

5.4.5 Catalina Foothills

For the purposes of this study, this watershed includes numerous washes draining the southern slopes of the Pusch Ridge of the Santa Catalina Mountains. These include Pima, Finger Rock, Valley View and Ventana Canyon Washes. Originating in near vertical terrain, these descend steeply through dramatic canyon walls before spilling out onto the alluvial bajada foothills and geologic floodplains associated with Rillito Creek. Within Pima County, it is comprised of 47,661 acres (74.5 square miles).

Figure 62 - Catalina Foothills Floodplain Map

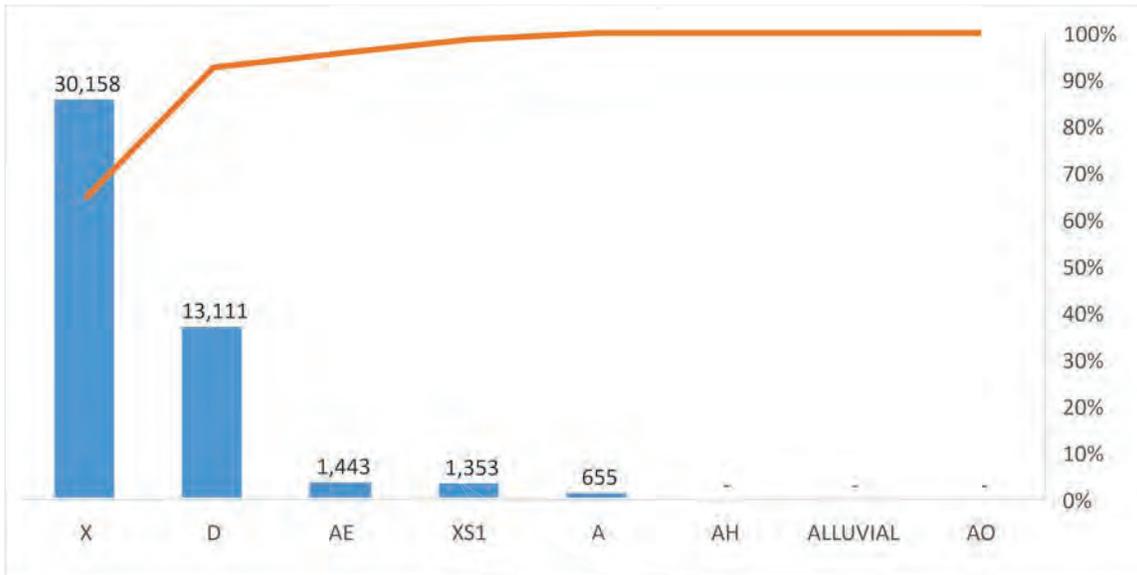


The watershed lies primarily within the flood control jurisdiction of Pima County, with the exception of discontinuous areas adjacent to the Rillito River under jurisdiction of the City of Tucson, and Town of Oro Valley area adjacent to Oracle Rd, north of Ina Rd.

5.4.5.1 Flood Characteristics

In addition to the 1,490 acres of SFHA included on the pie chart below, there are also 1,035 acres of District Special Studies Floodplains in this watershed. Together these mapped floodplain areas are 6.6 percent of the total watershed area.

Figure 63 - Catalina Foothills SFHA in Acres



Major tributaries in the watershed with 1% annual peak discharges in excess of 10,000 cfs, include the Ventana Canyon Wash, a tributary to Tanque Verde Creek, and its tributary, Esperero Wash. Tributaries with discharges in the range of 5000 cfs to 10,000 cfs, include Pima Canyon Wash and Finger Rock Wash, which drain to the Rillito River. The table below provides a summary of the historic USGS gaging station records.

Table 15 - Catalina Foothills Watershed USGS Streamflow Gages

USGS Gaging Station	Roller Coaster Wash NR Tucson AZ 09486050	Geronimo Wash Near Tucson, Ariz. 09485950	Pima Wash Near Tucson, Ariz. 09485900	Craycroft Wash NR Tucson AZ 09484533	Craycroft Wash Tributary Near Tucson AZ 09484530
Period of Record	1982-08-23 to 1990-07-24	1964-09-06 to 1981-07-10	1964-09-06 to 1983-10-01	1982-09-11 to 1983-10-02	1982-09-11 to 1990-07-20
Watershed Area (sq. m)	1.75	2.08	4.93	2.37	0.03
Flood Peak of Record (cfs)	960	705	460	557	28
Date	8-9-1983	8-12-1971	10-1-1983	10-02-1983	10-02-1983
FIS Discharge (cfs)	NA	NA	NA	NA	NA

The table below provides Pima County ALERT Gages. The locations are from the District's Alert map.

