

# City of Tucson Riparian Vegetation Preservation and Protection Codes, Standards and Policies Summary

Preservation of vegetation along the urban watercourses within the City of Tucson has been addressed to a varying extent since the early 1980's with the development of codes, policies and standards protecting riparian vegetation. Public demands and expectations regarding vegetation preservation along the watercourses has strengthened. The purpose of this document is to provide code clarification by presenting a brief background of the code or policy followed by a discussion of the applicability for private development, public construction projects and watercourse maintenance activities.

To better understand the applicability of the Codes to site development, it is recommended that site research start with [Development Standard 9-06](#). Development Standard 9-06 was developed to consolidate the requirements for [Tucson Code, Chapter 26, Floodplain and Erosion Hazard Management](#), [Tucson Code, Chapter 23, Land Use Code \(LUC\), Article II, Division 8, Section 2.8.6, Environmental Resource Zone \(ERZ\)](#) and [Tucson Code, Chapter 29, Article VIII, Watercourse Amenities, Safety, and Habitat - a.k.a. The WASH Regulations](#) into one document so there is a single process for review with consistent criteria for application, and to help property owners and the development community better understand the regulations.

The following riparian vegetation preservation and protection codes, standards, and policies are presented chronologically.

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## TUCSON CODE

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### [Tucson Code, Chapter 26, Floodplain and Erosion Hazard Management](#)

Since 1982, the Floodplain and Erosion Hazard Management Code has provided for the management of uses and development in floodplains to protect the public from flooding and to protect riparian habitats.

All proposed developments within the 100-year floodplain must be reviewed for compliance with these regulations. Any development in the 100-year floodplain requires a floodplain use permit that must be approved by the City Engineer. Sections 26-5.1.4 and 26-5.2.4 state that floodway and floodway fringe development shall: "not unnecessarily (emphasis added) alter riparian habitats of the watercourses and adjacent bank areas." Together, the floodway (usually the central portion of the floodplain near the channel) and floodway fringe (the remaining floodplain outside the floodway) comprise the 100-year floodplain. The Floodplain Regulations define development as "any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, landscaping, paving, excavation, drilling operations, or storage of equipment or materials." Watercourse is defined as "a lake, river, creek, stream, wash, arroyo, or other topographic feature on or over which water flows at least periodically." The smallest watercourses regulated by the Floodplain Regulations are minor watercourses. Minor watercourse are defined as "watercourses which convey or collect a 100-year (base flood) peak discharge of less than twenty-five hundred (2,500) cubic feet per second (cfs) but more than one hundred (100) cfs." To put this definition in perspective, a paved area of approximately 11 acres or more, or a natural area of approximately 17 acres or more may generate a 100-year flow of 100 cfs or more. With the City limits currently extending over 240 square miles, and future annexations expected, the number of potentially regulated watercourses is substantial.


### **Coverage**

At a minimum, the Floodplain Regulations cover the habitat along the watercourse and both banks. The term "adjacent bank areas" and the listing under floodway fringe development indicates that if habitat extends beyond the banks but lies within the 100-year floodplain and/or the erosion hazard area, the habitat is protected as well.

### **Applicability**

The Floodplain Regulations apply to properties within the 100-year floodplain and erosion hazard area. Exempted properties or activities are listed under the statutory exemptions in section 26-4. Exemptions are based on maintaining current property uses, building infrastructure (bridges, power transmission lines, parks, etc.) and mining. The Floodplain Regulations also meet the requirements for the City's eligibility for federal flood insurance. Strict enforcement of the Floodplain Regulations is essential to maintaining that eligibility.

### **Use**

Although the Floodplain Regulations state that development shall "not unnecessarily alter riparian habitats of the watercourses and adjacent bank areas," these regulations lack guidance for habitat delineation or mitigation if habitat disturbance is necessary. Current policy utilizes the [Chapter 29, Article VIII \(commonly known as the WASH Regulations\) "Guidelines"](#)  approved by Mayor and Council in May 1998 for habitat delineation and mitigation requirements. The word "unnecessarily" is key to the regulatory statement. Necessary alteration of habitat must be demonstrated, not just stated. Private developments must demonstrate that riparian habitat alteration is necessary under the numerous configurations and land use scenarios allowed under the current or proposed zoning. Maximizing lot yield alone is insufficient documentation. Similarly, public improvement projects and maintenance activities may not unnecessarily alter riparian habitat. The WASH Regulations Guidelines as discussed below provide the criteria for demonstrating "necessary" disturbance.


