

PIMA COUNTY REGIONAL FLOOD CONTROL DISTRICT

Brawley Wash Watershed Plan and Environmental Assessment *Pima County, Arizona*

SEPTEMBER 2026



Preparer:

United States Department of Agriculture, Natural Resources Conservation Service - Lead Federal Agency
in cooperation with Pima County Regional Flood Control District – Sponsoring Local Organization

**Brawley Wash Watershed Plan and Environmental Assessment
for the Pima County Regional Flood Control District, Arizona**

ABSTRACT

Lead Agency: United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), Arizona

Cooperating Agencies: Tucson Water

Sponsoring Local Organization: Pima County Regional Flood Control District (PCRCD)

Authority: This Watershed Plan-Environmental Assessment (Project) for the Pima County Regional Flood Control District ("District") has been prepared under the Authority of the Watershed Protection and Flood Prevention Act of 1954 (Public Law [PL] 83-566) in compliance with Part 601 of Title 390 – the National Watershed Program, as amended. This Plan-EA has also been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, PL 91-190, as amended (42 United States Code [U.S.C.] 43221 et seq.).

Abstract: The purpose of this document is to fulfill the conditions of NEPA for consideration and approval of PL 83-566 project funding. Approximately 198,000-acre (309 square miles) Brawley Wash Watershed project area is characterized by severe erosion and sedimentation, especially in areas where constructed embankments and canals from abandoned agricultural lands are no longer maintained and affect natural flow patterns. This causes the loss of wildlife habitat, as well as disruption of natural floodplains and drainage flow paths. The proposed PL-566 watershed plan will evaluate floodplain restoration, erosion control, structure removal and other conservation measures within the Planning Area and alternatives located only on County and City owned lands. The project will also benefit small, farming and ranching agricultural communities such as BKW Farms, and will include the Tohono O'odham Nation - a Native American Tribe which includes Schuk Toak Farm.

Non Discrimination Statement:

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

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The following is a link to USDA's "How to File a Program Discrimination Complaint" page:
<https://www.usda.gov/oascr/how-to-file-a-program-discrimination-complaint>.

Indigenous Land Acknowledgement:

Pima County Regional Flood Control District (PCRCD) acknowledges ancestral lands. On behalf of Pima County residents, we honor the tribal nations who have served as caretakers of this land from time immemorial and respectfully acknowledge the ancestral homelands of the Tohono O’odham Nation and the multi-millennial presence of the Pascua Yaqui tribe within Pima County. Consistent with Pima County’s commitment to diversity and inclusion, we strive toward building equal-partner relationships with Arizona’s tribal nations.

Watershed Agreement
between the
Pima County Regional Flood Control District
(Referred to herein as the Sponsor)
State of Arizona
and the

U.S. Department of Agriculture Natural Resources Conservation Service
(Referred to herein as NRCS)

Whereas, application has heretofore been made to the Secretary of Agriculture by the Sponsor for assistance in preparing a plan for works of improvement for the Brawley Wash Watershed, State of Arizona, under the authority of the Watershed Protection and Flood Prevention Act, as amended (16 U.S.C. Sections 1001 to 1008, 1010, and 1012); and

Whereas, the responsibility for administration of the Watershed Protection and Flood Prevention Act, has been assigned by the Secretary of Agriculture to NRCS; and

Whereas, there has been developed through the cooperative efforts of the Sponsor and NRCS a watershed project plan and environmental impact statement (or environmental assessment) for works of improvement for the Brawley Wash Watershed, State of Arizona, hereinafter referred to as the watershed project plan or plan, which plan is annexed to and made a part of this agreement;

Now, therefore, in view of the foregoing considerations, the Secretary of Agriculture, through NRCS, and the Sponsor hereby agree on this watershed project plan and that the works of improvement for this project will be installed, operated, and maintained in accordance with the terms, conditions, and stipulations provided for in this plan and including the following:

1. Term

The term of this agreement is for the two-year installation period and evaluated life of the project (50-years) and does not commit NRCS to assistance of any kind beyond the end of the evaluated life.

2. Costs

The costs shown in this plan are preliminary estimates. Final costs to be borne by the parties hereto will be the actual costs incurred in the installation of works of improvement.

3. Real Property

The sponsors agrees that all land acquired for measures, other than land treatment practices, with financial or credit assistance under this agreement will not be sold or otherwise disposed of for the evaluated life of the project except to a public agency which will continue to maintain and operate the development in accordance with the Operation and Maintenance Agreement. The amounts and percentages of the real property acquisition costs to be borne by the Sponsor and NRCS are as shown in the cost-share table in Section 5 hereof.

4. Uniform Relocation Assistance and Real Property Acquisition Policies Act

The Sponsor hereby agrees to comply with all of the policies and procedures of the Uniform Relocation Assistance and Real Property Acquisition Policies Act (42 U.S.C. Section 4601 et seq. as further implemented through regulations in 49 Code of Federal Regulations [CFR] Part 24 and 7 CFR Part 21) when acquiring real property interests for this federally assisted project. If the Sponsor is legally unable to comply with the real property acquisition requirements, it agrees that, before any Federal financial assistance is furnished, it will provide a statement to that effect, supported by an opinion of the chief legal officer of the state containing a full discussion of the facts and law involved. This statement may be accepted as constituting compliance.

5. Cost-share for Watershed Project Plans

The following table shows cost-share percentages and amounts for watershed project plan implementation. Associated mitigation costs are included in the project cost estimates and reflected in the watershed agreement cost-share table, consistent with PL 83-566 funding eligibility.

Cost-share Table for Flood Prevention (Flood Damage Reduction) Projects

Preferred Alternative – Tortuga Ranch (PA2) – Alternative 1					
Works of Improvement	NRCS		Sponsor(s)		Total
Cost-Shareable Items	%	Cost	%	Cost	Cost
Measures listed by purpose and rate of assistance ^{1/}					
Multipurpose Structure No. 1	0%	\$0	0%	\$0	\$0
Channels	0%	\$0	0%	\$0	\$0
Floodplain Easements (0 acres)	0%	\$0	0%	\$0	\$0
Land Treatment Measures	100%	\$1,102,800	0%	\$0	\$1,102,900
Mitigation ^{2/}	100%	\$54,800	0%	\$0	\$54,800
Real Property Acquisition Cost	0%	\$0	0%	\$0	\$0
Multiple Purpose site (0 acres)	0%	\$0	0%	\$0	\$0
Real Estate Appraisal Fees, legal fees, survey costs, flowage easements	0%	\$0	0%	\$0	\$0
Relocation ^{3/}	0%	\$0	0%	\$0	\$0
Sponsors Engineering Costs	0%	\$0	100%	\$5,000	\$5,000
Subtotal: Cost-Sharable Costs	>99%	\$1,157,600	<1%	\$5,000	\$1,162,600
<i>Non-Cost-Sharable Items ^{4/}</i>					
NRCS Technical Assistance/Engineering	100%	\$57,600	0%	\$0	\$57,600
Project Administration ^{5/}	N/A	\$5,800	N/A	\$5,800	\$11,600
Water, Mineral, and Other Resource Rights ^{6/}	0%	\$0	0%	\$0	\$0
Permits ^{6/}	0%	\$0	100%	\$15,000	\$15,000
Real Property Rights ^{6/}	0%	\$0	0%	\$0	\$0
Relocation, Beyond Required Decent, Safe Sanitary ^{7/}	0%	\$0	0%	\$0	\$0
Non-Project Costs	0%	\$0	0%	\$0	\$0
Subtotal: Non-Cost-Sharable Costs	75%	\$63,400	25%	\$20,800	\$84,200
Total	99%	\$1,221,000	1%	\$25,800	\$1,246,800
Preferred Alternative – Prickle Desert (PA6) – Alternative 3					
Works of Improvement	NRCS		Sponsor(s)		Total
Cost-Shareable Items	%	Cost	%	Cost	Cost
Measures listed by purpose and rate of assistance ^{1/}					
Multipurpose Structure No. 1	0%	\$0	0%	\$0	\$0

Channels	0%	\$0	0%	\$0	\$0
Floodplain Easements (0 acres)	0%	\$0	0%	\$0	\$0
Land Treatment Measures	100%	\$2,590,900	0%	\$0	\$2,590,900
Mitigation ^{2/}	100%	\$32,000	0%	\$0	\$32,000
Real Property Acquisition Cost	0%	\$0	0%	\$0	\$0
Multiple Purpose site (0 acres)	0%	\$0	0%	\$0	\$0
Real Estate Appraisal Fees, legal fees, survey costs, flowage easements	0%	\$0	0%	\$0	\$0
Relocation ^{3/}	0%	\$0	0%	\$0	\$0
Sponsors Engineering Costs	0%	\$0	100%	\$11,700	\$11,700
Subtotal: Cost-Sharable Costs	>99%	\$2,622,900	<1%	\$11,700	\$2,634,600
<i>Non-Cost-Sharable Items^{4/}</i>					
NRCS Technical Assistance/Engineering	100%	\$134,500	0%	\$0	\$134,500
Project Administration ^{5/}	N/A	\$13,100	N/A	\$13,100	\$13,100
Water, Mineral, and Other Resource Rights ^{6/}	0%	\$0	0%	\$0	\$0
Permits ^{6/}	0%	\$0	100%	\$15,000	\$15,000
Real Property Rights ^{6/}	0%	\$0	0%	\$0	\$0
Relocation, Beyond Required Decent, Safe Sanitary ^{7/}	0%	\$0	0%	\$0	\$0
Non-Project Costs	0%	\$0	0%	\$0	\$0
Subtotal: Non-Cost-Sharable Costs	84%	\$147,600	16%	\$28,100	\$175,700
Total	99%	\$2,770,500	1%	\$39,800	\$2,810,300

Cost-share Table for Flood Prevention (Flood Damage Reduction) Projects

Preferred Alternative – Tucker Road (PA7) – Alternative 1					
Works of Improvement	NRCS		Sponsor(s)		Total
<i>Cost-Shareable Items</i>	%	Cost	%	Cost	Cost
Measures listed by purpose and rate of assistance ^{1/}					
Multipurpose Structure No. 1	0%	\$0	0%	\$0	\$0
Channels	0%	\$0	0%	\$0	\$0
Floodplain Easements (0 acres)	0%	\$0	0%	\$0	\$0
Land Treatment Measures	100%	\$475,000	0%	\$0	\$475,000
Mitigation ^{2/}	100%	\$468,500	0%	\$0	\$468,500
Real Property Acquisition Cost	0%	\$0	0%	\$0	\$0
Multiple Purpose site (0 acres)	0%	\$0	0%	\$0	\$0
Real Estate Appraisal Fees, legal fees, survey costs, flowage easements	0%	\$0	0%	\$0	\$0

Preferred Alternative – Tucker Road (PA7) – Alternative 1					
Works of Improvement	NRCS		Sponsor(s)		Total
Relocation ^{3/}	0%	\$0	0%	\$0	\$0
Sponsors Engineering Costs	0%	\$0	100%	\$1,800	\$1,800
Subtotal: Cost-Sharable Costs	>99%	\$943,500	<1%	\$1,800	\$945,300
<i>Non-Cost-Sharable Items ^{4/}</i>					
NRCS Technical Assistance/Engineering	100%	\$20,300	0%	\$0	\$20,300
Project Administration ^{5/}	N/A	\$4,700	N/A	\$4,700	\$9,400
Water, Mineral, and Other Resource Rights ^{6/}	0%	\$0	0%	\$0	\$0
Permits ^{6/}	0%	\$0	100%	\$15,000	\$15,000
Real Property Rights ^{6/}	0%	\$0	0%	\$0	\$0
Relocation, Beyond Required Decent, Safe Sanitary ^{7/}	0%	\$0	0%	\$0	\$0
Non-Project Costs	0%	\$0	0%	\$0	\$0
Subtotal: Non-Cost-Sharable Costs	56%	\$25,000	44%	19,700	\$44,700
Total	98%	\$968,500	2%	\$21,500	990,000
1/ Installation costs explanatory notes: (a) List each multiple-purpose measure separately. Specific cost items and joint costs of multiple-purpose measures will be shown as separate line item entries. Single-purpose measures may be grouped by kind if the rate of assistance is the same for each measure or group. (b) For watershed protection enduring measures, the following footnote should be included: 1/ The cost-share rate is the percentage of the average cost of installing the practice in the selected plan for the evaluation unit. During project implementation, the actual cost-share rate must not exceed the rate of assistance for similar practices and measures under existing national programs. 2/Mitigation costs include expenditures to cover cultural resource mitigation for archaeological sites and biological mitigation. 3/ Relocation payments and assurances explanatory notes: (a) Includes replacement in kind, and payments necessary to meet decent, safe, and sanitary provisions. Enter the total estimated relocation assistance payment from table 1. Percentages for cost sharing will be based upon the cost-share rate of the project purpose requiring the relocation. The relocation assistance advisory services cost is to be included when computing the cost sharing percentages. These percentages are to be used for the life of the project regardless of future changes or supplements. (b) If the planned project measures will not cause the displacement of any person, business, or farm operation under present conditions, show cost sharing percentages, place \$0 1/ in "Estimated Relocation Payment Costs," and footnote the column as follows: 1/ Investigation of the watershed project area indicates that no displacements will be involved under present conditions. However, in the event that displacement becomes necessary at a later date, the cost of relocation assistance and payments will be cost-shared in accordance with the percentages shown. 4/ If actual non-cost-sharable item expenditures vary from these figures, the responsible party will bear the change. 5/ The sponsors and NRCS will each bear the costs of project administration that each incurs. Sponsor costs for project administration include relocation assistance advisory service. 6/ The sponsors will acquire with other than Watershed Protection and Flood Prevention Act funds, such real property as will be needed in connection with the works of improvement. The value of real property is eligible as in-kind contributions toward the sponsors' share of the works of improvement costs. In no case will the amount of an in-kind contribution exceed the sponsors' share of the cost for the works of improvement. The maximum cost eligible for in-kind credit is the same as that for cost sharing. 7/ Relocation payments for the cost of improvements beyond decent, safe and sanitary requirements is a nonproject cost ineligible for assistance under the act.					

Preferred Alternative – Tucker Road (PA7) – Alternative 1			
Works of Improvement	NRCS	Sponsor(s)	Total
Month and year of preparation or update: November 2024			

6. Land Treatment Agreements.

The Sponsor will obtain agreements from owners of not less than 50 percent of the land related to each flood restoration improvement. These agreements must provide that the owners will carry out farm or ranch conservation plans on their land. The Sponsor will provide assistance to landowners and operators to ensure the installation of the land treatment measures shown in the flood prevention project plan. The Sponsor will encourage landowners and operators to continue to operate and maintain the land treatment measures after the long-term contracts expire, for the protection and improvement of the watershed. There are no proposed dam or impounding structures to be constructed in the study area or preferred alternative.

7. Floodplain Management

Before construction of any project for flood prevention, the Sponsor must agree to participate in and comply with applicable Federal floodplain management and flood insurance programs. For plans approved as of the date of this revised manual the Sponsor is required to have development controls in place prior to NRCS or the Sponsor entering into a construction contract.

8. Water and Mineral Rights

The Sponsor will acquire or provide assurance that landowners or resource users have acquired such water, mineral, or other natural resources rights pursuant to state law as may be needed in the installation and operation of the works of improvement.

9. Permits

The Sponsor will obtain and bear the cost for all necessary federal, state, and local permits required by law, ordinance, or regulation for installation of the works of improvement.

10. Natural Resources Conservation Service Assistance

This agreement is not a fund-obligating document. Financial and other assistance to be furnished by NRCS in carrying out the plan is contingent upon the fulfillment of applicable laws and regulations and the availability of appropriations for this purpose.

11. Additional Agreements

A separate agreement will be entered into between NRCS and the Sponsor before either party initiates work involving funds of the other party. Such agreements will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific works of improvement.

12. Amendments

This plan may be amended or revised only by mutual agreement of the parties hereto, except that NRCS may deauthorize or terminate funding at any time it determines that the Sponsor has failed to comply with the conditions of this agreement or when the program funding or authority expires. In this case, NRCS must promptly notify the Sponsor in writing of the determination and the reasons for the deauthorization of project funding, together with the effective date. Payments made to the Sponsor or recoveries by NRCS must be in accordance with the legal rights and liabilities of the parties when project funding has been deauthorized. An amendment to incorporate changes affecting a specific measure may be made by mutual agreement between NRCS and the Sponsor having specific responsibilities for the measure involved.

13. Prohibitions

No member of or delegate to Congress, or resident commissioner, may be admitted to any share or part of this plan or to any benefit that may arise therefrom; but this provision may not be construed to extend to this agreement if made with a corporation for its general benefit.

14. Operation and Maintenance (O&M)

The Sponsor will be responsible for the operation, maintenance, and any needed replacement of the works of improvement by actually performing the work or arranging for such work, in accordance with an O&M agreement. An O&M agreement will be entered into before Federal funds are obligated and will continue for the project evaluation life (100 years). Although the Sponsor's responsibility to the Federal Government for O&M ends when the O&M agreement expires upon completion of the evaluated life of measures covered by the agreement, the Sponsor acknowledges that continued liabilities and responsibilities associated with works of improvement may exist beyond the evaluated life.

15. Emergency Action Plan

As none of the works of improvement include a dam or similar structure the preparation of an Emergency Action Plan (EAP) where failure may cause loss of life or as required by state and local regulations is not required for the Preferred Alternative.

16. Nondiscrimination Provisions

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW., Washington, DC 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

By signing this agreement the recipient assures the Department of Agriculture that the program or activities provided for under this agreement will be conducted in compliance with all applicable Federal civil rights laws, rules, regulations, and policies.

17. Certification Regarding Drug-Free Workplace Requirements (7 CFR Part 3021).

By signing this Watershed Agreement, the sponsors are providing the certification set out below. If it is later determined that the sponsors knowingly rendered a false certification or otherwise violated the requirements of the Drug-Free Workplace Act, the NRCS, in addition to any other remedies available to the Federal Government, may take action authorized under the Drug-Free Workplace Act.

Controlled substance means a controlled substance in schedules I through V of the Controlled Substances Act (21 U.S.C. Section 812) and as further defined by regulation (21 CFR Sections 1308.11 through 1308.15);

Conviction means a finding of guilt (including a plea of nolo contendere) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statutes;

Criminal drug statute means a Federal or non-Federal criminal statute involving the manufacturing, distribution, dispensing, use, or possession of any controlled substance;

Employee means the employee of a grantee directly engaged in the performance of work under a grant, including

- (i) all direct charge employees,
- (ii) (ii) all indirect charge employees unless their impact or involvement is insignificant to the performance of the grant, and
- (iii) (iii) temporary personnel and consultants who are directly engaged in the performance of work under the grant and who are on the grantee's payroll. This definition does not include workers not on the

payroll of the grantee (e.g., volunteers, even if used to meet a matching requirement, consultants or independent contractors not on the grantees' payroll, or employees of subrecipients or subcontractors in covered workplaces).

Certification:

- A. The Sponsor certifies that they will continue to provide a drug-free workplace by-
 - (1) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition.
 - (2) Establishing an ongoing drug-free awareness program to inform employees about
 - (a) The danger of drug abuse in the workplace.
 - (b) The grantee's policy of maintaining a drug-free workplace.
 - (c) Any available drug counseling, rehabilitation, and employee assistance programs.
 - (d) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace.
 - (3) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (1).
 - (4) Notifying the employee in the statement required by paragraph (1) that, as a condition of employment under the grant, the employee must-
 - (a) Abide by the terms of the statement; and
 - (b) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction.
 - (5) Notifying the NRCS in writing, within 10 calendar days after receiving notice under paragraph (4)(b) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer or other designee on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice must include the identification numbers of each affected grant.
 - (6) Taking one of the following actions, within 30 calendar days of receiving notice under paragraph (4)(b), with respect to any employee who is so convicted-
 - (a) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or
 - (b) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a federal, state, or local health, law enforcement, or other appropriate agency.
 - (7) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (1), (2), (3), (4), (5), and (6).
- B. The Sponsor may provide a list of the sites for the performance of work done in connection with a specific project or other agreement.
- C. Agencies will keep the original of all disclosure reports in the official files of the agency.

18. Certification Regarding Lobbying (7 CFR Part 3018).

- A. The Sponsor certifies to the best of their knowledge and belief, that-
 - (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the Sponsor, to any person for influencing or attempting to influence an officer or employee of an agency, Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
 - (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this

Federal contract, grant, loan, or cooperative agreement, the undersigned must complete and submit Standard Form LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

- (3) The Sponsor must require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients must certify and disclose accordingly.
- B. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. Section 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

19. Certification Regarding Debarment, Suspension, and Other Responsibility Matters Primary Covered Transactions (7 CFR Part 3017).

- A. The Sponsor certifies to the best of their knowledge and belief, that they and their principals-
 - (1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
 - (2) Have not within a 3-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state, or local) transaction or contract under a public transaction; violation of Federal or state antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 - (3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (federal, state, or local) with commission of any of the offenses enumerated in paragraph A(2) of this certification; and
 - (4) Have not within a 3-year period preceding this application/proposal had one or more public transactions (federal, state, or local) terminated for cause or default.
- B. Where the Sponsor is unable to certify any of the statements in this certification, such prospective participant must attach an explanation to this agreement.

20. Clean Air and Water Certification.

Applicable if this agreement exceeds \$100,000, or a facility to be used has been subject of a conviction under the Clean Air Act (42 U.S.C. Section 7413(c)) or the Federal Water Pollution Control Act (33 U.S.C. Section 1319(c)) and is listed by the U.S. Environmental Protection Agency (USEPA) or is not otherwise exempt.

- A. The project sponsoring organizations signatory to this agreement certify as follows:
 - (1) Any facility to be utilized in the performance of this proposed agreement is (), is not (x) listed on the USEPA List of Violating Facilities.
 - (2) To promptly notify the NRCS-State administrative officer prior to the signing of this agreement by NRCS, of the receipt of any communication from the Director, Office of Federal Activities, USEPA, indicating that any facility which is proposed for use under this agreement is under consideration to be listed on the USEPA List of Violating Facilities.
 - (3) To include substantially this certification, including this subparagraph, in every nonexempt subagreement.
- B. The project sponsoring organizations signatory to this agreement agree as follows:
 - (1) To comply with all the requirements of Section 114 of the Clean Air Act as amended (42 U.S.C. Section 7414) and Section 308 of the Federal Water Pollution Control Act (33 U.S.C. Section 1318), respectively, relating to inspection, monitoring, entry, reports, and information, as well as other requirements specified in Section 114 and Section 308 of the Air Act and the Water Act, issued there under before the signing of this agreement by NRCS.
 - (2) That no portion of the work required by this agreement will be performed in facilities listed on the USEPA List of Violating Facilities on the date when this agreement was signed by NRCS unless and until the USEPA eliminates the name of such facility or facilities from such listing.

- (3) To use their best efforts to comply with clean air standards and clean water standards at the facilities in which the agreement is being performed.
- (4) To insert the substance of the provisions of this clause in any nonexempt subagreement.
- C. The terms used in this clause have the following meanings:
 - (1) The term "Air Act" means the Clean Air Act, as amended (42 U.S.C. Section 7401 et seq.).
 - (2) The term "Water Act" means Federal Water Pollution Control Act, as amended (33 U.S.C. Section 1251 et seq.).
 - (3) The term "clean air standards" means any enforceable rules, regulations, guidelines, standards, limitations, orders, controls, prohibitions, or other requirements which are contained in, issued under, or otherwise adopted pursuant to the Air Act or Executive Order 11738, an applicable implementation plan as described in Section 110 of the Air Act (42 U.S.C. Section 7414) or an approved implementation procedure under Section 112 of the Air Act (42 U.S.C. Section 7412).
 - (4) The term "clean water standards" means any enforceable limitation, control, condition, prohibition, standards, or other requirement which is promulgated pursuant to the Water Act or contained in a permit issued to a discharger by the USEPA or by a state under an approved program, as authorized by Section 402 of the Water Act (33 U.S.C. Section 1342), or by a local government to assure compliance with pretreatment regulations as required by Section 307 of the Water Act (33 U.S.C. Section 1317).
 - (5) The term "facility" means any building, plant, installation, structure, mine, vessel, or other floating craft, location, or site of operations, owned, leased, or supervised by a sponsor, to be utilized in the performance of an agreement or subagreement. Where a location or site of operations contains or includes more than one building, plant, installation, or structure, the entire location will be deemed to be a facility except where the Director, Office of Federal Activities, USEPA, determines that independent facilities are collocated in one geographical area.

21. Assurances and Compliance.

As a condition of the grant or cooperative agreement, the Sponsor assures and certifies that it is in compliance with and will comply over the course of the agreement with all applicable laws, regulations, executive orders, and other generally applicable requirements, including those set out below which are hereby incorporated in this agreement by reference, and such other statutory provisions as a specifically set forth herein.

State, Local, and Indian Tribal Governments: Office of Management and Budget (OMB) Circular Nos. A-87, A-102, A-129, and A-133; and 7 CFR Parts 3015, 3016, 3017, 3018, 3021, and 3052.

Nonprofit Organizations, Hospitals, Institutions of Higher Learning: OMB Circular Nos. A-110, A-122, A-129, and A-133; and 7 CFR Parts 3015, 3017, 3018, 3019, 3021 and 3052.

22. Examination of Records.

The Sponsor must give NRCS or the Comptroller General, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to this agreement, and retain all records related to this agreement for a period of three years after completion of the terms of this agreement in accordance with the applicable OMB Circular.

23. Signatures

PIMA COUNTY REGIONAL FLOOD CONTROL DISTRICT

Eric Shepp, Director

Date

Regional Flood Control District

Public Works Building, 9th Floor

201 N. Stone

Tucson, AZ 85701

USDA-NATURAL RESOURCES CONSERVATION SERVICE

Keisha L. Tatem

Date

State Conservationist

Natural Resources Conservation Service

230 N. First Avenue, Suite 509,

Phoenix, Arizona 85003-1733

MEMORANDUM OF UNDERSTANDING (MOU)

between the

U.S. Department of Agriculture Natural Resources Conservation Service (NRCS)

U.S. Department of Agriculture (USDA)

and the

Pima County Regional Flood Control District

Sponsors for

Brawley Wash Watershed Works of Improvement

This MOU is between the USDA, NRCS, and the Pima County Regional Flood Control District, hereinafter 27T referred to as sponsor 27T. This MOU is between the USDA, NRCS, and the Pima County Regional Flood Control District, hereinafter Pima County Regional Flood Control District, referred to as sponsor.

AUTHORITIES, STATUTES, LAWS

The authority of NRCS to enter into this MOU is section 14 of The Watershed Protection and Flood Prevention Act, 16 U.S.C. Section 1012, as amended by Section 313 of Public Law 106-472. This section authorizes NRCS to provide technical assistance and financial assistance to local project sponsors for rehabilitation of aging dams constructed under the Watershed Protection and Flood Prevention Act (Public Law 83-566), the Flood Control Act of 1944 (Public Law 78-534), the Pilot Watershed Program, and the Resource Conservation and Development (RC&D) Program.

STATEMENT OF PURPOSE

Previously the NRCS provided technical assistance (TA), financial assistance (FA), or both to the sponsor for works of improvement known as [Brawley Wash Watershed]. This project was originally authorized and installed under the [NRCS Watershed Protection and Flood Prevention Project]. NRCS has determined that this dam is eligible for rehabilitation under the authorities cited above.

According to the project plan and operation and maintenance (O&M) agreement for this project, the sponsor is responsible for the O&M of this dam to assure it will function as designed and constructed. The sponsor has an interest in extending the service life of the dam and meeting applicable safety and performance standards. The sponsor recognizes that the process of rehabilitating a dam takes significant advance preparation, and would like to initiate work on specific areas of planning and design of a rehabilitation project.

Although NRCS has the authority to assist the sponsor with rehabilitation of the dam identified above, NRCS resources cannot be committed to this project at this time. However, NRCS concurs with the sponsor initiating work on specific areas of planning and design of the rehabilitation project

Federal funds for a particular rehabilitation project will be equal to 65 percent of the total costs of the rehabilitation project, but will not exceed 100 percent of the actual construction costs incurred in the rehabilitation. Also, the sponsor will be responsible for acquisition of all land rights and permits. The sponsor will be responsible for 100 percent of the costs of natural resource rights and local, State, and Federal permitting. The value of non-Federal in-kind contributions can be credited to the sponsor's 35-percent share of the total eligible project cost. Previously the NRCS provided technical assistance (TA), financial assistance (FA), or both to the sponsor for works of improvement in the Brawley Wash Watershed. This project was originally authorized and installed under the [NRCS Watershed Protection and Flood Prevention Program].

According to the project plan and operation and maintenance (O&M) agreement for this project, the sponsor is responsible for the O&M of these works of improvement to assure it will function as designed and constructed. The sponsor has an interest in extending the service life of these works and meeting applicable safety and performance standards.

Although NRCS has the authority to assist the sponsor with restoring floodplains within the Project Area as identified above and herein, NRCS resources cannot be committed to this project at this time. However, NRCS concurs with the sponsor initiating work on specific areas of planning and design of the restoration project

Federal funds for a particular flood prevention and restoration works will be equal to 100 percent of the total costs of the project, and shall not exceed 100 percent of the actual construction costs incurred. Also, the sponsor will be responsible for acquisition of all land rights and permits. The sponsor will be responsible for 100 percent of the costs of natural resource rights and local, State, and Federal permitting as well as Operation & Maintenance (O&M) activities.

GOAL

The primary goal of this MOU is to establish a framework under which the sponsor may proceed with work on specific aspects of the proposed rehabilitation project.

This MOU establishes a basis for cooperation between the parties to define acceptable in-kind contributions for this project. Therefore, the parties pledge to work together with the mutual goal of rehabilitation of this project within the current limits of their respective authorities and available funding. The primary goal of this MOU is to establish a framework under which the sponsor may proceed with work on specific aspects of the proposed restoration project.

This MOU establishes a basis for cooperation between the parties to define acceptable in-kind contributions for this project. Therefore, the parties pledge to work together with the mutual goal of flood prevention and restoration of this project within the current limits of their respective authorities and available funding.

SCOPE OF MOU

The sponsor may provide all or a portion of the sponsor's 35-percent share of the total eligible project cost by providing in-kind contribution of services and land rights acquisition. NRCS and sponsors agree that the following services and the maximum in-kind credit values may be considered for credit to the sponsor's share of the total rehabilitation cost of this project:

The sponsor must provide NRCS with documentation of the actual costs incurred for the services for determination of final credit values. The value of land rights must be determined by a professional land appraiser.

LIMITATIONS

The in-kind credit values shown above will be the maximum to be considered for the above-stated services and land rights (unless later amended and agreed to by both parties).

The technical quality of the services provided must be concurred with by NRCS prior to in-kind credit being given.

Only services and land rights acquisition provided by the sponsor after November 9, 2000 (date of enactment of Public Law 106-472), will be credited.

The in-kind credit values will not exceed 35 percent of the total costs of the rehabilitation project described above.

The sponsors will receive no cash reimbursement or credit for in-kind contributions that exceed this amount.

The sponsors are responsible for the cost of water, mineral, and other resource rights; all Federal, State, and local permits; and operation and maintenance, none of which are considered part of the total eligible project cost and none of which may be credited for the sponsor's cost share.

No credit for in-kind contributions will be given for sponsors' actions normally needed for carrying out their previously assigned responsibilities for this project.

This MOU is not a fund obligating document.

There is no guarantee that funds will be appropriated by Congress for the dam rehabilitation project described in this MOU.

There is no guarantee that, if funds are appropriated by Congress, the dam rehabilitation project described in this MOU will be given any priority for completion by NRCS.

There is no guarantee that, if the dam rehabilitation project described in this MOU is selected as a NRCS priority rehabilitation project, the alternatives currently considered by the sponsor will be the recommended or selected alternative. Determination of the final amounts to be credited shall be at the sole discretion of NRCS.

All actions taken and costs incurred by the sponsor prior to the time of the approval of the rehabilitation plan will be entirely at its own risk. Therefore, there is no guarantee, implied or otherwise, that any services or land rights provided by the sponsor will be credited as an in-kind contribution. The in-kind credit values shown above will be the maximum to be considered for the above-stated services and land rights (unless later amended and agreed to by both parties).

The technical quality of the services provided must be concurred with by NRCS prior to in-kind credit being given.

Only services and land rights acquisition provided by the sponsor after November 9, 2000 (date of enactment of Public Law 106-472), will be credited.

The sponsors will receive no cash reimbursement or credit for in-kind contributions that exceed this amount if such are found to apply.

The sponsors are responsible for the cost of water, mineral, and other resource rights; all Federal, State, and local permits; and operation and maintenance, none of which are considered part of the total eligible project cost and none of which may be credited for the sponsor's cost share.

No credit for in-kind contributions will be given for sponsors' actions normally needed for carrying out their previously assigned responsibilities for this project.

This MOU is not a fund obligating document.

There is no guarantee that funds will be appropriated by Congress for the flood prevention and restoration project described in this MOU.

There is no guarantee that, if funds are appropriated by Congress, the flood prevention and restoration project described in this MOU will be given any priority for completion by NRCS.

There is no guarantee that, if the flood prevention and restoration project described in this MOU is selected as a NRCS priority project, the alternatives currently considered by the sponsor will be the recommended or selected alternative. Determination of the final amounts to be credited shall be at the sole discretion of NRCS.

All actions taken and costs incurred by the sponsor prior to the time of the approval of the rehabilitation plan will be entirely at its own risk. Therefore, there is no guarantee, implied or otherwise, that any services or land rights provided by the sponsor will be credited as an in-kind contribution

Nondiscrimination Provisions

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW., Washington, DC 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

By signing this agreement the recipient assures the Department of Agriculture that the program or activities provided for under this agreement will be conducted in compliance with all applicable Federal civil rights laws, rules, regulations, and policies.

TERMINATION

This MOU can be modified or terminated at any time by mutual consent of both parties or can be terminated by either party giving 60 days written notice to the other party.