Table 16 - Catalina Foothills Watershed ALERT Streamflow Gages

Pima County Alert Gage	Pima Wash at Ina Road ID: 1253	Finger Rock Wash at Skyline Drive ID: 2393	Ventana Canyon Wash at Sunrise Drive ID: 2173	Tanque Verde Creek at Sabino Canyon Road ID: 2123
Location (Latitude, Longitude)	(32.3371,-110.9624)	(32.3231,-110.9008)	(32.3083,-110.8389)	(32.2653,-110.8414)
Period of Record	2001-10-18 to Present	2001-10-19 to Present	1991-08-27 to Present	1992-12-28 to Present
Watershed Area (sq. m)	4.95	4.38	7.12	219.8
Flood Peak of Record (cfs)	1836.8	102.9	3863.4	19788
Date	09-08-2014	07-29-2012	07-31-2006	07-31-2006

Table 17 - Catalina Foothills Watershed ALERT Precipitation Gages

Pima County Alert Gage	Pima Wash at Ina Road ID: 1250	Finger Rock Wash at Skyline Drive ID: 2390	Ventana Canyon Wash at Sunrise Drive ID: 2170	Tanque Verde Creek at Sabino Canyon Road ID: 2120	Swan Road near Camino del Pantera-Rillito Basin ID:2100
Location (Latitude, Longitude)	(32.3371,-110.9624)	(32.3231 - 110.9008)	(32.3083,-110.8389)	(32.2653-110.8414)	(32.2995,-110.8929)
Period of Record	2001-10-18 to Present	2001-10-19 to Present	1990-11-20 to Present	1987-07-23 to Present	2000-10-20 to Present

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The table below summarizes regulatory discharge locations within the watershed. The locations are from the District's Table of Regulatory Discharges (Revised October 28, 2014).

Table 18 - Catalina Foothills Watershed Regulatory Discharges

Watercourse	Regulatory Discharge, cfs 1% Return Frequency	Drainage Area, sq. miles	Source of Discharge Information
Camino Real Wash			
@River Road	1956	1.7	PCFCD Special Study #36
East channel downstream of River Rd	1205		"
West channel downstream of River Rd	1151		"
Campbell Wash			
Confluence with Rillito Creek	2899		From Previous Discharge Table
1,295 feet upstream of Campbell Ave.	2879	2.15	PCFCD Special Study #76
Upstream of junction with East Branch of Campbell Wash at Camino Juan Paisano	2160	1.34	"
2,150 feet downstream of Skyline Drive	1841	0.75	"
East Branch Campbell Wash @ Camino Juan Paisano	1336	0.62	"
Casas Adobes Wash			
@ Rillito Creek	1987	2.22	PCFCD Special Study #75
@ Las Lomitas	1474	1.42	"
@ La Cañada Road	1363	1.06	"
Tributary @Las Lomitas	1133	0.52	"
Tributary @ La Cañada Road	479	0.15	"
Citrus Wash			
Approximately 2,500 feet upstream of Oracle Jaynes Station Road	1562	0.80	FEMA Map Revision 02-09-0746X
@ Oracle Jaynes Station Road	1152	0.80	"
Craycroft Wash			
@ Rillito Creek	3620	3.16	PCFCD Special Study #56
South of Rio Verde Vista Drive	3145	2.51	"
West Branch Craycroft Wash North of Center Village Drive	1413	1.02	"
West Branch Craycroft Wash	1489	0.95	"

South of Territory Drive			
East Branch Craycroft Wash North of Center Village Drive	2093	1.34	"
East Branch Craycroft Wash South of Territory	1269	0.73	"
Esperero Wash			
Upstream of Confluence with Ventana Canyon Wash	8898		PCFCD Special Study #68
Upstream of Sunrise Drive	9170	6.19	PCFCD Special Study #68
Downstream of Thimble View Way	10,762	6.11	"
		5.9	
Finger Rock Wash			
@ Alvernon Way	5756		FEMA Map Revision 11-09-0275P
@ Skyline Drive	6060	6.4	"
@ Coronado National Forest Boundary	2324	5.3	"
Finger Rock Wash Split Flow @ Coronado Drive	1922	1.5	"
		3.4	
Flecha Caida Wash			
@ Confluence with Rillito Creek	1370		PCFCD Special Study #55
@ River Road	846	1.42	"
@ Via Ra Posa	781	0.83	"
@ Paseo del Bac	604	0.69	"
Eastern Tributary @ River Road	574	0.47	"
		0.41	
Friendly Village Wash			
@ Stone Loop	1610		PCFCD Special Study #73
@ Yvon Road	1671	1.16	"
	666	1.11	"
Friendly Village Wash, East Branch @ Agave Road	442	0.29	"
@ First Avenue		0.18	
			"
Friendly Village Wash, West Branch @ Approximately 1,800 Feet Upstream of Yvon Road	1101	0.62	"
@ First Avenue	1007		
		0.42	
Geronimo Wash			
@ confluence with Pima Wash	4894		PCFCD Special Study #54
			"
Approximately 500 feet upstream of			"