Necessary riparian habitat disturbance must be mitigated. The WASH Regulations Guidelines explain that mitigation consists of a plant preservation/revegetation plan that demonstrates how the site will be

revegetated to the same or greater density, diversity, and volume of vegetation that existed prior to disturbance.

### **Authority**

The City Engineer administers Tucson Code, Chapter 26. A variance to the Floodplain Regulations may be obtained if certain criteria are met and the request is approved by the Floodplain Board (Mayor and Council).

### **Tucson Code, Chapter 23, Land Use Code (LUC), Article II, Division 8, Section 2.8.6, Environmental Resource Zone (ERZ)**

The ERZ was adopted as a zoning regulation on July 3, 1990 to preserve open space, particularly the critical and sensitive habitats linked with public monuments, forests and preserves, and to supplement the [Interim Watercourse Improvement Policy](#)  (discussed under the Policy Section).

### **Coverage (LUC 2.8.6.4):**

The ERZ regulates development on parcels along specific washes that contain or may contain critical riparian habitat within the 100-year floodplain. These specific washes are listed in Section 2.8.6.2.B. Parcels along the listed washes regulated by ERZ are shown on ERZ Overlay Maps. As in Chapter 26, development includes "any manmade change to improved or unimproved real estate."

### **Applicability**

ERZ applies to all properties shown on the ERZ overlay maps. Exemptions are listed in section 2.8.6.3. Exemptions include any single-family residence or other development that existed prior to July 3, 1990. Improvements of 25% or more over the existing development configuration voids exemption status. ERZ does not regulate development or protect riparian habitat outside the 100-year floodplain.

Private development as well as public improvement projects and maintenance activities within 100-year floodplains along listed watercourses must conform to the ERZ.

### **Use**

1. Development on a parcel affected by the ERZ that leaves the 100-year floodplain undisturbed has no further requirements other than temporary barrier fencing to prevent damage from construction activities.
2. Any development on a parcel affected by the ERZ that will encroach into the 100-year floodplain requires a Resource Corridor Study (2.8.6.4.B) by a qualified professional to define the resource corridor and critical riparian habitat.
3. If disturbance of the critical riparian habitat is proposed, a mitigation plan (2.8.6.5.D) must be submitted and approved before disturbance may occur.

Preservation of 100% of the critical riparian habitat within the 100-year floodplain is required with few exceptions. Section 2.8.6.6 requires mitigation for all disturbances within the critical riparian habitat to minimize impacts of roadway, utility, walkway, and bicycle path crossings. The mitigation plan must explain why 100% preservation of the critical riparian habitat within the 100-year floodplain cannot be accomplished (lot yield is not sufficient cause). If disturbance is allowed, any disturbed area must be revegetated with plant density, diversity and volume equal to the pre-disturbance condition of the site. Greater detail is provided in [Development Standard 9-06](#).

### **Authority**

Under Tucson Code, Chapter 23A the Director of Development Services Department has the responsibility for reviewing proposed development for compliance with the ERZ regulations. Notice of decisions on ERZ plans must be provided to certain adjacent property owners. The DSD Director's decision may be appealed to the Mayor and Council. Questions about the interpretation of the LUC provisions governing the ERZ are determined by the Zoning Administrator. A variance to the requirements of the ERZ may be requested from the Board of Adjustments.

### **Tucson Code, Chapter 29, Article VIII, Watercourse Amenities, Safety, and Habitat - a.k.a. The WASH Regulations**

Chapter 29, Article VIII, Watercourse Amenities, Safety, and Habitat, commonly referred to as the WASH Regulations, was adopted by Mayor and Council on March 25, 1991 to implement the Interim Watercourse Improvement Policy, to protect existing vegetation near specific washes, to provide for restoration of vegetation along disturbed wash reaches, to reduce heat island effects and to aid groundwater recharge.