Keisha L. Tatem

Date

State Conservationist

Natural Resources Conservation Service

230 N. First Avenue, Suite 509,

Phoenix, Arizona 85003-1733

Eric Shepp, Director

Date

Regional Flood Control District

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ACRONYMS, ABBREVIATIONS, AND SHORT-FORMS

AAC	Arizona Administrative Code
ACHP	Advisory Council on Historic Preservation
ADEQ	Arizona Department of Environmental Quality
AGFD	Arizona Game and Fish Department
APE	Area of Potential Effects (for Cultural Resource Evaluation)
ARHP	Arizona Register of Historic Places
ASLD	Arizona State Land Department
ASM	Arizona State Museum
ASTL	Arizona State Trust Land
AVCA	Altar Valley Conservation Alliance
AZNPL	Arizona Native Plant Law
AZPDES	Arizona Pollutant Discharge Elimination System
BCC	Birds of Conservation Concern
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMPs	Best Management Practices
BOR	U.S. Bureau of Reclamation
CAAA	Clean Air Act Amendments of 1990
CAP	Central Arizona Project
CAVSARP	Central Avra Valley Storage and Recovery Project
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CLOMR	Conditional Letter of Map Revision
CLS	Conservation Lands System
CO	carbon monoxide

COT	City of Tucson
CWA	Clean Water Act
DEUR	Declaration of Environmental Use Restriction
EAD	Expected Annual Damages
EO	Executive Order
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
FGDC	Federal Geographic Data Committee
FONSI	Finding of No Significant Impact
FRS	Flood Retarding Structure
FWOFI	Future without Federal Investment
GM	General Manual
H&H	hydrologic and hydraulic
HUC	Hydrologic Unit Code
IBA	Important Bird Areas
ICZ	Important Interconnectivity Zones
IGA	Intergovernmental Agreement
IPaC	Information, Planning, and Conservation
IRA	Important Riparian Areas
MBTA	Migratory Birds Treaty Agreement
MSCP	Multi-Species Conservation Plan
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standards
NCRPH	National Cultural Resources Procedures Handbook
NEE	National Economic Efficiency

NEP	Non-essential Experimental Population
NEPA	National Environmental Policy Act
NGO	non-governmental organization
NHPA	National Historic Preservation Act of 1966
NLCD	National Land Cover Database
NOI	Notice of Intent
NPPO	Native Plant Protection Ordinance
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NWPH	National Watershed Program Handbook
NWPM	National Watershed Program Manual
PA	Problem Area(s)
PCRFCDD	Pima County Regional Flood Control District
PR&G	Principles, Requirements and Guidelines for Water and Land Related Resources Implementation Studies
Plan-EA	Brawley Wash Watershed Plan and Environmental Assessment
PL	Public Law
PM10	Particulate Matter 10 micrometers
RRH	Regulated Riparian Habitat
RWA	Rapid Watershed Assessment
RWP	Relatively Permanent Water
SAVSARP	Southern Avra Valley Storage and Recovery Project
SDCP	Sonoran Desert Conservation Plan
SFHA	Special Flood Hazard Areas
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Office

SIP	State Implementation Plans
SLO	Sponsoring Local Organization
SWPPP	Stormwater Pollution Prevention Plan
T&E	threatened and endangered
THPO	Tribal Historic Preservation Office
TN	Technical Notes
TNW	Traditionally Navigable Water
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
UST	Underground Storage Tanks
Watershed	Brawley Wash Watershed Project area
WOTUS	Waters of the United States
WWP	Watershed Work Plan

OFFICE OF MANAGEMENT AND BUDGET (OMB) FACT SHEET

Summary Watershed Plan and Environmental Assessment Document For The Pima County Regional Flood Control District Brawley Wash Watershed Pima County, Arizona, Congressional District 06 and 07	
Authorization	This watershed work plan and environmental assessment was prepared under authority of the Watershed Protection and Flood Prevention Act of 1954 (Public Law 83-566 Stat 666 as amended (16-U.S.C. Section 1001 et. Seq.) as amended.
Lead Sponsor	Pima County Regional Flood Control District (PCRFCF)
Proposed Action	The goal of the Project is to provide for the restoration of historic drainage flow patterns at specific locations within the Project by completing limited earthwork that includes the partial removal of various abandoned agricultural or man-made embankment/berms located in Pima County, Arizona, with the additional benefit of reducing flood damages. The project would involve installing small water harvesting basins behind the notched berms to restore natural flow patterns.
Federal Objective	The Federal Objective as set forth in the Water Resources Development Act of 2007 specifies that “Federal water resources investments shall reflect national priorities, encourage economic development, and protect the environment by (1) seeking to maximize sustainable economic development; (2) seeking to avoid the unwise use of floodplains and flood-prone areas and minimizing adverse impacts and vulnerabilities in any case in which a floodplain or flood-prone area must be used; and (3) protecting and restoring the functions of natural systems and mitigating any unavoidable damage to natural systems.” The project would address the following PL 83-566 authorized Federal purpose – flood prevention (flood damage reduction) – as listed in Title 390, NWPM, Part 500, Subpart A, Section 500.3.
Purpose and Need for Action	The Brawley Wash Watershed Plan and Environmental Assessment (Plan-EA) is being prepared to provide flood restoration, erosion, sediment, and flood damage reduction benefits for the watershed. The Brawley Wash Watershed has experienced adverse impacts to the natural drainage flow patterns and native habitat due to recent human related activities. These adverse impacts have altered the natural drainage flow patterns such that the watershed is experiencing sheet flow flooding, erosion of natural channels, and sedimentation issues throughout the watershed study area.
Description of the Preferred Alternative	The preferred alternative consists of three separate locations for works of improvement within the Brawley Wash Watershed. They all function to restore disturbed areas, restore the floodplain and natural flow patterns, and to provide downstream benefit resulting from reduced flood depths. Proposed improvements include partial removal of abandoned or other man-made earthen berms, Natural Infrastructure for Dryland Systems (NIDS aka water harvesting catchments), and construction of earthen diversion berm.
Mitigation, Minimization, and	The proposed action does not result in negative economic impacts that need to be mitigated for the selected preferred alternative.

Avoidance Measures	A project-specific environmental care plan should be developed for each site. At a minimum, the Plan will address preservation of existing native species and special status species; control of invasive species; and restoration strategies. Contractor and Design Team training: • Prior to the start of construction, all team members that will be on site shall be provided with site-specific information covering the environmental care plan. It is essential that everyone on site understands the project goals and considerations – this will help compliance with staying within the designated construction areas and having increased awareness on the site to stop the spread of invasive species. The Sponsor has successfully implemented these strategies for several recent projects. Preservation of existing native species and special status species: • Prior to site development, the project area should be surveyed for the presence of any special status species as well as areas of native species to be preserved in place. Vegetation is very difficult to establish on these sites – all efforts should be made to preserve the native plants that are there. • Construction staging areas and haul roads should be clearly defined and delineated in the field. This will help to limit the complication of soils, maintain areas of native vegetation to be preserved, and limit the spread of invasives. Control of invasive species: • Prior to any site disturbance, and continuing throughout construction, targeted invasive species should be eliminated within the construction area so that plants and seeds are not spread. • Contractor training to include target species recognition, understanding of seasonality, and protocol upon encountering target species are required in addition to physical controls such as vehicle washing and herbicide control. Restoration Strategies: • All disturbed project areas should be seeded with a site-specific native seed mix that includes species that will rapidly colonize and help prevent the invasion of exotic species. • Former efforts have shown that seeding must be integrated with water harvesting strategies to be successful. Prior to seeding, soil shall be pitted or otherwise roughened. Branch mulching or similar strategies shall be used to shade the soil, protect seedlings, and help trap moisture. • Resource islands of native plants shall be preserved in place, or where none exists, incorporated as part of the restoration efforts. • Monitoring and manual / herbicide treatment of invasives will be required during and beyond landscape establishment. Cultural resources: • The PCRFCDD has committed to avoiding all NRHP- and ARHP-eligible cultural resources. This will be accomplished through site-specific project design and the installation of avoidance measures, such as fencing will be maintained and inspected throughout construction. • If cultural and historic property, including human remains, are encountered during construction, an Inadvertent Discovery Plan, produced by Pima County or a qualified contractor working under the direction of the NRCS archaeologist, would be followed. Discovery protocol would be compliant with 36 CFR 800.13 (Section 106 Process, Post-review Discoveries) and Arizona Revised Statutes (ARS) 41-844 and ARS 41-865
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	(Arizona’s burial discovery laws applicable to state/municipal lands and private lands, respectively).		
	Migratory Birds		
	• If vegetation clearing in the Problem Areas is expected to take place during the nesting season (i.e., between mid-February and late September, with the nesting season for raptors being January through late June), nesting bird surveys and measures to protect active nests from destruction should be taken to avoid a violation of the MBTA. • If burrowing owls occur in the Problem Areas and active burrows cannot be avoided with a minimum 100-foot buffer until their nests become inactive, they may be relocated by Wild at Heart, a raptor rescue organization that provides capture, care, and relocation services.		
PROJECT AREA RESOURCE INFORMATION			
Subwatershed Name	12-digit Hydrological Unit Code	Latitude/Longitude Midpoint	Watershed Size
South Mendoza Wash	150503040403	31.991773/-111.441458	11,632.3 acres
Soto-Wash-Brawley Wash	150503040405	31.993245/-111.324721	25,978.5 acres
Town of Three Points	150503040504	32.061553/-111.274168	25,730.2 acres
Black Tank-Brawley Wash	150503040506	32.124866/-111.333564	15,439.4 acres
White Tank-Brawley Wash	150503040508	32.247941/-111.291221	51,169.3 acres
Lower Blanco Wash	150503040604	32.363094/-111.364179	35,233.2 acres
Los Robles Wash	150503040605	32.465718/-111.405374	28,135.4 acres
Watershed Name	10-digit Hydrological Unit Code	Latitude/Longitude Midpoint	Watershed Size
Upper Brawley Wash	1505030404	31.98824599/ -111.41164444	37,670.0 acres
Lower Brawley Wash	1505030405	32.16708999/ -111.21692355	92,339.6 acres

Los Robles Wash	1505030406	32.35401260/ -111.38950298	68,368.0 acres
Pima County Regional Flood Control District Size	5,880,960 acres		
Size of Brawley Wash Watershed Project Area	198,000 acres		
General Ecological Conditions	The Brawley Wash Watershed study area (hereafter referred to as the “project area”) located within the Sonoran Desert, spans 4,300 feet of elevation change and includes six plant communities. The plan area has a long history of ranching and agriculture use. Overgrazing, beginning in the 1800s has resulted in denuded areas and significant erosion.		
Elevation and Topography	The Brawley Wash Watershed Study Area (hereafter referred to as the “project area”) located within the Sonoran Desert, spans approximately 4,300 feet of elevation change and includes six plant communities. The plan area has a long history of ranching and agriculture use. Overgrazing, beginning in the 1800s, has resulted in denuded areas and significant change.		
Climate	Annual high temperature – 84° F Annual low temperature – 58° F (https://www.usclimatedata.com/climate/tucson/arizona/united-states/usaz0247)		
Average Annual Precipitation/ Snowfall	Rainfall – 11.92 inches Snowfall – 0 inches (https://www.usclimatedata.com/climate/tucson/arizona/united-states/usaz0247)		
Land Use in the Pima County Watershed Project area (198,000 acres)	Use	Acres	
	Agricultural/Rural	136,681	
	Reserve Lands	36,680	
	Residential	18,488	
	Undeveloped Open Space	4,997	
	Industrial	1,386	
Land Ownership in the Brawley Wash Watershed	Use	Acres	
	BLM	33,137	
	Tribal Lands	6,478	

Project area (198,000 acres)	Military	108	
	Private	73,956	
	State (ASLD)	77,268	
	National Park Service	5,338	
	State Wildlife Area	1,187	
	Bureau of Reclamation	623	
	Local or State Parks	40	
	Pima County	31	
PROJECT AREA RESOURCE INFORMATION (continued)			
Population and Demographics	Population statistics are not available specifically for the planning area; however, the nearby communities of Avra Valley, Picture Rocks, and Three Points have an estimated combined population of 20,639 based on 2021 2022 U.S. Census data. - White: 84.068 % - Hispanic or Latino (of any race): 31.925% - Black or African American: 0.6 3 % - American Indian/Alaskan Native: 1.30.4% - Asian: 1.20.5% - Native Hawaiian/Other Pacific Islander: 0% - Some Other Race: 10.50% - Two or More Races: 4.45%		
		Pima County	Arizona
	Population	1,042,393	7,172,282
	Unemployment Rate	3.8%	4%
	Median Household Income	\$67,929	\$76,872
Relevant Resource Concerns	Resource concerns were determined to remain relevant in the study area through detailed study of data gathered and input received during the scoping phase include: - Soils and geologic characteristics, stream bank and upland erosion, sedimentation - Hydrology and floodplain management - Ponding and flooding		

	• Air quality • Vegetation communities/habitat, invasive species • Terrestrial habitat for wildlife and invertebrates • Land use, recreation, public health and safety, socioeconomics • Sheet and rill erosion, Ephemeral gully erosion
ALTERNATIVES ANALYZED	
The process of formulating alternatives followed the Council of Environmental Quality's (CEQ's) regulations for implementing NEPA and the procedures outlined in the U.S. Department of Agriculture (USDA), NRCS National Watershed Program Manual (NWPM; NRCS 2015) Parts 500 through 506, USDA-NRCS National Watershed Program Handbook (NWPB; NRCS 2014) Parts 600 through 606, and other recent USDA-NRCS watershed planning policies, including NRCS Circular 290-21-1 and USDA Departmental Manual 9500-013. <u><i>Alternatives Dismissed</i></u> Out of fifteen (15) alternatives in consideration, twelve (12) alternative components were dismissed. Four of the seven (4 of 7) problem areas were initially evaluated with the Sponsor, stakeholders, project planning team, and input from the public. Problem Areas No. 3 and 4 were removed from consideration by request of the cooperating agency (Tucson Water), CAVSARP given potential adverse impacts to existing critical facilities. Concepts that were not viable solutions, did not align with the purpose and need for action, Federal Objective, and PR&G Guiding Principles were removed from further consideration. Concepts meeting the initial criteria underwent a feasibility assessment evaluating costs, logistics, existing technology, and environmental factors to eliminate alternatives from consideration. Some alternatives were combined to create an alternative that addressed the purpose and need statement, Federal Objective, and authorized project purpose (NWPM 501.37, PR&G 6.5b). Three (3) alternatives were defined and analyzed to discern and compare the merits and disadvantages of each. <u><i>No Action Alternative (Future without Federal Investment)</i></u> The No Action Alternative or FWOFI consists of current conditions with no flood prevention improvements in the project area, and flooding and erosion on a regional scale would not be mitigated. Flood risks would continue as they currently exist. No construction or permits would be required, nor would there be a need for ongoing maintenance of flood prevention facilities; leaving Pima County and the City of Tucson (COT) to respond with real-time emergency and clean-up actions during and after flood events. The responsibility for damage repairs and cleanup may also fall on private residential and agricultural landowners. Costs would include as-needed field visits, public relations, and damage cleanup and mitigation "after-the-fact." The No Action Alternative does not meet the purpose and need or align with the Federal Objective for the project as it would not provide attenuation or conveyance of floodwaters and does not prevent flood events from damaging residential and agricultural properties or public infrastructure. This alternative leaves the PCRFCO open to continued severe floodwater and sediment damages from major flood events and fails to provide a regional flood control solution for the project area. As development continues in the area without a local or regional solution, anticipated damages to properties and associated costs would likely continue to occur over time. While the No Action Alternative would not meet the purpose and need for the project, it is required under NEPA to be included in an environmental analysis as a baseline for which to compare impacts with the other alternatives. <u><i>Problem Area No. 1 – Buckelew West - Alternatives 1 and 2</i></u> This 616-acre abandoned agricultural field borders ADEQ wetlands on the problem area's northern and eastern boundary. Buckelew West lies within the immediate left overbank of Brawley Wash diverting natural flow around the perimeter of the problem area increasing flow depths and potentially erosive conditions within the main wash. The first alternative considered would result in the restoration of disturbed area(s) through partial removal of the existing agricultural embankment (a.k.a. berm). A second alternative of this problem area was based on the first alternative but also included the incorporation of NIDS located throughout the abandoned field. Both alternatives were eliminated due to high implementation costs and low cost benefit ratio. <u><i>Problem Area No. 2 – Tortuga Ranch - Alternative 1 (Preferred Alternative)</i></u> This site includes a linear feature (i.e., embankment) and after discussions with the Sponsor, the alternative found to be applicable to resolve restoration of historic flow paths, was the restoration of disturbed areas via partial removal of	

the man-made earthen embankment.

Problem Area No. 3 – CAVSARP West

This 1,400-acre site is located on an abandoned agricultural field. The western and eastern boundary of this area collects and diverts surface flow along the perimeter of the facility, increased erosion is the result of this condition. Site was removed from further consideration by request by cooperating agency (CAVSARP), given potential adverse impacts to existing critical facilities.

Problem Area No. 4 – CAVSARP South

This 1,070-acre site is located on an abandoned agricultural field Site was removed from further consideration by request by cooperating agency (CAVSARP), given potential adverse impacts to existing critical facilities.

Problem Area No. 5 – Cactus Avra - Alternatives 1, 2 and 3

This 4,700-acre site is located on abandoned agricultural field(s) located near Manville Road. Three individual alternatives related to this site were considered and included: 1) restore disturbed areas, 2) restore disturbed areas and incorporate diversion channels and/or berms and 3) restore disturbed areas and incorporate NIDs at designated locations. However, after initial hydraulic model, review of the results and the resulting low benefit-cost ratio(s), this site and all related alternatives were eliminated due to high implementation costs and low cost benefit ratio.

Problem Area No. 6 – Prickle Desert - Alternatives 1, 2 and 3 (Alternative 3 is the Preferred Alternative)

This 160-acre abandoned agricultural field was evaluated for three alternatives that included: 1) restore disturbed areas, 2) restore disturbed areas and incorporate diversion channels and/or berms and 3) restore disturbed areas and incorporate NIDs at designated locations.

Problem Area No. 7 – Tucker Road - Alternatives 1 and 2 (Alternative 1 is the Preferred Alternative)

This 480-acre abandoned agricultural field borders Blanco Wash along its western line. Deep stream erosion occurs within this named wash and the alternatives considered for this site included: 1) restore disturbed areas, 2) restore disturbed areas and incorporate diversion channels and/or berms and 3) restore disturbed areas and incorporate NIDs at designated locations.

Tortuga Ranch (PA2) – Alternative 1

Preferred Alternative Costs	PL 83-566 Funds		Sponsor(s)		Total Cost
<i>Cost-Shareable Items</i>	<i>%</i>	<i>Cost</i>	<i>%</i>	<i>Cost</i>	<i>Cost</i>
List measures by purpose and rate of assistance ^{1/}					
Stormwater Construction (Channels and Bank Rehab)	0%	\$0	0%	\$0	\$0
Floodplain Easements (0 acres)	0%	\$0	0%	\$0	\$0
Land Treatment Measures	100%	\$1,102,800	0%	\$0	\$1,102,900
Mitigation	100%	\$54,800	0%	\$0	\$54,800
Real Property Acquisition Cost	0%	\$0	0%	\$0	\$0
Real Estate Appraisal Fees	0%	\$0	0%	\$0	\$0
Relocation ^{2/}	0%	\$0	0%	\$0	\$0
Sponsors Engineering Costs	0%	\$0	100%	\$5,000	\$5,000

Subtotal: Cost-Sharable Costs	>99%	\$1,157,600	<1%	\$5,000	\$1,162,600
<i>Non-Cost-Sharable Items</i> ^{3/}					
NRCS Technical Assistance/Engineering	100%	\$57,600	0%	\$0	\$57,600
Project Administration ^{4/}	N/A	\$5,800	N/A	\$5,800	\$11,600
Water, Mineral, and Other Resource Rights ^{5/}	0%	\$0	0%	\$0	\$0
Permits ^{5/}	0%	\$0	100%	\$15,000	\$15,000
Real Property Rights ^{5/}	0%	\$0	0%	\$0	\$0
Relocation, Beyond Required Decent, Safe Sanitary ^{6/}	0%	\$0	0%	\$0	\$0
Subtotal: Non-Cost-Sharable Costs	75%	\$63,400	25%	\$20,800	\$84,200
Grand Total	99%	\$1,221,000	1%	\$25,800	\$1,246,800
Installation costs explanatory notes:					
Prickle Desert (PA6) – Alternative 3					
Preferred Alternative Costs	PL 83-566 Funds		Sponsor(s)		Total Cost
<i>Cost-Shareable Items</i>	<i>%</i>	<i>Cost</i>	<i>%</i>	<i>Cost</i>	<i>Cost</i>
List measures by purpose and rate of assistance ^{1/}					
Stormwater Construction (Channels and Bank Rehab)	0%	\$0	0%	\$0	\$0
Floodplain Easements (0 acres)	0%	\$0	0%	\$0	\$0
Land Treatment Measures	100%	\$2,590,900	0%	\$0	\$2,590,900
Mitigation	100%	\$32,000	0%	\$0	\$32,000
Real Property Acquisition Cost	0%	\$0	0%	\$0	\$0
Real Estate Appraisal Fees	0%	\$0	0%	\$0	\$0
Relocation ^{2/}	0%	\$0	0%	\$0	\$0
Sponsors Engineering Costs	0%	\$0	100%	\$11,700	\$11,700
Subtotal: Cost-Sharable Costs	>99%	\$2,622,900	<1%	\$11,700	\$2,634,600
<i>Non-Cost-Sharable Items</i> ^{3/}					
NRCS Technical Assistance/Engineering	100%	\$134,500	0%	\$0	\$134,500

Project Administration ^{4/}	N/A	\$13,100	N/A	\$13,100	\$13,100
Water, Mineral, and Other Resource Rights ^{5/}	0%	\$0	0%	\$0	\$0
Permits ^{5/}	0%	\$0	100%	\$15,000	\$15,000
Real Property Rights ^{5/}	0%	\$0	0%	\$0	\$0
Relocation, Beyond Required Decent, Safe Sanitary ^{6/}	0%	\$0	0%	\$0	\$0
Subtotal: Non-Cost-Sharable Costs	84%	\$147,600	16%	\$28,100	\$175,700
Grand Total	99%	\$2,770,500	1%	\$39,800	\$2,810,300
Installation costs explanatory notes:					

Tucker Road (PA7) – Alternative 1					
Preferred Alternative Costs	PL 83-566 Funds		Sponsor(s)		Total Cost
<i>Cost-Shareable Items</i>	%	Cost	%	Cost	Cost
List measures by purpose and rate of assistance ^{1/}					
Stormwater Construction (Channels and Bank Rehab)	0%	\$0	0%	\$0	\$0
Floodplain Easements (0 acres)	0%	\$0	0%	\$0	\$0
Land Treatment Measures	100%	\$475,000	0%	\$0	\$475,000
Mitigation	100%	\$468,500	0%	\$0	\$468,500
Real Property Acquisition Cost	0%	\$0	0%	\$0	\$0
Real Estate Appraisal Fees	0%	\$0	0%	\$0	\$0
Relocation ^{2/}	0%	\$0	0%	\$0	\$0
Sponsors Engineering Costs	0%	\$0	100%	\$1,800	\$1,800
Subtotal: Cost-Shareable Costs	>99%	\$943,500	<1%	\$1,800	\$945,300
<i>Non-Cost-Shareable Items ^{3/}</i>					
NRCS Technical Assistance/Engineering	100%	\$20,300	0%	\$0	\$20,300
Project Administration ^{4/}	N/A	\$4,700	N/A	\$4,700	\$9,400
Water, Mineral, and Other Resource Rights ^{5/}	0%	\$0	0%	\$0	\$0
Permits ^{5/}	0%	\$0	100%	\$15,000	\$15,000

Real Property Rights ^{5/}	0%	\$0	0%	\$0	\$0
Relocation, Beyond Required Decent, Safe Sanitary ^{6/}	0%	\$0	0%	\$0	\$0
Subtotal: Non-Cost-Sharable Costs	56%	\$25,000	44%	19,700	\$44,700
Grand Total	98%	\$968,500	2%	\$21,500	990,000

Installation costs explanatory notes:

1/ Installation costs explanatory notes:

(a) The cost-share rate is the percentage of the average cost of installing the practice in the selected plan for the evaluation unit. During project implementation, the actual cost-share rate must not exceed the rate of assistance for similar practices and measures under existing national programs.

2/ Relocation payments and assurances explanatory notes:

(b) Includes replacement in-kind, and payments necessary to meet decent, safe, and sanitary provisions. Percentages for cost-sharing will be based upon the cost-share rate of the project purpose requiring the relocation. The relocation assistance advisory services cost is to be included when computing the cost-sharing percentages. These percentages are to be used for the life of the project regardless of future changes or supplements.

(c) Investigation of the watershed project area indicates that no displacements will be involved under present conditions. However, in the event that displacement becomes necessary at a later date, the cost of relocation assistance and payments will be cost-shared in accordance with the percentages shown.

3/ If actual non-cost-sharable item expenditures vary from these figures, the responsible party will bear the change.

4/ The Sponsor(s) and NRCS will each bear the costs of project administration that each incurs. Sponsor costs for project administration include relocation assistance advisory service.

5/ The Sponsor(s) will acquire, with other than Watershed Protection and Flood Prevention Act funds, such real property as will be needed in connection with the works of improvement. The value of real property is eligible as in-kind contributions toward the Sponsors' share of the works of improvement costs. In no case will the amount of an in-kind contribution exceed the Sponsors' share of the cost for the works of improvement. The maximum cost eligible for in-kind credit is the same as that for cost sharing.

6/ Relocation payments for the cost of improvements beyond decent, safe and sanitary requirements is a non-project cost ineligible for assistance under the act.

PROJECT BENEFITS	DESCRIPTION
Project Benefits	The Preferred Alternative would restore historic flow of Brawley Wash Watershed providing flood reduction and long-term net-beneficial effects on provisioning, regulating, and cultural ecosystem services. Specifically, it would provide increased pollinator habitat, reduce the risk of urban and agricultural flood damage, reduce the level of erosion and sedimentation, increase opportunities for recreation, community cohesion, and quality of life.
Number of Direct Beneficiaries	The project directly benefits approximately 41 residential structures by removing them from the 100-year inundation boundary and protects at least 102 people assuming an average household size of 2.5.
Other Beneficial Effects	The Preferred Alternative would provide long-term net beneficial effects on environmental, social, and economic resources, supporting the health and resiliency of the ecosystem of Brawley Wash Watershed. Flood damage reduction costs benefit is estimated to be \$216,700 annually. Additional benefits offer positive economic benefits including protection of downstream agricultural crops, reduced emergency management costs, reduced flood damages, and improved public health and safety.

Annualized Monetary Benefits	\$216,700		
Flood protection - Urban	N/A		
Flood protection - Agricultural	\$216,700 (add footnote: Because all floodwater damage occurs within rural communities, all damages are considered agricultural-related.)		
Net Annual Cost	\$192,090		
Annualized Net Benefits (National Economic Efficiency [NEE])	\$24,610		
Benefit to Cost Ratio (authorized)	1.13		
Benefit to Cost Ratio (current)	1.13		
Fiscal Year 2024 Discount Rate	2.75%		
Installation Period	2 years		
Period of Analysis	52 years		
Evaluated Project Life	50 years		
Funding Schedule			
	PL 83-566	Other Funds	Total
Preferred Alternative (Total)			
Preferred Alternative (Year 1)			
Preferred Alternative (Year 2)			
<i>* These are estimates only and are subject to change depending upon timing of construction, timing of land acquisition, and other unforeseen circumstances that could affect the timing of implementation.</i>			
ENVIRONMENTAL EFFECTS			
The Preferred Alternative would be planned, designed, and installed to have long-term net beneficial effects on residential and infrastructure protection, agricultural production, and public safety. Short-term and long-term adverse effects are anticipated through implementation of the Preferred Alternative during the construction phase. Short-term adverse effects may include impacts to disturbed soils, vegetation and wildlife. Long-term adverse effects may occur in the soil and vegetation where construction occurs. The Sponsor would work closely with partners, contractors, and affected parties to incorporate measures to avoid and minimize short and long-term adverse impacts. More detailed discussions of each potentially impacted resource and the corresponding issues are provided below.			
ENVIRONMENTAL EFFECTS			
Resource	Issue	Discussion	
Soils and Geology (Section 4.1)			

Soils (Section 4.1.2)	Soils have been identified as a resource concern in the project area.	The Preferred Alternative would have an impact on soils in the action area (defined as the area where direct and indirect impacts could occur from the Preferred Alternative) during construction. However, it would not impact soil composition, and most impacts would be temporary during construction.
Stream Bank and Upland Erosion (Section 4.1.3)	Stream bank and upland erosion occurs within the project area but in general at isolated locations.	A detailed evaluation and assessment of stream banks and upland erosion were not undertaken for the area within the project area.
Sedimentation (Section 4.1.4)	Severe erosion and sedimentation in areas with constructed embankments that are no longer maintained. Natural flow patterns are affected.	The three preferred alternatives would help restore natural flow patterns, reduce erosion and sedimentation issues in the project vicinity. An Alternative Analysis Report has been prepared for this project and is provided in Appendix D.3, but such did not evaluate or analyze sedimentation or sediment transport.
Prime and Unique Farmland (Section 4.1.6)	Prime farmland is mapped by NRCS in all three Problem Areas.	No impacts to prime farmland would occur because the proposed work in the Problem Areas would not result in the unnecessary and irreversible conversion of farmland to nonagricultural uses.
Water Resources (Section 4.2)		
Hydrology and Surface Water (Section 4.2.1)	Severe erosion and sedimentation in areas with constructed embankments that are no longer maintained. Natural flow patterns are affected.	The three preferred alternatives would help restore natural flow patterns, reduce erosion and sedimentation issues in the project vicinity. An Alternative Analysis Report has been prepared for this project and is provided in Appendix D.2.
Surface Water Quality (Section 4.2.2)	Surface Water Quality is not at risk for the three Problem Areas.	Surface water quality sampling and/or testing was not undertaken mainly due to Brawley Wash being an ephemeral stream and therefore only flows after rainfall events.
Regional Water Management Plans (Section 4.2.3)	Multiple regional water management plans were identified within the Problem Areas.	The study area is within several jurisdictional boundaries of city, county, state, and utilities. Agencies will coordinate regional water management plans within their limits. Interagency coordination is anticipated for overlapping boundaries.
Waters of the U.S. (Section 4.2.4)	Ephemeral surface water features modeled by NWI are present in Problem Areas 2 and 7 that are potential WOTUS	There are no modeled features or potential WOTUS in Problem Area 7. The modeled NWI ephemeral R4SBC feature in Problem Area 2 and R5UBFx feature in Problem Area 7 would likely not be considered WOTUS because both features are likely not relatively permanent, and the latter feature is a human-made ditch excavated in uplands likely excluded from jurisdiction under 33 CFR 328.3(B)(3). No

		disturbance in WOTUS is anticipated because there are no WOTUS in the Problem Areas.
Wetlands and Riparian Areas <i>(Section 4.2.5)</i>	NWI-modeled wetlands are present in Problem Areas 2 and 7. Pima County IRA-C and IRA-D regulated riparian habitat is present at Problem Areas 2 and 6.	There are no modeled wetlands in Problem Area No. 6 and given the arid climate of all the Problem Areas, regulatory wetlands are unlikely to be present in Problem Areas No. 2 and 7. The IRA-C and IRA-D regulated riparian habitat present at Problem Areas 2 and 6, respectively, may be impacted by the proposed work in these two areas if vegetation is removed. However, the net impacts would be beneficial to riparian habitat because the proposed work would restore surface water flows downstream of the berms in the Problem Areas and the amount of xeroriparian habitat may increase.
Floodplain Management <i>(Section 4.2.6)</i>	In the study area, FEMA 100-year floodplain has been established by a separate Brawley Wash Floodplain Mapping Study in 2024.	Overall, the Preferred Alternatives would reduce the flooding risks adjacent to project vicinities. However, slightly increased floodplain areas might be observed by restoring natural flow patterns during construction. The preferred alternatives would be reviewed by all applicable local, state and Federal agencies to comply with floodplain regulations.
Air Quality Resources <i>(Section 4.3)</i>		
Pima County Air Quality <i>(Section 4.3.2)</i>	The study area is located in Pima County, which is in non—attainment for PM₁₀ in the form of fugitive dust from activities such as construction and agriculture occurring in previously disturbed areas.	Pima County codified air quality regulations in the Pima County Code of Ordinances (PCC), Title 17 (Pima County Code of Ordinances 2017). PCC §17.12 requires a fugitive dust activity permit for any project disturbing more than one acre of land, trenching over 300 feet, road construction over 50 feet, and blasting activities. The project activities will need to comply with all conditions of the Pima County Fugitive Dust Activity Permit.
Vegetation <i>(Section 4.4)</i>		
Vegetation Communities and Habitat <i>(Section 4.4.1)</i>	All project areas are heavily disturbed – there are no intact vegetative communities. Loss of vegetation has resulted in poor infiltration and the creation of deep gullies and arroyos.	Where native plants are present on site, they should be preserved. Resource islands of native plants shall be preserved in place, or where none exists, incorporated as part of the restoration efforts. Water harvesting strategies should be incorporated with all seeding and planting. Soil pitting, branch mulching, rock check dams or similar strategies shall be used to promote infiltration.

Special Status Plant Species (Endangered Species Act) <i>(Section 4.4.2)</i>	There are several sensitive, salvage-restricted, and USFWS listed plant species with potential mapped habitat within the project area.	Due to the highly disturbed nature of the project sites, it is unlikely that special status species are present, but mapping of project areas to be disturbed would be required.
Invasive Plant Species <i>(Section 4.4.3)</i>	Invasive plant species are present on all the project sites. The county will need to determine the species of greatest concern to treat.	Invasive species control and treatment should be planned with the initial planning for each project. Invasive species requires ongoing and repeated efforts rather than a single, one-time intervention. Areas of invasive plants with established seedbanks can take years to control. Land managers can expect reduced expenditures of hours and cost each year as the plant population is reduced, but ten years is not an unreasonable timeframe to expect to achieve near eradication. Even at this point, continual monitoring and treatment is required to keep new invasive plants from becoming established.
Wildlife <i>(Section 4.5)</i>		
General Wildlife and Wildlife Communities and Connectivity <i>(Section 4.5.1)</i>	General wildlife species may occur in the Problem Areas.	General wildlife species may use the Problem Areas to some extent; however, due to the degraded nature of the Problem Areas and the increased human activity and noise from equipment, it would be unlikely for these species to be present and impacted by the proposed activities associated with the project. In most cases following construction, the opening of berms in the Problem Areas would restore surface flows downstream of the berms in either natural or constructed channels, which could increase habitat value as the vegetation recovers in the vicinity of the channels and represent a beneficial impact on general wildlife species.
Special Status Wildlife Species (Endangered Species Act) <i>(Section 4.5.2)</i>	ESA-listed species: None of the 13 threatened, endangered, proposed, NEP, or candidates for listing wildlife species appearing on the planning area's USFWS Official Species List or the three additional species that had occurrence records or were predicted to occur based on habitat modeling within five miles of the planning area are known to occur in the Problem Areas; however, habitat research indicates that one species, the candidate monarch butterfly, has the potential to occur because the Problem Areas may contain vegetation or landscape features known to support this species.	ESA Candidate species: Milkweed plants that could be used by monarch butterflies for reproduction may be present within the Problem Areas, as well as flowering plants that this species could use while foraging. The proposed work in the Problem Areas may impact individual monarch butterflies, but it is not likely to result in a trend toward federal listing or loss of viability. Arizona Species of Greatest Conservation Need (SGCN): Due to the degraded nature of the Problem Areas and the increased human activity and noise from equipment, it would be unlikely for SGCN species to be present and impacted by the proposed activities associated with the project. In most cases following construction, the opening of berms in the Problem Areas would restore surface flows downstream of the berms in either natural or constructed channels, which could increase habitat value as the vegetation recovers in the vicinity of the channels and represent a beneficial impact on SGCN species.