confluence with Pima Wash	4002	3.37	"
		2.54	"
South of Orange Grove Road	4132		"
@ Skyline Avenue	4005	2.33	"
@ Ina Road	3713	1.9	"
North of Calle Sin Desengana	2411	1.68	
		0.99	PCFCD Special Study #48
Hacienda Del Sol Wash			
@ Rillito Creek	806		FEMA Conditional Map Revision 06-09-BG74R
Nanini Wash		0.66	PCFCD Special Study #74
@ Rillito Creek	2246		"
@ La Cholla Boulevard	1903	1.83	
@ La Cañada Boulevard	1831	1.78	FEMA Map Revision 04-09-0465X
		1.04	FEMA Map Revision 09-09-0020P
Pegler Wash			
@ Rillito Creek	3142		
@ Shannon Road	1874		FEMA FIS
Pima Wash			
Upstream of Confluence with Rillito Creek	5300		"
Upstream of Confluence with Geronimo Wash	4250	9.80	FEMA Map Revision 11-09-0275P
Pontotoc Canyon Wash		6.3	
@ Coronado National Forest Boundary	2503		PCFCD Special Study #71
Race Track Wash		1.1	"
@ River Road	1883		
Between Camino Padre Isidoro and Calle de la Culebra	1680	1.38	PCFCD Special Study #51
		0.93	
Tanuri Wash			"
@ Tanque Verde Creek	2409		"
Upstream of confluence with East Branch of Tanuri Wash	1887	1.8	
Tanuri Wash (East Branch)	1092	1.2	PCFCD Special Study #73
			"
Valley View Wash		0.5	
Near River Road	3514		PCFCD Special Study #50
@ Flecha Drive	3219	4	
@ Swan Road			PCFCD Special Study #68

Ventana Canyon Wash	2802	1.94	PCFCD Special Study #77
@ Confluence with Tanque Verde Creek		1.42	
Downstream of River Road	11,527		
Upstream of Kolb Road	12,058	16.64	
Downstream of confluence with Esperero Wash	15,939	15.87	
Upstream of confluence with Esperero	17,753	14.14	
		14.1	
Upstream of Sunrise Drive	11,484		
Upstream of Resort Drive		7.94	
	12,044		
Via Entrada Wash East Branch	10,596	6.98	
@ River Road		3.85	
Via Entrada Wash West Branch	944		
@ River Road		0.54	
	1630		
		0.67	

These records indicate that floods in the Catalina Foothills can occur from all three of the three primary flood mechanisms that occur in Pima County, convective storms, tropical storms and frontal storms. Rain on snow events occur in this watershed when frontal storms produce rain on existing winter snow.

In addition, 1% annual chance discharge values from 2-dimensional analyses are available at the Finger Rock Wash Lower Floodplain based upon the study, Two-Dimensional Hydraulic Modeling Study Report for the Finger Rock Wash Lower Floodplain. Completed in 2016, this report encompasses the area below the mouth of the incised channel of the Finger Rock Wash, west of Alvernon Road. Flood hazards associated with the watercourses include under-capacity roadway crossings, and flow splits, breakouts and shallow sheet flooding associated with the natural channels. Nanini and Casa Adobes washes have undersized infrastructure associated with older subdivisions. Distributary flow conditions are associated with flow hazards on the Valley View and Roller Coaster washes.

Currently there is no contained conveyance of runoff for the Finger Rock Wash from the mouth of the incised channel near Alvernon Way to the Rillito Creek. This results in a broad FEMA Zone A floodplain adjacent to Rillito Creek, impacting homes and businesses.

Three FEMA certified levees/floodwalls provide flood protection within the watershed. The Casa Adobe Levee is located on the west bank of the Casas Adobes Wash from immediately upstream of Sunset Rd. up to Las Lomitas Rd and on the eastside from Sunset Rd. to a point approximately 450 ft. north. The Camino Real Wash floodwall is