#### **Coverage**

The WASH Regulations regulate development (any human alteration as defined in 29-13) in "resource areas" along washes listed in Table 1 of the Code. Resource areas consist of the vegetative resources and wildlife habitat located between the wash banks, and the land area extending 50' from either side of the wash banks (the study area). Section 29-16(a) indicates that the channel and banks are considered resource area in all cases. The 50' on either side of the wash top of banks is referred to as the "study area." Vegetative resources and wildlife habitat in the "study area" may also constitute "resource area."


#### **Applicability**

The WASH Regulations (Section 29-14(a)) apply to all lots and parcels along listed watercourses with the exception of single family residences on lots or parcels that were created prior to April 25, 1991. Since the WASH Regulations apply to all other lots and parcels, any improvements or maintenance activities must comply with the WASH Regulations.

#### **Use**

WASH Regulations compliance can be analyzed using three steps:

1. If development within the study area (watercourse plus 50' either side of the top-of-bank) is proposed along a watercourse listed in Table 1, an inventory of vegetative resources and wildlife habitat of the entire study area must be completed to delineate the vegetative resource(s) and wildlife habitat area(s) that comprise the resource area. Other conditions and report requirements are listed in Section 29-15.b.
2. If disturbance of the resource area is proposed, it must be demonstrated why the resource area cannot be left in its natural state.
3. Any disturbance of the resource area requires an approved mitigation plan.

Additional criteria for steps 1, 2, and 3 are clarified in appendices for the [WASH Regulations Guidelines](#)  approved by Mayor and Council in May of 1998.

The WASH Regulations link riparian habitat to vegetative volume. The habitat may consist of native vegetation, non-native vegetation or a mix of both. The WASH Regulations Guidelines specify a 2" caliper for significant vegetation to be shown on the vegetative resources inventory map.

The use of concrete, in any form (soil cement, grouted rip-rap, gunite, etc.), is not permitted as a wash treatment (bank protection, grade control structures, crossings, ...) along a listed watercourse unless the City Engineer determines that an existing safety hazard warrants such treatment and Mayor and Council approve use of concrete as a wash treatment.

If disturbance of the study area and/or the resource is approved, section 29-17.b.3 of the WASH Ordinance requires notification be sent to all property owners within 200 feet of the site if the properties are adjacent to the study area. The Tucson Code, Chapter 29, Article VIII Guidelines adopted by Mayor and Council on May 1998 simplified the notification area to include all properties within 200' of the site.

### **Authority**

Both the City Engineer and the Planning Director review components of the WASH Ordinance. The City Engineer has responsibility for property owner notification and has final approval responsibility. Current administrative procedure delegates both the City Engineer and Planning Director review components with the Development Services Department. An appeal of a decision or a request for a variance is heard by the Mayor and Council.

### **The Tucson Code, Chapter 29, Article VIII (WASH Regulations) Guidelines**

Mayor and Council approved the WASH Regulations Guidelines in May of 1998. These guidelines were developed by a joint Stormwater Technical Advisory Committee - Tucson Stormwater Management Citizens Advisory Committee *ad-hoc* subcommittee to clarify the application of the WASH Regulations. The guidelines provide code clarification by defining and expanding criteria for delineating resource areas and mitigation of habitat disturbance. These guidelines are used for both the Floodplain and Erosion Hazard Management (Chapter 26) and the Watercourse Amenities Safety and Habitat (Chapter 29, Article VIII) Codes. Appendices A to G of the guidelines provide the detailed descriptions for certain components of the WASH Regulations.

### **Tucson Code, Chapter 23 (the Land Use Code), Article 3, Division 8, Sections 3.8.1 to 3.8.8, Native Plant Preservation - a.k.a. the NPPO**

This Code, commonly referred to as the NPPO due to adoption via the Native Plant Preservation Ordinance, primarily protects vegetation in upland (usually non-riparian component) areas of a site. NPPO requires preservation of vegetation meeting species, caliper, and viability criteria. Preservation of plants within riparian habitats may satisfy some or all of the NPPO preservation requirements. The full applicability and use of NPPO is beyond the scope of this discussion. Contact a planning official for further clarification. Tucson Code, Chapter 23A gives NPPO review authority to the Development Services Department Director.

