

# Pima County Floodplain Management Plan

## Action Plan Progress Report and Update

### October 2021 CRS Recertification

For each activity category and discreet project below a status is assigned and color coded as follows:

AA = Annual Activity

C = Complete, SC = Substantially Complete

UC = Under Construction, IP = In Progress, ID = In Design/Development

PP = Planned Project

New Activities are highlighted in gold and edits to existing activities in red type.

<u>Ref #</u>	<u>Activity</u>	<u>Implementation Progress*</u>	<u>Rank</u>	<u>Due</u>	<u>Status</u>
1.1	Current Preventative Activities				
1.1.a	Participate in the National Flood Insurance Program Community Rating System (CRS)	<p>The District maintained its rating of 5, implemented class 4 prerequisite activities and submitted rating modification documentation which was approved by ISO during March 2021. We await processing paperwork from ISO and notification from FEMA.</p> <p>The Action Plan activities below include region wide annual functions in Column B and site specific projects or phases in Column C. They include all six types of eligible activities under the CRS including those that are preventative, property protection, natural resources protection, structural projects, emergency services and public information. With Committee approval the next update will hide those unnumbered activity rows, that are subtasks or location specific projects that fall under an annual or region wide activity. A summary of progress can then be reported under the annual activities in the written report form, while the subtasks may be expanded when looking at the spreadsheet on the FMP webpage. This is consistent with the Deputy Director's recommendation that metrics be provided for all annual activities and implementation status only be reported on those that are new, and that individual maintenance projects be combined. For consistency the CRS Coordinator recommends that this approach be applied to all subtasks, such that all are hidden for reporting purposes and progress summarized under the overriding annual activity. For details see:</p> <p><a href="https://webcms.pima.gov/cms/one.aspx?portalId=169&amp;pageId=60305">https://webcms.pima.gov/cms/one.aspx?portalId=169&amp;pageId=60305</a></p>	High	2020	AA
1.1.b	Enforce Pima County Code including Floodplain Management Ordinance, Comprehensive Plan, Zoning and other standards and policies	<p>This is a countywide activity. Between April 7, 2021 when the plan was adopted and April 14, 2021, the District issued 1172 FPUPs, reviewed 52 Site Construction Permits for residential subdivisions and commercial developments and commented on 85 entitlements under the purview of the Planning and Zoning Commission. 619 complaints were followed by 93 violation enforcement actions.</p>	High	2020	AA

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1.1.c	Operate, inspect and maintain Flood Control lands and facilities	As of October 2020 the Drainage System includes 33,638 acres and annual maintenance budget \$2,000,000. This is a direct maintenance cost and does not include personnel and equipment. The Drainage System map is shown on the Action Plan status maps included with this progress report. The District Infrastructure Maintenance Division conducts inspection of the Pima County drainage system. These inspections are conducted annually, after rainfall events and in response to reports from the public or partners. Each inspection includes georeferenced site photographs, a report, and maintenance recommendation. These are uploaded to the Pima County Document Management System and linked to the infrastructure theme in the Geographic Information System operated by the District. Individual projects were included in the approved Action Plan and are listed below as separate actions for 2021 reporting purposes. It has been recommended, by the District's Deputy Director and Planning Committee member Eric Shepp that these discreet maintenance activities be combined.	High	2020	AA
1.1.c.1		Bellbrook channel repairs (CF) - Bellbrook channel was repaired using a JOC to construct grade control and bank protection.	High	2020	C
1.1.c.2		Mesquite Ranch Wash sediment removal (Pantano) - The project scope/charter, design and contact are completed and work at the site has begun.	High	2020	IP
1.1.c.3		Mitigate Los Reales erosion (SCRM) - The inspection has been completed.	High	2020	ID
1.1.c.4		Mitigate Sonoran Ranch erosion (Brawley) - The inspection has been completed.	High	2020	PP
1.1.c.5		Monitor and maintain bank protection (SCRL) - Inspection has been completed and a design for rip rap bank protection is in development.	High	2020	IP
1.1.c.6		Monitor and remove vegetation (SCRM) - Special inspections have been conducted by infrastructure and open space vegetation management experts as well as fire officials. Firebreaks, invasive species removal and select obstruction clearance have been completed along the lower Santa Cruz River.	High	2020	IP
1.1.c.7		Palo Verde Rd channel grading (Pantano) - A scope has yet to be completed. The schedule has been adjusted.	High	2021	PP
1.1.c.8		Repair Continental Ranch bank protection erosion (SCRL) - The project ID# scope/charter, design and contact are completed and work at the site has begun.	High	2020	IP
1.1.c.9		Repair Iberia sediment and sink holes (BW) - A scope has yet to be completed. The schedule has been adjusted.	High	2021	PP

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1.1.c.10		Repair Michael Perry Park bank protection (Pantano) - A scope has yet to be completed. The schedule has been adjusted.	High	2021	PP
1.1.c.11		Repair SCR Old West Branch Bank protection erosion at Silverlake (SCRM) - A scope has yet to be completed. The schedule has been adjusted.	High	2021	PP
1.1.c.12		Minor sediment control activities - are conducted as part of normal business.	High	2020	IP
1.1.c.13		Create Drainage System maintenance plans including vegetation, sediment, and debris (SCRL, SCRM, Rillito, Pantano, CDO) - A scope has yet to be completed. The schedule has been adjusted. Each improvement has Management Plans that are implemented adaptively as conditions change.	High	2024	PP
1.1.c.14		Create open space management plans and consider location specific vegetation maintenance practices (AV, CC, CDO, SCRM, SCRU, SCRL, SPR, TVC) - The Open Space Manager, Marisa Rice, created a strategic plan (see 3.2.b) for completion of open space management plans for each watershed. It includes model plan outline, however does not establish a schedule nor priority list. Identification of a project team and schedule is needed. Still, inspections and plant surveys have been completed, fencing installed, and erosion control and habitat restoration projects begun. During 2020, 2 other site specific open space management plans were in progress. The Cienega Corridor Management Plan (submitted to USFWS for review in March, 2021) and the Bingham Cienega Management Plan (approved by USFWS as MSCP Mitigation). Water conservation elements of these plans are managed by Principal Hydrologist David Scalero, while habitat rehabilitation is Managed by Environmental Planning Manager Jennifer Becker. In addition to these activities construction project maintenance agreements include native riparian plant lists. The following sites in which work was underway during 2020 are subject to these agreements: Cortatro Mesquite Bosque; Swan Wetlands/Sparrow Patch; Arroyo Chico Park Ave Basins; and Paseo de las Iglesias.	High	2020	IP
1.1.c.15		Install controlled access (countywide) - Wildlife friendly livestock fencing, vehicle barriers and gates have been installed at sites where uncontrolled access has contributed to illegal dumping, cutting, grazing and off road vehicle use. Fire breaks have been coordinated with local fire officials who also are responsible for conducting swift water rescues and have considered these needs in selecting sites for vegetation management and access controls.	High	2020	IP
1.1.c.16		Install fencing at Cienega Creek Preserve	M	2022	PP