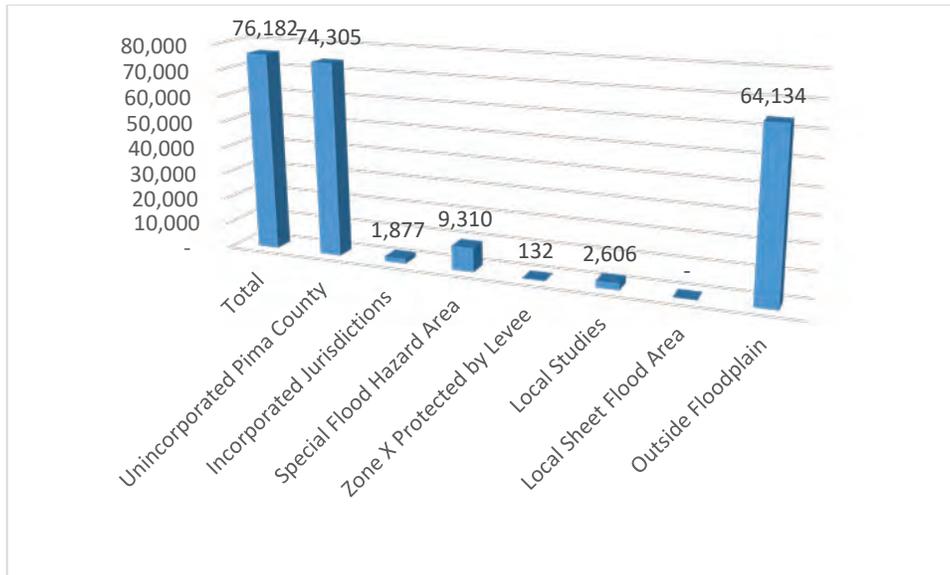
located upstream of River Rd. The Sotmayor Ranch levee is located on the north side of the Sotmayor Ranch Subdivision, north of Oracle Jaynes Station Rd. and provides flood protection from the Pegler Wash.

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5.4.5.2 Existing Development & Infrastructure Trends

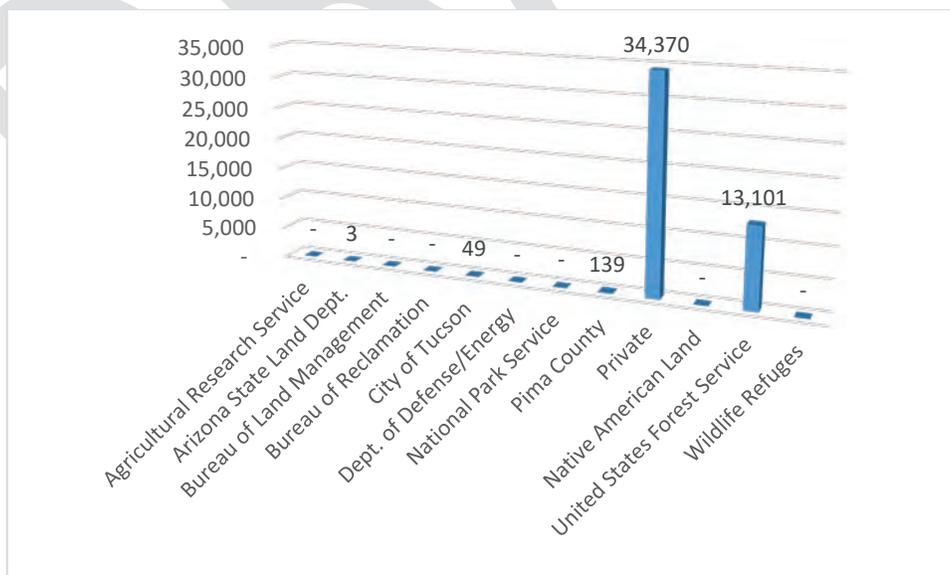
The chart below shows the distribution of residents within known floodplains, and distribution between incorporated and unincorporated areas. In this watershed 16% of the population lives on parcels within the floodplain, another 132 people live in areas protected by a levee.