	Arizona SGCN Species: There are occurrence records or modeled habitat for 143 SGCN within five miles of the planning area.	
Fish/Essential Fish Habitat (Section 4.5.3)	No issue identified.	None of the Problem Areas contain aquatic habitat suitable for fish.
Wildlife (Section 4.5)		
Migratory Birds and Eagles (Section 4.5.4)	Migratory birds, species of greatest conservation need, and eagles could occur within the project area.	Migratory Bird Treaty Act (MBTA), Bald and Golden Eagle Protection Act (BGEPA), and E.O. 13186 require NRCS to consider the impacts of planned actions on migratory bird populations and habitats for all planning activities. Migratory birds may be temporarily displaced by construction and noise during implementation. Vegetation removal or ground clearing should be avoided to the extent feasible during the migratory bird nesting season (January - September). If avoidance is not feasible, pre-construction breeding bird nest surveys and relocation are required to help avoid adverse impacts or take. A project specific USFWS Special Purpose permit may be required if burrowing owls are observed on-site. Eagles may avoid the area temporarily during construction, but the project would not result in take or adverse impacts that would result in take.
Human Environment (Section 4.6)		
Cultural and Historic Property (Section 4.6.1)	There are historic properties present in the project area.	Cultural resources, including historic properties have been identified the Area of Potential Effects (APE). Historic properties are any prehistoric or historic district, site, building, structure, or object that is included in, or eligible for inclusion in the NRHP (36 CFR 800.16l). National Historic Preservation Act (NHPA) Section 106 consultation letters were sent on December 9, 2020, August 5, 2024, and January 3, 2025 to the State Historic Preservation Office (SHPO), federal, state, local agencies and representatives, and potentially affected or interested Native American tribes regarding the undertakings potential to adversely affect historic properties. Additional land was added to the APE and surveyed on March 14, 2025 (Petersen and Hesse 2025). On May 16, 2025, NRCS resumed consultation with the SHPO, agencies, and federally recognized Native American tribes. In accordance with the Section 106 process, consultation letters were sent presenting the results of the additional Class III survey documenting NRCS made a finding of no historic properties affected. Consultations and responses were recorded to document PCRFCDD's commitment to avoid all historic properties.

Transportation and Infrastructure (Section 4.6.2)	Transportation & infrastructure could be impacted by flooding.	Transportation and infrastructure would, in general, not benefit (i.e., reduced overtopping depth during flooding) from the Preferred Alternative as it would provide conveyance of stormwaters and would reduce the possibility of road, railway, or canal closures. The possibility of a breach of the CAP Canal and erosion along the railway and roads associated with a flood event in the MMC would be reduced.
Land Use (Section 4.6.3)	No modifications to land use or land acquisitions needed in the project area.	The Preferred Alternative problem areas are all located in Pima County and owned by Tucson Water. Land acquisition would not be required. Land is primarily abandoned agricultural fields zoned as Rural Homestead (RH), the proposed improvements would not change land designation. Any Easements or Right-of-Ways would be acquired as needed.
Public Health and Safety (Section 4.6.4)	Public health and safety identified as a concern for this project.	The Preferred Alternative would reduce the risk of flooding, thereby increasing public health and safety. The Preferred Alternative would also reduce fuels in the problem areas, although this impact is not anticipated to substantially reduce fire risk in the area.
Natural Areas and Recreation (Section 4.6.5)	Recreation is not identified as a concern for this project.	The Preferred Alternatives do not contain any designated recreational areas or parks, local residents likely use wash corridors, agricultural embankments, roads and sidewalks for recreation.
Socioeconomics (Section 4.7)		
Socioeconomics (Section 4.7)	Concerns over socioeconomics have been identified for this project.	The implementation of the Preferred Alternatives is not expected to result in adverse socioeconomic effects. Instead, the project supports equitable economic resilience, particularly for populations most at risk from flood-related impacts, by reducing economic vulnerabilities and contributing to long-term community sustainability.
Local and Regional Economies (Section 4.7.2)	Concerns on how the project will impact local and regional economies.	The implementation of the three Preferred Alternatives is expected to generate both minor local and regional economic benefits. These benefits would result from reductions in flood-related damages to structures, vehicles, agricultural crops, and public infrastructure. In addition to long-term benefits, the Preferred Alternatives may result in short-term economic benefits through a temporary increase in construction-related employment.
National Economic Efficiency (NEE)		

NEE Analysis (Section 5.4.2)	Economic efficiency is a concern for this project.	A NEE analysis has been completed and can be referenced in (Section 5.4.2) as recommended by the 1983 Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies. Economic investigations and analyses can be referenced in <i>Appendix D.1</i>. The analysis has been completed in compliance with: • 1983 Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies • Principles and Requirements for Federal Investments in Water Resources (2013) and Interagency Guidelines (2014) (PR&G) • Guidance for Conducting Analyses under the PR&G for Water and Land Related Resources Implementation Studies and Federal Water Resources Investments (2017)
Ecosystem Services and Trade Offs		
Provisioning Services (Section 4.8.1)		
Wildlife Corridor	Wildlife corridors identified as a provisioning service.	The Preferred Alternative would temporarily displace wildlife during construction and restoration activities. Wildlife is expected to return to the area in the long-term. The Preferred Alternative would have no long-term effect on wildlife corridors.
Pollinator Habitat	Pollinator habitat identified as a provisioning service.	The Preferred Alternative would provide pollinator habitat enhancement on approximately 14.3 acres through re-seeding in strategic areas after project construction is complete to benefit insects like monarch butterfly (<i>Danaus plexippus</i>) and honeybees.
Water Quality and Quantity	Water quality and quantity identified as a provisioning service.	The Preferred Alternative would improve water quality through the restoration of more natural floodplain function. Water would move slower through the system, allowing it to be absorbed by vegetation, which helps to improve water quality. The slower-moving water will also allow some water to remain in the system, increasing water quantity.
Regulating Services (Section 4.8.2)		
Urban and Agricultural Flood Damage Reduction	Flood damage reduction identified as a regulating service.	The Preferred Alternative provides reduced risk of future flooding from impacting residential and agricultural properties and public infrastructure and over \$216,700 in expected annual damage savings. The Preferred Alternative would reduce the risk of urban and agricultural flooding through the restoration of more natural floodplain function. Water would expand over a

		larger area into a sheet-flow instead of a channelized flow, thereby reducing the risk of flooding.
Erosion Control	Erosion control identified as a regulating service.	The Preferred Alternative would provide decreased erosion and sedimentation through the restoration of more natural floodplain function. Water would expand over a larger area into a sheet-flow instead of a channelized flow, thereby reducing the risk of erosion.
Cultural Services (<i>Section 4.8.3</i>)		
Recreation	Recreation identified as a cultural service.	The Preferred Alternative would reduce impacts from flooding and erosion on recreational activities. Restoration of the natural floodplain would allow for an enhanced recreation experience.
Community Cohesion	Community cohesion identified as a cultural service.	The Preferred Alternative would reduce impacts from flooding and erosion, thereby increasing community cohesion.
Quality of Life	Quality of life identified as a cultural service.	The Preferred Alternative would reduce impacts from flooding and erosion and enhance recreational experiences, thereby increasing quality of life for the surrounding communities.

OMB FACTSHEET SUMMARY	
Major Conclusions	Selection of the Preferred Alternative, Problem Area No. 2 (Alternative 1), Problem Area No. 6 (Alternative 3), and Problem Area No. 7 (Alternative 1) are collectively based on the ability to meet the purpose and need for the project and provide the most beneficial impacts to health and human safety, environment, and social resources through flood damage reduction measures. The Preferred Alternative would reduce damages to residences, infrastructure, agricultural crops through restoration of the historic flows of Brawley Wash in the drainage corridors of the improved sections. The Preferred Alternative has the confidence and support of the Sponsor and stakeholders.
Areas of Controversy	No areas of controversy identified to date.
Issues to be Resolved	No issues to be resolved identified to date.
Evidence of Unusual Congressional or Local Interest	No evidence of unusual congressional or local interest known to date.
Compliance	Is this report in compliance with executive orders, public laws, and other statutes governing the formulation of water resource projects? Yes <u> X </u> No <u> ____ </u> .
<i>Month and year of preparation or update: January 2026</i>	

1. INTRODUCTION

The United States Department of Agriculture (USDA), Natural Resources Conservation Service, Arizona (USDA-NRCS) and the Pima County Regional Flood Control District (District), as the Sponsoring Local Organization (SLO), have initiated a Watershed Plan and Environmental Assessment (Plan-EA) to evaluate environmental impacts associated with proposed flood prevention measures within the Brawley Wash Watershed and disclose the potential impacts of the Watershed Plan and Environmental Assessment (Plan-EA) for the Brawley Wash, which is intended to control and prevent impacts from sheet flow flooding, erosion and sedimentation issues in the study watershed. The NRCS is the lead federal agency for this Plan-EA.

The watershed plan is being prepared under the Watershed Protection and Flood Prevention Program (Public Law [PL] 83-566) which authorizes federal funding and technical assistance. The PL 83-566 Watershed Program requires the development of a “physically, environmentally, socially, and economically sound improvement plan” to be implemented over a specific period of years. A Watershed Plan-EA will be developed as the first component of the proposed action for the purpose of implementing a range of eligible flood prevention measures to be evaluated during the development of the Plan-EA.

This Plan-EA is being commissioned by the USDA-NRCS to comply with the National Environmental Policy Act (NEPA) of 1970 and its implementing regulations. NRCS Policy documents include, but are not limited, to the following: General Manual (GM) Title 210 Part 500 National Engineering Manual (NEM) Title 180 Part 500 National Operations and Maintenance Manual (NOMM) Title 390, Part 500 National Watershed Program Manual (NWPM); Council on Environmental Quality (CEQ) regulations implementing NEPA at 40 Code of Federal Regulations (CFR) 1500-1508; the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (PR&G) of 1983; USDA’s NEPA regulations (7 CFR Part 650); NRCS Title 190 General Manual Part 410; National Environmental Compliance Handbook (NECH) Title 190 Part 601 National Cultural Resources Procedures Handbook (NCRPH) Title 450 National Handbook of Conservation Practices (NHCP) NRCS Engineering Technical Releases (TR) Title 210 Technical Notes (TN), and the NRCS National Environmental Compliance Handbook Title 190 Part 610 (May 2016). The Plan-EA also meets the guidelines of the NRCS National Watershed Program Manual (NWPM) Parts 501 through 505 (NRCS 2015) and the NRCS National Watershed Program Handbook Parts 600 through 606 (NRCS 2014).

1.1 Project Area

The Brawley Wash Watershed study area contains approximately 198,000 acres (309 sq. mi.) within Pima County, Arizona approximately 12-miles west of Tucson and 75-miles southeast of Phoenix ([Figure 1](#) in **Appendix B**). The project study area lies within the Brawley Wash Watershed and is located in northern Altar Valley and extending north through Avra Valley, is solely within Pima County, Arizona ([Figure 2](#) in **Appendix B**) and is defined by seven Hydrologic Unit Codes (HUC-12’s) ([Figure 3](#) in **Appendix B**). The project area’s northern limit is the southern border of Pinal County. The southern limits of the Brawley Wash Watershed study area extends approximately eight miles south of Three Points. The watershed extends north approximately 40-miles into the Avra Valley and Marana and terminates at the Santa Cruz River west of the Pinal Airpark. The Avra and Altar and Valleys, which the Brawley Wash Watershed is located, are located in the south-central portion of Arizona. The Valleys and Watershed lies west of Interstate 19 and east of the Baboquivari Mountains. The study watershed area is approximately comprised of State Lands, private lands, wildlife preserve, Bureau of Land Management (BLM), Tohono O’odham Indian Reservation, Pascua Yaqui, and local and national parks. The watershed is a broad alluvial filled valley that is surrounded by Basin and Range type mountains. The major communities within the watershed include the Town of Marana and the local unincorporated area known as Three Points. The original study boundary was modified to contain watershed domains within Pima County and add drainage areas not previously included for a more comprehensive hydraulic model, covered in Change Order No. 1.

Seven problem areas of interest were identified within the project area in coordination with the District and stakeholders in accordance with the Purpose and Need Statement for the Plan-EA. The location of each problem areas can be referenced in [Figure 3](#) in **Appendix B**.

1.1.1 Watershed Planning Area

The planning area is the Brawley Wash watershed, consisting of approximately 198,000 acres in Pima ([Figure 3 in Appendix B](#)), which is located in western Pima County and extends into the very southern portion of Pinal County. The planning area is west of the COT's incorporated limits and overlaps with the Town of Marana city limits in its eastern portion. Three Points lies within the planning area, and Sahuarita, Green Valley, and Sells are east, southeast, and southwest of the planning area, respectively. The Brawley Wash Watershed planning area encompasses a large portion of Brawley and Los Robles Washes, as well as the upstream area drained by Brawley Wash and Los Robles Wash, from approximately the beginning of Brawley Wash in the south to the confluence of Los Robles Wash and the Santa Cruz River in the north (see [Figure 3 in Appendix B](#)). The planning area includes portions of the Altar and Avra Valleys, and many unnamed and named ephemeral drainages such as South Mendoza Wash, Soto Wash, Blanco Wash, and China Draw. The southern part of the planning area contains a portion of the Coyote Mountains and the northern foothills of the Sierrita Mountains, including Gunsight Mountain. On the western boundary, the planning area contains a portion of the Rukrug Mountains, the Waterman Mountains, and the Pan Quemado Mountains. On the eastern boundary, the planning area contains a portion of the Tucson Mountains. The northern part of the planning area contains a portion of the Silver Bell Mountains, and the Samaniego Hills. The planning area consists of portions of the Brawley and Los Robles Washes within the Altar and Avra Valleys as well as mountainous areas within the watershed that drain into the Brawley or Los Robles Washes.

The elevation within the planning area ranges from 1,790 to 6,527 feet amsl. Topography in the planning area ranges from relatively flat to gently rolling hills to steep, rugged mountains. The planning area has been mapped into the following biotic communities: Arizona Upland subdivision of Sonoran Desert scrub (42.2% of the planning area), Lower Colorado River Valley subdivision of Sonoran Desert scrub (34.9% of the planning area), Semidesert Grassland (22.7% of the planning area), Madrean Evergreen Woodland (0.1% of the planning area), and Interior Chaparral (0.05% of the planning area) (Brown and Lowe 1982). While much of the planning contains relatively undisturbed natural desert, disturbances within the planning area includes: airports; residential communities, including the towns of Three Points and Avra Valley; commercial development; agricultural fields; roads, including many residential roads, collector roads, and State Route 86 (Ajo Highway) and State Route 286 (Sasabe Road); and, the Central Arizona Project (CAP) canal.

The planning area is mapped mostly within the NRCS Major Land Resource Area (MLRA) 40, Sonoran and Basin and Range, and the planning area extends into MLRA 41, Southeastern Arizona Basin and Range, to the south (USDA NRCS 2006).

1.2 Current Infrastructure

1.2.1 Parcels, Structures, and Vehicles

Study area structures (e.g., residential dwellings) were identified and categorized by land use type using GIS tax parcel data obtained from the Pima County Assessors Office. A total of 1,006 structures or structure groups are present within the study area floodplain. A structure group was defined as multiple structures of the same type on the same property, such as several agricultural buildings on a property, or two buildings associated with a commercial business. Properties that contained both residential and agricultural structures were subdivided within the inventory to correctly assess damage to each structure type. A total of 766 structures or structure groups are affected by a 100-year flood event under existing conditions. A total of 335 structures or structure groups are affected by a 10-year flood event under existing conditions.

Tax assessment data for structure values was either not available or not considered representative of replacement value. Therefore, the outline of each structure was delineated and included in a GIS polygon shapefile. Replacement values were determined on a square foot basis using Marshall Valuation Service data and were based on land use, class, and type of structure (Marshall Valuation Service 2023). Replacement values and contents values for structures are shown in **Table 6 in Subappendix D.1**.

Study area communities are primarily rural with pockets of residential neighborhoods. No major development or redevelopment plans were identified for inclusion in the flood damage estimate. Replacement values for solar

panels were estimated using the National Renewable Energy Laboratory. Large-scale solar farm panels cost \$1.06 per watt while residential panels cost \$3.16 per watt.

Future infrastructure development activities concentrate on maintaining existing roads and agricultural infrastructure. No major infrastructure projects were identified for inclusion in the flood damage estimate.

Vehicles were added to the inventory based on experience in prior flood events. The Federal Emergency Management Agency (FEMA) HAZUS-MH MR3 Technical Manual methodology was used to estimate personal vehicle value (FEMA, 2018). The FEMA methodology provides vehicle age distribution data by vehicle classification. Based on Kelley Blue Book transaction price data and the FEMA methodology, the average study area vehicle was assumed to be valued at \$17,800. Residences were assumed to have one mid-size sedan left vulnerable to flood damage. For residential homes with agricultural operations one light truck was assumed per property. Using the FEMA HAZUS methodology, light truck values within the study area were estimated to average \$24,600. No vehicles were assigned to commercial or institutional structures in the model, which is a conservative estimate to avoid over counting flooded vehicles.

1.2.2 Roadways

Roadways were divided into three categories: state route, major local road, and minor local road. Total mileage for each roadway type in the study area was estimated using ArcGIS and shown in **Table 7** in **Subappendix D.1**. There were no railroad lines in the study area affected by flooding. Twenty-three bridges were identified within the study area. Please refer to **Figures 5-10** in **Appendix C** showing roadway and bridge locations.

The primary arterial road within the project area is State Route 86 a.k.a. Ajo Highway. This two-lane undivided rural paved roadway runs west-to-east through the project area and crosses Three Points, an unincorporated region of Pima County. Ajo Highway is the primary access into Problem Area No. 1. Sandario Road is a major rural collector that runs south-to-north, located along the eastern edge of the Project Area and as is the primary access road into Problems Areas No. 2, 3, and 4. Mile Wide Road is a major rural collector that runs west-to-east and is the primary access into Problem Areas No. 5, 6 and 7. Additional minor rural collector(s) are involved when accessing Problem Areas No. 4, 6, and 7 but are not mentioned here for brevity.

No significant structures occur within the Project Area such as jurisdictional dam(s), lakes, man-made channel/canals, etc. Ajo Highway does include one concrete bridge where it crosses Brawley Wash near Three Points, Arizona. Minor structures such as culverts, abandoned agricultural or man-made berms/channels/ditches occurs throughout the Project Area and the presence of such were considered at all stages of this Plan-EA.

1.2.3 Railways

No railways existing within the Project Area.

1.2.4 Critical Facilities

The study area includes power generation, water supply, community and federal facilities characterized as critical under 7 CFR 650.25, Floodplain Management. The CAVSARP facility is a groundwater project constructed in 2003 to recharge, store and recover groundwater and Colorado River water for Tucson Water customers is located within the study area. The COT's SAVSARP facility is located south of CAVSARP within the study area.

In addition, the Central Arizona Project (CAP) canal runs along the eastern border of the study area, with portions located within the study area. The CAP, which is 336-miles in length and travels through Maricopa, Pima and Pinal counties, provides approximately 80% of the state's population with water (CAP 2023).

Avra Valley Solar Generating Station is a 34 MW photovoltaic power plant located in Avra Valley within the study area. Located about 20 miles west of Tucson, this solar farm uses ~300 acres of fallow agricultural land to generate power for Tucson Electric Power Company (Wichner 2012).

The Marana High School, Roadrunner Elementary School and Three Point Border Patrol facility are located within the study area and are characterized as critical under 7 CFR 650.25. Please refer to **Figure 4**, Economic Analysis Study Area Boundary in **Appendix C**.

1.2.5 Hydraulic Structures within the Brawley Wash Watershed

Minor hydraulic structures consisting of metal corrugated metal pipe culverts occur at various locations such as private and publicly owned roads within the Project Area. A series of hydraulic structure maps (see **Figures 5-10 in Appendix C**) were developed which details the hydraulic structures in the study area. Bridges are noted to occur where Brawley Wash crosses: Ajo Highway, Silverbell Road, Mile Wide Road and Avra Valley Road. Blanco Wash Bridge at Silverbell Road is currently under construction to replace the existing bridge at this present location.

1.3 Decision Framework

In accordance with the Federal Objective, Guiding Principles, and environmental, economic, and social effects, watershed plans must consider a range of alternatives in order to address the problems and opportunities associated with defined resource concerns in accordance with the Federal Objective; Guiding Principles; and environmental, economic, and social effects. Alternative formulation shall use the following four criteria: completeness, effectiveness, efficiency, and acceptability. The NRCS will select the alternative that most effectively and efficiently addresses the purpose and needs for the project in an environmentally acceptable manner while maximizing net public benefits, including monetary, nonmonetary and unquantified ecosystem services. The NRCS must also decide if the selected alternative would or would not constitute a major federal action significantly affecting the quality of the environment. If the NRCS State Conservationist (responsible federal official) determines that the selected alternative would not significantly affect the quality of the environment, then the NRCS State Conservationist will prepare and sign a Finding of No Significant Impact (FONSI), and the project may proceed. If the NRCS State Conservationist determines that the selected alternative would significantly affect the quality of the environment, then an EIS and a Record of Decision (ROD) must be prepared and signed before the project can proceed.

1.4 Cooperating Agency Framework

Tucson Water is the only cooperating agency working with PCRFC. All work associated with Problem Areas 6 and 7, occur on Tucson Water lands. An IGA between PCRFC and Tucson Water was completed in September 2023. The purpose of the IGA is to promote cooperative work, construction, and maintenance of land management improvements in the Brawley/Altar Valley.

2. PURPOSE AND NEED FOR ACTION

2.1 Federal Objective

As stated in NWPH 601.12 (8) regarding the Federal Objective and Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G): “Water resource projects are developed utilizing the P&G. The P&G states that, ‘The Federal Objective of water and related land resources project planning is to contribute to national economic development consistent with protecting the Nation’s environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements’ (P&G, Principles Section 2).”

This project must also follow PR&G which states: “The Federal Objective, as set forth in the Water Resources Development Act of 2007, specifies that Federal investments shall reflect national priorities, encourage economic development, and protect the environment by:

- (1) seeking to maximize sustainable economic development.
- (2) seeking to avoid the unwise use of floodplains and flood-prone areas and minimizing adverse impacts and vulnerabilities in any case in which a floodplain or flood-prone area must be used; and
- (3) protecting and restoring the functions of natural systems and mitigating any unavoidable damage to natural systems.”

Finally, the USDA NRCS Department Manual 9500-13 states: “Under the PR&G, Federal investments are evaluated with respect to the Federal Objective and Guiding Principles. By contrast, under NEPA, the PR&G Federal Objective and Guiding Principles are not incorporated into the purpose and need contained in an EIS. The lead agency’s purpose and need for the proposed action frames the NEPA analysis and is not part of the PR&G analysis. The Federal Objective

may overlap the purpose and need, but the Federal Objective should be stated separately and not incorporated into the purpose and need statement in the EIS.” The Federal Objective as stated in this section of the Plan-EA overlaps with this project’s purpose and need statement which is presented in the following section.

2.2 Purpose and Need Statement

The purpose of the proposed action is to provide flood prevention to the Brawley Wash Watershed by managing stormwater sheet flow and enhancing floodplain functions that would reduce potential flood damages to public and private infrastructure as well as agricultural land. The proposed action will restore natural drainage flow patterns and result in reducing both erosion and non-native invasive plant species and would enhance native habitat restoration and improve rangeland and soil health while maintaining access for property inspections, emergency responders, and fire management.

The proposed action is needed because past human activities have altered natural drainage patterns in the Brawley Wash watershed. This, in turn, has adversely impacted hydrologic function of the watershed causing substantial damages and economic losses in the watershed through:

- Endangerment to critical public infrastructure,
- Damage of private residences,
- Inundation of agricultural land and properties,
- Land surface losses due to erosion, and
- Loss of native habitat and introduction of non-native invasive species

The proposed actions will mitigate adverse impacts caused by many of the harmful past land management activities through installation of permanent flood damage reduction features that will restore natural floodplains as well as channel functions and values, thereby reducing erosion and sedimentation, enhancing wildlife habitat for both game and non-game species, improving rangeland and soil health, and reducing damages to irrigated farmland. Actions under this plan will restore up to 7,000 acres of abandoned agricultural land (which is currently denuded of native vegetation and plagued by invasive plant species), reduce flooding of habitable structures up to the 100-yr event, and improve all-weather access (passable in 10-year event and less than 1-foot in 100-year event) to paved public roads.

2.3 Watershed and Resource Opportunities and Sponsor Objectives

1. Restore natural drainage flow patterns by including a component within/along the existing diversion berm thereby allowing flow to pass along the natural drainage path. Result can reduce flow depths through the ranch and downstream active agricultural fields, Schuk Toak Farm, and abandoned agricultural fields, reducing erosion potential within Blanco Wash. This could also reduce flow depths to the west (private property).
2. Mitigate invasive species within the limits of the County owned parcel(s).
3. Vegetation management – reduce grazing within the southern portion.
4. Water Quality Improvement: Implementing conservation practices to reduce nonpoint source pollution, such as sediment, nutrients, and pesticides, from agricultural runoff and other sources. This may involve practices like riparian buffers, cover crops, nutrient management, and erosion control measures.
5. Erosion Control and Soil Health: Implementing practices to reduce soil erosion, improve soil health, and enhance soil conservation on agricultural lands. This could include conservation tillage, crop rotation, contour farming, and soil amendments.
6. Floodplain Management: Restoring and protecting floodplains to reduce flood risks, improve water storage, and enhance habitat for wildlife. This may involve levee setbacks, floodplain reconnection, and the restoration of natural hydrological processes.

7. Wetland Restoration: Restoring and enhancing wetlands to improve water quality, provide habitat for wildlife, and increase floodwater retention. Wetland restoration projects may involve reestablishing hydrology, controlling invasive species, and enhancing native vegetation.
8. Streambank Stabilization: Implementing practices to stabilize streambanks, reduce erosion, and improve aquatic habitat. This could include techniques such as bioengineering, vegetative stabilization, and structural streambank stabilization measures.
9. Community Engagement and Education: Engaging stakeholders, including landowners, local communities, and youth, in conservation education and outreach efforts. This may include workshops, field days, demonstration projects, and outreach materials to raise awareness about watershed issues and conservation practices.
10. Partnership Building: Collaborating with diverse stakeholders, including government agencies, nonprofit organizations, landowners, and businesses, to leverage resources, share expertise, and implement watershed management projects effectively.

2.4 Background

Approximately 198,000-acres (309 square miles) Brawley Wash project area is characterized by severe erosion and sedimentation, especially in areas where embankments, levees and canals from formerly irrigated land are no longer maintained and break up natural flow patterns. This causes the loss of wildlife habitat, disruption of natural floodplains and natural drainage flow paths. The proposed PL-566 watershed plan will evaluate floodplain restoration, erosion control, structure removal and other conservation measures within the Planning Area and alternatives located primarily on County and City owned lands. These are consistent with actions identified in the Pima County Flood Control District's 2020 Floodplain Management Plan. The Pima County Regional Flood Control District (District) is the principal governmental entity charged with floodplain management, has managed projects of similar scope and size, and is a co-implementer of related conservation efforts, including Pima County's Sonoran Desert Conservation Plan (SDCP), Multi-Species Conservation Plan (MSCP), and the Riparian In-Lieu Fee Mitigation Program. The In-Lieu program will provide the revenue to fulfill the cost-share requirements for project implementation under PL-566.

The District is working in close coordination with Pima County, the COT, and the Altar Valley Conservation Alliance (AVCA) - a broad area stakeholder coalition. The conservation work to be evaluated in the PL-566 Watershed Plan for the Brawley Wash will build on previous planning and data collection efforts including in the SDCP, the MPSCP, a previous PL-566 Plan (Brawley Wash Natural Resource Restoration Plan, Soil Conservation Service, June 1992), the NRCS June 2008 Brawley Wash – Los Robles Wash Watershed Rapid Watershed Assessment (RWA) and the District's 2020 Floodplain Management Plan. The District formulated the Floodplain Management Plan in coordination with a broad range of public stakeholders; including local governments, agricultural interests and conservationists; over the course of a two-year public planning process. The District has reinvigorated the Planning Committee to guide the 2025 Floodplain Management Plan update process. The 2025 Floodplain Management Plan and Watershed Master Plan are currently available for public review and comment. The project will also benefit a small, farming and ranching agricultural community, and will include the Tohono O'odham Nation - a Native American Tribe.

2.4.1 Previous Relevant Studies

During the course of this Plan-EA, the District through a grant from FEMA, undertook floodplain analysis related to the Brawley Wash and Black Wash Floodplain Delineation Study (2023). As this study directly impacted the effort related to this Plan-EA, the mapping study and H&H FLO-2D models were obtained from the FEMA study, that was used to evaluate surface water impacts/changes during the 10- and 100-year events.

2.4.2 Tribal Lands

The easternmost portion of the Tohono O'odham Nation Reservation intersects with the study area (AZHGIS 2024). No structures are located in this portion of the Nation's land and none of the Problem Areas are located within the boundaries of the Tohono O'odham National Reservation. Any individual project located on tribal lands would need

to coordinate with the tribe in order to determine any additional biological resources or species of concern for tribal lands, as well as completing any required approvals through the tribe and Bureau of Indian Affairs.

2.4.3 Pima County Multi-Species Conservation Plan

The Multi-species Conservation Plan (MSCP) (Pima County 2016) is the part of the SDCP that provides Pima County with incidental take protection under ESA for non-federal actions through Section 10 coverage. This document was approved by the USFWS in 2016 and serves to streamline ESA compliance for Pima County or PCRFCDD for maintenance and construction activities, and certain private sector development projects. A total of 44 species are covered under the Section 10 permit (Pima County 2016), with eight of them being currently listed under ESA and one species a candidate for listing. Of those 44 species, twenty-four have occurrence records or are predicted to occur within five miles of the planning area based on modeled habitat (AZHGIS 2024) (**Attachment 12 of Subappendix D.4**). Of the twenty-four species, six are federally listed or candidate species and are discussed above. The remaining 18 MSCP with known occurrences or modeled habitat within five miles of the planning area include Abert's towhee (*Melospiza aberti*), Arizona Bell's vireo (*Vireo bellii arizonae*), Papago talausnail (*Sonorella ambigua ambigua*), Cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*), California leaf-nosed bat (*Macrotus californicus*), desert box turtle (*Terrapene ornata luteola*), giant spotted whiptail (*Aspidoscelis stictogramma*), lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*), lowland leopard frog (*Lithobates yavapaiensis*), pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*), rufous-winged sparrow (*Peucaea carpalis*), San Xavier talussnail (*Sonorella eremita*), Swainson's hawk (*Buteo swainsoni*), Tucson shovel-nosed snake (*Chionactis occipitalis klauberi*), Tumamoc globeberry (*Tumamoca macdougalii*), western burrowing owl (*Athene cunicularia hypugaea*), western red bat (*Lasiurus blossevillii*), and western yellow bat (*Lasiurus xanthinus*).

2.5 State of Arizona Regulations

The Arizona Department of Environmental Quality (ADEQ) has been delegated the authority to implement CWA Section 402 regulations regarding the discharge of stormwater runoff from construction sites into WOTUS or Waters of Arizona through its Arizona Pollutant Discharge Elimination System (AZPDES) Construction General Permit. In addition, the ADEQ regulates point source discharges through its De Minimis Discharge Permit and its Aquifer Protection Permit programs. The State of Arizona does not regulate the discharge of dredge or fill material into surface water features under a State "Section 404-type" permit program.

2.5.1 Arizona Noxious Weeds

The ADA Plant Services Division is responsible for implementing the regulations found in Arizona Administrative Code (AAC) R3-4-245 for the control and eradication of noxious weeds (ADA 2021b). There are three categories of noxious weed defined by the ADA: Class A, Class B, and Class C Noxious Weed. Class A Noxious Weed is categorized as a species of plant that is not known to exist or of limited distribution in the State and is a high priority pest for quarantine, control, or mitigation. Class B Noxious Weed is categorized as a species of plant that is known to occur, but of limited distribution in the State and may be a high priority pest for quarantine, control or mitigation if a significant threat to a crop, commodity, or habitat is known to exist. Class C Noxious Weed is categorized as a species of plant that is widespread but may be recommended for active control based on risk assessment.

Noxious weeds and other invasive species are known to occur in the permit area and vicinity (iMap Invasives 2021). Individual projects may require surveys for noxious weeds prior to construction, noxious weed control, or use of standard BMPs to avoid spreading or introducing noxious weeds to individual project areas.

2.5.2 Arizona Game and Fish Species of Greatest Conservation Need

The AGFD manages wildlife in Arizona. The AGFD does not maintain a state list of threatened or endangered species. Instead, it maintains a list of Species of Greatest Conservation Need (SGCN). SGCN is a designation used by AGFD as a means to focus planning and conservation efforts. The list of Arizona SGCN species is found in **Attachment 12 of Subappendix D.4** of Arizona's State Wildlife Action Strategy (AGFD 2022). Each species is ranked according to seven vulnerability criteria and placed into one of three tiers: 1, 2, or 3, based on its level of vulnerability and AGFD's priority

levels for management of the species. This list also includes species listed as endangered or threatened under the ESA. Refer to [Section 4.5.2.2](#) for details on the SGCN species found within the planning area.

2.5.3 State Wildlife Protections

Some species receive additional protections under Arizona State Law. The Sonoran Desert tortoise receives State protection by the AGFD under Arizona Revised Statutes 17-306 and 17-309. Arizona state law protects individuals but not habitat for this species. All bat species are protected by Arizona State Law and any bats residing in caves or caverns are protected by AGFD under Arizona Revised Statutes §13-3702. Bat colonies occur within five miles of the planning area (AGFD 2024) (**Attachment 12 of Subappendix D.4**). Raptors, including owls, and their nests or eggs receives protection under Arizona Revised Statutes 17-236.

2.5.4 Arizona State Land Department Requirements

For individual projects occurring on lands owned by the Arizona Land Department (ASLD), a native plant survey and valuation in accordance with the current ASLD Native Plant Survey Protocol (ASLD 2011) and the August 2020 Disposition of Natural Products Policy Memo No. P79-1 (ASLD 2020), including an inventory of noxious weeds and ESA-listed species may be required prior to ground-disturbing activities. Project proponents may be required to pay up to the total amount of the native plant valuation to the Arizona State Trust in order to compensate for the loss of vegetation attributable to an individual project's activities.

2.6 Local Regulations – Pima County Regulations

The PCRFCFCD regulates floodplains within unincorporated Pima County and issues Floodplain Use Permits, as applicable. The PCRFCFCD is delegated this authority through Arizona Revised Statutes, Title 48, Chapter 21, Article 1, Sections 48-3601 through 3627. More specifically, A.R.S. 3609 directs county flood control districts to adopt floodplain regulations.

2.6.1 Pima County Native Plant Preservation Ordinance

The Pima County Native Plant Preservation Ordinance (NPPO) (Chapter 18.72) requires preservation-in-place, transplanting on-site, and mitigation of protected native plants and native plant communities for projects within the County. It outlines the methods that can be chosen to comply with the NPPO including mitigation for replacement and transplant quantities.

The following plants listed in the Pima County NPPO have occurrence records within five miles of the planning area: Thornber fishhook cactus and desert night-blooming cereus (=desert thread cactus), and Pima pineapple cactus. Many other species listed in the NPPO are known to occur or have the potential to occur based on habitat and range. A plant inventory may be required prior to any individual project within the planning area.