**NOTE:** NPPO plant inventories do not satisfy the vegetation resource and wildlife habitat inventory or reporting requirements associated with delineating resource areas for the WASH Regulations. NPPO is species specific and uses a 4" caliper for designating significant vegetation to be shown on a vegetation inventory map. The WASH Regulations are not species specific and the adopted guidelines use a 2" caliper for significant vegetation to be shown on the vegetative resources inventory map.

### **DEVELOPMENT STANDARD**

#### **Development Standard 9-06**

Mayor and Council adopted this Development Standard through Resolution 20505 on November 7, 2006. It is the intent of this standard that the Protected Riparian Area incorporate the Critical Riparian Habitat in ERZ watercourses, the Resource Areas in WASH watercourses, and riparian habitat within the

undesigned regulatory floodplains so that there is a single process for review with consistent criteria for application.

### **Coverage**

The Regulated Areas under this development standard include the floodplain and floodway fringe areas as defined in Tucson Code, Sec. 26-2, and the adjacent banks and associated riparian habitat as provided in Sec. 26-5.2 (3) and (4), which are established as the “**Regulated Areas**”. If there is no encroachment within these Regulated Areas, the documentation requirements, development restrictions and mitigation requirements do not apply.

Where the Regulated Areas are based upon maps prepared for the TSMS Phase II Stormwater Master Plan, the Critical and Sensitive Wildlife Habitat Map, or similar maps prepared by Pima County, there is a presumption that riparian habitat that should be preserved has been documented on the property. Any development must therefore comply with this standard to establish the precise location of riparian habitat. It is, however, the actual documentation of the location of the habitat pursuant to this standard that will determine where the development may occur, not the maps. If there is encroachment into the Regulated Areas, the standard requires that the riparian habitat be identified and delineated as the “**Protected Riparian Area**”. This will include the submittal of an Environmental Resource Report that will document (1) the areas that contain riparian and wildlife habitat that is to be preserved and (2) those areas without such habitat. Development is permitted within the Regulated Areas that are outside the Protected Riparian Areas. Development within the Protected Riparian Area is limited as set forth in the standard.

### **Applicability**

This standard regulates development modifications to riparian habitat in any regulatory floodplain (100 cfs or more). The development standard applies to all watercourses and sheet flow areas and includes all WASH and ERZ Regulated watercourses. Private development as well as public improvement projects and maintenance activities within 100-year floodplains must conform to the development standard.

**Remember**, a WASH regulated watercourse may have resource area outside the 100-year floodplain that is considered part of the Regulated Area and Protected Riparian Area per this standard.

Exemptions are listed in section 9-06.1.2

### **Use**

1. Development that does not encroach into the Regulated Area (leaves the 100-year floodplain and any WASH study area outside the 100-yr floodplain undisturbed) has no further requirements.
2. Any development into the Regulated Area requires an Environmental Resource Report prepared by a qualified professional to define the Protected Riparian Areas (PRA) within the Regulated Area. The PRA must include the resource area on a WASH regulated watercourse.
3. Disturbance of the PRA must meet the Development Restrictions specified in section 9-06.2.5.B.2. Any mitigation plan required for disturbance of the PRA must meet the requirements in section 9-06.2.5.B.3
4. Floodplain Restoration (which means revegetation, restoration or enhancement) shall not constitute “encroachment” under applicable codes. A Floodplain Restoration Plan must be prepared and approved in conformance with section 9-06.2.5.A.4 in order to undertake floodplain revegetation, restoration or enhancement. For areas within the Regulated Areas that are to remain as open space after development, revegetation and restoration of the open spaces areas is encouraged, but not required, to enhance the riparian resources within the Regulated Area. See section 9-06.2.5.A.4 for details.

### **Authority** (Section 9-06.3.0)

The Community Design Review Committee (CDRC) and the appropriate review sections within Development Services Department (DSD) reviews submitted materials. The Stormwater Advisory Committee (SAC) reviews plans for development that encroaches within the Protected Riparian Areas that is not in accordance with an approved Floodplain Restoration Plan. The Office of Conservation and Sustainable Development is available for predevelopment consultations regarding this Development Standard.