Figure 64 - Catalina Foothills Watershed Population Distribution



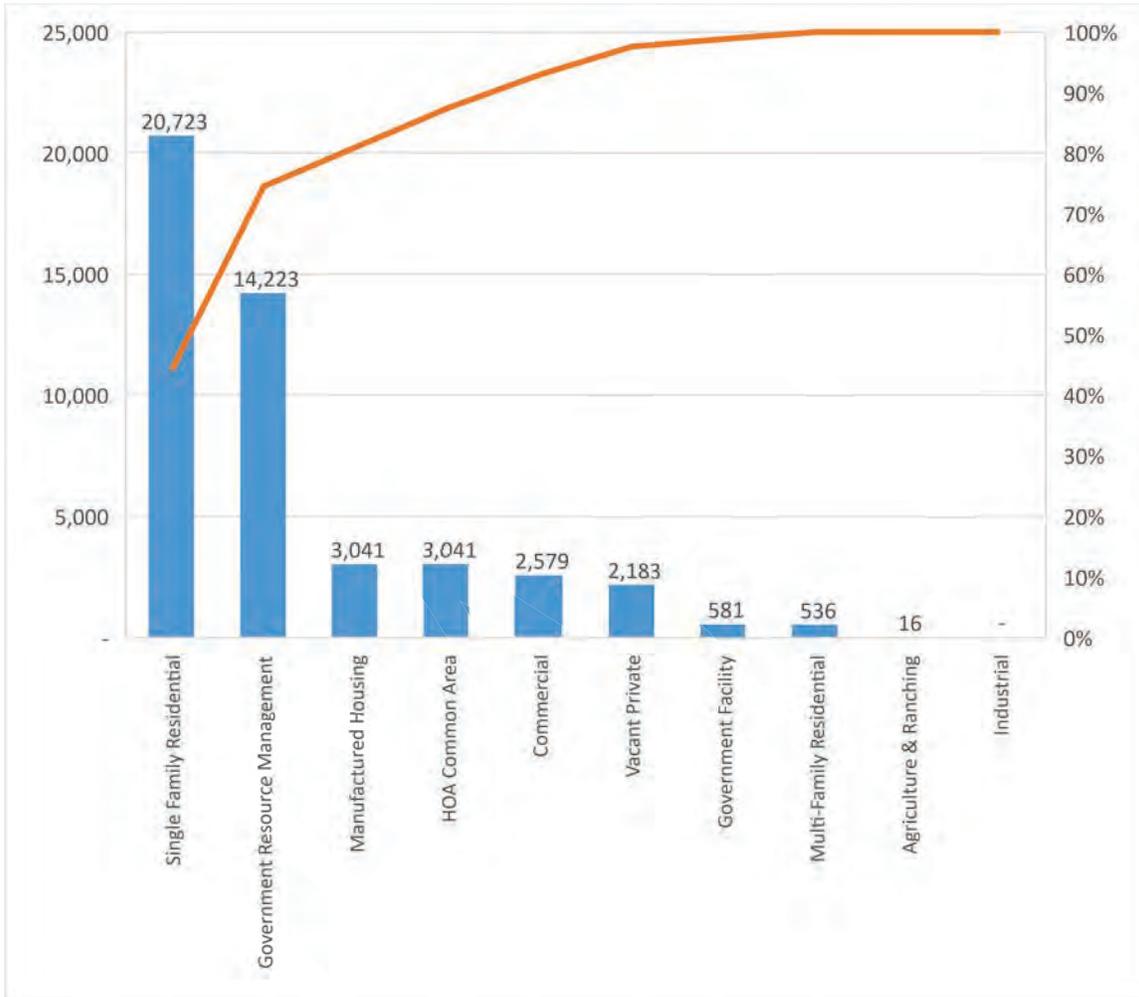
Located at the base of the escarpment of the Coronado National Forest, within unincorporated Pima County 72% of this watershed is private.

Figure 65 - Catalina Foothills Watershed Ownership in Acres



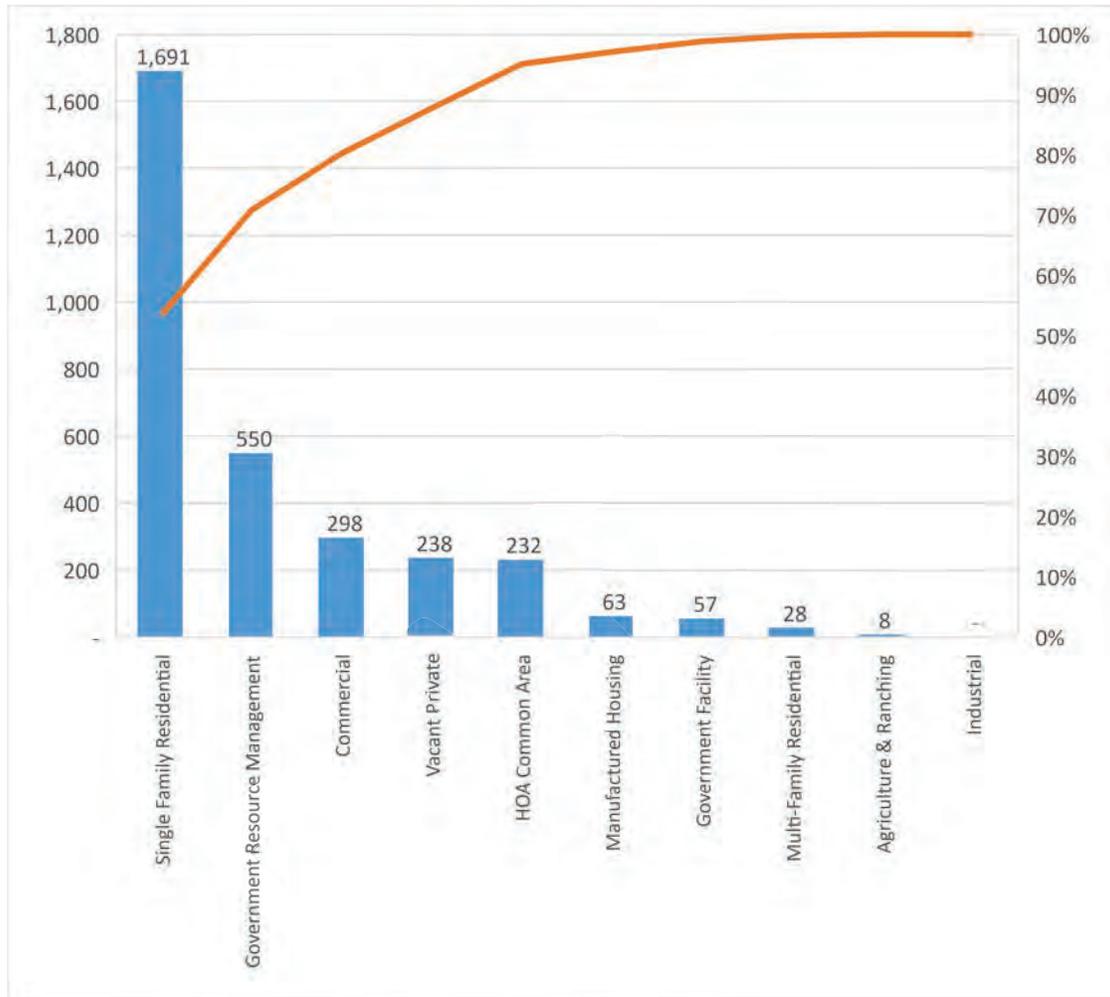
Much of the private land is residential site built homes on large lots of one to five acres, or clustered housing with common areas intended to remain natural by covenant.