2.6.2 Conservation Lands System

The Maeveen Marie Behan Conservation Lands System (CLS) was created to protect biodiversity and provide land-use guidelines consistent with the SDCP. The CLS, adopted in 2005, categorizes and identifies priority biological resource locations within Pima County. The CLS designations and policies apply to land uses and activities under the jurisdiction of Pima County and PCRFCFCD.

The CLS defines seven categories (Pima County 2015):

- *Important Riparian Areas*: Areas containing higher biological diversity and that contain higher water availability, vegetation density, and biological productivity. Important for preserving landscape connectivity.
- *Biological Core Management Areas*: Areas with the potential to support high value habitat for five or more priority vulnerable species as identified in the SDCP.
- *Scientific Research Areas*: Lands currently managed for research (i.e., the Santa Rita Experimental Range and the University of Arizona Desert Laboratory at Tumamoc Hill).

- *Multiple Use Management Areas:* Lands that are not as biologically rich as the biological core management areas but have potential to support high value habitat for three or more priority vulnerable species as identified by the SCDP.
- *Agricultural In-Holdings within the CLS:* Lands used for agricultural purposes or lands where agricultural uses have been abandoned.
- *Special Species Management Areas:* Lands crucial for the conservation of specific native species of special concern to Pima County (i.e., currently cactus ferruginous pygmy-owl, Mexican spotted owl, and southwestern willow flycatcher).
- *Critical Landscape Connections:* Broadly defined areas that provide connectivity for movement of native biological resources, but which may contain potential or existing barriers.

Portions of the planning area are within Maeveen Marie Behan Conservation Lands System (Pima County 2021b). The planning area overlaps with areas mapped within six of the seven categories (all except Scientific Research Areas) (Pima County 2005; 2021). Large portions of Brawley Wash and adjacent areas are mapped as Important Riparian Areas and Biological Core Management Areas.

2.6.3 Town of Marana

Title 17 of the Town of Marana Land Development Code outlines the Environment Resources Preservation and Native Plant Protection Landscape Requirements regulated by the Town. Lands within Marana would be required to follow the Town's regulations for inventory, protection, and mitigation for protected native plant species. A small portion of the project area occurs within the Town of Marana, and Marana land use code applies to a small area within the watershed and any projects within the Town limits would need to coordinate and comply with any applicable regulations (e.g., Town of Marana Native Plant Preservation Ordinance and pre-clearance Sonoran Desert tortoise surveys). The problem areas identified in the Plan-EA study area are outside the jurisdiction of the Town of Marana.

3. SCOPE OF THE PLAN-EA

The scoping process followed the general procedures contained in the NRCS National Watershed Program Handbook (NWPH) (NRCS 2014) and the NRCS National Watershed Program Manual (NWPM) (NRCS 2014). Both NRCS procedures and NEPA regulations (40 CFR 1500-1508) require that the NRCS use a scoping process early in the planning process to identify issues, concerns, and potential impacts that require detailed analysis.

3.1 Agency, Tribal, and Public Outreach

Federal, state, and local agencies and representatives, as well as area non-governmental organizations (NGOs), received an invitation to the early scoping phase of the Plan-EA. Scoping notices announcing the public scoping meeting were placed in the Desert Times, the Arizona Daily Star, and The Runner (Tohono O'odham), which are newspapers of general circulation for the study area. Scoping notices announcing the public scoping meeting were also placed on Nextdoor and Facebook. The 30-day formal scoping period for this project began on March 30, 2021, and ended on April 30, 2021.

Native American Tribal consultation was conducted in accordance with the National Historic Preservation Act (NHPA) of 1966 and Executive Order (EO) 13175, Consultation with Indian Tribal Governments, to maintain the NRCS' government-to-government relationship. Letters were sent to the SHPO and the following Native American Tribes with ancestrally affiliated lands within Areas of Potential Effects (APE) of their right to consult on forthcoming Brawley Wash Watershed study area in accordance with Section 106:

- Tohono O'odham Nation
- Pascua Yaqui Tribe
- Ak-Chin Indian Community
- Fort McDowell Yavapai Nation
- Gila River Indian Community
- Hopi Tribe
- Mescalero Apache Tribe
- Pueblo of Zuni
- Salt River Pima-Maricopa Indian Community
- San Carlos Apache Tribe
- White Mountain Apache Tribe
- Yavapai Apache Nation

3.2 Stakeholder Meeting

A stakeholder meeting was held on March 16, 2021, from 9:00 AM to 10:30 AM. The meeting was held as a virtual meeting web audio/video presentation format. Members of the project team, including the Local Sponsoring Organization (SLO: PCRFCD) and the NRCS-Arizona, made presentations regarding the location of the project, the purpose and need for the project, the proposed action description and maps of the study area, the NEPA process, how to get involved, and the project schedule. Forty (40) people attended the meeting including the project team.

3.3 Public Scoping Meeting

A public scoping meeting was held on March 30, 2021, from 5:30 PM to 7:30 PM. Members of the project team, including the Local Sponsoring Organization (SLO: PCRFCD) and the NRCS, made presentations regarding the purpose and need for the project, the proposed action description and maps of the study area, the NEPA process, how to get involved, and the project schedule. Thirty-eight (38) people attended the meeting including the project team. Comments included the following topics/issues of concern:

- What is the mission or goal of the project?
- Will permaculture methods be evaluated for water harvesting?
- Is this area recognized as a floodplain for flood insurance purposes?
- What conflicts might arise between the environmental aspects of this project and flood control?
- How will costs for the project be paid? Where is the funding for the project coming from?

- Will this project make the benefitted lands more attractive to developers?
- Will the project take into consideration of doing nothing or no-action?
- Will the study take into consideration subsidence cracks?
- How will the project affect ranches and agricultural areas within the project area?
- How will the project address wildlife issues within the project area?
- Will the Indian communities be involved with the project?
- Will the project report discuss the historic flooding and how that came about?
- What would be the best-case scenario at the very end?
- What field work is being conducted with the project?
- How will the study/plan address invasive species?

To address these comments, this Plan-EA looked at a wide array of flood prevention measures to identify the best options to provide substantial flood reduction from the 100-year event including potential costs of such measures. Prior to this Plan-EA, a few other smaller measures were implemented by Pima County; with the availability of funding from the NRCS. NRCS is providing funding for this Plan-EA.

3.3.1 Scoping Comments and Responses

Over fifty individuals of the public, local, state, and federal agencies were in attendance at the virtual public scoping meeting held on March 30, 2021. Approximately sixty-eight comments (see **Attachment 2** in **Appendix A** for Brawley Wash Plan-EA Public Outreach Comments) were presented by individuals calling in or attending in person, with several attendees submitting comments and attachments via www.brawleywashplan.com. Most of the comments and responses were presented by the local and state agencies discussing the following matters of concern:

- "Does TW still plan to expand recharge basins in this area?"
- "Can provision be made here for accommodating overland flows safely, without disturbing the narrow, existing channel, which has evidently been pretty stable?"
- Requesting clarification of the study area boundary, if they were due to the mine in the area.
- "Will the rapid and deep recovery trigger subsidence and will the CAP canal itself be affected?"
- "Pima County owns a parcel in this vicinity that is encumbered by a restrictive covenant (208230260). Use restrictions apply. Please contact Pima County for more information."
- "Opportunity to restore habitat and flows and reduce erosion by return flows to farm?"
- "This is Charlie's Lake. It is a significant intermittent water in area that needs to be developed to hold more water longer."
- "The one time we had water on the ground it was maybe 6 inches deep and wasn't moving with any observable speed, so there wasn't any destruction of any kind I could observe, just a slow receding. I don't believe that in the desert 6" of non-moving water qualifies as destructive flooding."

3.4 Identification of Resource Concerns

Based on initial data gathering and input received during the scoping phase, several environmental and human resource concerns for the study area were identified.

[Table 1](#) provides a summary of resource concerns and their relationship to the Preferred Alternative. Resource items determined to either not be present or not be relevant to the study area have been eliminated from detailed study while those determined to be relevant have been carried forward for analysis.

Table 1 - Summary of Resources of Concern

Resource	Relevant to Proposed Action?		Discussion/Justification
	Yes	No	
Geology and Soils			
Geology		X	Geologic resources are not considered a resource concern in the study area. The potential impacts of seismic activity to proposed flood prevention methods would be considered minimal to the study area due to seismic activity is very low for the region. This resource was dismissed from further analysis.
Soils	X		The project would have mid to long-term negative impacts on localized soils in the study area during construction activities related to compaction on/along haul roads, staging areas, and within work zone(s). The partial removal of abandoned agricultural or other man-made earthen embankments would require extensive excavation but would not impact soil composition or otherwise impact geologic resources. Overall, any mid to long-term negative effects to the soil will be localized and not significant. This resource was dismissed from further analysis.
Stream Bank and Upland Erosion	X		Short-term increase in erosion during construction activities related to partial removal of abandoned agricultural earthen embankments. Protection measures to be installed during construction. No perennial streams were identified.
Sedimentation	X		A detailed study and quantification of the sediment yield and transport was not conducted as a part of this study; however, the wash bottom was observed to be without vegetation and lacking major scour except in isolated locations, possibly suggesting an ample supply of sediment coupled with low to moderate flow velocities coupled with slightly erodible soils. Therefore, due to the anticipated alternatives sedimentation was not considered as an issue of concern especially given the location of each alternative to the thalweg of Brawley Wash. This resource was dismissed from further analysis.
Land Use (Agricultural Lands)		X	Non-productive associated agricultural land is owned by the Sponsor that is being restored for flood mitigation and not for future agricultural land use.
Prime and Unique Farmland	X		Prime and Unique Farmland is present in the study area. The proposed action areas consist of primarily abandoned farmland, no soils are irrigated. Flood damage reduction measures would be designed and implemented to restore the historic floodplain and potentially decrease adverse impacts to local agricultural lands. This resource is retained for further analysis.
Water Resources			
Coral Reefs		X	No coral reefs present in the study area. This resource was dismissed from further analysis.
Coastal Zone Management Area		X	The study area is not in the vicinity of a coastal zone, no management needed. This resource was dismissed from further analysis.
Hydrology	X		The project would have a minor alteration to the runoff hydrology in the project area in that it would catch flood flows that would otherwise be routed along the outside the abandoned agricultural or other man-made earthen embankments.
Surface Water	X		The project would have no impacts to surface water in the study area, as there are no perennial streams or other waterbodies present. This resource was dismissed from further analysis.
Sole Source Aquifers		X	Per the EPA, the Upper Santa Cruz & Avra Basin Sole Source Aquifer (SSA) overlaps with the project area. Consideration and/or evaluation of the impacts to this resource were not undertaken nor required by the Sponsor. However, it is believed that the proposed action would have no effect on this SSA.

Resource	Relevant to Proposed Action?		Discussion/Justification
	Yes	No	
Groundwater		X	The proposed action would have no effect on groundwater levels in the study area. This resource was dismissed from further analysis.
Surface Water Quality	X		Surface water quality testing is not undertaken due to Brawley Wash being an ephemeral stream. This resource was dismissed from further analysis.
Regional Water Management Plans	X		The study area is within several jurisdictional boundaries of city, county, state, and utilities. Agencies will coordinate regional water management plans within their limits. Interagency coordination is anticipated for overlapping boundaries.
Waters of the U.S.	X		There are no WOTUS in the Problem Areas, and the proposed work associated with the three Problem Areas would result in no impact on WOTUS.
Streams and Lakes		X	No streams or lakes present in the study area. This resource was dismissed from further analysis.
Wetlands and Riparian Areas	X		Wetlands and riparian areas are present in the study area.
Floodplain Management	X		More than 1,000 structures are located within the 100-year floodplain. The study area contains state routes, major and minor local roads and 23 bridges. The study area includes power generation, water supply, community and federal facilities characterized as critical under 7 CFR 650.25, Floodplain Management.
Wild and Scenic Rivers		X	No wild and scenic rivers. This resource was dismissed from further analysis.
Water Rights or Leasing		X	The proposed action would not involve the transfer of water rights, nor would it otherwise impair existing water rights in the study area. This resource was dismissed from further analysis.
Air			
Air Quality (Clean Air Act)	X		Construction activities would have temporary impacts to air quality in the study area.
Vegetation			
Vegetation Communities and Habitat	X		The disturbed project area should be limited to that required for the Preferred Alternative Improvements. Plant cover and roots are the first line of defense for minimizing erosion and all native plant cover should be left in place to the extent possible.
Ecologically Critical Areas	X		There are no ecologically critical areas present. This resource was dismissed from further analysis.
Forest Resources		X	No forest resources in the project area. This resource was dismissed from further analysis.
Parklands		X	No parklands exist within the selected project areas. This resource was dismissed from further analysis.
Natural Areas		X	There are no designated natural areas within the three selected project areas. This resource was dismissed from further analysis.
Special Status Plant Species	X		There are several special status plant species with potential mapped habitat within the project area.
Endangered and Threatened Species	X		There is one endangered plant species with potential mapped habitat within the project area.
Invasive Species	X		The project area has a number of invasive species, including many exotic grasses that were introduced for forage and erosion control. Prior to any site disturbance, and continuing throughout construction, targeted invasive species should be eliminated within the construction area so that plants and seeds are not spread. Contractor training to include target species recognition, understanding of seasonality, and protocol upon encountering target species are required in addition to physical controls such as vehicle washing and herbicide control.

Resource	Relevant to Proposed Action?		Discussion/Justification
	Yes	No	
Wildlife			
Fish		X	No fish species were identified as present in the study area. This resource was dismissed from further analysis.
Essential Fish Habitat		X	There is no essential fish habitat in the study area. This resource was dismissed from further analysis.
General Wildlife and Wildlife Communities	X		There would be temporary impacts to wildlife communities during construction due to noise and other construction- related activities. No wildlife communities would be adversely impacted long-term.
Special Status Wildlife Species (ESA)	X		The project would have No Effect on ESA-listed wildlife species and no impact on other special-status species due to a lack of suitable habitat.
Invasive Species	X		Although field studies have not been conducted, it can be assumed through knowledge of the area that the project sites all contain a number of invasive species – predominantly grasses and forbs. Any ground disturbance, construction activity, and changes in water flow have the potential to introduce and spread invasive species. Invasive species control and treatment should be considered as part of any project.
Migratory Birds/Bald Eagles/Golden Eagles	X		Migratory birds occur in all the Problem Areas and may nest in those areas that contain suitable vegetation in which to support nests (USFWS 2024a). In addition, the Problem Areas are located in fallow agricultural fields which is suitable habitat for western burrowing owl which is a SGCN species that is also protected under the MBTA. Bald and golden eagles have known occurrence records within five miles of the planning area and suitable prey species for foraging golden eagles may be present in the Problem Areas; however, it is unlikely for either species to nest in the vicinity of the Problem Areas due to the absence of suitable nesting habitat (USFWS 2024a.
Human Environment			
Cultural and Historic Property	X		NRHP-eligible archaeological sites that have the potential to be affected by the project’s implementation are present; however, PCRFCD’s commitment to avoid these resources will ensure that no adverse effects to the sites will take place.
Paleontological Resources		X	Paleontological resources have yet to be discovered onsite and not anticipated to impact project.
Recreation	X		The project would not impact existing recreational resources and does not include any new recreational resources.
Public Health and Safety	X		Public health and safety are at risk from wildfires and flooding. Vegetation (fuel) is sparse throughout the planning area. However, conditions are typically dry, and where vegetation is present, it presents a wildfire potential from lightning strikes, utility failures, and manmade causes. Much of the Brawley Wash watershed is considered within the 100-year floodplain. Structures and roadways in these flood prone areas are subject to flooding and related damage. Additionally, flooded areas become difficult to navigate (flooded roadways) during emergency response situations.
Scenic Beauty/ Visual Resources		X	The proposed action would not introduce new features into the viewshed. This resource was dismissed from further analysis.
Scientific Resources		X	No recognized scientific resources or study sites are within the project area. This resource was dismissed from further analysis.
Land Use		X	The proposed action would not require land acquisition for the modification of activities related to partial removal of abandoned agricultural or other man-made earthen embankments. This resource was dismissed from further analysis.
Noise	X		Noise pollution is expected in the short-term due to construction, which can disturb the public and wildlife, however, can be mitigated by limiting construction times to regular business hours.

Resource	Relevant to Proposed Action?		Discussion/Justification
	Yes	No	
Transportation and Infrastructure	X		Transportation and infrastructure have been identified as a resource concern as they are impacted currently by flooding. Transportation and infrastructure would only benefit slightly but the extent of the benefit was not undertaken as part of this study.
Hazardous Materials		X	Because there are no hazardous materials concerns within the project area, this resource was dismissed from further analysis.
Socioeconomics or Social Issues			
Socioeconomics	X		The project is not expected to result in adverse socioeconomic effects. Instead, the project supports equitable economic resilience, particularly for populations most at risk from flood-related impacts, by reducing economic vulnerabilities and contributing to long-term community sustainability.
Local and Regional Economy	X		The project is expected to generate both minor local and regional economic benefits. These benefits would result from reductions in flood-related damages to structures, vehicles, agricultural crops, and public infrastructure. This resource is retained for further analysis.
National Economic Development (NEE)	X		An economic cost/benefit analysis is required by the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G). The NEE cost/benefit ratio is 1.88.
Ecosystem Services			
Provisioning Services	X		Provisioning services in the study area include agricultural crops. This topic is retained for further analysis.
Regulating Services	X		Regulating services such as water quality and quantity, urban agricultural flood damage reduction, and erosion control were identified for analysis. This topic is retained for further analysis.
Supporting Services		X	Supporting services such as wildlife corridors and Natural vegetation and pollinator habitat. This topic is retained for further analysis.
Cultural Services	X		Cultural services such as recreation, quality of life, and community cohesion would be supported by flood damage reduction and could be impacted by alternatives. This topic is retained for further analysis.
Greenhouse Gas Emissions			
Greenhouse Gas Emissions		X	The project's effects on greenhouse gas emissions would be de minimus. This resource was dismissed from further analysis.
Month and year of preparation or update: December 2024			

4. AFFECTED ENVIRONMENT

Per the NRCS Watershed Program Manual, Section 501.36: “The “Affected Environment” section describes the current physical, biological, ecological, economic, and social environment for the watershed and other areas of project impact. This provides the context for determining the effects of alternatives. Some conditions will be constant throughout the evaluated life of the project, while others will be subject to change because of social, economic, and political influences. The information must be adequate to forecast the conditions expected to exist in the future with and without the project.

4.1 Soils and Geology

4.1.1 Geologic Setting

The Brawley Wash Watershed is located within the Basin and Range Province, which extends from western and northern Mexico into the western United States. The Basin and Range Province of southern and western Arizona is characterized by abrupt changes in topography, alternating between narrow mountain chains and flat valleys or basins. These mountains and valleys have formed by faulting and the vertical motion of large crustal blocks.

The Basin and Range Province was formed by tectonic extension beginning approximately 17 million years ago as the Baja California portion of the Earth’s tectonic Pacific Oceanic plate began diverging from the continental plate. The extensional environment in the region causes the crustal blocks to break and drop in a pattern of valley basins and high peak ranges.

Locally, the watershed is bounded on the west by the Baboquivari Mountains, a range of block-faulted mountains that are crosscut by northwest-striking faults and shear zones that are part of a regional structural pattern. The Baboquivaris are composed of Jurassic, Cretaceous, and Tertiary granite interspersed with small amounts of schist and sedimentary rocks (Goodwin, 1985). The Tucson, Sierrita, and Tumacacori Mountains make up the eastern limit of the watershed, and to the south the Atascosa Highlands and Pajarita Mountains form the watershed’s southeastern limit.

The area is rich in metallic minerals with significant copper, silver, gold, molybdenum, lead, and zinc. The largest existing mines in the area are located in the Sierrita Mountains, which consist of Paleozoic and Mesozoic sedimentary rocks and Cretaceous-aged volcanic rocks. Copper and molybdenum are the predominant minerals mined in the region.

The only identified geologic hazard in the Brawley Wash watershed project area are earth fissures. Earth fissures are cracks that occur on valley floors in arid areas that result from ground subsidence as a result of extensive groundwater withdrawal. Only minor earth fissures have been mapped in the project area, and they are documented in the “Earth Fissure Map of the Avra Valley Study Area: Pima County Arizona” provided by the Arizona Geological Survey. It does not appear the entire project area has been mapped for earth fissures, so the lack of mapped earth fissures does not necessarily preclude other or more significant earth fissures from being present. Additionally, there are no mapped active faults in the project area.

4.1.2 Soils

The soils in the Brawley Wash Watershed are diverse and generally range from clays, sands, gravels, and loams in the flood plain and valleys, with more coarse, rocky soil or rock outcrops on the steeper hillsides and mountain slopes. Soil Maps and Soil Data for the study area was obtained from Natural Resources Conservation Service (NRCS) Soil Survey maps are available for the project area. **Attachment 8** is available in **Subappendix D.3**.

4.1.2.1 Active Floodplain Soils

The NRCS soils mapping was clipped approximately to the active floodplain of the Brawley Wash Watershed study boundary to analyze the soil units contained. **Table 10** in **Subappendix D.3** details the soil units within the active 100-year floodplain and their relative percentage of the total area and the soil characteristics present.

4.1.3 Stream Bank and Upland Erosion

Erosion and sedimentation are major problems within the watershed. Brawley Wash started to incise in the early 1900's and today is a large, entrenched channel. Tributaries to Brawley Wash are also entrenching due to increased channel gradients resulting from channel incisions (USDA NRCS, 2008).

A detailed evaluation and assessment of stream banks and upland erosion (i.e., rate and volume), were not undertaken for this study.

4.1.4 Sedimentation

A detailed study and quantification of the sediment yield and transport was not conducted as a part of this study; therefore, the following is a qualitative generalization of the sedimentation risks that occur. The Brawley Wash Watershed generates sediment which is collected and conveyed within the study area along existing washes. There are three primary land uses within this project area including agricultural fields, undeveloped and/or fallow ground, and developed land. Due to leveling and placement of borders within the fields, agricultural land does not likely yield much sediment during rain events. Undeveloped lands generate sediment during certain rain events, contributing to the flow of sediment within Brawley Wash and other washes within the study area. The third land use, developed lands, generate sediment along unvegetated and unpaved road shoulders, lots, and other exposed areas but are generally limited to the extreme northern portion of the study area. Where this area drains to pavement there may be sedimentation on the roads; however, the roads eventually convey the sediment towards the Santa Cruz River (i.e., outside the study limits). Field observations were not performed in this study however the wash bottom was observed to be without vegetation and lacking major scour except in isolated locations, possibly suggesting an ample supply of sediment coupled with low to moderate flow velocities coupled with slightly erodible soils. Therefore, due to the anticipated alternatives sedimentation was not considered as an issue of concern especially given the location of each alternative to the thalweg of Brawley Wash.

4.1.5 Agricultural Land

The USDA Cropland Data Layer for 2023 was reviewed to identify the crop mix for the study area, and the following were identified as the primary crops: grassland/pasture, cotton, alfalfa, and durum wheat, see **Figure 11**, Study Area Agriculture in **Subappendix D.1**. There are approximately 3,233 acres of active cropland under the four primary crops within the 10-year flood extent and 4,807 acres of active cropland under the four primary crops within the 100-year flood extent. Grassland was approximately 62.8 percent of the agricultural land use in the study area, followed by cotton (18.5%), alfalfa (12.9%) and durum wheat (2%). Fallow cropland or cropland with a percentage below 2% of the agricultural land use in the study area was not considered in the analysis.

4.1.6 Prime and Unique Farmland

Prime and Unique Farmland data was provided by the NRCS and is categorized as: farmland of unique importance, prime farmland if irrigated, and prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season. (see **Figure 12** in **Appendix C**) shows these noted regions.

4.2 Water Resources

4.2.1 Hydrology and Surface Water

The Project Area lies within the Brawley Wash Watershed and is located in northern Altar Valley and extending north through Avra Valley, is solely within Pima County, Arizona (**Figure 2** in **Appendix B**). The approximately 198,000-acre study area consists of three Hydrologic Unit Code [HUC]-10 watersheds and seven HUC-12 subwatersheds within the HUC-8 Brawley Wash Subbasin (HUC code 15050304; 901,722 acres) as defined by the USGS's Watershed Boundary Dataset (USGS 2021a; **Figure 3** in **Appendix B**). The study area lies within several FEMA Flood Insurance Rate Map panels and contains a variety of flood hazards (FEMA 2021). The Brawley Wash floodplain was under evaluation during this study (PCRFD, 2024). Hydrology and hydraulic models (FLO-2D Pro Version) from the 2024 FEMA floodplain mapping study were utilized as the basis of drainage evaluation in the Alternative Analysis Report. The overall Brawley Wash Watershed, which discharges into the Santa Cruz River, is ~1,400 square miles.

4.2.1.1 Hydrologic Modeling

Hydrologic modeling was not required for this project, such was performed by the concurrent FEMA study of Brawley - Black Wash Floodplain Mapping. The FEMA FLO-2D models were reviewed from the Brawley and Black Wash Risk Analysis and Mapping Study (2023) and modified to incorporate proposed berm openings, water harvesting basins, diversion channels, and berm features for alternative floodplain mitigation simulations.

Background

The U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) dataset qualitative classifications are the result of an adaptation of the classifications in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al 1979). As detailed in the Federal Geographic Data Committee (FGDC) *Classification of Wetlands and Deepwater Habitats of the United States*, the FGDC Wetlands Classification Standard provides minimum requirements and guidelines for classifications of wetlands that are consistent with the FGDC Wetlands Mapping Standard (FGDC-STD-004-2013) and are used to map all nontidal deepwater habitats except for the Great Lakes, and all coastal and inland wetlands except for permanently flooded tidal freshwater wetlands (FGDC 2013). As stated in the FGDC Standard “The FGDC Wetlands Classification Standard is neither designed, nor intended, to support legal, regulatory, or jurisdictional analyses of wetlands mapping products, nor does it attempt to differentiate between regulatory and non-regulatory wetlands.” Therefore, an interpretation of the mapped NWI features is necessary to identify which resources classes may or may not be under Federal, Tribal, state, or local agencies’ jurisdiction.

NWI Classifications of Surface Water Features in the Study Area

The Brawley Wash Watershed study area GIS layer was overlaid on the USFWS NWI dataset (USFWS 2021) and the results are provided in **Table 8** in **Subappendix D.2**. The NWI dataset classifications of the mapped surface water feature types are provided in **Table 9** in **Subappendix D.2**.

4.2.2 Surface Water Quality

Surface water quality testing is not undertaken due to Brawley Wash being an ephemeral stream.

4.2.3 Regional Water Management Plans

The Brawley Wash Watershed study area is within the regional jurisdictions of multiple entities managing water resources within the COT and Pima County boundaries. Brawley Wash Watershed is subject to the following water management plans:

- PCRFC’s Floodplain Management Plan
- Pima Association of Governments Areawide Water Quality Management Plan
- Pima County’s Drought Response Plan & Water Wasting
- Altar Valley Watershed Plan

Tucson Water maintains two known active permits within the Study area, ADWR Underground Storage Facility Permit (USF Permit No. 71-211276) that lies within the CAVSARP facility and ADWR Recovery Well Permits (No. 74-211288.0002) located in the SAVSARP facility that is set to expire July 7, 2035.

4.2.4 Waters of the U.S.

4.2.4.1 Waters of the United States

The CWA serves as the federal regulatory structure to protect surface water quality. Federal jurisdiction of surface waters extends to features that meet the definition of WOTUS, as defined under 33 CFR 328. The CWA and associated WOTUS definitions have undergone a series of changes in recent years. Most recently, the March 2023 Revised Definition of Waters of the United States (2023 WOTUS Rule) was amended on September 8, 2023, to conform the definition of WOTUS to the Supreme Court of the United States decision in the Sackett v. Environmental Protection Agency case (EPA 2023). The amended 2023 WOTUS Rule is currently effective in Arizona. The 2023 WOTUS Rule and amendment were developed by the EPA and the USACE to clarify nationwide regulations that define the jurisdictional extent of the CWA and the definition of WOTUS for use in regulations under the CWA. 33 CFR Part 328 defines the term waters of the United States as it applies to the jurisdictional limits of the authority of the USACE.

4.2.4.2 Review of Previous Approved Jurisdictional Determinations

Jurisdictional determination no longer relevant due to SCOTUS ruling (see [Section 4.2.4.1](#)). The March 2023 Revised Definition of Waters of the United States (2023 WOTUS Rule) was amended on September 8, 2023, to conform the definition of WOTUS to the Supreme Court of the United States decision in the Sackett v. Environmental Protection Agency case (EPA 2023). The amended 2023 WOTUS Rule is currently effective in Arizona. The 2023 WOTUS Rule and amendment were developed by the EPA and the USACE to clarify nationwide regulations that define the jurisdictional extent of the CWA and the definition of WOTUS for use in regulations under the CWA.

4.2.5 Wetlands and Riparian Areas

The planning area contains regulated riparian habitat protected under Pima County's Riparian Habitat Protection Ordinance 2005-FC2. The Riparian Habitat Protection Ordinance was created to "promote stable flow and sediment transport conditions, preserve natural floodplain functions, and provide watercourse management by preserving and/or enhancing riparian vegetation and habitat along water courses and floodplains" (PCRFC 2011). Much of the following information has been excerpted from Pima County's Riparian Habitat Protection Ordinance and the Regulated Riparian Habitat Mitigation Standards and Implementation Guidelines (PCRFC 2011).

Regulated Riparian Habitat Classifications

There are three RRH classifications under the ordinance: Important Riparian Areas (IRAs), Hydroriparian and Mesoriparian (Class H), and Xeroriparian (Classes A–D) (PCRFC 2011).

Important Riparian Areas

An IRA is defined by Pima County as follows: "Important Riparian Areas occur along the major river systems and provide critical watershed and water resource management functions as well as providing a framework for landscape linkages and biological corridors. Important Riparian Areas are valued for their higher water availability, vegetation density, and biological productivity, as compared to adjacent upland habitats" (PCRFC 2011:5).

Hydroriparian and Mesoriparian (Class H) – Hydroriparian habitat is defined by Pima County as follows: "Hydroriparian habitats are generally associated with perennial watercourses and/or springs. Plant communities contain obligate or preferential wetland plant species such as willow and cottonwood" (PCRFC 2011:5) Mesoriparian habitat is defined by Pima County as follows: "Mesoriparian habitats are generally associated with perennial or intermittent watercourses or shallow groundwater. Plant communities may be dominated by species that are also found in drier habitats (e.g., mesquite) but contain some preferential riparian plant species such as velvet ash (*Fraxinus velutina*) or netleaf hackberry (*Celtis reticulata*)" (PCRFC 2011:5).

Xeroriparian Habitat – Xeroriparian habitat is defined by Pima County as follows: "Xeroriparian habitats are generally associated with an ephemeral water supply. These plant communities typically contain species also found in upland habitats; however, these plants are typically larger and/or occur at higher densities than adjacent uplands. Xeroriparian habitat is divided into Classes A, B, C, and D" (PCRFC 2011:5–6).

Xeroriparian subcategories are defined as:

<i>Xeroriparian A</i>	The densest Xeroriparian subcategory.
<i>Xeroriparian B</i>	Moderately dense Xeroriparian subcategory.
<i>Xeroriparian C</i>	Less dense Xeroriparian subcategory.
<i>Xeroriparian D</i>	Less to sparsely dense Xeroriparian subcategory that provides hydrologic connectivity to other riparian habitat areas.

Applicability, Compliance, and Mitigation

The Riparian Habitat Protection Ordinance applies to all property in unincorporated areas of Pima County that contains RRH, including State Trust land and property owned by Pima County (PCRFC 2011). Any disturbance to RRH requires review and approval by the PCRFC, and any disturbance of 0.33 acre (14,520 square feet) or more requires a mitigation plan (PCRFC 2011).

Chapter 16.30 stipulates that an applicant (private property owner, government agency, or developer) can mitigate for unavoidable negative impacts to RRH through the use of one of the following compensatory on-site mitigation options: preservation, enhancement, restoration, or establishment. If these on-site mitigation options are

investigated and deemed infeasible for the applicant, then off-site mitigation may be proposed; however, approval by the PCRFCDD is required. The Pima County Board of Directors must approve if IRA or Class H is impacted and exceeds more than five percent of the RRH on-site. Currently, three off-site compensatory mitigation options are available for consideration:

Mitigation on another parcel of land with comparable riparian habitat and appropriate long-term protection measures;

1. A land exchange if the project is a large commercial or master-planned community; and
2. An in-lieu monetary fee.

It should be noted and stressed that off-site mitigation opportunities become an option only after the applicant has shown that avoidance is not possible, impacts to RRH have been minimized, and the ability to mitigate entirely on-site has been proven infeasible. Compensation for RRH loss (in-lieu fee) is not meant to replace avoidance and minimization (PCRFCDD 2011).

Much of the planning area is within unincorporated Pima County and contains mapped RRH, and project activities must comply with the Riparian Habitat Protection Ordinance. Problem Area 2 contains IRA-C habitat, Problem Area 5 6 contains IRA-D, and no riparian habitat is mapped within Problem Area 7. Problem Areas 1 and 3-5 were omitted from this study.

Wetlands modeled by NWI in the overall planning area are addressed above in [Section 4.2.5](#). Modeled wetlands were identified including PUBF (palustrine, unconsolidated bottom, semi permanently flooded) at Problem Areas 2 and 7, R4SBC (riverine, intermittent, streambed, seasonally flooded) at Problem Area 2, and R5UBFx (riverine, unknown perennial, unconsolidated bottom, semi permanently flooded, excavated) at Problem Area 7. Pima County 2005 FC-2 regulated riparian habitat is mapped at Problem Area 2 (IRA-C) and at Problem Area 6 (IRA-D). No NWI features are modeled at Problem Area 6 and no riparian habitat is mapped at Problem Area 7 (see [Figures 13-19 in Appendix C](#)).

4.2.6 Floodplain Management

Within the Watershed Plan-EA, existing conditions are equivalent to the No Action, or Future Without Federal Investment (FWOFI) Alternative. The No Action/FWOFI consists of no flood prevention improvements in the study area. Flood risk, erosion and sediment damages on a regional scale would not be mitigated. This No Action/FWOFI Alternative, or existing conditions scenario, presents a baseline for comparison to estimate flood protection being provided by each alternative.

The PCRFCDD recently completed a re-study of the floodplain(s) within and crossing the study area (see [Section 2.4.1](#) and [Figure 3 in Appendix B](#) for Floodplain Map). Impacts to the existing floodplain(s) along Brawley Wash could require a re-study and preparation of an application to FEMA as a Conditional Letter of Map Revision (CLOMR) (see [Section 8.4](#)).

4.3 Air

Ambient air quality is influenced by the regional climate, emissions from various local and regional sources, and emissions controls imposed on those sources by federal, state, and local laws and regulations. This section describes the existing air quality conditions in the planning area, and the regulatory considerations for air quality in the planning area.

The study area is located in Pima County, Arizona, within the Rillito PM₁₀ moderate nonattainment area. The concentration of PM₁₀ in the air in Rillito is frequently above federal standards. The Arizona Department of Environmental Quality (ADEQ) is developing a nonattainment State Implementation Plan (SIP) to improve the air quality in this area. The plan will include an updated emissions inventory, modeling demonstration, strategy for Exceptional Events and rules for PM₁₀ controls. Sources of PM₁₀ in the Rillito nonattainment area include unpaved roads, construction, windblown dust, agricultural activities, and cleared areas/vacant lots (ADEQ 2021). The planning area is also within a maintenance area for carbon monoxide as addressed in the Carbon Monoxide Limited Maintenance Plan for the Tucson Air Planning Area (ADEQ 2008).