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1.1.c.17		Install fencing at Agua Verde	M	2022	PP
1.1.d	Develop and maintain staff expertise	During the previous year there were 20 CFMs employed by PCRFC. The District also hosts a "Brown Bag" lecture series that qualifies for Continuing Education Credits for Certified Floodplain Managers.	High	2020	AA
1.1.e	Update spatial information periodically	During 2020 6 map revisions including FEMA SFHA and Shaded X Protected by Levee, Local Studies and Developer Mapped Floodplains were completed bringing the total to 72.	High	2020	AA
1.1.f	Participate in interagency reviews of development and studies/projects including those distributed by State, Federal and Local agencies.	District staff reviewed 21 interagency requests for comment on proposed developments including Federal Environmental Impact Statements for utilities, State Land Use Permits, and developments in incorporated areas of Pima County that are adjacent to major watercourses for which the District is responsible.	High	2020	AA
1.1.g	Participate in regional watershed planning activities to promote uniform standards (Need to define)	District staff participated in 4 regional watershed activities to promote uniform standards as follows: COT FMP Planning Committee; COT adoption of the District Standards for Stormwater Retention and Detention; 1 District Technical Policy (Tech-026: Regulation of Development within Flow Corridors.); the Oro Valley Drainage Standards Manual update.	High	2020	AA
1.1.g		Create Intergovernmental Agreements with other jurisdictions (countywide) - The District has two IGAs in development as described below:	High	2020	AA
1.1.g.1		Coordinate with the City of Tucson for the Santa Cruz River Heritage Groundwater Recharge project and One Water efforts (SCRM) - IGA in progress	High	2020	IP
1.1.g.2		Coordinate with the Tohono O'odham Nation on the Sells Bank Protection Project - IGA awaits approval by the TON Legislative Council and an updated design from the NRCS		2022	IP
1.2	New Preventative Activities				
1.2.a	Conduct studies to identify diversions, alluvial fans, debris flows, local floodways and other geomorphic hazard areas	2 studies were underway during the reporting period. This is a countywide annual activity. Associated discreet projects or phases are described below.	L	2020	AA
1.2.a.1		Identify areas of shallow groundwater (ACW, Sabino, TVC) - The date was adjusted, although monitoring is underway at select sites a scope to update the map used for regulatory purposes has not been completed.	L	2025	PP
1.2.a.2		Assess unstable geomorphology (Pantano) - Assessment completed and grade controls installed.	L	2020	C
1.2.a.3		Establish alluvial fan flow corridors (TF) - A scope has not been created so the due date has been adjusted.	M	2024	PP

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1.2.a.4		Expand riparian habitat maps to excluded watercourses (TM) - A scope has not been created so the due date has been adjusted to reflect the original priority ranks assigned by the Committee.	L	2024	PP
1.2.a.5		Identify debris flows (ACW, CF, Sabino) - The project was partially completed. The debris flows mapped by the USFS/USGS have not yet been added to PCGIS.	L	2020	SC
1.2.a.6		Identify agriculture diversions - A scope has not been created so the due date has been adjusted to reflect the medium priority. However this is a part of the Avra Valley Basin Study currently in progress. This project includes coordinating with Tribal entities and the NRCS. More information is valuable at: <a href="https://webcms.pima.gov/cms/One.aspx?portalId=169&amp;pageId=668645#:~:text=Pima%20County%20is%20conducting%20the,a%20stron g%20environmental%20resource%20focus">https://webcms.pima.gov/cms/One.aspx?portalId=169&amp;pageId=668645#:~:text=Pima%20County%20is%20conducting%20the,a%20stron g%20environmental%20resource%20focus</a>	M	2024	IP
1.2.a.7		Identify and map canyon wash floodways - A scope has not been created so the due date has been adjusted.	M	2024	PP
1.2.a.8		Identify and monitor erosion on tributaries to the Santa Cruz River - A scope has not been created so the due date has been adjusted.	H	2024	PP
1.2.a.9		Monitor sand and gravel operations - Staff recommends that this be an annual activity with a unique Action Plan reference number. The number of sand and gravel operation Inspections would be a possible metric.	M	2020	AA
1.2.a.10		Remap the Carmack Wash in the distributary flow area.	M	2024	IP
1.2.a.11		Work to address issue of sediment placement during road maintenance activities - Although no written procedure is in place force account and JOC contractors working in dip sections coordinate with the Districts IMD. Staff recommends that this be an annual activity with a unique Action Plan reference number.	L	2020	AA
1.2.b	Improve floodplain hazard mapping (e.g. New delineations, revise out of date mapping)	15 studies were underway this year. This is a countywide annual activity. Associated discreet project progress is described below.	L	2020	AA
1.2.b.1		Complete RiskMap & SFHA - This project is led by FEMA. The District participates as a CTP. During 2020 discovery was completed.	H	2020	IP
1.2.b.2		Conduct a detailed floodplain analysis of Pima County Fair Grounds (LMW)	H	2020	C