Figure 66 - Catalina Foothills Watershed Land Use in Acres



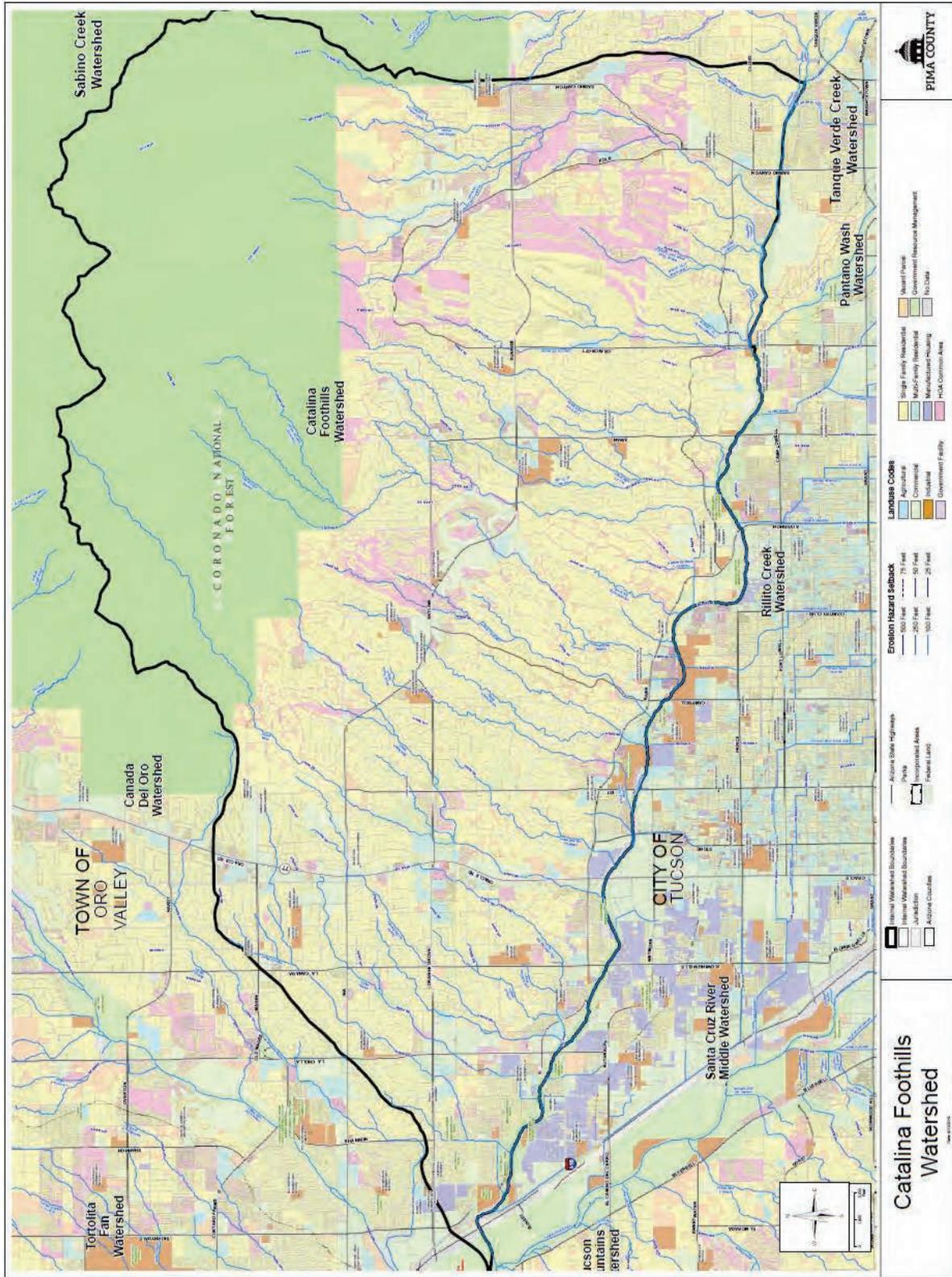
As indicated below while drainageways may be preserved, they are within common area controlled by Homeowners Associations and not public ownership.