4.3.1 Federal Air Quality Requirements

The U.S. Environmental Protection Agency (EPA) promulgates the National Ambient Air Quality Standards (NAAQS) which are established in the Clean Air Act Amendments (CAAA) of 1990 (42 USC 7401 et seq.).

The National Ambient Air Quality Standards (NAAQS) currently applies to the following six principal pollutants, also known as “criteria pollutants”:

- Particulate matter with an aerodynamic diameter ≤ 2.5 microns (“PM_{2.5}”)
- Nitrogen dioxide (“NO₂”)
- Sulfur dioxide (“SO₂”)
- Carbon monoxide (“CO”)
- Ozone (“O₃”)
- Lead (“Pb”)

These pollutants are common in outdoor air, considered harmful to public health and the environment, and come from numerous and diverse sources. The Clean Air Act requires the EPA to review the standards – and the science behind them – periodically to determine whether changes are warranted. The standards are set to provide public health protection, including protecting the health of “sensitive” populations such as asthmatics, children, and the elderly. They also provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The *National Ambient Air Quality Standards (NAAQS)*, established by the *Clean Air Act*, define allowable levels of harmful pollutants in the atmosphere. These standards are set by the U.S. *Environmental Protection Agency (EPA)* the NAAQS focus on six principal pollutants, known as “criteria pollutants,” which are common in outdoor air, considered detrimental to public health and the environment, and originate from diverse sources.

The Clean Air Act (CAA) requires the EPA to issue national ambient (outdoor) air quality criteria (standards) for certain listed pollutants and then review those standards every five years. Among the air pollutants for which EPA issued a national ambient air quality standard (NAAQS) was particulate matter (PM), especially PM 2.5 micrometers or less in diameter (PM_{2.5}). Exposure to PM has been associated with adverse health effects, with haze formation, and with other ecological effects.

If the NAAQS levels are exceeded, the area is designated a non-attainment area and the development of a State Implementation Plan (SIP) is required. The SIP sets allowable emissions levels to be met and identifies control strategies to meet the NAAQS for those specific criteria pollutants that experienced exceedances.

It is the prerogative of an individual State to implement standards that are more restrictive than those of the NAAQS. The State of Arizona has incorporated the NAAQS and does not have any additional State-level ambient air quality standards.

4.3.2 Pima County Air Quality Requirements

Pima County has been delegated authority pursuant to ARS 49-402 and ARS 49-112 to maintain and operate an air quality control program under the SIP. Pima County codified air quality regulations in the Pima County Code of Ordinances (PCC), Title 17 (Pima County Code of Ordinances 2017). PCC §17.12 requires a fugitive dust activity permit for any project disturbing more than one acre of land, trenching over 300 feet, road construction over 50 feet, and blasting activities. An opacity standard of 20 percent applies to visible emissions from a nonpoint source. Until the area becomes permanently stabilized, dust controls during construction and operations are required such as applying adequate amount of dust suppressant to the affected area. The project activities will comply with all conditions of the Pima County Fugitive Dust Activity Permit.

4.3.3 Considerations / Data Gaps

Existing air quality in the planning area is adversely affected by PM₁₀ in the form of fugitive dust from previously disturbed areas. There are no notable data gaps. However, project activities in the study area will need to consider fugitive dust requirements as indicated in Pima County's Fugitive Dust Activity Permit should project development intend to disturb new land areas.

4.4 Vegetation

The Brawley Watershed Plan Area (plan area) covers approximately 198,000-acres, spans approximately 4,300 feet of elevation change (the lowest point is at the northern edge of the site near the Santa Cruz River at 1,820 ft; the highest point, at 6,133 ft elevation, is at the headwaters of South Mendoza Wash in the Coyote Mountains in the southwest portion of the site), and includes six distinct vegetation communities as well as agricultural fields, ranch lands, and residential and urban development (refer to **Figure 21 in Subappendix D.4**). It is important to note that most of the undeveloped areas within the watershed have likely had some type of previous intensive use (grazing and or agriculture) and are not reflective of pristine textbook vegetation communities.

With the loss of vegetative cover (no plant matter to soften the erosive effects of raindrops, and no plant roots to hold the soil in place), topsoil has been washed downstream, leaving hard soils un conducive to plant growth (Rosen 2005). The result are the conditions that we see today – considerable swaths of land lacking plant growth and extensive erosion issues – from lack of infiltration to the creation of deep gullies and arroyos.

4.4.1 Vegetation Communities and Habitat

The vegetation community data used in this report and depicted on the Biotic Communities Map was generated by Pima County and David E. Brown in 2017. Brown is the author of *Biotic Communities: Southwestern United States and Northwestern Mexico*, 1994, which provided extensive reference material for this report.

From casual site observation and aerial imagery comparison (no ground truthing was performed) the 2017 information is an accurate reflection of the site conditions today, with the addition of some residential development that has occurred within the last four years. Brown maps six distinct vegetation communities within the plan area: Sonoran Savanna Grassland, Sonoran Palo Verde – Cacti-Mixed Scrub, Sonoran Creosote Bursage Scrub, Semidesert Grasslands, Riparian Mesquite Forest, and Madrean Evergreen Woodland. Refer to the Biotic Communities Map, **Figure 22 in Subappendix D.4** for distribution of plant communities and **Table 11 in Subappendix D.4** for surface coverage details.

4.4.2 Special Status Plant Species

Two federal agencies and the State of Arizona Department of Agriculture list special status species that occur in our plan area. **Table 12 in Subappendix D.4** identified the special Status Species Within, or Within five miles of the Plan Area.

4.4.2.1 Federal Listing

T&E Plant Species

U.S. Fish and Wildlife Service (USFWS)

The USFWS is responsible for administering the Endangered Species Act (ESA). Under the ESA species are listed as T&E. “Endangered” means that the species is in danger of extinction throughout all or a significant portion of its range (USFWS 2021). In our plan area there are four species listed endangered and one species listed threatened. The endangered species are: Arizona Eryngo (*Eryngium sparganophyllum*), Kearney’s blue-star (*Amsonia kearneyana*), Nichol’s Turk’s head cactus (*Echinocactus horizonthalonius* var. *nicholii*), and Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*). The threatened species is: Bartram’s Stonecrop (*Graptopetalum bartramii*).

The USFWS Information for Planning and Consultation (IPaC) project planning tool was queried to assist with identification of special status species.

Bureau of Land Management (BLM)

BLM maintains a list of at-risk plant species for the land it manages. In our plan area three species are designated sensitive by BLM: Arizona Sonoran rosewood (*Vauquelinia californica* ssp. *sonorensis*), Pima Indian mallow (*Abutilon parishii*), and Tumacoc globeberry (*Tumacoca macdougalii*). The goal of the BLM listing is to promote conservation of these species on BLM land, so they do not in the future contribute to an ESA listing (BLM 2021).

The Arizona Game and Fish (AZGF) Online Environmental Review Tool was used to identify BLM sensitive species.

4.4.2.2 State Listing

Arizona Native Plant Law

The Arizona Native Plant Law (AZNPL) (Arizona Revised Statutes 3-904) (ADA 2021a) was enacted to protect rare plant species and to protect some species from being over harvested. This law states that protected plants cannot be salvaged from lands, including private lands, without landowner permission and a permit from the ADA. However, plants can be cleared from private property by the property owner after filing a Notice of Intent to Clear Land with the ADA. The ADA is tasked with preventing the unauthorized destruction, removal, and transport of plants:

There are four categories of protected native plants per the Arizona Revised Statutes:

- *Bulleled Highly Safeguarded (HS)* - Highly safeguarded native plants to be afforded the exclusive protections, including the use of scientific or threatened collection and salvage permits, provided this category in this chapter. This category includes those species of native plants and parts of plants, including the seeds and fruit, whose prospects for survival in this state are in jeopardy or which are in danger of extinction throughout all or a significant portion of their ranges, and those native plants which are likely within the foreseeable future to become jeopardized or in danger of extinction throughout all or a significant portion of their ranges. This category also includes those plants resident to this state and listed as endangered, threatened, or category 1 in the federal endangered species act.
- *Salvage Restricted (SR)* - Salvage restricted native plants to be afforded the exclusive protections involving the use of salvage permits, tags and seals provided in this chapter. This category includes those native plants which are not included in the highly safeguarded category but are nevertheless subject to a high potential for damage by theft or vandalism.
- *Salvage Assessed (SA)* - Salvage assessed native plants to be afforded the exclusive protections, involving the use of salvage tags and seals and annual salvage permits, provided in this chapter. This category includes those native plants which are not included in either the highly safeguarded or salvage restricted categories but nevertheless have a sufficient value if salvaged to support the cost of salvage tags and seals.
- *Harvest Restricted (HR)* - Harvest restricted native plants to be afforded the exclusive protections involving the use of harvest permits and wood receipts provided in this chapter. This category includes those native plants which are not included in the highly safeguarded category but are subject to excessive harvesting or overcutting because of the intrinsic value of their by-products, fiber or woody parts.

A large number of protected native plant species are known to occur or have the potential to occur within the planning area based on range and habitat. Plant species protected by the AZNPL have occurrence records within five miles of the planning area (AZHGIS 20214). Two highly safeguarded species have occurrence records within five miles of the planning area: Nichol's turk's head cactus (*Echinocactus horzonthalonius* var. *nicholii*) and Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*) (AZHGIS). Eight salvage restricted native plant species have occurrence records within five miles of the planning area: Pima Indian mallow (*Abutilon parishii*), Thornber fishhook cactus (*Mammillaria thornberi*), varied fishhook cactus (*Mammillaria viridiflora*), Tumamoc globeberry (*Tumamoca macedougallii*), and Kelvin pricklypear (*Cylindropuntia x kelvinensis*), magenta hedgehog cactus (*Echinocereus fasciculatus*), Nichol's hedgehog cactus (*Echinocereus nicholii*), and desert night-blooming cereus (*Peniocereus greggii* var. *transmontanus*).

Native plants protected by the ADA are present within the project area. If plants listed under AZNPL would be impacted during individual project activities, a Notice of Intent (NOI) to Clear Land for the removal or destruction of these plants normally must be provided to the ADA prior to disturbance. However, pursuant to ARS 3-915, projects that contain or occur within existing canals, laterals, ditches, electrical transmission and distribution facilities, public ROWs, or other facilities, structures or equipment owned, operated, or used by public service corporations or special districts or projects that will involve native plant destruction that is incidental to normal and routine maintenance are exempt from the ADA NOI to Clear Land requirement. The time requirement for notification depends on the acreage of the proposed disturbance. If native plants will be salvaged and replanted off-site, then the applicant needs to include this information with the NOI to Clear Land form at the time of its submittal and request salvage permits. More information regarding this state regulation can be found on the ADA website (ADA 2021a).

4.4.2.3 Local Native Plant Regulations

Pima County Native Plant Preservation Ordinance

Pima County's Native Plant Preservation Code (Chapter 18.72 of the Pima County Code) was established to protect plant species native to Pima County by requiring preservation and or mitigation for individual plants and plant communities. There are numerous protected tree, shrub, and succulent species that occur within the plan area and would require inventory / mitigation prior to site disturbance.

Pima County Conservation Areas

As part of the formulation of the Sonoran Desert Conservation Plan and Multi Species Conservation Plan, Pima County, in consultation with species experts, identified critical conservation areas for identified endangered and high priority species in Pima County. These areas are known as Priority Conservation Areas (PCAs). PCAs identify those areas where land conservation activities, such as mitigation, should be prioritized to ensure the conservation of Priority Vulnerable Species (Pima County 2016). While inexact and subject to periodic updates, PCAs are based on local knowledge and incorporate concerns for habitat quality, threats, and species population distributions. Refer to the Special Status *Plant Species*

Range & Conservation Areas map showing critical habitat areas identified for endangered species within the plan area.

Town of Marana Native Plant Preservation Ordinance

Title 17 of the Town of Marana Land Development Code outlines the Environment Resources Preservation and Native Plant Protection Landscape Requirements regulated by the Town. Lands within Marana would be required to follow the Town's regulations for inventory, protection, and mitigation for protected native plant species.

4.4.3 Invasive Plant Species

One of the objectives of the Plan-EA study was to ascertain the types of invasive vegetation species and extent-limits of the identified invasive species within the project study area. The Plan-EA conducted a desktop analysis of available invasive plant data and GIS databases from various agency and non-governmental organizations. The organizational inventory included Pima County, Tucson Water, Bureau of Land Management (BLM), the Saguaro National Park, Arizona Sonora Desert Museum, the Arizona Native Plant Society, and the web-based tool "iMap Invasives".

The findings from the invasive plant species inventory indicates that organizational investment is more oriented toward invasive plant species eradication rather than programmatic mapping of invasive extents and detailed types of invasives. There is no apparent comprehensive database for invasive species data.

Agency Provided Invasive Plant Data Map (**Figure 23** in **Subappendix D.4**) provides a mapped compilation of the data made available from the organizations. The species included on the map were selected based on: (a) availability of data and (b) presence of species on the noxious weed list or priority Pima County invasive species. The inventory of invasive species found that 98 percent of the data received was for buffelgrass, and 98% of the records are within the Saguaro National Park. The Plan-EA was limited to conducting a desktop review of invasive species data, and as a result of that limitation there are known invasives throughout the study area but there was not available mapping data to indicate the detailed types and extents (e.g.: Lehmann lovegrass is common throughout the study area).

Each organization has a ‘priority list’ of invasive species. The highest threat is from those species that can completely and rapidly transform an ecosystem as has been seen with buffelgrass in desert ecosystems, and tamarisk in riparian areas. There has not been sustained funding for mapping of invasive species. The trend appears to be toward using funds on treatment rather than mapping.

The locations shown on (**Figure 23** in **Subappendix D.4**) within the Saguaro National Park are actively being treated on a regular basis. The Saguaro National Park creates a list of priority treatment areas each year – where and when spraying occurs is based on rainfall (plants must be green to spray). SNP’s plan for invasive species treatment is part of the 2014 Restoration Management Plan Environmental Assessment (EA).

Of the invasive non-native plants (87 species as of 2014 EA) known to be present in the park, twenty-six of those are under management. The Saguaro National Park has identified the following species as the highest priority:

- Buffelgrass (*Pennisetum ciliare*) Fountain grass (*Pennisetum setaceum*)
- African lovegrass (*Eragrostis echinochloidea*)
- Natal grass (*Melinis repens*)
- Salt cedar or tamarisk (*Tamarix spp.*)
- Malta starthistle (*Centaurea melitensis*)
- Sahara mustard (*Brassica tournefortii*)
- Stinknet (*Oncosiphon piluliferum*)

4.5 Wildlife

Many wildlife and game species would be expected to use the planning area given its extent, its large elevational range, and its large number of different natural and human-influenced habitats.

4.5.1 General Wildlife, Wildlife Communities and Connectivity

Wildlife Communities

Mammals (small-, medium-, and large-sized; including bat species and game species), birds (year-round residents; breeding, migratory, and wintering residents), reptiles, amphibians, fish, and invertebrates would all be expected to occur in the planning area. **Table 13** in **Subappendix D.4** lists some wildlife species that might be expected to occur in the planning area based on biotic community. This is not a complete list of the wildlife species that could occur or would be expected to occur. Individual projects within the planning area would need field reconnaissance to determine wildlife and game species that occur or would have the potential to occur. All three Problem Areas are within the Lower Colorado Valley subdivision of the Sonoran Desert scrub biotic community.

Wildlife Connectivity

The Arizona’s Wildlife Linkages statewide assessment report identified habitat blocks (i.e., areas of land that consists of important wildlife habitat that can be reasonably expected to remain wild for 50 years), fracture zones (i.e., areas of reduced permeability between habitat blocks where roads, canals, urban areas, railroads, or border security operations limit or prevent wildlife movement), potential linkage zones (i.e., subsets or portions of the fracture zones

identified as an area critical for wildlife movement), and riparian linkage zones (i.e., streams that historically supported riparian communities) (Arizona Wildlife Linkages Workgroup 2006) .

The planning area overlaps with potential wildlife linkage zones identified in the Arizona’s Wildlife Linkages statewide assessment report (Arizona Wildlife Linkages Workgroup 2006). Potential Linkage Zones “represent areas that are important to Arizona’s wildlife and natural ecosystems.” The planning area overlaps with potential wildlife linkage zones including Ironwood-Tortolita (79), Avra Valley (85), and Central Arizona Project Canal (152).

The planning area overlaps with several additional types of wildlife corridors and connectivity zones as identified with AGFD online environmental review tool (**Attachment 12 of Subappendix D.4**) (AZHGIS 2024): those identified in the Pima County Stakeholder Wildlife Connectivity Zones (AGFD 2012a) (see **Figure 24 of Subappendix D.4** showing results for Pima County), Important Connectivity Zones (ICZs) that were modeled as part of a connectivity or linkage assessment (Perkl 2013) (see **Figure 25 of Subappendix D.4** showing the ICZs in Arizona), and Linkage Designs that are individual wildlife corridors that have been modeled to maintain or restore ability of wildlife to move between wildland blocks (Beier et al. 2007; AGFD 2012b).

Problem Areas 2, 6, and 7 are within a wildlife Landscape Movement Area, and Problem Area 6 is adjacent to a Riparian Movement Area.

4.5.2 Special Status Species

Special-status wildlife species are categorized by federal and state agencies as either sensitive or threatened and endangered. The U.S. Fish and Wildlife Service (USFWS), Bureau of Land Management (BLM), Arizona Game and Fish Department (AGFD) were utilized to identify special status species that occur within the planning area. SWCA utilized available databases to determine which special-status species and other biological resources were known or have the potential to occur in the planning area.

The planning area overlaps with special habitat areas, including critical habitat, wildlife waters, Important Bird Areas (IBA), and wildlife connectivity.

The planning area overlaps with the Tucson Mountains IBA, a 73.2 square mile area centered on the Tucson Mountains and adjacent upland Sonoran Desert vegetation habitats; however, none of the Problem Areas are within this IBA (Arizona IBA Program 2011) (**Figure 26 in Subappendix D.4**). Year-round resident birds associated with this IBA include Abert’s towhee (*Melospiza aberti*), Anna’s hummingbird (*Calypte anna*), black-throated sparrow (*Amphispiza bilineata*), cactus wren (*Campylorhynchus brunneicapillus*), canyon towhee (*Melospiza fusca*), Costa’s hummingbird (*Calypte costae*), Gambel’s quail (*Callipepla gambelii*), Gila woodpecker (*Melanerpes uropygialis*), gilded flicker (*Colaptes chrysoides*), greater roadrunner (*Geococcyx californianus*), Harris’s hawk (*Parabuteo unicinctus*), northern cardinal (*Cardinalis cardinalis*), pyrrhuloxia (*Cardinalis sinuatus*), rufous-crowned sparrow (*Aimophila ruficeps*), and rufous-winged sparrow (*Peucaea carpalis*) (Arizona IBA Program 2011). Breeding birds associated with this IBA include ash-throated flycatcher (*Myiarchus cinerascens*), Bell’s vireo (*Vireo bellii*), black-chinned hummingbird (*Archilochus alexandri*), brown-crested flycatcher (*Myiarchus tyrannulus*), elf owl (*Micrathene whitneyi*), hooded oriole (*Icterus cucullatus*), Lucy’s warbler (*Oreothlypis luciae*), purple martin (*Progne subis*), western screech owl (*Megascops kennicottii*), and white-winged dove (*Zenaidura macroura*). Species that use the IBA for migration include MacGillivray’s warbler (*Geothlypis tolmiei*), rufous hummingbird (*Selasphorus rufus*), and Wilson’s warbler (*Cardellina pusilla*). Wintering bird species at this IBA include Brewer’s sparrow (*Spizella breweri*), green-tailed towhee (*Pipilo chlorurus*), Lincoln’s sparrow (*Melospiza lincolnii*), and ruby-crowned kinglet (*Regulus calendula*).

4.5.2.1 Federally Listed Wildlife Species

T&E Species

U.S. Fish and Wildlife Service (USFWS) –

The ESA (Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) specifically prohibits the “take” of a listed wildlife species. Take is defined as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct.” However, the ESA does not provide the same take protections of plant species, except on federal land. The USFWS is responsible for administering the Endangered Species Act (ESA). Under the ESA species are listed as either endangered or threatened. “Endangered” means that the species is in danger of extinction throughout all or a significant portion of its range (USFWS 2021).

Endangered species are those in imminent jeopardy of extinction. The ESA specifically prohibits the take of a species listed as endangered. Threatened species are animal or plant species likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Non-Essential Experimental Population (NEP) are experimental populations of a species designated under Section 10(j) of the ESA for which the USFWS, through the best available information, believes is not essential for the continued existence of the species. Regulatory restrictions are considerably reduced under an NEP designation. Candidate species are those for which the USFWS has sufficient information on biological vulnerability and threats to support proposals to list as endangered or threatened under the ESA. However, proposed rules have not yet been issued because such actions are precluded at present by other listing activity. Considerably reduced under an NEP designation. Proposed endangered species are those that are not currently federally protected under the ESA but are eligible to be listed as endangered under the ESA. Proposed Threatened. Proposed threatened species are those that are not currently federally protected under the ESA but are eligible to be listed as threatened under the ESA.

The U.S. Fish and Wildlife Service (USFWS) maintains a list of Endangered Species Act (ESA) protected species and critical habitat that are known to occur in each Arizona county. The protected species lists for Pima and Pinal counties can be found in **Attachments 9 and 10** respectively in **Subappendix D.4**. In addition, planning area-specific information regarding protected species and their critical habitat is available online through the USFWS's Environmental Conservation Online System-Information, Planning and Conservation (ECOS-IPaC) database (USFWS 2024a). The official ECOS-IPaC list (**Attachment 11** in **Subappendix D.4**) includes species that are currently listed as endangered or threatened under the ESA, as well as non-essential experimental population (NEP) and candidate species.

Endangered species are those in imminent jeopardy of extinction. The ESA specifically prohibits the take of a species listed as endangered. Threatened species are animal or plant species likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Non-Essential Experimental Population (NEP) are experimental populations of a species designated under Section 10(j) of the ESA for which the USFWS, through the best available information, believes is not essential for the continued existence of the species. Regulatory restrictions are considerably reduced under an NEP designation. Candidate species are those for which the USFWS has sufficient information on biological vulnerability and threats to support proposals to list as endangered or threatened under the ESA. However, proposed rules have not yet been issued because such actions are precluded at present by other listing activity. Considerably reduced under an NEP designation. Proposed endangered species are those that are not currently federally protected under the ESA but are eligible to be listed as endangered under the ESA. Proposed Threatened. Proposed threatened species are those that are not currently federally protected under the ESA but are eligible to be listed as threatened under the ESA.

There are a total of 28 endangered, threatened, NEP, proposed, or candidate species that have the potential to occur in Pima and Pinal Counties (**Attachments 9 and 10** of **Subappendix D.4**). Of those, the planning area specific ECOS-IPaC official species list (Consultation Code: 2025-0002637) (USFWS 2024) (**Attachment 11** of **Subappendix D.4**) includes the following 13 wildlife species: jaguar (*Panthera onca*), an endangered species; Mexican wolf (*Canis lupus baileyi*), a NEP species; ocelot (*Leopardus [=Felis] pardalis*), an endangered species; Sonoran pronghorn (*Antilocapra americana sonoriensis*), an endangered and NEP species; cactus ferruginous pygmy owl (*Glaucidium brasilianum cactorum*), a threatened species; California least tern (*Sterna anillarum browni*), an endangered species; masked bobwhite (*Colinus virginianus ridgwayi*), an endangered species; southwestern willow flycatcher (*Empidonax traillii extimus*), an endangered species; yellow-billed cuckoo (*Coccyzus americanus*), a threatened species; Sonoyota mud turtle (*Kinosternon sonoriense longifemorale*), an endangered species; Chiricahua leopard frog (*Rana chiricahuensis*), a threatened species; Gila topminnow (incl. Yaqui) (*Poeciliopsis occidentalis*), an endangered species; and monarch butterfly (*Danaus plexippus*), a candidate species.

Six of these wildlife species have occurrence records within five miles of the planning area (AZHGIS 2024) (**Attachment 12** of **Subappendix D.4**): jaguar, yellow-billed cuckoo, southwestern willow flycatcher, cactus ferruginous pygmy owl, Gila topminnow, and Chiricahua leopard frog. And additional three federally listed species had occurrence records or were predicted to occur based on habitat modeling within five miles of the planning area: Sonora chub (*Gila ditaenia*), razorback sucker (*Xyrauchen texanus*), and Mexican spotted owl (*Strix occidentalis lucida*) (AZHGIS 2024) (**Attachment 12** of **Subappendix D.4**).

The southwestern portion of the planning area overlaps with the Baboquivari-Coyote subunit of the Baboquivari Unit of jaguar designated critical habitat (USFWS 2014). The Baboquivari-Coyote subunit contains 41,823 total acres in the northern Baboquivari, Saucito, Quinlan, and Coyote Mountains in Pima County, Arizona and was considered occupied at time of listing (USFWS 2014). As recently as 2008, a jaguar or sign of jaguar (e.g., tracks, scat) was documented in the Coyote Mountains in the southwestern portion of the planning area (Wildlife Conservation Society [WCS] 2021).

Bureau of Land Management (BLM)

Portions of the planning area overlap with lands administered by the Bureau of Land Management (BLM). The BLM 6840 Manual (BLM 2008) defines BLM sensitive species as:

Species designated as Bureau sensitive must be native species found on BLM-administered lands for which the BLM has the capability to significantly affect the conservation status of the species through management, and either:

1. There is information that a species has recently undergone, is undergoing, or is predicted to undergo a downward trend such that the viability of the species or a distinct population segment of the species is at risk across all or a significant portion of the species range, or
2. The species depends on ecological refugia or specialized or unique habitats on BLM-administered lands, and there is evidence that such areas are threatened with alteration such that the continued viability of the species in that area would be at risk.

The BLM maintains a list of sensitive species for Arizona that was most recently updated in 2017 and is broken up by district office (BLM 2017) (**Attachment 13 of Subappendix D.4**). BLM sensitive species also includes federally listed, proposed, or candidate, and delisted species in the five years following their delisting. The planning area lies within both the Gila District Office (GDO) and the Phoenix District Office (PDO). Aside from federally listed, proposed, or candidate species, 67 BLM sensitive species are listed for on either the GDO or the PDO or both (BLM 2017). Of those 67 species, twenty-six species have occurrence records or modeled habitat within five miles of the planning area (AZHGIS 2021) (**Attachment 12 of Subappendix D.4**). These species include American peregrine falcon (*Falco peregrinus anatum*), Arizona Botteri's sparrow (*Peucaea botterii arizonae*), Arizona myotis (*Myotis occultus*), Arizona Sonoran Rosewood (*Vauquelinia californica ssp. sonorensis*), bald eagle, banner-tailed kangaroo rat (*Dipodomys spectabilis*), cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*), California leaf-nosed bat (*Macrotus californicus*), cave myotis (*Myotis velifer*), desert box turtle (*Terrapene ornata luteola*), desert mud turtle (*Kinosternon sonoriense sonoriense*), desert purple martin (*Progne subis hesperia*), ferruginous hawk (*Buteo regalis*), gilded flicker (*Colaptes chrysoides*), golden eagle, greater western bonneted bat (*Eumops perotis californicus*), LeConte's thrasher (*Toxostoma lecontei*), lowland burrowing treefrog (*Smilisca fodiens*), lowland leopard frog (*Lithobates yavapaiensis*), northern goshawk (*Accipiter gentilis*), pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*), Pima Indian mallow (*Abutilon parishii*), Sonoran green toad (*Anaxyrus retiformis*), spotted bat (*Euderma maculatum*), Tumamoc globeberry (*Tumamoca macdougalii*), and western burrowing owl (*Athene cunicularia hypugaea*) (AZHGIS 2024).

Sonoran Desert Tortoise Candidate Conservation Agreement

Currently, a candidate conservation agreement (CCA) has been developed to facilitate conservation of Sonoran Desert tortoise. This CCA was created and finalized in 2015 to facilitate cooperation among agencies, avoid or minimize impacts, and implement mitigation measures to offset impacts to tortoises (USFWS and AIDTT 2015). In November 2020, the USFWS announced that the Sonoran Desert tortoise would be returned to the candidate list (USFWS 2020) and it was subsequently removed from the list two years later in November 2022 (USFWS 2022).

Several federal agencies that are signatories of the CCA including BLM and Natural Resources Conservation Service (NRCS). State agencies that are signatories of the CCA include AGFD and Arizona Department of Transportation. Because the NRCS is Participating Federal Agency of the CCA, the provisions of the CCA would apply to this project. The specific conservation measures agreed to by NRCS are included in Appendix A: Stressor/Conservation Measure Matrix of the CCA (USFWS and AIDTT 2015).

4.5.2.2 State Sensitive Species

The AGFD manages wildlife in Arizona. The AGFD does not maintain a state list of threatened or endangered species. Instead, it maintains a list of Species of Greatest Conservation Need (SGCN). SGCN is a designation used by AGFD as a

means to focus planning and conservation efforts. The list of Arizona SGCN species is found in **Attachment 12 of Subappendix D.4** of Arizona's State Wildlife Action Strategy (AGFD 2022). Each species is ranked according to seven vulnerability criteria and placed into one of three tiers: 1, 2, or 3, based on its level of vulnerability and AGFD's priority levels for management of the species. This list also includes species listed as endangered or threatened under the ESA.

Aside from federally listed, proposed, or candidate species that are discussed in **Section 2.5.2**, a total of 143 SGCN species have occurrence records or modeled habitat within the planning area (AZHGIS 2024) (**Attachment 12 of Subappendix D.4**). Species that have both species and subspecies records were only counted one time, as were species that had both occurrence records and modeled habitat. Of those 143 species, 17 were ranked as 1, 122 species were ranked as 2, and 4 were ranked as 3. SGCN species often overlap with species having other special status (e.g., BCC, BLM sensitive species).

Some species receive additional protections under Arizona State Law. The Sonoran Desert tortoise receives State protection by the AGFD under Arizona Revised Statutes 17-306 and 17-309. Arizona state law protects individuals but not habitat for this species. All bat species are protected by Arizona State Law and any bats residing in caves or caverns are protected by AGFD under Arizona Revised Statutes §13-3702. Bat colonies occur within five miles of the planning area (AGFD 2021) (**Attachment 12 of Subappendix D.4**). Raptors, including owls, and their nests or eggs receives protection under Arizona Revised Statutes 17-236.

4.5.3 Fish/Essential Fish Habitat

The planning area generally lacks perennial or intermittent water features (**Section 4.2**) to support native fish. Fish could occur in the planning area if translocated by human intervention, as transients in the CAP canal, or in locations where permanent water occurred (e.g., in stock tanks or springs). Native fish have the potential to occur or to be introduced or reintroduced in the planning area where suitable habitat occurs (e.g., Gila topminnow [*Poeciliopsis occidentalis*]) and non-native fish would be expected to occur in stock tanks or the CAP canal (e.g., mosquitofish [*Gambusia affinis*], channel catfish [*Ictalurus punctatus*], red shiner [*Cyprinella lutrensis*]).

4.5.4 Migratory Birds and Eagles

4.5.4.1 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act of 1940 (BGEPA) (16 USC 668–668c), as amended, prohibits take of bald eagles (*Haliaeetus leucocephalus*) or golden eagles (*Aquila chrysaetos*), including their parts, nests, or eggs, without a permit from the USFWS. Both the bald and the golden eagle have occurrence records within five miles of the planning area (AZHGIS 2024) (**Attachment 12 of Subappendix D.4**). Evaluation of the potential for suitable breeding or foraging habitat for these species would need to occur prior to implementation of any individual project occurring in the permit area.

4.5.4.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (MBTA) (16 USC 703–712) provides federal protection to all migratory birds and their nests and eggs. To maintain compliance with the MBTA, a permit must be obtained from the USFWS prior to relocating or altering any MBTA-protected nests. However, Section 1 of the Interim Empty Nest Policy of the USFWS, Region 2, states that if the nest is completely inactive at the time of destruction or movement, a permit is not required.

Protected migratory birds include most native bird species and do not include game species (e.g., quail). Many species of protected migratory birds are known to occur in the planning area (AZHGIS 2024) (**Attachment 12 of Subappendix D.4**), and many additional protected migratory bird species have the potential to occur. Suitable nesting substrates (e.g., snags, cacti, trees, shrubs, burrows) occur within the planning area. Measures must be taken to protect any active nest from disturbance or destruction to avoid a violation of the MBTA, and those measures would depend on specific project activities, but could include preconstruction surveys, timing construction to avoid nesting season (general nesting season is March through September, while the nesting season for raptors is generally January through late June), or avoidance of active nests found during project activities.

4.5.4.3 Birds of Conservation Concern

The Fish and Wildlife Conservation Act, as amended in 1988 (16 USC 2901-2911) requires USFWS to identify Birds of Conservation Concern (BCC), which include species, subspecies, and populations of all migratory nongame birds that could become candidates for listing under the ESA if additional conservation actions are not taken (USFWS 2008).

The planning area is mapped into two BCRs (USFWS 2008). Most of the planning area is located in BCR 33, Sonoran and Mojave Deserts, with a portion of the southern planning area mapped into BCR 34, Sierra Madre Occidental. The ECOS-IPAC (2024) planning area-specific query (**Attachment 12 of Subappendix D.4**) shows 29 birds of concern that may be impacted based on project location. Two of those birds of concern are eagle species that are not BCC for the planning area (see previous section). Twenty-seven of those birds of concern are BCC either within the planning area region or rangewide. Of those 27 species, nine have either been documented to occur or are predicted to occur based on habitat modeling (AZHGIS 2024) (**Attachment 12 of Subappendix D.4**): Arizona woodpecker (*Picoides arizonae*), black-chinned sparrow (*Spizella atrogularis*), Botteri's sparrow (*Aimophila botterii*), burrowing owl (*Athene cunicularia*), Costa's hummingbird (*Calypte costae*), elf owl (*Micrathene whitneyi*), Gila woodpecker (*Melanerpes uropygialis*), mountain plover (*Charadrius montanus*), and rufous-winged sparrow (*Aimophila carpalis*). These and other BCC have the potential to occur in the planning area.

4.6 Human Environment

4.6.1 Cultural and Historic Property

Section 106 of the NHPA and its implementing regulations (36 CFR 800) require federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment. The issuance of federal funds is a type of federal undertaking that is subject to Section 106 review and compliance.

4.6.1.1 Cultural Context

Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations (36 CFR § 800) outlines a process requiring Federal agencies to consult with the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Office (SHPO), Tribal Historic Preservation Office (THPO), Native American groups, and other interested parties as necessary. This consultation ensures that historic properties are adequately considered during the planning and implementation of Federal projects. The NRCS serves as the lead agency for Section 106 review and compliance.

