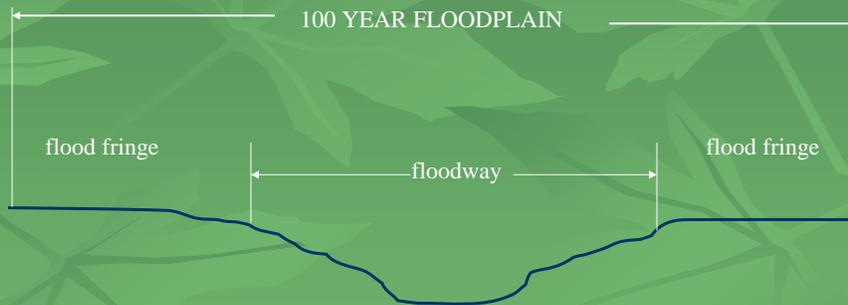
- Mitigation Sequencing
 - Avoid
 - Minimize
 - Rectify
 - Reduce or eliminate over time
 - Compensate
 - Monitor
- Buffers
- Permanent Protection Measures

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 (Wellhead Protection); 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

Critical Aquifer Recharge Area 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 $\geq 15\%$, 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

CAO SUMMARY

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