Figure 67 - Catalina Foothills Floodplain Land Use



Owners may not always dedicate floodplains to the county. There is, therefore a high percentage of residential floodplain. It is also notable that little is vacant. Preservation may depend upon regulation of and choices made by private landowners. The map below shows these patterns.

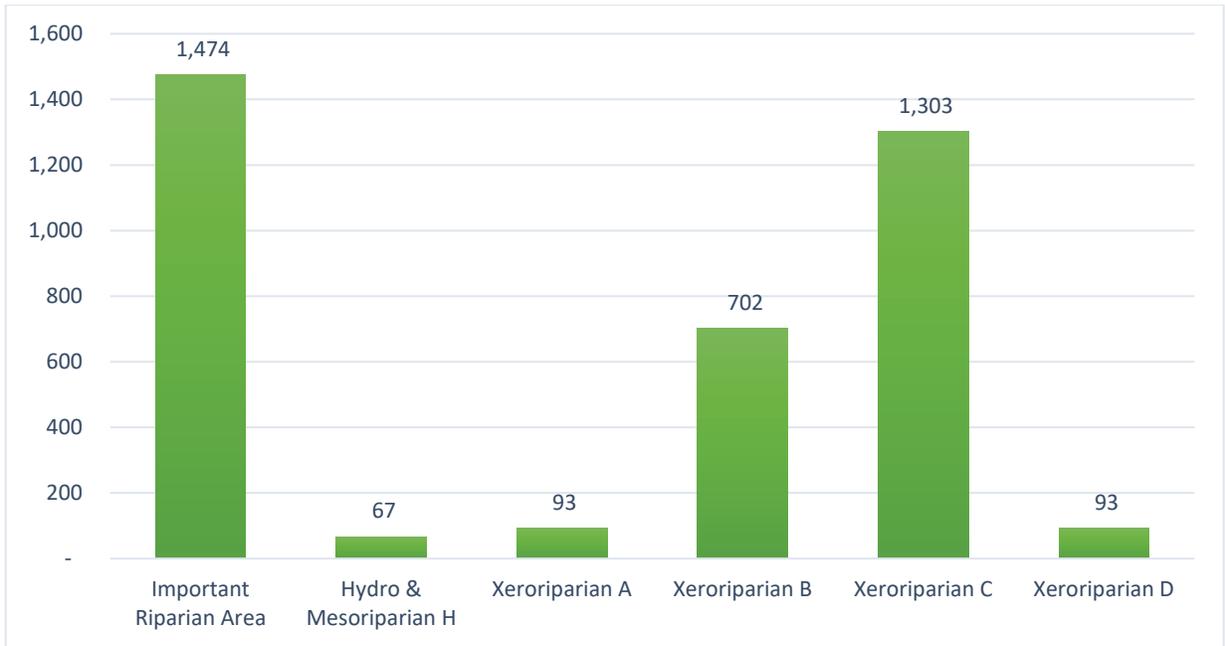
Figure 68 - Catalina Foothills Land Use Map



5.4.5.3 Riparian Habitat and Natural Areas

As shown on the bar chart below, there are 2,258 acres of Pima County Regulated Riparian Habitat in this watershed; 1,474 acres is IRA. There are also 13,215 preserved acres in this watershed, including 12 in regulatory floodplain.