### **POLICY**

#### **Interim Watercourse Improvement Policy (IWIP)**

The Interim Watercourse Improvement Policy, adopted by Mayor and Council on June 27, 1988 established the policy that washes were to be preserved in their natural state whenever possible. If, due to right-of-way and/or safety concerns and/or the wash requires reconfiguration, innovative and creative design of a natural appearing revegetated earthen channel is encouraged. When necessary, due to unsafe conditions, washes may be reconstructed based on criteria established in the IWIP. The City Engineer must approve this construction. IWIP criteria are based on a balance between flow conveyance needs and revegetation potential/multi-use compatibility. "Any proposed encroachment/use/bank protection shall not disrupt important wildlife movement corridors. (Refer to Shaw's maps on 'Critical and Sensitive Habitats of Eastern Pima County', August, 1986)." The Shaw maps are available at Pima County Maps and Records. Copies are on file with the Transportation Engineering Division, Stormwater Management Section and may be viewed at the [Stormwater Maps website](#). Maintenance performed in washes must accommodate/preserve designed or incidental revegetation (see paragraph #2 of IWIP).

#### **Coverage**

The IWIP includes "the bed, banks, and immediate adjacent vegetation associated with the water carrying area." There is no stated lower or upper limit to the watercourse flow rate or geometry, therefore the policy covers **all** washes.

#### **Applicability**

The IWIP applies to improvements and maintenance activities on all watercourses within the City. IWIP does not directly regulate developments or maintenance but provides policy guidance to City staff in enforcement of other Regulations.

#### **Use**

The primary emphasis of the IWIP is to guide design for channel reconstruction and establish criteria to meet floodwater conveyance needs while promoting aesthetics and revegetation. Appropriate configurations are suggested for channel reconstruction. Maintenance activities must attempt to preserve existing vegetation (within safety parameters) regardless of whether the vegetation was intentionally planted, or grew as a "volunteer" due to natural processes.

#### **Authority**

The City Engineer administers the IWIP.

#### **Interim Watercourse Maintenance Guidelines (IWMG)**

Interim Watercourse Maintenance Guidelines were developed as part of the Tucson Stormwater Management Study (TSMS) to "provide field guidance to maintenance workers to achieve consistent drainage maintenance City-wide." The Interim Watercourse Maintenance Guidelines provide general

maintenance techniques for natural, altered from natural, and constructed watercourse classifications that reflect the extent of urbanization of the watercourse.

*Natural:* The wash is unaltered or not appreciably altered except for roadway crossings. There are very few "natural" watercourses within the City core area. Most natural watercourses are on the far east, west and south sides of the City. According to the guidelines, natural washes require minimal maintenance. Only when vegetation and debris present an obstruction of flow and a potential safety hazard are they trimmed or removed. The wash is generally left alone.

*Altered from Natural:* The majority of watercourses in Tucson are altered from natural (partially modified). Many washes may appear to be altered from natural but are actually constructed channels that have become vegetated with native and non-native species. Most altered from natural channels do not contain the 100-year flood flows within the tops of banks. Consequently, maintenance guidelines call for keeping the channel flowline open, repairing existing flow control facilities, as-needed/judicious tree trimming of vegetation located below the top of bank, removing debris, and filling scour holes.

*Constructed:* Usually these highly altered/reconstructed channels have little vegetation left along the constructed channel (earthen, concrete, soil cement, gabion) and/or banks. The maintenance guidelines focus on preservation of channel floodwater conveyance capacity. Trees, obstructive vegetation, and debris in the channel and below the top of bank of the channel are usually removed. Vegetation outside the channel is preserved or trimmed per safety needs. Grading to level the flowline and bank erosion repairs are routinely performed.

The Interim Watercourse Maintenance Guidelines should be followed on all watercourses unless more specific maintenance criteria have been developed for a specific watercourse reach, and/or the IWMG is superseded by another document (in preparation).

The IWMG will be replaced with the Watercourse Maintenance Guidelines (WVG) for use by any entity responsible for watercourse maintenance.