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1.2.b.3		Conduct detailed mapping of approximate FEMA Special Flood Hazard Areas - 2 studies are underway within the TF and BW watersheds.	M	2020	IP/PP
1.2.b.4		Conduct floodplain modeling for City of South Tucson (SCRM) - During 2020, the drainage infrastructure and floodplain study was completed, results delivered to the City of South Tucson and design sessions scheduled for proposed improvements.	H	2020	SC
1.2.b.5		Develop floodplain maps for Rincon Foothills Unnamed Wash #s 8, 9 and 10 (TVC) - A scope/charter has not been completed and the due date has been adjusted to reflect the medium priority.	L	2024	PP
1.2.b.6		Provide detailed mapping for the area between the Herman's Road and Valencia Road (BW) - The scope and charter for project ID# has been completed and modelling is underway by JE Fuller under the direction of staff. Staff have participated in two site visits with impacted property owners and their representatives. Black Mountain TSDN is pending approval.	M	2020	IP
1.2.b.7		Remap floodplains to confluence with the Tanque Verde Creek (Rillito) - A scope/charter has not been completed and the due date has been adjusted to reflect the medium priority.	M	2024	PP
1.2.b.8		Remap Twenty-Seven Wash floodplain/floodway (CDO) - A scope/charter has not been completed and the due date has been adjusted to reflect the medium priority.	M	2024	PP
1.2.b.9		Remap floodplains for Alamo Wash in the City of Tucson (Rillito) - The TDN developed in cooperation with the City of Tucson and awaits approval by the Chief Engineer.	M	2020	SC
1.2.b.10		Remap floodplains for Bronx Wash in the City of Tucson (SCRM) - The TDN developed in cooperation with the City of Tucson has been approved by the Chief Engineer.	M	2020	SC
1.2.b.11		Remap floodplains for Christmas Wash in the City of Tucson (Rillito) - The TDN developed in cooperation with the City of Tucson has been approved by the Chief Engineer.	M	2020	SC
1.2.b.12		Remap floodplains for Navajo/Wilson Washes in the City of Tucson (SCRM) - The TDN developed in cooperation with the City of Tucson has been approved by the Chief Engineer.	M	2022	SC
1.2.b.13		Remap floodplains for Silvercroft Wash in the City of Tucson (SCRM) - A scope/charter has not been completed.	M	2024	PP
1.2.b.14		Remap floodplains for the Roller Coaster Wash (ACW) - A scope/charter has not been completed.	M	2021	PP

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1.2.b.15		Remap floodplains for the Wyoming and Dakota Washes (SCRM, TM) - A scope/charter has been completed for project ID# has been completed and staff is conducting the modelling.	M	2021	IP
1.2.b.16		Update Black Wash Administrative Floodway (BW) - A scope/charter has not been completed.	H	2024	PP
1.2.b.17		Update floodplain maps for Sopori Wash (SW) - A scope/charter has not been completed.	M	2022	PP
1.2.b.18		Identification of flood risks at Sopori and SCR Confluence (SCRU, Sopori) - A scope/charter has been completed for project ID# and staff is conducting the modelling.	H	2022	IP
1.2.b.19		Sabino Canyon Hazard Study	H	2022	IP
1.2.c	Refine local approximate sheet flood maps and identify flow corridors	This is a countywide activity. Although this is done on an as needed basis; a scope/charter for a countywide effort has not been completed, and the due date has been adjusted. Associated discreet projects or phases are described below.	L	2024	AA
1.2.c.1		Conduct detailed mapping for remaining local approximate sheetflow floodplains - Currently these maps are updated as a part of local studies. The scale of a countywide effort and limited impact on developing areas makes such an effort infeasible while local studies can be prioritized. This activity therefore was assigned a medium priority and remains so. During 2020, 4 detailed floodplain mapping studies in approximate mapped sheet flood areas were underway including at Black Mountain and the La Cholla Wash.	M	2021	IP/PP
1.2.c.2		Conduct detailed mapping for Sierrita Mountain Road area (Brawley) - The scope is under development and the date has been adjusted.	M	2022	ID
1.2.c.3		Remap Pistol Hill sheet flow floodplains (Pantano) - The study has been completed and awaits approval by the Chief Engineer.	M	2020	SC
1.2.d	Update the Critical Basin map	This is a countywide activity. Associated discreet projects or phases are described below. Preliminary discussions have been held by District staff. Awaiting management direction. Options include remapping the entire county vs select watersheds as a component of basin studies.	L	2025	PP

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1.2.d.1		Identify undersized insufficient infrastructure - The District conducts floodplain studies to identify areas of development that are at risk. Basin studies are then completed to identify undersized infrastructure and mitigation alternatives. PCRFCO maintains an inventory of drainage infrastructure in a GIS with links to plan sets to facilitate this analysis. It is recommended that critical basin determination should be added to Basin Study scopes of work. During 2020/2021, 2 basin studies are underway in Avra Valley and the Lower Santa Cruz River watersheds.	H	2025	IP
1.2.d.2		Identify existing development at risk from flooding - Per the Pima County Standards for Stormwater Retention and Detention, basins with infrastructure that is inadequate to pass the base flood and where severe hazards are known, require basin studies and concept and implementation plans to fix these deficiencies and wherein over detention standards should apply. During 2020 basins studies were underway for Black Wash and the Lower Santa Cruz River. More information is available here: <a href="https://www.webcms.pima.gov/government/flood_control/reports/santa_cruz_river_management_plan/">https://www.webcms.pima.gov/government/flood_control/reports/santa_cruz_river_management_plan/</a> and <a href="https://webcms.pima.gov/cms/One.aspx?portalId=169&amp;pageId=668645#:~:text=Pima%20County%20is%20conducting%20the,a%20strong%20environmental%20resource%20focus">https://webcms.pima.gov/cms/One.aspx?portalId=169&amp;pageId=668645#:~:text=Pima%20County%20is%20conducting%20the,a%20strong%20environmental%20resource%20focus</a>	H	2025	AA
1.2.e	Participate in monitoring groundwater change with other responsible parties	This is a countywide activity. Associated discreet projects or phases are described below. Within Pima County groundwater levels in the Tucson Active Management Area (TAMA) are monitored by Tucson Water, this data may not always be available to others who desire it. Outside the TAMA the District monitors levels at select restoration sites including those described below. Although a specific metric has not been included for this activity the monitoring results are published in an annual report available here: <a href="https://pagregion.com/sustainability/water-quality/water-reliability/">https://pagregion.com/sustainability/water-quality/water-reliability/</a>	L	2020	AA
1.2.e.1		Conduct groundwater depth & quality monitoring District staff monitor # wells/site and produce the annual report linked above.	L	2020	AA
1.2.e.2		Operate Marana High Plains groundwater recharge project The Marana High Plains Recharge Project details are provided in the annual report linked above.	H	2020	AA
1.2.f	Develop plan to provide controlled access to District lands	A scope has not been developed, therefore the due date has been adjusted.	L	2024	PP