Consulting parties for the Section 106 review include SHPO, COT, Pima County, , and Arizona State Museum (ASM) for non-tribal. Tribal consultation parties involved in this project are the Ak-Chin Indian Community, Gila River Indian Community, Hopi Tribe, Mescalero Apache Tribe, Pascua Yaqui Tribe, Pueblo of Zuni, Salt River Pima-Maricopa Indian Community, San Carlos Apache Tribe, Tohono O'odham Nation, Tonto Apache Tribe, White Mountain Apache Tribe, and Yavapai Apache Nation. Under Section 106, the lead Federal agency identifies the Area of Potential Effects (APE) and evaluates how the undertaking may affect historic properties within that area. The APE encompasses geographic areas where the project may directly or indirectly alter the characteristics of historic properties. Its boundaries are determined by the scale and nature of the undertaking and generally include all areas subject to foreseeable effects. For this project, the APE includes potential construction areas for flood prevention measures. Additionally, a cultural resources project area was established, encompassing the APE and a one-mile search radius around it. This broader area facilitates the identification of previously recorded cultural resources and historic properties near the Brawley Watershed. Prior cultural resource surveys provide valuable insight into potential cultural resources within the APE before it was surveyed.

Historic properties, as defined by Section 106, are prehistoric or historic districts, sites, buildings, structures, and objects that are included in or eligible for inclusion on the NRHP. Eligibility determinations are made by applying the National Register criteria found at 36 CFR 60.4 to districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and one or more of the following criteria:

Criterion A: Association with significant historical events at local, state, or national levels.

Criterion B: Connection to the lives of individuals significant in history, tied to the reasons for their significance.

Criterion C: Representation of distinctive characteristics of a type, period, or method of construction, or works of exceptional artistic value.

Criterion D: Potential to yield important information about prehistory or history.

Properties are generally considered historic if they are at least 50 years old unless younger properties demonstrate exceptional importance. Properties that do not meet these criteria are not eligible. If insufficient information exists to determine eligibility, a property may remain unevaluated until further investigation is conducted but is treated as eligible during the Section 106 process.

Additional federal and state laws relevant to the treatment of cultural resources in the APE include NEPA, the Arizona State Historic Preservation Act of 1982, the Arizona Antiquities Act, and the American Indian Religious Freedom Act of 1978. Arizona laws such as ARS § 41-844 and ARS § 41-865 provide protection for human remains and funerary objects found on non-federal public or private lands.

The Class I and III Cultural Resources (**Appendix E**) identifies seven APEs in which ground-disturbing activities may take place, including road improvements needed to access the problem areas; however not all of the APE would be subjected to ground disturbing activities. The location of Problem Areas APE are provided in **Table 32** in **Appendix E**.

4.6.1.2 Cultural Setting

Human occupation of the Avra and Altar Valleys spans approximately 12,000 years, from the Paleoindian period to the present, generally paralleling that of the Tucson Basin. The cultural history of the Brawley Watershed reflects approximately 12,000 years of human occupation, divided into five major time periods: Paleoindian (10,000–7500 B.C.), Archaic (7500 B.C.–A.D. 300), Ceramic (A.D. 200–1450), Protohistoric (A.D. 1450–1700), and Historic (A.D. 1700–1962), as summarized by Huckell (1984) and Doelle and Wallace (1991).

4.6.1.3 Archaeological Records Search

The records search showed that 188 archaeological surveys have been conducted within the cultural resources project area from the 1970s through 2019. The surveys were conducted for a variety of projects, the majority of which were related to the Tucson Aqueduct/Central Arizona Project/CAVSARP projects and other water utilities, gas pipelines, transmission and distribution lines, materials pits, road improvements, landfills, land exchanges, communication networks and facilities, and land development. Three notable projects that have provided the bulk of information available regarding the prehistory of the area are, for the Avra Valley, the Tucson Aqueduct/Central Arizona Project (Downum et al. 1986, Czaplicki and Ravesloot 1988, 1989a, 1989b), and for the Altar Valley, the Arizona Department of Transportation (ADOT) SR 286 Survey (Stone 1996) and the 2006 El Paso Sasabe Lateral Pipeline Project (Wilcox et al. 2007). These extensive linear projects have yielded a data set through which a partial reconstruction of the prehistoric archaeological landscape can be made.

Four hundred and eight archaeological sites have been documented in the cultural resources project area. Prehistoric sites in the project area and surrounds are moderate-density artifact scatters with and without features, generally located in the areas between larger intermittent drainages. Some of the sites have processing artifacts such as portable and bedrock ground stone, and features such as roasting pits, while others have extensive artifact middens and masonry structures, with indications of occupations of considerable time depth. Most of the sites were attributed to the Hohokam tradition at the time of recordation, although some of the sites have earlier Middle to Late Archaic and/or late prehistoric Trincheras and early historic Tohono O’odham components.

4.6.1.4 Cultural Surveys

Upon further analysis three Problem Areas were selected for additional study, including the Tortuga Ranch, Prickle Desert, and Tucker Road problem areas. For each of these three PAs, the NRCS, in consultation with the PCRFC, defined the APE to be the area in which ground-disturbing project activities would take place. Next, a Class III Cultural Resources Inventory was conducted to assist in identifying historic properties that have the potential to be affected by the undertaking (Petersen and Hesse 2024; Petersen and Hesse 2025). The Location of Problem Areas APE are provided in **Table 32** in **Appendix E**.

The survey of the APE was conducted on September 12, 13, and 20, 2024 and on March 14, 2025 under the authority and conditions of an Arizona Antiquities Act permit for non-collection archaeological survey. Evidence for cultural resources was sought in the form of artifacts (e.g., ceramics, lithics, historical metals, or glass) or features (concentrations of fire-affected rock, charcoal-stained soil, prehistoric or historic structures, or other cultural anomalies). Three newly discovered Hohokam archaeological sites were found within the APE, one within the Tortuga Ranch problem area and two within the Tucker Road problem area. Two sites are considered eligible for inclusion in the NRHP under Criterion D (information potential) and one site is unevaluated for the NRHP; all sites are treated as historic properties requiring further consideration under Section 106 review. The Class I, III, and III – new APE, Cultural Resources Inventory Reports are located in **Appendix E**.

NRCS has worked with PCRFCDD to avoid or minimize impacts to the archaeological sites, and PCRFCDD has committed to avoiding all sites. The NRCS made a finding of No Historic Properties Affected Section 106 finding of effects, which is appropriate when historic properties are present but the undertaking will have no effect upon them (36 CFR 8004d(1)). Through continued Section 106 consultation with the SHPO, agencies, and Tribes, the NRCS received SHPO concurrence on the NRHP eligibility of the three sites, and the APE. Correspondence documenting Section 106 consultation can be referenced in **Appendix E**.

4.6.2 Transportation and Infrastructure

See **Section 1.2** for current transportation and infrastructure in place within the study area.

Roadways

Future expansion is anticipated and planned for the Interstate 11 (I-11) corridor and would pass through the northern half of the planning area, from just south of Picture Rocks to the northern-most point of the planning area near Sasco Road. This new large interstate highway would introduce more intense traffic safety issues from much higher traffic speeds and notably increased traffic volumes (ADOT 2021).

Electrical Transmission Lines and Energy Development

There are multiple electrical transmission and distribution lines throughout the planning area, and at least two solar farms. High voltage transmission lines and distribution lines carry electrocution risks if working in proximity to facilities, fenced areas around substations become accessible, or if facilities become damaged. Damaged facilities (lines and/or substations) are potential sources of wildfire. Electrical facilities are subject to damage from wildfire, lightning strikes, overloading, and accidental damage.

Natural Gas Pipelines

Natural gas pipeline facilities intersect the planning area. Above ground pipeline facilities such as pipes, pump stations, and valves are typically protected with security fencing. However, should the fencing become compromised, facilities vandalized, or subject to accidental damage the contents are pressurized, toxic, volatile, and explosive. Leakage can cause an explosion and/or wildfire. Leakage can cause environmental pollution to soils, as well as surface water and groundwater.

4.6.3 Land Use

4.6.3.1 *Land Ownership*

Most of the land within the planning area is either ASLD-administered land or privately owned. Other large landowners are the BLM, National Park Service, and the Tohono O’odham National Reservation (see **Table 16** in **Subappendix D.5**).

4.6.3.2 *Land Uses*

Located in central Pima County, the Brawley Watershed is notable for its undeveloped open spaces that include mountainous natural areas, scenic upland foothills, and open lowland basins. A breakdown of the acreage of each type of land use is provided in **Table 19** in **Subappendix D.5**.

The project area covers a mix of agricultural, developed, undeveloped, and protected lands. The majority of the project area is contained within the lowland basins of the Brawley watershed, characterized by natural desert scrub interspersed with agriculture and rural development.

The land uses within the watershed includes irrigated croplands. A small portion of these croplands are being converted to urban and exurban land uses, a trend that will continue into the future. Livestock operations are also found within the watershed which includes ephemeral steer operations at lower elevations and cow and calf operations at the higher elevations.

The National Land Cover Database (NLCD) provides spatial reference and descriptive data characteristics for the land surface. There are twelve land cover categories mapped within the planning area (**Table 14** in **Subappendix D.4**). The Scrub/shrub category is the dominant land cover type in the planning area (88.3%).

Agriculture

Agricultural land uses such as irrigated croplands are present throughout the north half of the planning area, most of which are north of Three Points.

Ranching and Grazing

There are multiple ranches with active grazing allotments that intersect the planning area. While grazing areas are typically fenced with gates and/or cattle guards, livestock sometime escape fenced areas posing safety concerns for traffic. If not rotated to other pastures, livestock have potential to overgraze an area, increasing erosion protentional on steeper slopes or near wash banks, which can adversely affect soil quality and surface water quality.

Landfill

The Marana Regional Landfill is located in the northern part of the planning area between Avra Valley and Marana and serves both communities. This facility does not accept hazardous waste and uses a multi-layered liner system to prevent leachate entering the groundwater. The facility has a leachate collection and treatment system in place and conducts regular groundwater monitoring (Waste Management 2021).

Small-Scale Commercial Uses

Small-scale commercial businesses such as gas stations, convenience stores, feed supply, repair facilities, occur in the planning area. Some of these facilities, such as gas stations store toxic substances such as fuels and lubricants.

Hazardous Waste Sites - Taylor Airfield, which has declaration of environmental use restriction (DEUR) and is the site of an active remediation area (ADEQ 2021). There are 18 identified inactive underground storage tanks (UST) located in the planning area, most of which are associated with gas stations, maintenance facilities, farms, and airstrips (ADEQ 2021).

Agricultural Lands

Agricultural land uses such as irrigated croplands are present throughout the north half of the planning area, most of which are north of Three Points. Depending upon chemical makeup, application method, environmental conditions, and proximity, the herbicides and pesticides used on agricultural lands may present health concerns to local residents, as well as soils, surface waters, and groundwater.

4.6.4 Public Health and Safety

For the purposes of this analysis, a comprehensive review of specific existing public health and safety concerns for the planning area was not completed. Instead, this document summarizes public health and safety considerations by type, and roughly describes potential issues that can be associated with each type.

Wildfire

Vegetation (fuel) is sparse throughout the planning area. However, conditions are typically dry, and where vegetation is present, it presents a wildfire potential from lightning strikes, utility failures, and manmade causes.

Flooding

Much of the Brawley Wash watershed is considered within the 100-year floodplain. Structures and roadways in these flood prone areas are subject to flooding and related damage. Additionally, flooded areas become difficult to navigate (flooded roadways) during emergency response situations.

4.6.5 Natural Areas and Recreation

Study area recreation opportunities include the federally owned Ironwood Forest National Monument and Robles Ranch Community Center. The Ironwood Forest National Monument has 129,000-acres of land with 1,360-acres (1%) of motorized roads and recreation trails. Two recreation trails would be impacted by the 100-year flood event (BLM 2024). There is no use data available or developed recreation amenities associated with the trails. Adverse effects to these trails would be minimal, with potential temporary access limitations following large flood events.

Robles Ranch Community Center, operated by Pima County, provides community services, child-care, senior programs, public meeting space, and recreation. The 100-year flood event does not impact the community center building, access to the facility or adjacent recreation facilities. Based on minimal expected flood damages, recreation impacts were not included in the analysis.

Pima County is working on preserving or acquiring open space areas, trail corridors, and regional parks throughout the County to benefit natural and cultural resources and the local communities. Pima County has invested heavily in acquiring conservation properties, especially in fulfilling the goals of the Sonoran Desert Conservation Plan (Pima County 2024). The County's recreation planning takes into consideration the existing and proposed development patterns, the County's relationship with incorporated areas, the relative population densities in unincorporated areas, the conservation of valuable natural resources, and the impact potential growth characteristics may have on these resources, the priorities identified by the public (Pima County 2024). The Pima County Parks and Recreation Master Plan and Pima Regional Trail System Master Plan provide an overview of Pima County's regional trail corridors.

4.7 Socioeconomics

4.7.1 Socioeconomics

The socioeconomic area of consideration (the Brawley Wash Watershed boundary) can be assessed on a state, county, and local scale. For the purposes of this analysis, socioeconomic conditions are presented for the State of Arizona, Pima and Pinal Counties, and census-recognized places and boundaries in the watershed (i.e.- census tracts [CT], census designated places [CDP]). The following sections and tables describe the current demographic, employment, income, and economic conditions that have a potential to be affected by project alternatives analyzed in the EA.

The existing population conditions for the area of consideration is presented in **Table 17** in **Subappendix D.5**. The ethnicity and race characteristics for the area of consideration is presented in **Table 18** in **Subappendix D.5**, and select economic characteristics are presented in **Table 20** in **Subappendix D.5**.

4.7.1.1 Population

Located east of the Project, in 2022 the total population of Avra Valley, in Pima County, was approximately 6,281 people, representing a 6.1 percent decrease from 2010. Similarly, the total population of Three Points, located in Pima County, was approximately 5,100 people in 2022, representing a 1.5 percent decrease from 2010 (Headwaters Economics 2024a, 2024b). In comparison, the total population of Picture Rocks, in Pima County, was estimated to be 9,258 people in 2022, which represented a 10.5 percent increase from 2010 (Headwaters Economics 2024c). The two counties, Pima and Pinal, both experienced a population increase from 2010. Pima County's population was estimated at 1,042,393 in 2022, representing an 8.1 percent increase, while Pinal County estimated at 433,338 in 2022, representing a 31.6 increase in population (Headwaters Economics 2024d, 2024e)

In **Table 17** in **Subappendix D.5**, people aged 19 and younger in Three Points make up 27.2% percent of the population; this is a greater portion than in Avra Valley (24%), Picture Rocks (19.6%), and Pima County (22.5%), and Pinal County (23.5%)(U.S. Census Bureau 2022b).

4.7.1.2 Race and Ethnicity

Table 18 in **Subappendix D.5** provides percentages of the racial and ethnic groups represented in the U.S. Census data for Avra Valley, Picture Rocks, Three Points, Pima County, and Pinal County in comparison with the state of Arizona.

English is the dominant language spoken at home in Avra Valley (92.8%), Three Points (83.5%), Picture Rocks (80.2%), Pinal County (80.8%) and in Pima County (73.2%). The second most popular language spoken at home is Spanish in Picture Rocks (17.6%), Three Points (16.3%), Avra Valley (5.5%), Pima County (21.6%) and Pinal County (15.8%) (U.S. Census Bureau 2022a–f).

4.7.1.3 Education

Educational data from the U.S. Census Bureau indicate that Pima County (21.3%) and Three Points (29.9%) have a lower percentage of individuals aged 25 and older who have obtained a high school degree or equivalent (and no college) as compared to Avra Valley (43.5%) and Picture Rocks (31.1%) (U.S. Census Bureau 2022a–d) **Table 19** in **Subappendix D.5** provides a comprehensive breakdown of the educational attainment levels in the Project area.

4.7.1.4 Industry

The percentages below represent the portion of the workforce employed in various industries, with the top industries by employment. Currently, the top two major industries for employment in the Project area is retail trade and educational services, and health care and social assistance. Major industries for employment percentages of the workforce in various occupations are presented in **Table 20** in **Subappendix D.5** (U.S. Census Bureau 2022a–f).

4.7.1.5 Housing Values and Income

Housing values in the Project area exhibit a higher percentage of housing units valued at \$50,000 to \$99,999 or \$100,000 to \$149,999, which is below the statewide average. For a more detailed breakdown of these percentages, refer to **Table 21** in **Subappendix D.5**

In Avra Valley, 41 percent of residents rent properties priced below \$500 per month. This surpasses the statewide average in Arizona, where only four percent of residents fall into this rental bracket. A total of 44 percent of Picture Rocks residents, 55 percent of Three Points residents, 39 percent of Pima County residents, and 24 percent of Pinal County residents rent properties priced between \$500 to \$999 per month (U.S. Census Bureau 2022a–e). **Table 22** in **Subappendix D.5** provides median monthly rent for residents and the percentage breakdown.

4.7.1.6 Labor Force and Income

According to the U.S. Census, the employment rates in Picture Rocks (43%), Avra Valley (55%), Pima County (55%), and Pinal County (51%) are below the employment rate for the state of Arizona (57%). In Addition, the Three Points employment rate (36%) is considerably below the state average (U.S. Census Bureau 2022a–d).

The average poverty percentage among individuals under 18 years old is 20 percent in Avra Valley, 16 percent in Picture Rocks, 12 percent in Three Points, 13 percent in Pima County and 11 percent in Pinal County. Avra Valley, Picture Rocks, and Three Points all within Pima County surpasses the state average in Arizona, which stands at 12 percent. When examining the average poverty percentages among individuals that are under 18 years old, Avra Valley registers higher figures at 33 percent, compared to the statewide average in Arizona, which is 17 percent. Conversely, Picture Rocks demonstrates a lower poverty rate at 14 and Pinal County at 10 percent for the that age group. For individuals aged 65 and older, Three Points stands alone with the average poverty percentage at four percent which is lower than the state average of 9 percent. See **Table 23** in **Subappendix D.5** for a comprehensive breakdown of poverty by age (U.S. Census Bureau 2022a–e).

4.7.2 Local and Regional Economies

The economy of Three Points, supports 1,440 workers. The primary industries in the area are Retail Trade, Health Care and Social Assistance, and Construction, while the highest-paying sectors include Transportation and Warehousing, Utilities, Agriculture, Forestry, Fishing and Hunting, Mining, and Other Services Except Public Administration (U.S. Census Bureau 2022a; U.S.).

In Avra Valley, the local economy employs approximately 2,730 people. The largest industries are Retail Trade, Educational Services, and Construction. The highest-paying industries in the area are Public Administration, Health Care and Social Assistance, and Professional, Scientific, and Technical Services (U.S. Census Bureau 2022b).

Picture Rocks, has an employed population of 3,390 individuals. The leading industries include Health Care and Social Assistance, Retail Trade, and Construction. The highest-paying sectors in Picture Rocks are Mining, and Oil and Gas Extraction, followed by Professional, Scientific, and Technical Services and Public Administration (U.S. Census Bureau 2022c).

Retail and construction are the primary employers, while public administration, finance and insurance, and real estate and rental and leasing, and specialized services offering the highest wages in the area.

4.8 Ecosystem Services

NRCS requires evaluating alternatives for comparison of Ecosystem Services. Ecosystem Services are those services that benefit people that are derived from functioning ecosystems. Typically, A summary of the Ecosystem Services considered for this project (provisioning, regulating, and cultural) are provided in **Section 4.8.1** through **4.8.3**.

4.8.1 Provisioning Services

According to DM 9500-013, provisioning services are defined as “tangible goods provided for direct human use and consumption, such as food, fiber, water, timber, or biomass” (USDA 2017).

During scoping and evaluation of alternatives, the spatial and temporal extent, number and variety of ecosystem services to be considered, and the population groups potentially impacted by the decision were considered in coordination with agencies and the public. A detailed list ecosystem services within all categories (provisioning, regulating, and cultural) was developed and the list was selectively prioritized using the criteria outlined in

DM 9500-013 – 8, specifically the

- 1) Anticipated magnitude of impact;
- 2) Reversibility of the given decision;
- 3) Irretrievability of potential resources;
- 4) Local societal importance of resources, and
- 5) Potential to affect pre-existing regulatory thresholds.

Note that some ecosystem services can overlap several categories such as pollinator habitat and wildlife corridors. This section provides an overview of the ecosystem services identified in the scoping phase and discusses those services within the category that is most applicable for the study area.

4.8.1.1 *Wildlife Corridor*

NRCS requires evaluating alternatives for comparison of Ecosystem Services. Ecosystem Services are those services that benefit people that are derived from functioning ecosystems. A brief summary of the Ecosystem Services considered for this project (provisioning, regulating, and cultural) are provided in **Section 4.8.1** through **4.8.3** below.

Roads, urbanization, canals, railways, energy corridors and activities of illegal migrants and border security operations destroy habitat and create barriers that isolate wildlife populations and disrupt ecological functions such as gene flow, predator-prey interactions, and migration (Arizona Wildlife Linkages Workgroup 2006).

Healthy wildlife populations provide provisional ecosystem services by providing food and tradable goods. Landscape connectivity is an important component of ecosystem health. Wildlife corridors, which provide landscape connectivity, are crucial to the long-term viability of wildlife populations and provide opportunities for activities such as daily foraging, seasonal migration, dispersal events to seek new territories, and multi-generational range shifts in response to climate fluctuations. (Callahan et. al. 2014). The planning area overlaps with potential wildlife linkage zones identified in the Arizona’s Wildlife Linkages statewide assessment report including the Ironwood-Tortolita, Avra Valley and Central Arizona Project Canal as well as other additional types of wildlife corridors and connectivity zones identified by the AGFD online environmental review tool, Pima County Stakeholder Wildlife Connectivity Zones and Important Connectivity Zones (ICZs) (see **Figure 25** of **Subappendix D.4**) showing the ICZs in Arizona). Roads, urbanization, canals, railways, energy corridors and activities of illegal migrants and border security operations destroy habitat and create barriers that isolate wildlife populations and disrupt ecological functions such as gene flow, predator-prey interactions, and migration (Arizona Wildlife Linkages Workgroup 2006).

4.8.1.2 *Pollinator Habitat*

Restoration planting can add significant diversity within the project area, providing foraging and nesting habitat for many species. The project area lies within The Pacific Flyway (migratory bird route) as well as the migration path for

monarch butterflies. Ecosystem services such as pollination of food crops, plant reproduction, and soil stabilization are key benefits to humans. Revegetation plant selection should include a diversity of species and be sure to address structural diversity (plant height and growth form that provide essential foraging, roosting, and nesting habitat) in addition to seasonal characteristics such as bloom time.

4.8.1.3 Water Quality and Quantity

Healthy ecosystems provide provisional ecosystem services by improving water quality and quantity. Native vegetation and their corresponding root systems help to filter out excess nutrients, pesticides, and sediment in surface waters, providing cleaner water inputs into larger drainage systems. Healthy floodplains reduce the rate at which water exits the system, allowing for the capture and storage of some water during storm events. Past land management activities have modified the floodplain, reducing the ability of the floodplain to improve water quality and quantity. Floodplain alterations include agricultural practices, wetland removal or modification, noxious weed invasions, and modification of channel function.

4.8.2 Regulating Services

Regulating services “maintain a world in which it is possible for people to live, providing critical benefits that buffer against environmental catastrophe – examples include flood and disease control, water filtration, existing and future hydrologic changes and flooding, or crop pollination” (DM 9500-013).

4.8.2.1 Water Quality and Quantity

Healthy ecosystems provide provisional ecosystem services by improving water quality and quantity. Native vegetation and their corresponding root systems help to filter out excess nutrients, pesticides, and sediment in surface waters, providing cleaner water inputs into larger drainage systems. Healthy floodplains reduce the rate at which water exits the system, allowing for the capture and storage of some water during storm events. Past land management activities have modified the floodplain, reducing the ability of the floodplain to improve water quality and quantity. Floodplain alterations include agricultural practices, wetland removal or modification, noxious weed invasions, and modification of channel function. Section 4.2.2 describes the existing and future water quality and quantity within the study area.

4.8.2.2 Urban and Agricultural Flood Damage Reduction

Natural floodplains provide regulating ecosystem services to reduce flooding by reducing runoff and storing floodwater during storm events (FEMA 2024). Past land management activities have altered the floodplain within the Brawley Wash Watershed, increasing the potential for floods in urban and agricultural areas. Water is not being stored or slowed by native vegetation or within natural channels, causing the water to continue to flow over the land before reaching a suitable drainage area, which can include urban and agricultural areas. Floodplain alterations include agricultural practices, wetland removal or modification, noxious weed invasions, and modification of channel function.

4.8.2.3 Erosion Control

Similar to flood reduction services, natural floodplains provide regulating ecosystem services to reduce erosion by reducing runoff and storing floodwater during storm events (FEMA 2024). Past land management activities have altered the floodplain within the Brawley Wash Watershed, increasing the amount of water moving through the system and the speed at which water moves over the soil. This in turn increases erosion and sedimentation. Floodplain alterations include agricultural practices, wetland removal or modification, noxious weed invasions, and modification of channel function.

4.8.3 Cultural Services

Cultural services “make the world a place in which people want to live – recreational use, spiritual, aesthetic viewsheds, or tribal values” (DM 9500-013).

4.8.3.1 Recreation

A healthy ecosystem provides opportunities for cultural ecosystem services through recreation opportunities. Flooding can impact existing recreational facilities or infrastructure, reducing the availability of recreation temporarily or permanently. Additionally, flooding and poor floodplain management can reduce the enjoyment of these areas to recreationists. **Section 4.6.5** describes the existing and future recreational opportunities in the Brawley Wash Watershed.

4.8.3.2 Community Cohesion

A healthy ecosystem provides opportunities for cultural ecosystem services through recreation opportunities. Flooding can impact existing recreational facilities or infrastructure, reducing the availability of recreation temporarily or permanently. Additionally, flooding and poor floodplain management can reduce the enjoyment of these areas to recreationists. **Section 4.6.5** describes the existing and future recreational opportunities in the Brawley Wash Watershed.

A healthy ecosystem provides opportunities for cultural ecosystem services through community cohesion. Natural floodplains manage water and flood levels appropriately at a landscape scale, allowing for intentional development of community infrastructure and residences outside of flood-prone areas. Altered floodplains, like that of the Brawley Wash Watershed, may cause less predictable flood damage that may disproportionately impact communities. This could result in reduced community cohesion.

4.8.3.3 Quality of Life

A healthy ecosystem provides opportunities for cultural ecosystem services through quality of life. As described throughout **Section 4.8**, ecosystem services provide provisional, regulating, and cultural services that impact people's ability to access food and water, reduce their flood risk, and provide recreational and community opportunities. Large flood events can be particularly disrupting to the quality of life of community members. Managing floodplains to reduce the risk of flooding can improve quality of life and economic opportunities.

5. ALTERNATIVES

5.1 Alternatives Development and Formulation Process

On August 24, 2022, a Feasibility Workshop was held and attended by stakeholders (submitted meeting summary under separate cover). The purpose of the workshop was to evaluate each recommended alternative option, during the meeting such was referred to merely as “the alternative”, for each noted Problem Area using evaluation criteria developed and agreed upon by the project team and stakeholders. The workshop included anonymous feedback forms completed online by each of the attendees and the result of the evaluation is summarized herein. Supporting information related to each alternative component was provided prior to the meeting and in the Alternatives Selection Memo (see **Attachment 14** in **Appendix E**).

Based on feedback from the Tucson Water (cooperating agency), Problems Areas 3 and 4 were removed from further consideration given potential impacts to existing critical facilities (e.g., potable water distribution system components).

The evaluation criteria used to solicit feedback from the attendees are:

1. Does the alternative restore natural drainage flow patterns?
2. Does the alternative reduce potential flood and erosion damages to public and private infrastructure?
3. Does the alternative reduce potential flood and erosion damages to active agricultural lands?
4. Does the alternative enhance native habitat, rangeland health and soil health?
5. Does the alternative maintain access (e.g., site maintenance, emergency response)?

The above criteria were based on the Purpose and Need Statement for this project, and PR&G criteria (DM9500-013, 2017). Weighting factor(s) were not applied to any of the above criteria. The feedback from attendees was limited to the following:

- Positive – does the alternative result in a positive benefit based on the noted criteria?
- Negative – does the alternative result in a negative benefit (e.g., adverse result) based on the noted criteria?
- Neutral - does the alternative result in essentially no change to the noted criteria?

The results of stakeholder feedback for each Problem Area and evaluation criteria are provided in the Alternatives Selection Memo (see **Attachment 14** in **Appendix E**).

The following criteria were considered during the development of alternatives:

- | | |
|---|--|
| • Purpose and Need | • Floodplain Land Acquisition Program (FLAP/FLIP) |
| • Site Specific Conditions | • Completeness, Effectiveness, Efficiency, Acceptability |
| • Opinion of Probable Cost (Engineering, Construction, Contingency costs) | |

The Workshop allowed alternative components to be listed, incrementally analyzed, and ranked for each Problem Area for further evaluation. Rationale for eliminating alternative components were based on site-specific conditions, were found to be infeasible, did not support the Purpose and Need Statement, were not consistent with NRCS Principles, Requirements and Guidelines (PR&G) (Guidance for Conducting Analysis Under Principles, Requirements, and Guidelines for Water and Land Related Resources Implementation Studies and Federal Water Resource Investments, DM 9500-013, Section 6(b)(4)(a), January 5, 2017) or were deemed to be a feature or an enhancement of a given alternative and are explained in the following table.

The results of the Workshop lead to the alternatives presented in the following sections of this Plan-EA.

5.2 Alternatives Eliminated from Detailed Study

A list of alternative components that have been eliminated from the detailed study was determined in the Feasibility Workshop, the eliminated components were justified in [Table 25 \(Appendix E\)](#) in the “Rationale for Elimination” column.

5.3 Alternatives Descriptions

For the seven Problem Areas, each alternative has been defined. The alternative description is provided after the areas of interest.

1. Problem Area No. 1 – Buckelew West

- i) Alternative No. 1 - Restore Disturbed Area
 - a) [5.3.1](#), [5.3.2](#), [5.3.3](#)
- ii) Alternative No. 2 - Restore Disturbed Area, Natural Infrastructure for Dryland Streams
 - a) [5.3.1](#), [5.3.2](#), [5.3.3](#), [5.3.5](#)

2. Problem Area No. 2– Tortuga Ranch

- i) Alternative No. 1 – Restore Disturbed Area, Road Improvements
 - a) [5.3.1](#), [5.3.2](#), [5.3.3](#), [5.3.6](#)
- ii) Alternative No. 2 – Not Available. A second alternative (i.e., combination of components) is not available for this problem area given that this is a linear feature and in general can only be slightly modified based on the resulting ranked components.

3. Problem Area No. 3 – CAVSARP – removed from further consideration by request by cooperating agency, given potential harm to existing critical facilities.

4. Problem Area No. 4 – CAVSARP – removed from further consideration by request by cooperating agency, given potential harm to existing critical facilities.

5. Problem Area No. 5 – Cactus Avra

- i) Alternative No. 1– Restore Disturbed Area
 - a) [5.3.1](#), [5.3.2](#), [5.3.3](#)
- ii) Alternative No. 2 – Restore Disturbed Area, Diversion System(s) (diversion channels and/or berms)
 - a) [5.3.1](#), [5.3.2](#), [5.3.3](#), [5.3.4](#)
- iii) Alternative No. 3 – Restore Disturbed Area, Natural Infrastructure for Dryland Streams
 - a) [5.3.1](#), [5.3.2](#), [5.3.3](#), [5.3.5](#)

6. Problem Area No. 6 – Prickle Desert

- i) Alternative No. 1 – Restore Disturbed Area
 - a) [5.3.1](#), [5.3.2](#), [5.3.3](#)
- ii) Alternative No. 2 – Restore Disturbed Area, Diversion System(s) (diversion channels and/or berms)
 - a) [5.3.1](#), [5.3.2](#), [5.3.3](#), [5.3.4](#)
- iii) Alternative No. 3 – Restore Disturbed Area, Natural Infrastructure for Dryland Streams
 - a) [5.3.1](#), [5.3.2](#), [5.3.3](#), [5.3.5](#)

7. Problem Area No. 7– Tucker Road

- i) Alternative No. 1 – Restore Disturbed Area, Natural Infrastructure for Dryland Streams
 - a) [5.3.1](#), [5.3.2](#), [5.3.3](#), [5.3.5](#)
- ii) Alternative No. 2 – Culverts, Natural Infrastructure for Dryland Streams
 - a) [5.3.1](#), [5.3.2](#), [5.3.5](#), [5.3.7](#)

5.3.1 Alternative – Delineate Flow Corridor(s) (10-year)

Non-structural practices whereby no physical change to the land or structures is performed and accomplished through administrative procedures only. This distinction is of note as the purpose of any hydraulic modeling is to evaluate impacts to flow resulting from the consideration of structural components (e.g., change to terrain). (SLO management practice).

5.3.2 Alternative – Invasive Species Management, Wildlife Management, and Vegetation Management

The purpose of this component is to protect wildlife habitat and migration paths, minimize habitat loss, establish native vegetation on the project sites that will help to limit erosion, improve the ecological value (increase plant species diversity and re-introduce plant species that have been extirpated), and decrease / control the invasive plant species. This component meets the acceptability, effectiveness and efficiency goals.

The following NRCS Conservation Practice Standards would be implemented together to achieve these goals:

Herbaceous Weed Treatment (ac) (315) 10/20 ESD-GLS 5: Mechanical and chemical methods for removal of invasive species. Used on its own, this has the potential to expose more soil to erosion. Used in tandem with the other CPSs, this is a tool to create space for native plant establishment.

Conservation Cover (ac) 327 2024: Establishing native vegetative cover protects soil from water and wind erosion and can provide habitat for native wildlife species. Plants should be selected that are suitable to the current soil and water conditions, and that will provide a range of vegetative heights to maximize wildlife use.

Critical Area Planting (ac) 342 09/16: Considerations within this standard would be used along new flow areas that have been created by allowing water onto the sites via diversion channels or openings in berms. These areas will be especially susceptible to erosion and will need to be aggressively addressed.

Restoration of Rare or Declining Natural Communities (Ac.) (643) (3/17): Tumamoca macdougalii (*Tumamoc Globeberry*) is an example of a plant that could be re-introduced to the project sites. This species is USFS Sensitive, BLM Sensitive, and AZ Salvage Restricted. This practice standard would be carefully coordinated with invasive species control and native vegetation establishment to maximize the chance for successful reintroduction.

Road/Trail/Landing Closure and Treatment (Ft.) (654) (10/17): Roads and trails are corridors for the encroachment of invasive species. Retaining only required roads will help limit potential spread.

5.3.3 Alternative – Restore Disturbed Area

Poke holes in the constructed diversion berm or perimeter agricultural berms. (*NRCS Obstruction Removal (no) (500) 09/20 CED-AE 10*).

5.3.4 Alternative – Diversion System(s)

Addition of diversion channels and/or berms. This is a feasible component related to the Purpose and Need Statement and the conditions present within each PA. In the context of each noted PA, this component is meant to divert flow from the surrounding flood source into each abandoned agricultural field. This component meets the acceptability, effectiveness and efficiency goals. (*NRCS Dike (ft) (356) 11/02 CED-HE 20 and/or Diversion (ft) (362) 05/16 CED-AE 10*) feasible component related to the Purpose and Need Statement and the conditions present within each PA. This component meets the acceptability, effectiveness and efficiency goals. (*NRCS Water Harvesting Catchment (no) (636) 10/14 CED-DE 20*).