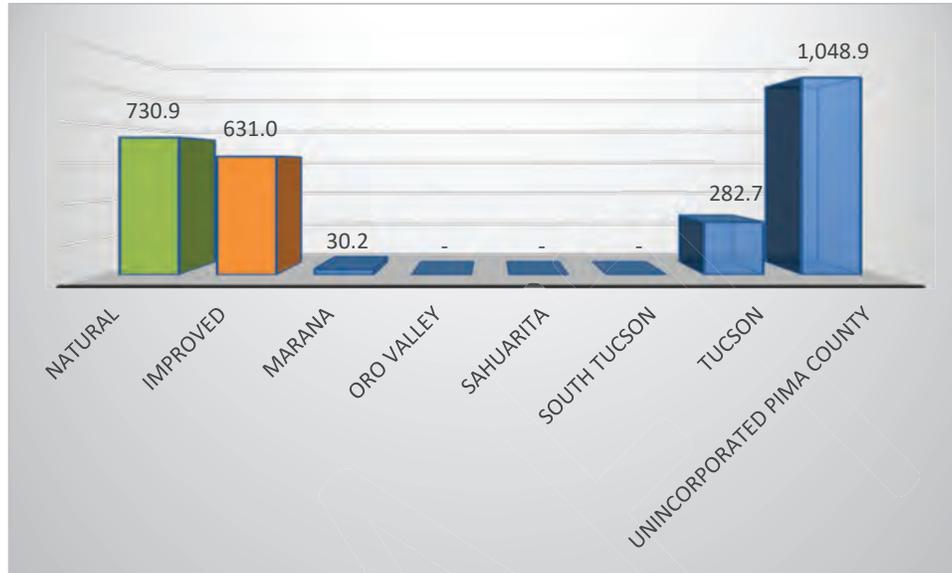
Figure 69 - Catalina Foothills Watershed Riparian Habitat in Acres



5.4.5.4 Historic Floodplain Management Approach

The figure below shows the split between natural and improved drainageways, and how many acres the District is responsible for in each jurisdiction.

Figure 70 - Catalina Foothills Drainageway Acreage



The Camino Real Wash levee is located upstream of River Road. River Road is a component of the levee. This is an earthen (roadway) embankment and floodwall. There are two drainage outlets downstream of River Road. The County inspects roadway culverts for sedimentation. The culverts are part of the roadway and are the maintenance responsibility of the Pima County Department of Transportation.

The Casas Adobes levee consists of gunite protected earthen berm and channel along both embankments of the Casa Adobes Wash upstream of Sunset Road.

The Sotomayor Ranch levee is an earthen embankment levee that has gunite and riprap bank protection. It is located on the north side of the Sotomayor Ranch Subdivision and provides flood protection from the Pegler Wash.

5.4.5.5 Needs – Capital Improvement

For each watershed; monitoring, frequently flooded structures and properties subject to damage, exposed infrastructure, and safety concerns have been described in full detail in the District’s Flood Response Field Manual (April 2019). Each of the areas so identified have addresses and geodetic coordinates associated with them and District personnel have them mapped in the Geographic Information System used. For planning purposes, specific items of concern follow; the complete report is in Appendix D.

Data Gathering Needs

- No site-specific issues identified.

Frequently Flooded Structures and Properties Subject to Damage

- 5584 N. Ventana Vista (114-64-4650) has been flooded by Esperero Wash. (T13S R15E Sec. 17) <GIS Point ID: CAT-FSP-001>
- 5572 N. Ventana Vista (114-64-4660) has been flooded by Esperero Wash. (T13S R15E Sec. 17) <GIS Point ID: CAT-FSP-002>
- Homes near the intersection of Havasu Road and Placita Arquilla and to the north are in the bottom of the geologic floodplain of Finger Rock Wash and are likely to get damaged during large events. (T13S R14E Sec. 03) <GIS Point ID: CAT-FSP-003>

Infrastructure

- There are undersized culverts under Sunrise Rd. at Esperero Wash. Water weirs over the road, forcing the road to be closed. The water gets diverted and has caused flooding damage at 5584 N. Ventana Vista and 5572 N. Ventana Vista. Gabions have been damaged downstream of Sunrise. (T13S R15E Sec. 17) <GIS Point ID: CAT-INF-001>
- Monitor and document the flood water level at the UPRR railroad crossing. If the water level appears to be within 18 inches of the crossing infrastructure, call District or 911. (T13S R13E Sec 8) <GIS Point ID: CAT-INF-002>

Safety Concerns

- The Valley View Wash creates hazardous conditions, including erosion and deposition issues, on Calle Pantera. (T13S R14E Sec. 15) <GIS Point ID: CAT-SAF-001>
- Do not attempt to cross Camino de la Tierra Road if there is any flood water on roadway. Otherwise, watch for flash flooding. (T13S R13E Sec. 08) <GIS Point ID: CAT-SAF-002>

5.4.5.6 Floodplain Management

Future needs identified by District staff include:

- Continue special studies where needed
- Old mapping is inaccurate 50 yr. or none mapped
- Cumulative improvements impacts on residential roads in older subdivisions built to old standards
- Lack of HOA maintenance
- Large lot splits where allowed
- Debris flows



Figure 71 - Sabino Canyon Debris Flow Photo