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1.2.g	Develop standards for site layout of large scale development in sheet flood areas	A scope has not been developed.	L	2022	PP
1.2.h	Develop methods to identify future climate scenarios and upper watershed conditions (e.g. rain on snow, post catastrophic fire, debris flows)	A scope has not been developed nor working team established, although these activities are within the scope of assigned duties and qualifications. During 2020 District staff helped lead two large scale projects. The District is a sponsor and major contributor to the Lower Santa Cruz River Basin Study underway by the Bureau of Reclamation, University of Arizona, Sonoran Institute, Community Water Coalition, PAG, Watershed Management Group, FICO, CAP and other local partners. Also, in the wake of the Bighorn Fire the District has assessed post fire flood risk changes to help mitigate risk as the severity and frequency of flooding increases with storms, drought, fires, debris flows, and development. This work was accomplished in partnership with the National Weather Service and National Forest Service BAER Team. Needed maintenance and capital improvements have been identified and are being pursued.	L	2022	IP
1.2.i	Develop criteria for site design and infrastructure at major watercourse confluence areas	Although a scope has not been developed nor working team established this is under continuous evaluation by District engineers. Planning Committee members from the Tucson Mountain Association and Community Water Coalition have expressed interest in this activity and have led tours to existing and potential sites for use of compound channels. Several large scale developments along the Loop have led to related conversations. The District requires dedication of major watercourses and a 50' easement from top of bank along bank protected areas to facilitate flood control maintenance, recreation and habitat. While developers wish to pass tributaries underground along the river corridors the District has sought to keep them open and natural, although not always successfully. Criteria are needed to address and guide future conditions.	L	2022	PP
1.2.j	Develop criteria to minimize encroachments in regulatory floodplains, erosion hazard areas and riparian habitat during entitlement and permitting processes	Technical Policy-024 clarifying avoidance requirements and Technical Policy-26 defining flow corridors is scheduled for the Board in May 2021.	L	2021	IP

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2.1	Current Property Protection Activities				
2.1.a	Provide outreach and assistance on mitigation strategies to the community including obtaining flood insurance	The District continued to implement the approved Program for Public Information (PPI) including mailers, utility bill inserts, publications, kiosks, events, training, public meetings and media. As a result of this outreach during 2020, District staff including hydrologists, biologists and engineers conducted 104 "front counter" customer service consultations with property owners.	H	2020	AA
2.1.b	Implement Floodprone Land Acquisition Program	Since plan adoption the District acquired 585 acres utilizing FLAP, bringing the total size of the drainage system to 33,638 acres.	H	2020	AA
2.1.c	Identify and address maintenance needs of private infrastructure during the entitlement and permitting processes	85 entitlements and 52 site construction permits were processed by District staff since April 2020 when the plan was approved. Maintenance needs are required by detention standards. Other needs are addressed as conditions of permits. The Committee did not believe this was being adequately addressed and no new policy has been created however an outreach pamphlet for HOAs was. Of the 619 complaints received, 93 were for private regulatory drainage systems that required enforcement or maintenance action by the District.	H	2020	AA
2.2	New Property Protection Activities				
2.2.a	Develop standards to address climate change concerns (e.g. Increase design flood elevation and channel freeboard requirements, consider fully vegetated and compound channels in design)	The District continues a large scale drainageway acquisition and restoration campaign as the most viable means to address changing conditions. Planning Committee members from the Community Water Coalition have expressed interest in this activity and have led tours to existing and potential sites for use of compound channels. Several large scale developments along the Loop have led to related conversations. The District requires dedication of major watercourses and a 50' easement from top of bank along bank protected areas to facilitate future flood control maintenance, recreation and habitat. While developers propose to convey these tributaries across their sites underground, the District has sought to keep them open and natural, although not always successfully. Criteria are needed to address and guide future conditions.	H	2022	PP

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2.2.b	Identify areas of flooding problems related to existing development and identify property protection funding or technical assistance	This is a countywide annual activity. Associated discreet projects or phases are described below. These areas known to have flooding problems have been identified in the Flood Response Manual and FMP Watershed Hazard Assessment Appendices and they are monitored annually, after storms and by the ALERT system monitor, complaints, and subsequent targeted inspection. FCDAC and Planning Committee processes also may bring forward emerging problem areas. During 2020, 619 complaints were received with technical assistance provided on each one. Potential funding sources for assisting property owners directly have been explored by staff however a proposal has not been made, nor strategic commitment made to establish such a fund.	H	2024	AA
2.2.b.1		Provide assistance to property owners related to bank reclamation (ACW, Sabino, TVC, TM)	L	2021	IP
2.2.b.2		Conduct drainage infrastructure mapping for City of South Tucson - During 2020, the drainage infrastructure study was completed, results delivered to the City of South Tucson and design sessions scheduled for proposed improvements.	H	2020	SC
2.2.b.3		Construct drainage improvements in the El Vado Watershed in the City of Tucson (SCRM) - The scope/charter for project ID# are in development.	M	2022	ID
2.2.b.4		Construct drainage improvements in the Ruthrauff/Gardner Lane area (SCRM) - The project 5RUPR5 scope/charter are completed and design has begun.	M	2024	ID
2.2.b.5		Construct El Rio Golf Course drainage improvements (SCRM) - The project is under construction.	M	2020	C
2.2.b.6		Evaluate cumulative impacts of lot-splits and identify mitigation (BW, TM) - Technical Policy 18, which has been drafted and awaits approval addresses lot splits and 3 studies have been completed or are underway that address cumulative impacts in existing lot split areas.	L	2024	AA
2.2.b.7		Work with responsible parties to address flooded roads (CDO, LMW, Pantano, Rillito, Sabino, TVC, TF, TM) - Identifying various ways to send targeted messages and improve multi-jurisdictional collaboration.	M	2021	AA
2.2.c	Conduct voluntary floodprone land acquisition program outreach to areas impacted by flooding	This is a countywide activity. Associated discreet projects or phases are described below. A related message is to be added to annual outreach sent to all floodplain property owners.	L	2021	PP
2.2.c.1		Acquire property rights for effective management - This activity was specific to the need for erosion controls for the Pantano Wash. Staff recommends that it be combined with 1.1.c.	M	2020	AA