5.3.5 Alternative – Natural Infrastructure for Dryland Streams

A feasible component related to the Purpose and Need Statement and the conditions present within each PA. This component meets the acceptability, effectiveness and efficiency goals. (*NRCS Water Harvesting Catchment (no) (636) 10/14 CED-DE 20*).

5.3.6 Alternative – Road Improvements (Low Water Crossing)

NRCS Access Road (ft) (560) 09/20 CED-AE 10.

5.3.7 Alternative – Culverts

Addition of culvert(s). The purpose of this component would be to install corrugated metal pipe(s) at a specific interval within existing abandoned agricultural embankments within a given PA. This component meets the acceptability, effectiveness and efficiency goals. (*NRCS Structure for Water Control (no) (587) 10/17 CED-DE 20*).

5.4 Summary and Comparison of Alternatives

5.4.1 Cost Estimation of Alternatives

An Engineer's Opinion of Quantities and Probable Cost of Construction (Cost Estimate) was prepared for each alternative as shown in **Table 26** in **Appendix E**. The steps followed to develop the Cost Estimates include:

- A 15-percent design level analysis was developed using reasonable design solutions that meet locally accepted practices. Typical elements of each alternative were designed and then drawn in CAD to help define quantities and constructed footprint.
- Designs were separate for each major design component (e.g., NID construction) and the recommended unit cost was based on engineering judgement. Typically unit costs are collected with the primary source being the Arizona Department of Transportation's bid item history (Estimated Engineering Construction Cost E2C2, <https://apps.azdot.gov/e2c2/HistoricalPrice.aspx>), however, due to recent inflationary and supply concerns, such were not used here. Recent bid tabs and construction costs were not available or relevant to the project's location and/or design components.
- Other costs, such as design analysis and construction improvement plan development and other supporting tasks (e.g., survey) were estimated based upon typical ratios of these items to the total construction cost.
- No additional land to construct the Preferred Alternative is needed for this project but drainage and/or temporary construction easement will need to be obtained. No value for the obtainment of easements was undertaken for this project as such is typical practice in the region.
- An estimate was made for annual inspection and maintenance costs of the constructed facilities based upon information provided by the COT which currently maintains approximately 17,000 acres of abandoned agricultural land.
- Present Values of 100-years of O&M were estimated based upon a 100-year lifespan of the project.

5.4.2 National Economic Efficiency (NEE) Alternatives

The Preferred Alternative (implementation of Alternatives P2A1, P6A3, and P7A1) has been identified as the alternative that maximizes public benefits in consideration of cost and therefore, is identified as the National Economic Efficiency (NEE) plan. The Preferred Alternative optimizes the tradeoffs between net monetary benefits of the alternatives considered and environmental and social public benefits when non-monetized outputs are considered. These non-monetized benefits include restoring natural drainage flow patterns, reducing erosion, mitigating invasive species, carbon sequestration and regulation of future hydrologic changes and flooding, ground water quality improvements and recharge, and avoiding negative flood-related impacts to grazing livestock.

6. ENVIRONMENTAL CONSEQUENCES

During the Alternatives Analysis – Problem Areas 3 and 4 - CAVSARP was removed from future analysis and consideration at the request of the District to avoid conflicts to existing critical facilities. Initial hydraulic impacts and economic cost benefit analysis was performed and at the discretion of the District and NRCS-AZ, dismissed Problem Areas 1 – Buckelew West, and Problem Area 5 – Cactus Avra due to the low cost benefit ratio the proposed measures would have minimal impact at restoration floodplain efforts. The environmental consequences will not be evaluated for Problem Areas 1, 3, 4, and 5 in Section 6.

6.1 Geology and Soils

6.1.1 Soils

Existing Conditions

See [Section 4.1.2](#) of this Plan-EA.

No Action Alternative (Future without Federal Investment)

Under the No Action Alternative, there would be no direct impacts to soil composition or consistency or any other geologic resources. Under the No Action Alternative, there would be no planned construction activities and, therefore, no direct impacts to soil composition or consistency or other geologic resources in the project area. Residential and agricultural areas would continue to be impacted by sediment-laden stormwater flows. Emergency management activities necessary to recover from catastrophic flood events would likely require soil movement in the channel and within the overbanks where damage occurs. Indirect effects from sediment erosion and deposition would also continue to occur under the No Action Alternative.

Impacts to Soil of Alternatives

The impacts to soils of Alternatives were not evaluated for this Plan-EA and not included in the scope of this project. The project would have both temporary and permanent direct and indirect negative impacts soils in the footprint of the alternative for all three PAs. The negative mid- to long-term effects from construction to soils are anticipated due to compaction would not be considered significant since construction would remain local.

Permanent direct impacts to soils would occur within an approximately 25-acre area (including construction equipment access route(s)) related to Problem Area No. 2, 80-acre-area associated with Problem Area No. 6 and approximately 63-acre-area associated with Problem Area No. 7. Preliminary design plans for this alternative were not prepared for this study. This alternative for each Problem Area would not impact overall soil composition or otherwise impact geologic resources, and many impacts would be localized and temporary during construction (e.g., construction equipment access routes and staging areas).

6.1.2 Bank and Upland Erosion

Existing Conditions

See [Section 4.1.3](#) of this Plan-EA.

No Action Alternative (Future without Federal Investment)

Under the No Action Alternative, bank and upland erosion would not be directly impacted as no construction activities would occur. However, under existing conditions, areas experiencing bank erosion and upland erosion will continue to experience eroding conditions dependent on size of future flood events.

Impacts to Bank and Upland Erosion of Alternatives

The impacts to Bank and Upland Erosion of Alternatives were not evaluated for this Plan-EA and not included in the scope of this project.

6.1.3 Sedimentation

Existing Conditions

See [Section 4.1.4](#) of this Plan-EA.

No Action Alternative (Future without Federal Investment)

Under the No Action Alternative, there would be no planned construction activities and therefore, no direct impacts to sedimentation in the project area. However, without implementation of the Proposed Action, indirect effects from sediment erosion and deposition would continue to occur under the No Action Alternative, directly impacting soils with high erodibility susceptibility during large storm events. Residential and agricultural areas would also continue to be impacted by sediment-laden stormwater flows. Indirect effects from sediment erosion and deposition would also continue to occur under the No Action Alternative. Emergency management activities necessary to recover from catastrophic flood events would likely require sediment mitigation/management where damage occurs.

Alternatives

Maintenance would be necessary to monitor the changes in sediment deposit and/or removal to determine if further mitigation or planning is necessary. The estimated effect of the alternative on the sediment transported across the watershed, based on the vast difference between the estimate area of disturbance (approx. ¼-square mile) and the watershed area (approx. 1,400 square miles) would be negligible.

Mitigation Measures

Short-term sedimentation impacts could result from ground disturbance during construction, but BMPs will be followed to decrease runoff. Common practice(s) or other suitable erosion control measures would be used to minimize soil erosion and prevent sediment from entering water bodies during construction. For project-specific components that would disturb an acre of soil or more, the contractor would submit a SWPPP to reduce potential impacts of sedimentation on water bodies.

6.1.4 Prime and Unique Farmland

Existing Conditions

See [Section 4.1.6](#) of this Plan-EA.

No Action Alternative (Future without Federal Investment)

The No Action Alternative would result in no impacts on prime and unique farmland because the proposed work at the three Problem Areas would not occur.

Alternatives

Prime farmland is mapped by NRCS in all three PAs; however, no impacts to this farmland would occur as work in the Problem Areas would not result in the unnecessary and irreversible conversion of farmland to nonagricultural uses.

6.2 Water Resources

Hydrology Existing Conditions

See [Section 4.2.1](#) of this Plan-EA.

No Action Alternative (Future without Federal Investment)

Tortuga Ranch (Problem Area No. 2) – Alternative 1

Without any improvements, runoff from upstream would continue ponding against the diversion berm, with flow depths up to approximately 6-feet. The ponded runoff is diverted northwesterly towards the ranch, resulting in higher flow depths and discharges in the Tortuga Ranch area. Tortuga Ranch staff indicated that floods from previous years (around 2021) could last up to couple of days with maximum flow depths of between 1- to 2-feet. This caused difficulties with Tortuga Ranch operations. Similar flooding patterns would be expected for future flooding events with No Action Alternative.

Prickle Desert (Problem Area No. 6) - Alternative 3

Without any improvements, the abandoned agricultural berms would still function to block natural flow paths and the runoff would pond against the berms. The agricultural lands behind the berms are deprived of surface water from upstream at more frequent storm events, such as 2-year rainfall events. However, during less frequent flood events such as 100-year rainfall events, the abandoned earthen berms could be breached at isolated locations and cause severe local flooding and erosion problems.

Tucker Road (Problem Area No. 7) - Alternative 1

Without any improvements, the agricultural field could be up to 20-feet higher than the Blanco Wash channel (to the east of the agricultural field). As a result, Blanco Wash runoff could hardly drain to the agricultural field due to the elevation differences, especially with the presence of existing earthen berm around the perimeter of the agricultural field. Natural flow patterns are still disturbed.

Alternatives

Tortuga Ranch (Problem Area No. 2) - Alternative 1

The improvements would allow upstream runoff to pass through the man-made earthen berm via proposed openings. The natural flow pattern is partially restored, resulting in much less runoff draining toward and into Tortuga Ranch, less erosion/sedimentation issues caused by ponding and diverting flow, less flooding flow depths and durations by allowing runoff draining efficiently via natural flow paths.

Prickle Desert (Problem Area No. 6) - Alternative 3

The improvements would allow upstream runoff to pass through the berm via proposed openings. In addition, the proposed Natural Infrastructure for dryland Systems (NIDS) function to retain flow at shallow depths. The purpose of the berm openings is to restore natural flow patterns. Ponding against the berm and sediment issue along the berm are mitigated with the proposed openings. The runoff could drain to the agricultural field via the proposed berm openings and the NIDS could function to store local or upstream runoff. The proposed improvements would result in less flooding depths, restoring natural drainage patterns, and less sediment issues. In addition, the NIDS would help with ecological system restoration.

Tucker Road (Problem Area No. 7) - Alternative 1

The proposed diversion berm along the southwest corner of the agricultural field would help direct a portion of the runoff within Blanco Wash right overbank areas and overland flow from the east toward and into the agricultural field, via the proposed berm openings. Allowing a portion of Blanco Wash runoff entering the agricultural field has the following major benefits: (1) runoff on the agricultural field would help restore its ecological system; and (2) reduced runoff in Blanco Wash could help reduce downstream flow depths and erosion potential within the wash.

6.2.1 Surface Water Quality

Existing Conditions

See [Section 4.2.2](#) of this Plan-EA.

No Action Alternative (Future without Federal Investment)

Surface water quality testing will not be undertaken in the future due to Brawley Wash being an ephemeral stream.

Alternatives

For the foreseeable future, surface water quality testing and monitoring will not likely be undertaken in any of the Problem Areas due to Brawley Wash being an ephemeral stream.

6.2.2 Regional Water Management Plans

Existing Conditions - See [Section 4.2.3](#) of this Plan-EA.

No Action Alternative (Future without Federal Investment)

The No Action Alternative would result in no changes or impacts to the various jurisdictional Regional Water Management Plans in place listed in [Section 4.2.3](#) of this Plan-EA.

Alternatives

See [Section 4.2.3](#) of this Plan-EA.

6.2.3 Waters of the U.S. (WOTUS)

Existing Conditions

See [Section 4.2.4](#) of this Plan-EA.

No Action Alternative (Future without Federal Investment)

The No Action Alternative would result in no impacts on WOTUS because the proposed work at the three Problem Areas would not occur within the anticipated limits of WOTUS.

Alternatives

There are no potential WOTUS conflicts present in Problem Area 6. The modeled NWI ephemeral R4SBC feature in Problem Area 2 and R5UBFx feature in Problem Area 7 would likely not be considered WOTUS because both features are likely not relatively permanent, and the latter feature is a human-made ditch excavated in uplands likely excluded from jurisdiction under 33 CFR 328.3(B)(3). Because there are no WOTUS in the PAs, the proposed work associated with the three Problem Areas would result in no impact on WOTUS.

6.2.4 Wetlands and Riparian Areas

Existing Conditions

See [Section 4.2.5](#) of this Plan-EA.

No Action Alternative (Future without Federal Investment)

The No Action Alternative would result in no impacts on wetlands or riparian areas because the proposed work in the Problem Areas would not occur.

Alternatives

There are modeled PUBF wetlands present in Problem Areas No. 2 and 7; however, actual wetlands are unlikely to be present given the arid climate of all the Problem Areas. The IRA-C and IRA-D regulated riparian habitat present at Problem Areas No. 2 and 6, respectively, may be impacted by the proposed work in these two areas if vegetation is removed. However, the net impacts would be beneficial to riparian habitat because the proposed work would restore surface water flows downstream of the berms in the Problem Areas and the amount of xeroriparian habitat may increase.

6.2.5 Floodplain Management

Existing Conditions

See [Section 4.2.6](#) of this Plan-EA.

No Action Alternative (Future without Federal Investment)

All of the three alternative locations still under consideration (Problem Areas No. 2 – Tortuga Ranch, 6 – Prickle Desert, and 7 – Tucker Road) have earthen berms. The areas around the berms (with significant ponding flow depths) are mapped as FEMA floodplain areas in a recent Brawley Wash Floodplain Mapping Study by PCRFC (2024). Without any improvements. These areas are still subject to flooding with significant ponding flow depths against the berm. In addition, the areas behind the berm are typically dry due to lack of available upstream runoff. However, during significant storm events, such as 100-year rainfall events, the berms could be breached at isolated locations and cause adverse drainage impacts to areas downstream of the earthen berms.

Alternatives

Alternatives Problem Areas No. 2 – Tortuga Ranch, 6 – Prickle Desert, and 7 – Tucker Road have berm openings and they function to restore natural drainage patterns by allowing runoff drains to downstream. Existing FEMA FLO-2D models were used from the 2023 Brawley and Black Wash Risk Analysis Mapping Study and modified to incorporate proposed berm openings, water harvesting basins, diversion channels, and berm features for alternative floodplain mitigation simulations. The 100-year model result maps are provided in **Subappendix D.2**, Problem Area 2 (**Exhibit 3B** in **Appendix B** in **Subappendix D.2**), Problem Area 6 (**Exhibit 7B** in **Appendix B** in **Subappendix D.2**), and Problem Area 7 (**Exhibit 8B** in **Appendix B** in **Subappendix D.2**). These alternatives would result in reduced ponding depths, reduced flooding hazards, and restored natural drainage patterns. In addition, it would potentially mitigate the adverse downstream flooding impacts due to potential earthen berm breach at isolated locations (Norman, 2022). Although many impacts to the floodplain are anticipated to be beneficial, temporary adverse impacts might occur during construction of the proposed improvements. The preferred alternatives would be reviewed by all applicable local, state and Federal agencies to comply with floodplain rules.

6.3 Vegetation

6.3.1 Vegetation Communities and Habitat

Existing Conditions

See [Section 4.4.1](#) of this Plan-EA.

Tortuga Ranch (Problem Areas No. 2) – Alternative 1

No Action Alternative (Future without Federal Investment)

Native vegetation within this area has been altered extensively through grazing and farming. Historically a grassland, with perennial native grasses such as tobosa dominating, this area is now quite barren, with minimal native grass and many introduced non-native species including tumbleweed and red brome. With little vegetation to protect the soil, sheet and rill erosion are severe.

Under the No Action Alternative, continued erosion is predicted. It is anticipated that exotic perennials and annuals will be dominant, with native grasses and shrubs present in smaller numbers. Shrubby mesquite cover may increase. This project site has not been field-verified, but due to its location and former agricultural use no federally listed or protected plant species are assumed on site.

Invasive Species

The project area has a number of invasive species, including many exotic grasses that were introduced for forage and erosion control. These species are expected to persist and spread under the No Action Alternative.

Alternative

Creating holes in the existing diversion berm would allow for water flow to move to the north in more of a sheet-flow pattern (rather than creating concentrated flow at the end of the berm). This may also 'dry out' the area south of the berm which currently holds water and supports denser vegetation (including invasive buffelgrass). The existing concentrated flow has allowed for the growth of larger trees along a drainage channel northwest of the berm. Re-direction of that flow will likely lead to their decline. We anticipate that vegetation will come in along the new channels that are created. These areas will be conduits for the spread of both native and invasive species.

No impact to federally protected plant species is anticipated. There are no known critical habitat areas within the project site.

Mitigation Measures

Ground disturbance should be minimal – disturbed ground is a magnet for invasives. Areas with ground disturbance should be monitored for emergent invasive species. Plant cover and roots are the first line of defense for minimizing erosion and all plant cover should be left in place to the extent possible. Where invasive species are removed a project-specific native seed mix should be used, combined with continued monitoring for, and treatment of, invasives.

Prickle Desert (Problem Area No. 6) - Alternative 3

No Action Alternative (Future without Federal Investment)

Historically this area was a desert grassland, with perennial native grasses being dominant. Excessive grazing and subsequent agriculture has resulted in a now-barren erosive landscape that hosts many exotics including tumbleweed, wild oats and red brome. With little vegetation to protect the soil, sheet and rill erosion can be severe.

Under the No Action Alternative, the land will continue in a degraded state with increasing erosion and proliferation of non-native invasive species. It is anticipated that exotic perennials and annuals will be dominant, with native grasses and shrubs present in smaller numbers. Shrubby mesquite cover may increase. This project site has not been field-evaluated by Wilder, but due to its location and former agricultural use no federally listed or protected plant species are assumed on site.

Invasive Species

The project area has a number of invasive species, including many exotic grasses that were introduced for forage and erosion control. These species are expected to persist and spread under the No Action Alternative.

Alternative

Restoration of Disturbed Areas (meaning the removal of existing agricultural embankments which currently re-direct stormwater around the site rather than through it) would allow stormwater to flow through the project site. In combination with Natural Infrastructure for Dryland Streams (restoration practices to slow water moving through the landscape, including one rock dams, check dams and earthen berms) stormwater could be spread and infiltrated. This would support vegetation development in currently barren areas. No impact to federally protected plant species is anticipated. There are no designated or existing critical habitat areas within the project site. Although studies indicate the use of NIDS increase the opportunity for infiltration to groundwater there is no estimate related to groundwater recharge.

Mitigation Measures

Providing pathways for water movement through the site should be coordinated with existing plant locations. Ground disturbance should be limited to areas devoid of native plant material – intact plant communities should be preserved. Disturbed ground is a magnet for invasive species encroachment - areas with ground disturbance should be monitored for emergent invasive species. Plant cover and roots are the first line of defense for minimizing erosion and all plant cover should be left in place to the extent possible. Where invasive species are removed a project-specific native seed mix should be used, combined with continued monitoring for, and treatment of, invasives.

Tucker Road (Problem Area No. 7) - Alternative 1

No Action Alternative (Future without Federal Investment)

The historical savanna grassland plant community consisted of perennial grasses, shrubs, and cacti with a few native trees such as foothill palo verde and mesquite. Heavy grazing and subsequent agriculture has resulted in a sparsely vegetated landscape that is heavy on exotic annuals, non-native grasses, and a few trees and shrubs. The exception to this is the area on the east of the site bordering the Blanco Wash – continuous heavy grazing has resulted in a very dense (almost impassible) thicket of shrub shrubby mesquite trees. The wash is deeply incised within this stretch.

Under the No Action Alternative, it is anticipated that exotic perennials and annuals will persist, with native grasses and shrubs present in smaller numbers. Shrubby mesquite cover may increase. This project site has not been field-evaluated by Wilder, but due to its location and former agricultural use no federally listed or protected plant species are assumed on site.

Invasive Species

The project area has a number of invasive species, including many exotic grasses that were introduced for forage and erosion control. These species are expected to persist and spread under the No Action Alternative.

Alternative

Restoration of Disturbed Areas (meaning the removal of existing agricultural embankments which currently re-direct stormwater around the site rather than through it) would allow stormwater to flow through the project site. In combination with Natural Infrastructure for Dryland Streams (restoration practices to slow water moving through the landscape, including one rock dams, check dams and earthen berms) stormwater could be spread and infiltrated. This would support vegetation development in currently barren areas. No impact to federally protected plant species is anticipated. There are no designated or existing critical habitat areas within the project site.

Mitigation Measures

Providing pathways for water movement through the site should be coordinated with existing plant locations. Ground disturbance should be limited to areas devoid of native plant material – intact plant communities should be preserved. Disturbed ground is a magnet for invasive species encroachment - areas with ground disturbance should be monitored for emergent invasive species. Plant cover and roots are the first line of defense for minimizing erosion and all plant cover should be left in place to the extent possible. Where invasive species are removed a project-specific native seed mix should be used, combined with continued monitoring for, and treatment of, invasives.

6.3.1.1 Special Status Plant Species

Existing Conditions

See [Section 4.4.2](#) of this Plan-EA.

No Action Alternative (Future without Federal Investment)

Under the No Action Alternative, existing plants would persist in their current conditions. Continuing erosion may impact plant viability.

Alternative

Due to the highly disturbed nature of the project sites, it is unlikely that any of the measures under the alternatives would impact special status species (it is unlikely that these species exist on site). However, the following species have the potential to occur in the vicinity as noted by Agency (Arizona eryngo requires marsh or wetland habitat which is not present):

Tortuga Ranch (Problem Area No. 2) – Alternative 1

USFWS listed endangered:

- Pima pineapple cactus (*Coryphantha scheeri* var. *Robustispina*)
- Arizona Eryngo (*Eryngium sparganophyllum*)

BLM Sensitive:

- Tumacoc globeberry (*Tumacoca macdougallii*)

Arizona Department of Agriculture Salvage Restricted:

- Kelvin Cholla (*Cylindropuntia x kelvenensis*)
- Thornber Fishhook Cactus (*Mammillaria thornberi*)

Prickle Desert (Problem Area No. 6) - Alternative 3

USFWS listed endangered:

- Arizona Eryngo (*Eryngium sparganophyllum*)

BLM Sensitive:

- Tumacoc globeberry (*Tumacoca macdougallii*)

Arizona Department of Agriculture Salvage Restricted:

- Thornber Fishhook Cactus (*Mammillaria thornberi*)
- Desert Night-blooming Cereus (*Peniocereus greggii* var. *Transmontanus*)

Tucker Road (Problem Area No. 7) - Alternative 1

USFWS listed endangered:

- Arizona Eryngo (*Eryngium sparganophyllum*)

BLM Sensitive:

- Tumacoc globeberry (*Tumacoca macdougallii*)

Arizona Department of Agriculture Salvage Restricted:

- Thornber Fishhook Cactus (*Mammillaria thornberi*)

Mitigation Measures

The disturbed project area would be limited to that required for the Alternative Improvements. A site survey of the project footprint should be conducted to determine the presence of any special status species. To minimize impact to plant species and to limit the spread of invasive species, construction limits and designated haul routes should be

roped off in the field. The size of the project areas offers ample room to work around existing native plant species- project elements should be field adjusted to limit impacts.

6.3.2 Invasive Plant Species

Existing Conditions

See [Section 4.4.3](#) of this Plan-EA.

No Action Alternative (Future without Federal Investment)

Under the No Action Alternative, existing plant material (both native and invasive) would remain in place. Based on observations of other areas over time, it can be assumed that the invasive plants currently on site will continue to spread along drainages and roadways. Stinknet has been showing up in undisturbed areas, presumably carried by wind. Relatively new invasives such as yellow blue stem may appear.

Alternative

All alternatives create changes to downstream flow and involve the creation of new pathways for water. As a result, invasive species may be introduced to areas of the site where they are not currently present. Although field studies have not been conducted, it can be assumed through knowledge of the area that the project sites all contain a number of invasive species – predominantly grasses and forbs. Any ground disturbance, construction activity, and changes in water flow have the potential to introduce and spread invasive species.

Mitigation Measures

Invasive species control and treatment should be considered as part of any project. Documentation of species observed on the project sites is recommended to increase knowledge of species' presence and allow for Agency budgeting of invasive species treatment prior to any site disturbance.

Invasive species can spread rapidly, and species can appear in areas where they have not been previously observed. Brian Powell, Division Manager, Pima County Conservation Lands and Resources Department, noted that yellow bluestem and stinknet have been detected in Avra Valley and appear to be spreading quickly. These relatively new invasives have few observed data points, and the Invasive Species map does not tell the tale of the serious threat that these pose.

Roadways, washes and drainages are primary vectors for invasives. Successful treatment of invasives varies by species. The bunch grasses (buffelgrass, fountain grass) in the desert scrub areas present many challenges. Large infestations are best treated chemically. Small infestations can be treated mechanically, but care must be taken to remove the roots and avoid scattering seed into the newly disturbed soil, which would only serve to sow the next year's crop. Chemical treatment must occur during the warm growing season after the onset of monsoonal rains. Identification is most easily accomplished after the grass flowers, which leaves a small (4 – 6 week) window to treat the grass before it has set viable seed. Most importantly, the project team, stakeholders and the public need to understand that treatment of invasives is not a one-time thing. Areas of invasive plants with established seedbanks can take years to control. Land managers can expect reduced expenditures of hours and cost each year as the plant population is reduced, but ten years is not an unreasonable timeframe to expect to achieve near eradication. Even at this point, continual monitoring and treatment is required to keep new invasive plants from becoming established.

6.3.3 General Wildlife, Wildlife Communities and Connectivity

Existing Conditions

See [Section 4.5.1](#) of this Plan-EA.

No Action Alternative (Future without Federal Investment)

Under the No Action Alternative, the existing conditions for general wildlife and wildlife communities at the Problem Areas would remain the same and there would be no impacts.

Alternative

General wildlife species may utilize the Problem Areas to some extent; however, due to the degraded nature of the Problem Areas and the increased human activity and noise from equipment, it would be unlikely for these species to be present and impacted by the proposed activities associated with the project. In most cases following construction, the opening of berms in the Problem Areas would restore surface flows downstream of the berms in either natural or constructed channels, which could increase habitat value as the vegetation recovers in the vicinity of the channels and represent a beneficial impact on general wildlife species.

In total, the proposed activities at the three Problem Areas would temporarily (during construction) adversely impact up to approximately 641 acres of marginal wildlife communities, or approximately 0.3% of the overall planning area. Following construction, with the restoration of downstream surface flows and subsequent regeneration of vegetation, this would result in a negligible, beneficial increase in wildlife community conditions.

6.3.4 Special Status Wildlife Species

Existing Conditions

See [Section 4.5.2](#) of this Plan-EA.

No Action Alternative (Future without Federal Investment)

USFWS Listed Species

The No Action Alternative would have the same resulting impact as all action alternatives at all Problem Areas and there would be no impacts on USFWS listed species.

BLM Sensitive Wildlife Species

The Problem Areas are on private land where BLM does not have jurisdiction to implement their sensitive species management policies.

Arizona Wildlife SGCN

Under the No Action Alternative no impacts to SGCN species would occur.

Alternative

USFWS Listed Species

None of the 13 wildlife species appearing on the planning area's USFWS Official Species List or the three additional species that had occurrence records or were predicted to occur based on habitat modeling within five miles of the planning area as threatened, endangered, proposed, NEP, or candidates for listing are known to occur in the PAs; however, habitat research indicates that one species, the candidate monarch butterfly, has the potential to occur because the Problem Areas may contain vegetation or landscape features known to support this species. Monarch butterfly is discussed in **Table 15** in **Subappendix D.4**.

The other 12 wildlife species are not likely to occur in the Problem Areas because they are clearly beyond the known geographic or elevational range of these species, they are unlikely to contain vegetation or landscape features known to support these species, or both. Habitat requirements, potential for occurrence, and possible effects of the project on listed species are summarized in **Table 15** in **Subappendix D.4**.

BLM Sensitive Wildlife Species

The Problem Areas are on private land where BLM does not have jurisdiction to implement their sensitive species management policies.

Arizona Wildlife SGCN

There are occurrence records or modeled habitat for 143 SGCN within five miles of the planning area; however, due to the degraded nature of the Problem Areas and the increased human activity and noise from equipment, it would be unlikely for these species to be present and impacted by the proposed activities associated with the project. In most cases following construction, the opening of berms in the Problem Areas would restore surface flows downstream of the berms in either natural or constructed channels, which could increase habitat value as the vegetation recovers in the vicinity of the channels and represent a beneficial impact on SGCN species.

6.3.5 Migratory Birds and Eagles

Existing Conditions

See [Section 4.5.4](#) of this Plan-EA.

No Action Alternative (Future without Federal Investment)

Under the No Action Alternative, no impacts to migratory birds and eagles would occur.

Alternative

Migratory birds occur in all the Problem Areas and may nest in those areas that contain suitable vegetation in which to support nests (USFWS 2024a). In addition, the Problem Areas are located in fallow agricultural fields which is suitable habitat for western burrowing owl which is a SGCN species that is also protected under the MBTA.

Bald and golden eagles have known occurrence records within five miles of the planning area and suitable prey species for foraging golden eagles may be present in the Problem Areas; however, it is unlikely for either species to nest in the vicinity of the Problem Areas due to the absence of suitable nesting habitat (USFWS 2024a).

Problem Areas is expected to take place during the nesting season (i.e., between mid-February and late September, with the nesting season for raptors being January through late June), nesting bird surveys and measures to protect active nests from destruction should be taken to avoid a violation of the MBTA.

If burrowing owls occur in the Problem Areas and active burrows cannot be avoided with a minimum 100-foot buffer until their nests become inactive, they may be relocated by Wild at Heart, a raptor rescue organization that provides capture, care, and relocation services. Wild at Heart holds necessary permits from the USFWS and AZGFD to conduct owl relocation activities. However, starting in 2024, the project proponent would also need a project-specific USFWS Special Purpose permit for burrowing owl relocation. If a burrowing owl is observed on-site, the Burrowing Owl Project Clearance Guidance for Landowners (Arizona Burrowing Owl Working Group 2009) should be followed to avoid impacting the species.

6.4 Human Environment

6.4.1 Cultural and Historic Property

Existing Conditions

See [Section 4.6.1](#) of this Plan-EA.

No Action Alternative (Future without Federal Investment)

Under the No Action Alternative for all Problem Areas, no improvements would be implemented and no direct effects to cultural and historic property would occur. However, excessive erosion in the watershed would continue to be a problem that has the potential to be an indirect adverse effect to archaeological resources.

Alternative

Tortuga Ranch (Problem Area No. 2) – Alternative 1

The restoration of the disturbed area has the potential to adversely affect one archaeological site that is eligible for the NRHP. PCRFCDC has determined that it can accomplish its restoration goals while ensuring avoidance of the archaeological site. Therefore, with PCRFCDC's commitment to avoid the site, the implementation of this alternative would have no direct and no reasonably predictable indirect effects on historic properties.

Prickle Desert (Problem Area No. 6) - Alternative 3

No cultural and historic properties are known to be present in the area within this Problem Area where improvements would occur. Therefore, the implementation of this alternative would have no direct and no reasonably predictable indirect effects on historic properties.

Tucker Road (Problem Area No. 7) - Alternative 1

The proposed improvements within this Problem Area have the potential to adversely affect two known archaeological sites, one of which has been determined eligible to be listed in the NRHP and Arizona Register of Historic Places (ARHP) and one of which is unevaluated for its eligibility for inclusion in the NRHP and ARHP, but which shall be treated as eligible for preservation purposes until additional archaeological study in the form of eligibility testing is conducted. PCRFCDC has determined that it can accomplish its restoration goals while ensuring avoidance of

the archaeological sites. Therefore, with PCRFCDD's commitment to avoid the sites, the implementation of this alternative would have no direct and no reasonably predictable indirect effects on historic properties.

Mitigation Measures

Avoidance measures would be used to offset site-specific project adverse effects. Avoidance is typically achieved by modifying the project design to avoid direct effects to areas where historic properties are known to exist. Sometimes protective measures can be incorporated into the project design and implementation that can also avoid historic properties. The APE around the sites has been abandoned, and the sites will be marked for avoidance during construction or ground-disturbing activities permitted within the sites and a 50-ft avoidance buffer. For the current undertaking, all sites will be avoided by ground disturbing activities and protective measures will be employed as deemed necessary.

If cultural and historic property, including human remains, are encountered during construction, an Inadvertent Discovery Plan, produced by Pima County or a qualified contractor working under the direction of the NRCS archaeologist, would be followed. Construction would stop in the vicinity of the discovery, the area would be secured and protected, a professional archaeologist would assess the discovery, consultation with SHPO and NRCS cultural resources staff would occur as appropriate, and the appropriate tribes, agencies and the Arizona State Museum would be notified. Continuation of construction would occur in accordance with applicable guidance and laws. Discovery protocol would be compliant with 36 CFR 800.13 (Section 106 Process, Post-review Discoveries) and Arizona Revised Statutes (ARS) 41-844 and ARS 41-865 (Arizona's burial discovery laws applicable to state/municipal lands and private lands, respectively). Transportation and Infrastructure

Existing Conditions

See [Section 4.6.2](#) of this Plan-EA.

No Action Alternative (Future without Federal Investment)

Under the No Action Alternative for all Problem Areas, no improvements would be implemented and no changes to transportation and related infrastructure would occur.

Alternative

For all the Problem Areas including Problem Areas 2, 6, and 7, transportation and infrastructure systems would realize minimal change given the vast region covered by the existing and future conditions floodplain/drainage characteristics.

6.4.2 Land Use

Existing Conditions

See [Section 4.6.3](#) of this Plan-EA.

No Action Alternative (Future without Federal Investment)

Under the No Action Alternative for all Problem Areas, no improvements would be implemented and no changes to land use would occur. However, erosion in the watershed would continue to be a problem that has the potential to adversely impact land use in those areas, resulting in continued flooding issues and flooded travel corridors.

Alternative

For all the Problem Areas including Problem Areas 2, 6, and 7, the current land use is agriculture and contain portions of the Brawley Washes or other associated irrigation canals or drainages that function as part of the floodplain. All the Problem Areas are within Pima County and are zoned as Rural Homestead (RH). This zoning category is intended to "preserve the character and encourage the orderly growth of rural areas in the county" and is "intended to encourage rural development in areas lacking facilities for urban development and to provide for commercial and industrial development only where appropriate and necessary to serve the needs of the rural area." (Pima County Code). Some portions of the Problem Areas are located within overlays designated as for the Brawley Wash Preserve Corridor, including portions of Problem Areas No. 1, and 5.

The proposed improvements would not conflict with current or planned land use and would provide a beneficial impact to land use by improving drainage flow patterns and reducing flood risk, allowing continued use for agriculture, flood control and open space.

6.4.3 Public Health and Safety

Existing Conditions

See **Section 4.6.4** of this Plan-EA.

No Action Alternative (Future without Federal Investment)

Under the No Action Alternative for all Problem Areas, no improvements would be implemented and no changes to public health and safety would occur. However, as noted in **Section 6.4.3**, no improvements would occur related to erosion protection in the watershed, which would result in continued flooding issues and flooded travel corridors.

Alternative

As discussed in **Section 6.4.3**, all the Problem Areas are currently used for agricultural and flood control/drainage. These areas currently experience flooding and have the potential for wildlife issues. Implementation of proposed improvements at all the Problem Areas would be anticipated to reduce flooding risk. The improvements may result in a change in the amount and type of vegetation (fuel) that is present in the problem areas but would not be anticipated to have a substantial effect related to fire risk.