### **Tucson General Plan**

The [General Plan](#) presents a series of policies and recommendations for Tucson and, in some cases, all of eastern Pima County. It is in effect only within the corporate limits of the City of Tucson. The policies establish a basic direction and approach to guide the future growth and development of Tucson. The policies also provide guidance for the preparation of more detailed environmental, land use, and transportation proposals; the refinement of community facility and service plans; and the development or amendment of subregional, area, neighborhood, and other specific plans.

The policies presented in the *Plan* address environmental planning and conservation; cultural heritage; land use; circulation and bicycling; parks, recreation, open space, and trails; community character and design; safety; public buildings, services, and facilities; growth areas and population; cost of development; economic development; conservation, rehabilitation, and redevelopment; water resources; and housing.

The General Plan makes numerous riparian habitat preservation policy statements under 10 of the 14 components of the Plan.

### **Interim Watercourse Preservation Policy**

As part of the Resolution 20505 which adopted Development Standard 9-06 included the **Interim Watercourse Preservation Policy** This policy was adopted to assure habitat preservation during development of a habitat code that replaces the WASH, ERZ, IWMG, IWIP, DS 9-06, and satisfies the Floodplain Regulations habitat preservation verbiage.



## **Administrative Directive 1.07-6, Code Compliance in City Improvement Projects**

This Administrative Directive requires that all new City developments and improvements or repairs to existing City facilities shall conform to all permit requirements and Development Standards. Such activities require plan approval, permitting, and inspection by the appropriate department as would occur if the project were a private development. The City Manager may provide a waiver from some requirements under exceptional circumstances.

## **Administrative Directive 4.05-1, Coordination of City Construction and Maintenance in Watercourses, Regulatory Floodplains, or Erosion Hazard Areas**

This Administrative Directive establishes coordination of City construction and "major maintenance" (see definition in Appendix 9) operations within watercourses, regulatory floodplains or erosion hazard zones. All departments performing construction or major maintenance work in regulatory watercourses, regulatory floodplains, or erosion hazard zones must receive authorization from the City Engineer and must coordinate with the Transportation Department for Stormwater Pollution Prevention Plans (SWPPP).

### **How These Codes/Policies Affect City Business Maintenance**

Watercourse maintenance should proceed under the assumption that all watercourses are regulated by one of the aforementioned codes, standards or policies. None of these codes standards or policies prohibit watercourse maintenance. The Interim Watercourse Maintenance Guidelines provide general guidance for watercourse maintenance that meets the intent of all codes, standards and policies. The primary goal of maintenance is that vegetation which does not present a safety hazard or an obstruction to floodwaters should be **preserved as-is**.

Neighborhood or citizen input to wash maintenance is becoming more common and often deviates from the Interim Watercourse Maintenance Guidelines. Unless a specific functional plan for a specific watercourse reach is in place, the Office of Conservation and Sustainable Development should be contacted for specific direction on channel maintenance, conveyance and safety needs.

### **Illegal Activities**

Washes can become sites for illegal activities due to dense, overgrown vegetation and steep banks that may block visibility. All criminal activities should be reported to the Police Department. Habitat destruction to establish visibility is not appropriate. Judicious trimming of vegetation along the banks and tops of banks of the wash as described in the Interim Watercourse Maintenance Guidelines should be sufficient to establish visibility and deter illegal activities.

Illegal activities in culverts are issues for the Police Department. Fencing across a wash presents safety issues and is not allowed unless a design accompanied by an engineering study demonstrates compatibility with flood conveyance and habitat needs.

### **Citizen Concerns**

Citizens may contact many different agencies with wash-related concerns. All citizens with wash-related concerns should immediately be referred to the Streets and Traffic Maintenance Division, or the Engineering Division, Floodplain Section depending on whether the concern is related to maintenance or flooding, respectively. Citizen concerns should be appropriately assessed to avoid unduly halting maintenance activities needed to maintain flow capacity and reduce flooding hazards. The Interim Watercourse Maintenance Guidelines describe procedures to ensure a balanced approach to wash maintenance that is both efficient and responsible.

**Fire Hazards**

Many washes have the potential to become fire hazards due to thick dry grass and "weed" growth subsequent to wet periods. This flammable vegetation, not necessarily the nearby trees, can be trimmed or mowed, but should never be removed by grading the wash banks. Mowing should not remove tree saplings that present neither existing or future safety hazard or channel flow capacity obstruction.