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2.2.c.2		Target floodways and flow corridor areas (BW, Brawley, SCRM, SPR). This project has been added to the PPI but has not begun. Staff recommends that it be moved and made a discreet task of activity 6, Public Outreach.	H	2022	PP
2.2.d	Promote use of Green Infrastructure/Low Impact Development techniques during redevelopment	This is an annual regionwide activity. Prior to 2020, the District published a Green Infrastructure and Low Impact Development Manual (GI/LID) and updated retention and detention requirements to incorporate, and credit, site design techniques; including water harvesting, natural channel bottoms and avoidance. These standards are enforced with all new development and substantial improvements. Furthermore per the Pima County Comprehensive Plan, an Integrated Water Management Plan (IWMP) is required for rezoning cases that may have an impact on groundwater dependent habitat. Furthermore the Pima County Regulated Riparian Habitat (PCRRH) standards require avoidance and mitigation. Since approval of the plan 85 entitlement reviews have promoted use of GI/LID practices.	L	2020	AA
2.2.e	Expand outreach to Homeowners and Neighborhood Associations about the need for and approaches to maintaining private infrastructure	A Maintenance Handbook for Homeowners Associations has been printed and is distributed to HOAs that contact the District to discuss maintenance issues. The need to maintain private drainage was also included in targeted outreach to those living in areas identified by the District as having increased flood or debris flow risk after the Bighorn Fire.	L	2020	IP
3.1	Current Natural Resource Protection Activities				
3.1.a	Enforce the Riparian Habitat Mitigation Standards during permitting and entitlement processes	Since plan approval in April 2020, 10 Pima County Regulated Riparian Habitat Mitigation Plans were reviewed by the District. Additionally, Technical Policy-024 that clarifies avoidance policies, is scheduled for consideration at the Board of Supervisors public hearing tentatively in May 2021.	H	2020	AA
3.1.b	Use <b>open space</b> management plans for monitoring, maintaining and protecting the Drainage System and Preserves in collaboration with partners <b>District uses O&amp;M Manuals</b>	There are 14,820 acres of the drainage system that are natural. During 2020, inspection and inventory of District lands continued. This includes erosion, infrastructure, drainage, nuisance and habitat conditions. Plans have been completed for 2 sites. Partners are involved in each. However, although a format for these plans has been established (see activity 1.1.c) a schedule for development of written plans has yet to be developed for individual properties as contemplated by this activity. In future plan updates it would be valuable to list properties for which plans are needed as separate activities as is done herein for structural projects and studies.	H	2020	AA

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3.1.b.1		Monitor base flows - The District and it's partners in the Pima County Office of Sustainability and Conservation and at the Sonoran Institute monitor base flows of the Lower Santa Cruz River, Cienega Creek, Edgar and Buehman Canyon. Results are published in the Living River Report, Pima County Sustainable Action Plan for County Operations Annual Report Card. For Cienega Creek base flow is reported as a percent of the 9.5 mile reach monitored. In 2020 pre-monsoon baseflow was 15% wet or 1.425 miles. Detailed information for Cienega Creek is available in an annual report published by Pima Association of Governments in cooperation with the District entitled Riparian Health Assessment 2020 and is available at <a href="http://bit.ly/PAGlibrary">http://bit.ly/PAGlibrary</a> or <a href="https://pagregion.com/sustainability/water-quality/water-reliability/">https://pagregion.com/sustainability/water-quality/water-reliability/</a> . For the Santa Cruz River base flow is reported in the Living River Report published by the Sonoran Institute in cooperation with the District. In addition the Pima County Office of Sustainability and Conservation monitors base flows in Buehman and Edgar Canyon in the San Pedro River Watershed.	H	2020	AA
3.1.c	Identify, acquire, preserve, restore and enhance the Drainage System and Preserves including riparian habitat and wildlife corridor areas	During 2020 the District acquired 585 FLAP acres, bringing the total of land within the Drainage System to 33,638 acres. There are 14,820 acres of Preserves and areas of the Drainage System that are natural. This includes 8 acres at Sparrow Patch and 1 acre at Arroyo Chico Park Ave Basin where the District enhanced lizard habitat by adding rubble and brush piles. These are constructed per specifications created in partnership with Dr. Phil Rosen of the University Arizona and other experts.	H	2020	AA
3.1.c.1		Support work for the Altar Valley Watershed Management Grant - The scope and grant application are currently in development by a stakeholder committee that District staff coordinate. It includes addressing agricultural diversions.	H	2020	IP
3.1.d	Invasive species management	# acres were treated during 2020, this spatial extent is often treated multiple times. Invasive species management by removal and treatment is an annual activity as it applies to all construction, maintenance, and restoration activities within the District operated Drainage System and preserves. Furthermore the District partners with non-governmental organizations including Tucson Clean and Beautiful to conduct events at which volunteers and first responders remove invasive species. Removal is critical to restoration of native habitat which is less fire prone and therefore associated with less erosion, risk of debris laden flash floods, and healthy natural floodplain function.	H	2020	AA

<u>Ref #</u>	<u>Activity</u>	<u>Implementation Progress*</u>	<u>Rank</u>	<u>Due</u>	<u>Status</u>
3.1.e	Coordinate with water owners and entities on ground water recharge and effluent uses	Coordination is ongoing with stakeholders in 3 watersheds, including Lower Santa Cruz River at Marana High Plains and wastewater treatment facility, the Middle Santa Cruz River Heritage Waters project, and Avra Valley CAP Recharge facility.	H	2020	AA
3.2	New Natural Resource Protection Activities				
3.2.a	Spatially rectify riparian classification maps	Since plan approval in April 2020 District staff approved revisions based upon better data at 245 sites as of 12/11/2020. This process includes concurrence and updating the PCGIS PCRRH layer.	L	2020	AA
3.2.b	Refine, expand and implement District natural resource management plans including the Multi-Species Conservation Plan	During 2020, 2 natural resource plans were created or updated. In addition, the District created a strategic plan for completion of open space management plans for each watershed. It includes a model plan outline however does not establish a schedule. Identification of a project team, scope and schedule is needed to ensure completion by 2023 as scheduled (see 1.1.c). Staff recommends adding these below as discreet actions as they are undertaken.	L	2023	AA
3.2.b.1		Complete Cienega Corridor Management Plan (CC) - Final draft to be submitted to USFWS in April, 2021.	M	2021	SC
3.2.c	Establish best management practices (BMP) for and identify utility operators in the Drainage System	The District has established a permit system for drainage system users. Staff recommends that the permitting portion of this activity be moved to annual activities, with number of permits as the metric, while establishment of BMPs remain as a new project.	L	2024	PP
4.1	Current Emergency Response Activities				
4.1.a	Operate the flood recognition and warning system	During 2020 112 of streamflow gages and weather stations were operated by the District as part of the ALERT Flood Threat Recognition and Early Warning System. See activity 4.1.c for a description of how the syetm was expanded during 2020.	H	2020	AA
4.1.b	Coordinate with other Departments in development of Hazard Mitigation Plans, Emergency Operations Plan Flood Annexes, Flood Response Plans and Grant Applications	The District assists in PCOEM annual updates of the Inter-Jurisdictional Hazard Mitigation Plan, Emergency Operations Plan including Flood and Storm Incident Annex/Flood Response Plan and sought BRIC and PF-HMGP funds for levee augmentation, critical infrastructure protection and invasive species management. The CDO Levee and Finger Rock Wash culvert at Skyline Drive have been ranked the top requests in the state and have been submitted to ADEMA for programmatic and environmental reviews at the Federal level as required prior to award.	H	2020	AA

<u>Ref #</u>	<u>Activity</u>	<u>Implementation Progress*</u>	<u>Rank</u>	<u>Due</u>	<u>Status</u>
4.1.c	Coordinate with the Office of Emergency Management and sponsor annual events (e.g. exercises, drills and training)	The District submits an annual exercise plan as part of the MyTEP process conducted by PCOEM for southern Arizona that includes at least one exercise per year. In the 2 years prior to COVID this Table Top Exercise TTX was successfully conducted which led to program improvements and identification of further needs. During 2020 the Bighorn wildfire burned much of the vegetation on the mountains above Tucson and increased flood risk was identified. The District coordinated with PCOEM, TAR, and the Pima County Communications Office to conduct outreach to impacted residents, to add pre-scripted messages for these areas to the Early Warning Dissemination System and to create an After Action Report/Improvement Plan. This plan has been submitted to the CRS auditors to meet Class 4 pre-requisites and further reduce insurance rates. Planning for the next TTX is underway.	H	2020	AA
4.1.d	Identify critical facilities exposed to or isolated by flooding and evaluate level of risk	A list of critical facilities within floodplains and inundation areas identifiable by GIS query was included in the CRS Rating Modification request. Areas that may be isolated during floods but not within the floodplain have yet to be identified. A project to do so is included as activity 4.2.a below.	H	2020	AA
4.2	<b>New Emergency Response Activities</b>				
4.2.a	Develop a plan to enhance public safety where roads flood and/or create isolated areas (e.g. reporting, warning, signage, permanent closures, all-weather crossings, automated temporary closures)	Pima County Department of Transportation is to lead, District staff will be technical experts. Hiring underway for Smart Streets and Mobility. Need to create map of potentially isolated areas. Real time traffic routing application under development by PCDOT.	H	2024	PP
4.2.b	Adopt an All-Hazards Planning Strategy per the Approved Hazard Mitigation Plan (e.g. health, catastrophic fire, extreme weather)	Complete and to be updated in 2021. Staff recommends this be moved to annual activities.	M	2020	AA
4.2.c	Expand and update the District's flood threat recognition system and integrate it with warning system	This is a countywide activity. Associated discreet projects and phases are described below. 5 new gages were installed during the reporting period bringing the total to 112. These included gages in Massingale Basin, the isolated community of Ajo and in and downstream of the Bighorn fire burn scar. The latter includes a site in Catalina State Park on Southerland Wash, one in the top of Ventana Canyon, Thimble Peak in the National Forest, and Sanders Road Bridge in Marana. See 4.2.e for additional needs.	H	2020	AA

<u>Ref #</u>	<u>Activity</u>	<u>Implementation Progress*</u>	<u>Rank</u>	<u>Due</u>	<u>Status</u>
4.2.c.1		Coordinate with other jurisdictions including the Tohono O'odham Nation on flood warning needs (RS, SC, SR, Tule, SCRUI) - Creating agreements with Sahuarita at Quail Crossing of the Santa Cruz River and the Town of Oro Valley. An IGA with the Tohono O'odham Nation has been approved by attorneys for both parties and is awaiting approval by the Nation's Legislative Council. While for a bank protection project it also facilitates coordination. District and PCOEM staff also have participated in response and exercises related to Menager's Dam within the Gu:vo District of the Tohono O'odham Nation.	L	2025	IP/PP
4.2.c.2	Expand inundation mapping coverage for flood warning for use in flood warning system	This is a countywide activity. This year post Big Horn wildfire inundation areas were added to the existing Flood Threat Recognition (FTR) and Early Warning Dissemination (EWD) systems including pre-scripted messages and associated outreach campaign. This brings the total number of structures covered to 2,295. Associated discreet projects and phases are described below.	M	2020	AA
4.2.c.3		Create inundation mapping for Black Wash and Gibson Arroyo - Neither a scope or project team has been established.	H	2023	PP
4.2.e	Increase pre-event technical assistance to the Office of Emergency Management and first responders including identifying all weather emergency response access routes	This is a countywide activity. The Pima County Office of Emergency Management (PCOEM) has requested that the District update the Emergency Operation Plan (EOP) and Flood Response Annex (FRP). Associated discreet projects and phases are described below.	H	2022	PP
4.2.e.1		Utilize new streamflow gages to warn emergency services of road closures on Silverbell Road - Neither sites nor funding has been identified.	L	2023	PP
4.2.f	Provide outreach and technical assistance to critical facility operators regarding development of flood response plans.	Neither a scope or project team has been established.	H	2024	PP
5.1	Current Capital Program for Structural Projects				
5.1.a	Utilize property tax revenues to fund drainage improvements to protect existing development and seek additional funds when available	This is a countywide activity. During 2020/2021 the CIP budget requested was \$17,281,261. Grants were pursued for invasive species management, levee augmentation, and critical infrastructure protection. Associated discreet projects or phases are described below.	H	2020	AA
5.1.a.1		Address erosion advancing towards Soldier Trail - Anticipated to be funded with maintenance budget.	H	2021	PP



<u>Ref #</u>	<u>Activity</u>	<u>Implementation Progress*</u>	<u>Rank</u>	<u>Due</u>	<u>Status</u>
5.1.a.2		Construct bank protection for El Rio Preserve - The project 5LKMNA has been constructed using soil cement bank protection, including hand rail.	H	2020	C
5.1.a.3		Construct bank protection on the north bank of Canada del Oro Wash between I-10 and Thornydale and riverpark project - CIP project number 5CDONB soil cement bank protection and riverpark improvements are underway.	H	2021	C
5.1.a.4		Construct drainage improvements within Christmas Wash and other urban watersheds - CIP number 5XMSWS Seneca and Ritchie basins construction was completed by JOC and the BSD is leading GI components with the COT.	H	2020	IP
5.1.a.5		Construct Highlands Wash drainage improvements - A scope has yet to be completed. Targeted grant funds were not awarded and staff recommends that the project be removed due to lack of funds. The Town of Oro Valley will re-evaluate whether this is a priority for local funding.	H	2023	PP
5.1.a.6		Construct Sells Wash bank protection - Pending IGA and design by Tohono O'odham Nation and the Natural Resources Conservation District (NRCD).	H	2025	ID
5.1.a.7		Coordinate with the City of Tucson stakeholders on planned drainage improvements along Silverbell Road - Neither a scope or project team has been established.	H	2025	PP
5.1.a.8		Remove un-necessary diversions - A scope of work for removal has yet to be completed, however identification of diversions is included in the Avra Valley and Black Mountain LOMR study scope of work.	H	2025	PP
5.1.a.9		Stabilize the Pantano Wash and tributaries - CIP number 5PANGC scope/charter are complete and it is in design.	H	2025	ID
5.1.a.10		Construct Channel Improvements - Neither a scope nor project team has been established.	H	2024	PP
5.1.a.11		Mitigate erosion at Hacienda del Sol.	H	2020	C
5.1.a.12		Ruthrauff area drainage improvements - Coordination for CIP number 5RUPRR with United Pacific Railroad (UPRR) is underway.	H	2023	PP
5.1.b	Complete new river and basin studies to identify needs and develop alternatives	This is a countywide annual activity. Studies are completed both in-house by staff and using consultants under contract. Please see below for descriptions of the 3 underway since plan adoption.	H	2020	AA

<u>Ref #</u>	<u>Activity</u>	<u>Implementation Progress*</u>	<u>Rank</u>	<u>Due</u>	<u>Status</u>
5.1.b.1		Coordinate with the Town of Marana on implementation of their Marana Drainage Master Plan - This coordination includes Town participation in the FCDAC and a major basin study for the LSCR. The scope, public stakeholder input, hydrologic study and alternative development is complete. Alternative selection is scheduled to occur in 2021. Furthermore PCRFC staff have reviewed and commented upon the General Plan update completed by the Town on 2020. The schedule has been adjusted accordingly.	H	2023	IP
5.1.b.2		Create Basin Management Plans - A scope for AV is in development. Staff recommends this discreet activity be combined with 5.1.b as it is a duplicate.	H	2023	ID
5.1.b.3		Develop Santa Cruz River Management Plan - A major basin study for the LSCR is nearing completion. The scope, public stakeholder input, hydrologic study and alternative development is complete. Alternative selection is scheduled to occur in 2021. The schedule has been adjusted accordingly.	H	2020	IP
5.1.c	Develop a 10-year plan for prioritizing the design and construction of capital projects	This is a countywide activity. This year 21 projects were included in the budget and 20 on the 10 -year list of projects not included in the budget. In addition to those needs identified by post flood and annual inspections, repeat maintenance areas, basin studies and as part of development review and floodplain management, projects may be requested by the public and those municipalities represented on the Pima County Regional Flood Control District Advisory Committee. The latter includes one of one representative from each jurisdiction and each Supervisorial District. Each jurisdiction submits an annually project request. Then, as part of the budget process, the FCDAC recommends which projects be included and also updates the 10 year plan. Associated discreet projects or phases are described below under Activity 5.2.	H	2020	AA
5.1.d	Design flood control improvements using a multi-function approach including infiltration, water quality, recreation and habitat enhancement	This year the District designed 20 projects using a multi-function approach.	H	2020	AA

<u>Ref #</u>	<u>Activity</u>	<u>Implementation Progress*</u>	<u>Rank</u>	<u>Due</u>	<u>Status</u>
5.2	New Capital Projects				
5.2.a	Identify potential locations for Green Infrastructure/Low Impact Development projects	This is a countywide activity. In addition to incorporating these techniques in most projects as part of efforts to meet the goals of the Sustainable Action Plan for County Operations (SAPCO) the District assisted in completion of a GI+Trees Potential Projects Map. Associated discreet projects or phases are described below.	L	2020	AA
5.2.a.1		Coordinate with the Altar Valley Conservation Alliance to implement watershed restoration - District staff participate in and coordinate quarterly meetings, potential restoration projects are being identified as part of the scope of work for the Avra Valley Basin Study under development with funds from BOR.	H	2020	IP
5.2.a.2		Loop and Trail Enhancements - This year the completed construction of enhancements along 6 new miles and continued ongoing maintenance and floodplain restoration.	L	2020	AA
5.2.a.3		Coordinate with City of Tucson on Proposition 407 projects - This District staff helped coordinate design and installation at two sites within the City, at Cherry Avenue Park and Murrietta Park.	H	2020	PP
5.2.a.4		SBGHRN Post Fire Hazard Mitigation Grant Program: Canada Del Oro Wash Levee Augmentation and Finger Rock Wash Critical Infrastructure Protection	H	2020	ID
5.2.a.5		Pima County Fairgrounds SELC Channels	H	2023	ID
5.2.b	Apply Green Infrastructure/Low Impact Development design principles in District projects	This year the District used GI/LID designs in all 21 Capital Improvement Projects listed above under Activity 5.1.a.	L	2020	AA
5.2.c	Prohibit the use of levees and floodwalls except as necessary to protect existing development	Use of new levees or floodwalls to protect development is prohibited by PCC Section 16, the Floodplain and Riparian Habitat Management Ordinance.	H	2020	AA
5.2.d	Consider Future Conditions including climate and land use changes in design	Modelling standards are in development to guide future designs. Qualified staff have been assigned to develop methods of assessing future conditions in hydrologic and hydraulic modeling in arid environments as most FEMA guidance is associated with sea level rise.	H	2023	PP
5.2.e	Develop and implement alternative construction techniques and site designs to protect from flood hazards by mimicking natural conditions (e.g. compound channels, distributed retention)	PMs consider alternatives in project design, however no standard contract language, new policy or design guidelines have been created. However prior to plan adoption the District published the Design Guidelines for Green Infrastructure and Low Impact Development.	H	2023	PP/IP

<u>Ref #</u>	<u>Activity</u>	<u>Implementation Progress*</u>	<u>Rank</u>	<u>Due</u>	<u>Status</u>
5.2.e.1		Develop and implement an erosion mitigation plan using natural channel design techniques - While these techniques are considered for most projects a specific "plan" has yet to be conducted. Staff recommends this activity be reworded to call for creation of a manual or best management practices such as a Technical Policy.	M	2020	PP/IP
6.1	Current Outreach Activities				
6.1.a	Implement the Program for Public Information	The current 330 Outreach score is 327 of 380.	H	2020	AA
6.1.b	Provide a system for the community to receive technical assistance or to address drainage concerns	During 2020 104 customers were served by PCRFCFCD staff at the front counter.	H	2020	AA
6.1.c	Coordinate outreach with local municipalities to promote consistent messages among the regions jurisdictions	During 2020 District staff coordinated 4 interjurisdictional outreach projects with local municipalities including: a Monsoon Safety leaflet included in the City of Tucson Water bills, direct mailers to those Town of Marana residents living in areas protected by levees and those within post fire inundation areas in the Town of Oro Valley. A regionwide post Bighorn Fire "Floods Follow Fires" radio, television, social and print media campaign was conducted in cooperation with elected officials including Sheriff, the Tucson Association of Realtors and PCOEM to encourage those in the area to sign up for flood insurance and warning systems.	H	2020	AA
6.1.d	Provide a regional federal map repository	As of October 2020 there was 228,455 acres of SFHA within unincorporated Pima County.	H	2020	AA
6.1.e	Provide map information services in unincorporated Pima County	During 2020 104 customers were served by PCRFCFCD staff at the front counter.	H	2020	PP/IP

<u>Ref #</u>	<u>Activity</u>	<u>Implementation Progress*</u>	<u>Rank</u>	<u>Due</u>	<u>Status</u>
6.2	New Outreach Activities				
6.2.a	Update outreach messages for new targets and audiences (e.g. critical facilities, private infrastructure, renters, riparian habitat and high stress index populations)	This is a countywide activity. Associated discreet projects or phases are described below. The update provided with the last CRS Annual Recertification is attached. Staff recommend this activity be moved to annual activities.	L	2020	AA
6.2.a.1		Conduct targeted outreach about protection of vegetation and riparian habitat to prevent or reduce drainage runoff problems - This target has been added to the PPI, a message added to the annual mailing to floodplain residents, and a brochure was created. However a unique project for the Tortolita Fan has yet to be undertaken.	M	2021	PP/ID
6.2.a.2		Conduct targeted outreach about improvements to nonconforming use structures - Neither a scope nor project team has been identified. This activity is scheduled for 2021.	H	2021	PP
6.2.a.3		Conduct targeted outreach to property owners in the vicinity of the break-out of the Brawley Wash below 3 Points Bridge - Neither a scope nor project team has been identified. This activity is scheduled for 2021.	H	2021	PP
6.2.a.4		Conduct targeted outreach to property owners within the floodway - Neither a scope nor project team has been identified. This activity is scheduled for 2021.	H	2021	PP
6.2.a.5		Identify and conduct targeted outreach to areas which can get cut-off during flood events - Neither a scope nor project team has been identified. This activity is scheduled for 2021 and will require coordination with PCDOT and PCOEM as well as other jurisdictions.	H	2021	PP
6.2.a.6		Promote flood insurance with Increased Cost of Compliance coverage for homes in the vicinity south of Irvington Rd. and east of San Joaquin Ave - An updated information sheet on the increased cost of compliance has been created and is included in annual mailers to Repetitive Loss Areas however neither a scope nor project team has been identified for this target area. This activity is scheduled for 2021.	H	2021	PP
6.2.a.7		Provide outreach on the availability of private road and drainage easement technical assistance - Neither a scope nor project team has been identified. A brochure on common area drainage maintenance including roads has been developed for HOAs, however a large area of impact is not within planned subdivisions. Outreach material has not yet been created and a campaign to distribute it will require targeting.	M	2022	PP/ID
6.2.a.8		Provide outreach promoting assistance available to homeowners in the vicinity of Oriole Circle and Mayes Place - Neither a scope nor project team has been identified. The implementation due date has been adjusted.	H	2021	PP

<u>Ref #</u>	<u>Activity</u>	<u>Implementation Progress*</u>	<u>Rank</u>	<u>Due</u>	<u>Status</u>
6.2.a		Provide outreach promoting assistance available to homeowners in the vicinity of TRS131332 - Neither a scope nor project team has been identified.	<b>M</b>	2023	PP
6.2.b	Create on-line crowd source reporting platform	District staff have tested the capabilities and allowances of software to have a crowd sourced platform but have yet to implement it. This activity is scheduled for 2021. Crowd source methods are being used in the Lower Santa Cruz Basin Study currently underway and is managed by the Sonoran Institute under contract to the District.	<b>L</b>	2021	ID
6.2.c	Provide regional local map repository	An agreement to have City of Tucson GIS Data Layers for floodplains maintained by PCRFCO is underway.	<b>L</b>	2023	PP
6.2.d	Establish message partnerships with community based organizations serving access & functional needs populations	Neither a scope nor project team has been identified. This activity is scheduled for 2021.	<b>H</b>	2021	PP