6.4.4 Recreation

Existing Conditions

See **Section 4.6.5** of this Plan-EA.

No Action Alternative (Future without Federal Investment)

The No Action Alternative would not have a direct impact on recreation. There are no formalized recreation opportunities in the study area or three Problem Areas.

Alternative

No important designated recreation areas or parks lie within the three Problem Areas, but local residents in the area likely use wash corridors, agricultural embankments, roads, and sidewalks for recreation.

6.5 Socioeconomics

The alternatives are anticipated to result in both short-term and long-term beneficial impacts on socioeconomic conditions within the project area. The proposed improvements would enhance community safety and resilience during flood events, providing indirect benefits such as improved peace of mind and financial security, particularly for vulnerable populations, including low-income households. These groups often lack resources to recover from flood-related damages, and the project would help mitigate disproportionate economic burdens they face. However, as noted in **Section 4.7**, no improvements would occur related to erosion protection in the watershed, which would result in continued flooding issues and flooded travel corridors.

The alternatives would protect existing and future property uses, preserve local transportation infrastructure, ensuring continued access and avoiding road removal, and reduce the risk of flood and erosion damage to agricultural lands, which are a critical economic resource in the project area. No adverse impacts to the availability of agricultural land are anticipated; instead, the project may enhance agricultural productivity by improving soil quality and reducing erosion. Economic benefits include the restoration of natural hydrologic processes, which contribute to the reduction of erosion, the control of invasive species, improved carbon sequestration and hydrologic changes, enhanced groundwater quality and recharge, and the mitigation of negative flood impacts on grazing livestock. These outcomes align with the goals of sustaining local agriculture and protecting rural livelihoods, which are especially vital for low-income and resource-dependent populations.

The implementation of the alternatives is not expected to result in adverse socioeconomic effects. Instead, the project supports equitable economic resilience, particularly for populations most at risk from flood-related impacts, by reducing economic vulnerabilities and contributing to long-term community sustainability.

6.5.1 Local and Regional Economics

Existing Conditions

See [Section 4.7.2](#) of this Plan-EA.

No Action Alternative (Future without Federal Investment)

Under the No Action Alternative, no improvements would be implemented, and adverse long-term and short-term impacts to the local economy could occur. The potential for future flooding events would remain unmitigated, increasing the likelihood of damage to residential, agricultural, and commercial properties, as well as public infrastructure. Such damages would disproportionately affect low-income populations, who often have fewer resources to recover from the economic and social impacts of flooding.

Alternative

The lack of mitigation measures could result in sustained economic vulnerabilities, including ongoing repair and replacement costs for structures, vehicles, crops, and infrastructure, which may strain local and regional economies. The absence of action may also exacerbate economic disparities, as low-income households are more likely to experience prolonged recovery times and financial hardship following flood events.

The implementation of the Alternatives is expected to generate both minor local and regional economic benefits. These benefits would result from reductions in flood-related damages to structures, vehicles, agricultural crops, and public infrastructure (see [Section 7](#) for detailed estimates of monetary benefits). By mitigating flood risks, the project would contribute to economic stability in the area, particularly for populations dependent on agriculture and natural resources for income and employment. In addition to long-term benefits, the Alternatives may result in short-term economic benefits through a temporary increase in construction-related employment. These jobs would provide income opportunities that could support the local workforce and stimulate economic activity during the construction phase. The combination of long-term risk reduction and temporary job creation can enhance the overall socioeconomic resilience of the community.

6.6 Ecosystem Services

6.6.1 Provisioning Services

Existing Conditions

Provisioning ecosystem services evaluated within the study area focused on agricultural crop production. -Existing conditions would mirror the No Action Alternative described in the following [Section 4.8.1](#).

No Action Alternative (Future without Federal Investment)

Under the No Action Alternative, no improvements to the Brawley Wash Watershed floodplain would take place. There would therefore be no impacts to wildlife corridors or movement, which would maintain existing provisional ecosystem services. However, there would also be no beneficial activities targeted at improving the floodplain through the diversion of water or restoration of previously disturbed areas to prevent agricultural flood damage or erosion. Invasive weeds would continue to spread throughout the watershed, reducing habitat suitability for pollinators. This would result in the continued decline of provisional ecosystem services.

Alternative

Under the Alternatives, activities targeted at improving the Brawley Wash Watershed floodplain would take place, which would reduce the potential for agricultural flood damage and erosion. Implementation of the alternatives would not remove agricultural lands from production and would protect existing agricultural lands from flood damage and erosion. This would result in increased regulating ecosystem services. Disturbance during construction and restoration activities would be controlled to minimize impacts to the surrounding environment. Wildlife movement through wildlife corridors would be temporarily impacted, with wildlife moving away from noise and human disturbance. However, after construction and restoration activities are complete, wildlife is expected to return. There would be no long-term impacts to wildlife movement corridors. This would maintain existing provisional ecosystem services.

Pollinator habitat would be improved under the Alternatives. Natural floodplain function would be restored, and any existing native plants would be protected from disturbance to the greatest extent possible. Any areas that are

disturbed would be re-seeded with a native plant mix that would benefit pollinators, providing additional provisional ecosystem services.

Water quality and quantity would be improved under the Alternatives. Natural sheet-flow patterns would be restored, allowing water to move slowly through the environment where it can be absorbed by vegetation that helps to remove excess nutrients and pesticides. The slower-moving water allows for enhancement of ecological resilience in degraded waterway systems, including flood detention and groundwater recharge.

6.6.2 Regulating Services

Existing Conditions

Regulating ecosystem services identified in the Problem areas included water quality and quantity, urban agricultural flood damage reduction, and erosion control services. Existing conditions would mirror the No Action Alternative described in the following [Section 4.8.2](#).

No Action Alternative (Future without Federal Investment)

Under the No Action Alternative, no improvements to the Brawley Wash Watershed floodplain would take place. There would therefore be no improvements to the potential for urban and agricultural flood damage or erosion. This would result in the continued decline of regulating ecosystem services including water quality and quantity, urban agricultural flood damage reduction, and erosion control services.

Alternative

Under the Alternatives, activities targeted at improving the Brawley Wash Watershed floodplain would take place, which would reduce the potential for urban and agricultural flood damage and erosion. The Alternatives would allow the water to expand into a sheet-flow pattern instead of becoming channelized, which increases the risk of flooding and erosion. Sheet-flow patterns would be restored to more natural conditions, reducing runoff, erosion, and flooding. This would result in increased regulating ecosystem services primarily to floodplain management.

6.6.3 Cultural Services

Existing Conditions

Existing conditions would mirror the No Action Alternative described in the following [Section 4.8.3](#).

No Action Alternative (Future without Federal Investment)

Under the No Action Alternative, no improvements to the Brawley Wash Watershed floodplain would take place. There would therefore be no improvements to the existing and planned recreational sites, community cohesion would continue to be at risk, and there would be no improvements to the existing quality of life. This would result in the continued decline of cultural ecosystem services.

Alternative

Under the Alternatives, activities targeted at improving the Brawley Wash Watershed floodplain would take place, which would increase recreational experiences and opportunities, provide increased community cohesion, and improve quality of life. Restoration of the natural floodplain would allow for decreased impacts to recreational infrastructure and increase the value of the recreation experience. Community cohesion would be improved through decreased flood events and inequality in flood damage. Quality of life would also increase through reduced flood risk. This would result in increased cultural ecosystem services.

6.7 Cumulative Effects

This section includes a description of past, current, reasonably foreseeable future actions, and cumulative effects organized by resource. Cumulative effects are defined as the effect on the environment which results from the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (DM 9500 4.b.(2)(m)).

6.7.1 Past Actions

Past actions are summarized as land development activities that include irrigated agriculture, suburban development, industrial land uses, commercial development, water diversions for non-agricultural uses, and transportation infrastructure within the Brawley Wash project area. The nature and extent of these past actions and how they have influenced the existing environment are described for each resource in [Section 4](#).

6.7.2 Cumulative Effects by Major Resource Topics

Current actions are those projects, developments, and other actions that are presently underway, either because they are under construction or are occurring on an ongoing basis. Reasonably foreseeable future actions generally include those actions formally proposed or planned, or highly likely to occur based on available information. Various sources including local, state, and Federal agency websites and city and county staff were consulted to obtain information about current and potential future development in the project area. The following sections describe these current actions and reasonably foreseeable future actions.

6.7.2.1 Soils, Upland/Bank Erosion, and Sedimentation

A detailed evaluation and assessment of soils, stream banks and upland erosion (i.e., rate and volume), and sedimentation were not undertaken for the area within the Project Area.

6.7.2.1.1 Prime and Unique Farmland

The proposed work at the three Problem Areas would have no adverse impacts to prime and unique farmland and therefore would not result in cumulative impacts to this resource.

6.7.2.2 Water Resources

6.7.2.2.1 Hydrology

The PCRFCDD has been the sponsor or key stakeholder in various flood prevention and/or floodplain studies/projects including King 98 Ranch and the Brawley & Black Wash Risk Analysis and Floodplain Mapping project. The PCRFCDD is currently planning for additional studies within the Brawley Wash Watershed. The construction of the Preferred Alternative is anticipated to benefit water resources and would help to restore historic flood flow patterns. The Alternatives would contribute a negligible increase to runoff hydrology (i.e., due to increased contribution via Problem Areas No. 6 and 7). The Alternatives would likely not, as such was not evaluated in detail, contribute beneficial cumulative effects to the hydrologic conditions of the project area given the vastness of the watershed when compared to the cumulative area resulting from the Alternatives, through reduced flooding and associated sedimentation.

6.7.2.2.2 Surface Water Quality

Surface water quality testing is not undertaken due to Brawley Wash being an ephemeral stream and streamflow only occurs during excess rainfall events, therefore would not result in a cumulative impact to this resource.

6.7.2.2.3 Waters of the U.S./Wetlands and Riparian Areas

The proposed work at the three Problem Areas would have no adverse impacts to waters of the U.S., including wetlands and riparian areas, and therefore would have no cumulative effect to these resources.

6.7.2.2.4 Floodplain Management

Past actions that have may have adversely affected floodplains across and within the study area consist of the construction of the CAP Canal, the development and abandonment of agriculture field and support systems and other man-made features such as diversion berms, swales...etc. and residential development. Although the Alternatives would restore flood flow adjacent to each noted Problem Area the cumulative effect is only marginal given the overall size of the watershed (i.e., 1,400 sq.mi. +/-).

Overall long-term benefit to resulting floodplain/flood flows, would result in reduced complexity regarding floodplain management given the removal of several man-made structures, most of which are man-made and were likely not built to a specific engineering standard.

6.7.2.3 Vegetation

The proposed work at the three Problem Areas would have negligible, temporary adverse impacts to existing vegetation (where present) and with successful water harvesting and planting / other restoration efforts would ultimately have a long-term, beneficial effect on vegetative diversity, abundance, and health.

6.7.2.3.1 Special Status Plant Species

Due to the disturbed nature of the three project sites, it is anticipated that the proposed work would have no adverse impacts to special-status plant species and therefore would have no cumulative effect to these resources.

6.7.2.3.2 Invasive Species

Invasive species are present at all three project areas. While the proposed work may alter species type or location, no negative cumulative effect is expected. With proper treatment and maintenance efforts, there should be a positive effect on the reduction of invasive species on site.

6.7.2.4 Wildlife

The proposed work at the three Problem Areas would have negligible, temporary adverse impacts to wildlife and would ultimately have a long-term, beneficial effect to wildlife. When considered cumulatively with other past, present and reasonably foreseeable future actions the project would have no adverse cumulative effects to wildlife.

6.7.2.4.1 Special Status Wildlife Species

The proposed work at the three Problem Areas would have no adverse impacts to special-status wildlife species and therefore would have no cumulative effect to these resources.

6.7.2.4.2 Cultural Resources

The proposed work at the three Problem Areas is not anticipated to result in adverse impacts to cultural resources with incorporation of appropriate avoidance measures and therefore would have no cumulative effect to cultural resources. Avoidance would be accomplished through site-specific project design and the installation of avoidance measures, such as fencing, during construction. All historic properties will be marked for avoidance during the project.

6.7.2.4.3 Transportation and Infrastructure

The proposed work within the Problem Areas would have minimal changes to transportation and infrastructure given the vast region covered by the existing and future conditions of floodplain/drainage characteristics; therefore, when considered cumulatively with other past, present, and reasonably foreseeable future actions would range from no adverse cumulative effects to a minor beneficial cumulative impact to transportation and infrastructure.

6.7.2.4.4 Land Use

The proposed work within the Problem Areas would have beneficial impacts to land use, providing improvements in drainage flow patterns and flood control; therefore, when considered cumulatively with other past, present and reasonably foreseeable future actions would range from no adverse cumulative effects to a minor beneficial cumulative impact to land use.

6.7.2.4.5 Public Safety

The proposed work within the Problem Areas would have beneficial impacts to land use, providing improvements in drainage flow patterns and flood control; therefore, when considered cumulatively with other past, present and reasonably foreseeable future actions would range from no adverse cumulative effects to a minor beneficial cumulative impact to land use.

6.7.2.4.6 *Socioeconomic Resources*

Past, ongoing, and reasonably foreseeable activities including agricultural, residential, and commercial development have impacted socioeconomics in the Project area. The Alternatives are expected to have minor but generally positive effects on socioeconomics. By stabilizing or enhancing property values along the channel and protecting residents and farmers from flood damage, it would provide a modest benefit to the cumulative impacts on socioeconomic resources. The Alternatives also involve reduced flooding and repair needs, combined with stabilized property values, which may improve economic efficiency in the area. Overall, the benefits of the Alternatives are anticipated to outweigh the costs, offering a positive contribution to cumulative impacts on the local and regional economy.

6.7.2.5 *Ecosystem Services*

Improvement of water infiltration through water harvesting strategies combined with revegetation would provide numerous ecosystem services including: reduced downstream runoff and flooding; increased pollination of nearby food crops; reduction of insect pests due to greater bird presence; reduction in dust pollution as well as reduction in sediment outflow due to stabilization of site soils; aesthetic improvements; and reduction of the spread of invasive plant species (invasive species are often carried by wind, water and vehicles – reduction of these populations reduces downstream and down-road occurrences).

6.8 Risk and Uncertainty

6.8.1 H&H Modeling

The H&H modeling in this study utilized following H&H modeling parameters: (1) NOAA 14 upper 90% rainfall values, with 24-hr SCS Type II rainfall distribution. Areal Reduction Factor (ARF) of 0.63 is applied to the entire study area; (2) SCS Curve Number infiltration method; and (3) Manning's roughness coefficients based on Comprehensive Plan Land Use Intensity – Pima Prospers 2015. The modeling provides reasonable H&H results for the overall watershed study areas.

The hydrologic analyses relied upon published NOAA 14 data for rainfall depth and soil data for determining infiltration rates. Both of these datasets have a degree of uncertainty and therefore, modeling was performed utilizing reasonable conservative assumptions to account for potential future unknown factors. For example, the rainfall depth data utilized the NOAA 14 upper 90% values instead of the mean values. Transmission losses within the Brawley watershed vary at different locations. Along the lower portion of the watershed, transmission losses could result in appreciable reduction in flow rates. With SCS Curve Number infiltration method, transmission losses within the Brawley watersheds were not accounted for, resulting in reasonably conservative flow rates. The Manning's roughness coefficient selection was based on future planned land use data. These conservative assumptions help to address the uncertainty of hydrology and hydraulics that might actually occur in the future.

6.8.2 Economics

Flood risk reduction benefits were estimated based upon the flood damages that would be avoided by implementation of the proposed project. The areas of risk and uncertainty associated with the analysis include uncertainty associated with simplifying assumptions used to estimate benefits. The use of input assumptions supported by published data, aerial photography and field review, and stakeholder verification, reduces the level of uncertainty to the extent possible.

Uncertainty is also present due to damages not captured quantitatively within the analysis (e.g., erosion and sediment deposition, habitat impacts). However, the impacts of the uncertainty are to a considerable degree mitigated by the fact that the same assumptions are applied for each alternative.

Uncertainty is present in relation to future changes in cost estimates as engineering design progresses. Costs can be influenced by several economic factors that cannot be predicted with certainty during the planning process. Fuel shortages, unforeseen labor and materials shortages, natural disasters, and international incidents can adversely affect costs and construction schedules.

This Plan-EA is based on a 52-year period of analysis, including a 50-year evaluated life, and two-year implementation period. The life expectancy of the infrastructure is expected to meet the minimum requirements of the evaluation

period, but it has not been confirmed that the structure would last for a longer period. As the service life is extended, there is an increased risk that assumptions and conditions will be different than predicted.

7. CONSULTATION, COORDINATION AND PUBLIC PARTICIPATION

7.1 Public Announcements

- NRCS Public Notice: www.brawleywashplan.com
- Newspaper Ads: *Desert Times*, *Arizona Daily Star*, *Tohono Runner*
- Social Media: *Nextdoor*, *Facebook*,
- Flyer Distribution to Public Locations
- News Release to Local Media

7.2 Public Involvement Website

Information about the proposed project was added to <https://www.pima.gov/brawley-wash-watershed-plan>, a website created to involve and inform the public. The website included the following information:

- Overview of Brawley Wash Watershed Plan/ Environmental Assessments (Plan/EA) Scope
- Environmental Resources to be Accessed List
- Brawley Wash Watershed and Study Area Map
- Public Participation Options - Interactive Website, Project Website links, Conference Call Information
- PCRFCDD Contact Information

7.3 List of Persons and Agencies Consulted

The following lists include persons and agencies with a vested interest in the Brawley Wash Watershed Plan-EA or parties consulted during the planning process. This includes agencies that provided formal or required consultation, or individuals who were conferred with and contributed input. Coordination with state and local agencies has been ongoing since the start of the project, the Agency Consultation Record can be referenced in **Table 31** in **Appendix E**. Local entities and individuals that have land ownership or share resource within PCRFCDD include the COT and Pima County. Federal, state and local agencies and representatives, as well as area NGO's received an invitation to the early scoping phase of the Plan-EA. The following agencies were:

- | | |
|--|---|
| • USDA-NRCS | • Coalition for Sonoran Desert Protection |
| • Pima County Regional Flood Control District | • Community Water Coalition of Southern Arizona |
| • Altar Valley Conservation Alliance (AVCA) | • Department of Forestry and Fire Management |
| • Arizona Department of Environmental Quality | • Environmental Defense Fund |
| • Arizona Department of Water Resources | • Environmental Protection Agency |
| • Arizona Game & Fish Department (AZGFD) | • Environmental Protection Agency—Arizona Regional Office |
| • Arizona State Historic Preservation Office | • NRCS State Archaeologist |
| • Arizona State Land Department (ASLD) | • NRCS State Partner Biologist |
| • Arizona State Museum | • Office of the Governor of Arizona |
| • Army Corps of Engineers —Arizona District Office | • Pima Association of Governments |
| • ASARCO – Silver Bell Mine | • Pima County Administrator's Office |
| • Avra Valley Wildlife Connectivity Working Group | • Pima County Planning |
| • BKW Farms | • Pima County Department of Environmental Quality |
| • Bureau of Land Management (BLM) | • Pima County Natural Resources, Parks and Recreation (Pima Co. NRPR) |
| • Central Arizona Project (CAP) | • Pima County Office of Conservation and Sustainability |
| • Citizens for Picture Rocks | • Pima County Regional Wastewater Reclamation Department |
| • City of Tucson (COT) | |

Tribal consultation was conducted in accordance with the NHPA of 1966 and Executive Order (EO) 13175, Consultation and Coordination with Indian Tribal Governments, to maintain the NRCS' Government-to-Government relationship. Letters were sent to the SHPO and Native American Tribes with ancestrally affiliated lands located within the project area (based on information provided in the State Historic Preservation Office's Government to Government Consultation Toolkit website, <https://sites.google.com/view/az-consultationtoolkit/home>) about the project. NRCS identified the following Native American Tribes who may have interests in the project:

- Ak-Chin Indian Community
- Fort McDowell Yavapai Nation
- Gila River Indian Community
- Hopi Tribe
- Mescalero Apache Tribe
- Pascua Yaqui Tribe
- Pueblo of Zuni
- Salt River Pima-Maricopa Indian Community
- San Carlos Apache Tribe
- Tonto Apache Tribe
- Tohono O'odham Nation
- White Mountain Apache Tribe
- Yavapai Apache Nation

8. PREFERRED ALTERNATIVE

8.1 Selection and Rationale for the Preferred Alternative

NRCS, with support from the District, has chosen: for Problem Area No. 2, Restore Disturbed Areas (Alternative No. 1), for Problem Area No. 6, Restore Disturbed Areas and Natural Infrastructure for Dryland Systems (a.k.a. “NIDS”) (Alternative No.3), and for Problem Area No. 7, Restore Disturbed Areas albeit with a slightly modification to include a minor diversion berm (Alternative No.1). These alternatives are based on the goal and function to meet the purpose and need for the project, best address the Federal Objective and Guiding Principles, and provide the most beneficial effects on environmental, social, and economic resources. PCRFC, cooperating agencies, and local cost sharing partners have agreed that the alternative listed for each Problem Area are their Preferred Alternative (see [Section 5.4](#) for additional information).

Non-productive associated agricultural land is owned by the District that is being restored for flood mitigation and not for future agricultural land use. Agriculture benefits are not the primary purpose; however, secondary agricultural benefits would occur through reduced flood damages to irrigated farmland and associated infrastructure.

Additionally, there would be positive economic benefits including protected downstream agricultural crops, reduced emergency management costs, and reduced flood damages. When compared to the No Action Alternative and considering current hydrological and climatic conditions and future environmental changes, the Preferred Alternative would support the health and resiliency of the ecosystem within the project area.

The Preferred Alternative was selected following the evaluation and comparison of alternatives carried forward for detailed analysis based on the project Purpose and Need, Federal Objective, and applicable PR&G criteria, summarized in [Table 26](#), [Appendix E](#) – Supporting Information.

8.2 Measures to be Installed

The alternative associated with each Problem Area (i.e., No. 2, 6, and 7) are alternatives designed to restore the floodplain and to provide downstream benefit resulting from reduced flood depth(s). Land treatment measures consist of conservation practices such as berm modifications, and related soil and water conservation treatments designed to restore flow patterns, reduce runoff concentration, and decrease erosion and sediment transport within the watershed. These measures are implemented as part of a coordinated watershed system supporting overall project performance. Cost-share rates are applied consistent with PL 83-566 authorities and do not exceed applicable limitations for similar practices under existing USDA conservation programs. For all preferred alternatives, the installation of new embankments or hydraulic structures are not anticipated.

Existing flooding conditions within the Brawley Wash during the 100-year event are shown on [Exhibits 1B, 3D, and 8D](#) in Appendix B of [Subappendix D.2](#). The Preferred Alternative would include the following elements (see [Table 27](#) in [Appendix E](#)). [Exhibits 1A, 3B, and 8B](#) in Appendix B of [Subappendix D.2](#) show the benefitted areas, flood inundation areas, and flow depths of the existing conditions versus with the Preferred Alternative.

- Problem Area No. 2, - Alternative 1
 - 10- and 100-year design and construction related to planned partial removal of earthen embankment making up the man-made earthen berm.
- Problem Area No. 6 – Alternative 3
 - 10- and 100-year design and construction related to planned removal of earthen embankment making up the abandoned agricultural berm(s).
 - Design and construction related to NIDS strategically placed downstream of the abandoned agricultural berm(s).
- Problem Area No. 7 – Alternative 1
 - 10- and 100-year design and construction related to planned removal of earthen embankment making up the abandoned agricultural berm.

- Design and construction of an earthen diversion embankment located at the southwest corner of the subject project area.

It is expected that the improvements presented in **Table 28** in **Appendix E** would be designed and constructed by PCRFC. Implementation of the listed alternatives would not require land acquisition or easement from the COT, but an Intergovernmental Agreement (IGA) would be required for implementation and operation/maintenance. In support of Problem Area No. 6, an easement across a portion of APN 208-39-024 would be required.

The estimated total installation project cost for the Preferred Alternative is \$4,960,000. With additional project administration and technical assistance costs, the total project cost would be \$5,047,100. Installation costs associated with this alternative include planning and design, surveying, construction, property acquisition, and permitting with involved land management agencies. Costs also include as-needed field visits, coordination with landowners and agencies, and public relations. Estimated annual O&M costs are \$0. Under current conditions, the City of Tucson incurs approximately \$360,000 annually in land management cost for invasive species management. This cost is comprised of \$1,000 at P2A1, \$120,000 at P6A3, and \$239,000 at P7A1. Under proposed conditions, it is possible that Pima County would assume responsibility for annual O&M/land management. However, no new O&M cost is generated by the implementation of the Preferred Alternatives. Because there is no difference between existing and proposed conditions, O&M cost is shown as \$0.

8.3 Minimization, Avoidance, and Compensatory Mitigation Measures

Prior to construction, mitigation measures and BMPs would be implemented to minimize disturbance to air quality, soils, open waters, farmlands, wildlife, plants, cultural or historic property, and the human environment. It should be noted that the following list of mitigation measures provided below is not exhaustive. Specific mitigations for each potentially impacted resource are included below.

- Ground disturbances would be limited to only those areas necessary to minimize effects on soils, vegetation, wildlife, open waters, and land use.
- Existing roads and/or access routes into each Problem Area would allow for construction access, and therefore temporary access routes would not be necessary.
- Impacts to recently mapped floodplains would need to be assessed and re-mapped where necessary.
- Historic properties identified in the area would be avoided through site-specific project design and the installation of appropriate avoidance measures during project construction, as necessary.
- If cultural and historic resources, including human remains, are encountered during construction, an Inadvertent Discovery Plan, produced by Pima County or a qualified contractor working under the direction of the NRCS archaeologist, would be followed. Discovery protocol would be compliant with 36 CFR 800.13 (Section 106 Process, Post-review Discoveries) and Arizona Revised Statutes (ARS) 41-844 and ARS 41-865 (Arizona's burial discovery laws applicable to state/municipal lands and private lands, respectively). Dust abatement measures would be implemented to reduce fugitive dust during construction.
- Cultural and environmental resource protection costs are included in the benefit cost analysis and total construction costs to minimize cultural and environmental impacts to each Problem Area.
- A SWPPP would be implemented and BMPs followed to decrease erosion during construction.
- Construction schedules would be determined to minimize physical and auditory disturbance to wildlife and the public.
- CWA Section 404/401 permitting would not be required along with potential coordination with USACE and ADEQ.
- If vegetation clearing in the Problem Areas is expected to take place during the nesting season (i.e., between mid-February and late September, with the nesting season for raptors being January through late June), nesting bird surveys and measures to protect active nests from destruction should be taken to avoid a violation of the MBTA.

8.4 Permits and Compliance

Permitting for the design and construction of the Preferred Alternative associated with each Problem Area would not be required by the PCRFCDD. Permitting through the FEMA as it relates to changes to delineated Special Flood Hazard Areas (SFHAs) will be required (via standard CLOMR/LOMR process).

8.4.1 Local and County

City of Tucson

The City would only contribute approval(s) of the necessary IGA to allow the PCRFCDD to enter onto lands currently owned by the City for the purposes of constructing and maintaining the proposed works.

Pima County

The County is a cost-sharing partner for this project and would contribute funding as necessary for design and construction of the Preferred Alternative for each of the Problem Areas. All work within or having impact to the 100-year floodplain would be under the approval and consultation with the County floodplain administrator would determine appropriate permitting requirements.

8.4.2 State

Arizona Department of Environmental Quality

The Arizona Pollutant Discharge Elimination System program (AZPDES), implemented by ADEQ and as delegated by the EPA, would require a SWPPP and stormwater permit for construction activities including clearing, grading, excavation, materials or equipment staging, and stock piling that would disturb 1 or more acres of land and have the potential to discharge into surface waters or conveyance systems leading to surface waters of the state.

Arizona Game and Fish Department

If burrowing owls are encountered during construction, the County or its contractors shall follow AZGFD guidelines in accordance with the Burrowing Owl Project Clearance Protocols (Arizona Burrowing Owl Working Group 2009ci). Any encounters and related mitigation measures taken by the District or its contractors shall be documented and reported to the EPO within 30 days.

8.4.3 Federal

Federal Cooperating Agencies - The NRCS, as Lead Federal Agency, has primary responsibility for compliance with the requirements of NEPA and preparation of the Draft and Final EA. Information and evaluation necessary to support permit reviews, authorizations, and/or the decisions of the agencies have been provided to the extent possible in the EA, under the participation of the parties to this agreement.

8.4.3.1 Federal Laws

8.4.3.1.1 National Environmental Policy Act

The NEPA requires that all Federal agencies prepare an evaluation of relevant environmental effects of a Federal project or action. This process begins when an agency develops a proposal addressing a need to take action. This Plan-EA document fulfills the NEPA requirements for a Federal agency (NRCS) undertaking the project in coordination with other cooperating agencies (Tucson Water) and important stakeholders.

8.4.3.1.2 National Historic Preservation Act

NHPA Section 106: Pursuant to Section 106 of the NHPA (1966, as amended in 2000) (54 U.S.C. 306108), and the regulations implementing Section 106 (36 CFR Part 800), Federal agencies must take into account the potential effect of an undertaking on "historic properties," which refers to cultural resources listed, or eligible for listing, in the NRHP. Consultation with SHPO, agencies, and tribes to fulfill Section 106 obligations, is complete, and resulted in SHPO's concurrence on the adequacy of the identification of historic properties effort and the APE.

8.4.3.1.3 Clean Water Act

The CWA serves as the federal regulatory structure to protect surface water quality. Federal jurisdiction of surface waters extends to features that meet the definition of WOTUS, as defined under 33 CFR 328. There are no potential

WOTUS present in Problem Area No. 6. The modeled NWI ephemeral R4SBC feature in Problem Area No. 2 and R5UBFx feature in Problem Area No. 7 would likely not be considered WOTUS (see [Section 6.2.3](#)). Therefore, no further permitting with USACE or ADEQ is required for project implementation.

8.4.3.1.4 Farmland Protection Policy Act

The Farmland Protection Policy Act (7 U.S.C. 4201 et seq.) directs Federal agencies to identify and quantify adverse effects of Federal programs on farmlands. The Act's purpose is to minimize the number of Federal programs that contribute to the unnecessary and irreversible conversion of agricultural land to nonagricultural uses. Prime farmland is mapped by NRCS in all three Problem Areas; however, no impacts to this farmland would occur because the proposed work in the Problem Areas would not result in the unnecessary and irreversible conversion of farmland to nonagricultural uses.

8.4.3.1.5 Endangered Species Act

The ESA establishes a national program for the conservation of T&E species and the preservation of the ecosystems on which they depend. The ESA is administered by the USFWS for wildlife and freshwater species, and by NOAA Fisheries for marine and anadromous species. The ESA defines procedures for listing species, designating critical habitat for listed species, and preparing recovery plans. It also specifies prohibited actions and exceptions. Section 7 of the ESA, called "Interagency Cooperation," is the mechanism by which Federal agencies ensure the actions they take, including those they fund or authorize, do not jeopardize the existence of any listed species. Under Section 7 of the ESA, Federal agencies must consult with USFWS or NOAA when any action the agency carries out, funds, or authorizes (such as through a permit) may affect a listed endangered or threatened species.

8.4.3.1.6 Migratory Bird Treaty Act

The MBTA implements various treaties and conventions between the United States and other countries, including Canada, Japan, Mexico, and the former Soviet Union, for the protection of migratory birds (16 U.S.C. 703–712). Under the Act, taking, killing, or possessing migratory birds, or taking, destroying, or possessing their eggs or nests, is unlawful. The Act classifies most species of birds as migratory, except for upland game birds and nonnative species.

8.4.3.1.7 Bald and Golden Eagle Act

The BGEPA prohibits the taking or possessing of, and commerce in, bald and golden eagles, with limited exceptions (16 U.S.C. 668–668d). The Act covers international acts or acts in "wanton disregard" of the safety of bald or golden eagles. This project would not result in "take" of either bald or golden eagles as defined by the Act.

8.5 Costs

Table 29 in **Appendix E** presents the total project cost of \$5,047,100 for the Preferred Alternative for each of the Problem Areas. PL 83-566 funds would support \$4,960,000 of the total project cost and the \$87,100 remainder of the cost would be contributed by other, non-Federal funds. **Table 29** in **Appendix E** also itemizes the costs for each project task and the distribution of how the costs would be shared by the District and NRCS for each cost item. presents a detailed breakdown of installation costs in total and as distributed into PL 83-566 funding sources by land status.

8.6 Installation and Financing

The following sub-sections present the installation and financing of the Preferred Alternative for each Problem Area. Problem Areas 1 and 5 were removed from further consideration per NRCS. Included in this section is a framework for implementing the Preferred Alternative, the sequence of installation, responsibilities, contracting, real property and relocations, other agencies, cultural resources, financing, and conditions for providing assistance.

Framework for Carrying Out the Plan

PCRFCDD would obtain all approvals and permits for the project prior to the start of construction. The costs shown in this plan are preliminary estimates. Final costs to be borne by the parties hereto will be the actual costs incurred in the installation of works of improvement. The entire project would likely commence in 2026 and be completed within two years. PCRFCDD would develop an appropriate project schedule that focuses on sections of the system with high

residential property loss and worked within engineering and funding constraints to meet PCRFCDD, cost-sharing partners, and community development needs.

Responsibilities

NRCS is responsible for leading the planning efforts, providing engineering design and construction oversight assistance, and certifying completion of the project. PCRFCDD would be responsible for easement acquisition, engineering design, project administration, environmental permitting, contracting, and construction implementation. PCRFCDD is a flood control district organized under Chapter 18 of A.R.S. Title 48 and has agreed to exercise its authority to implement the actions described in this Plan-EA.

Contracting

The earthwork measures would be completed using NRCS funding mechanisms. PCRFCDD would be primarily responsible for overseeing and administering the construction of the project in coordination with NRCS which would involve contracting various parties to complete the work.

Real Property and Relocations

Where possible, construction would take place in existing public easements or on lands owned by the COT. However, an easement across privately owned land (i.e., APN 208-39-024) would be required in support of the Preferred Alternative for Problem Area No. 7. Prior to construction, PCRFCDD would obtain any land right agreements and/or IGA with the COT.

Financing

NRCS can provide up to 100 percent of the eligible project costs for the Preferred Alternative through PL 83-566 funding. The PCRFCDD is responsible for securing funding for items that are not eligible under the National Watershed Program (project administration and technical assistance).

Section 8.6 presents annual installation costs and the proportion of funding through PL 83-566 and other funding sources. PCRFCDD has a strong history of securing public funding through grants, loans...etc.. The majority of the required funding would be expected to be provided through Flood Control District tax (i.e., secondary property tax). If necessary, a portion of the project cost could be financed through short-term loans. Financing costs are not included in the NEE analysis.

O&M costs after project completion would be provided through the revenues of PCRFCDD. O&M costs would be budgeted on an annual basis. NRCS reserves the authority and right to discontinue or reduce program benefits based on changes in agency priorities, funding availability, or the failure of PCRFCDD to fulfill the provisions of their agreement. Cost-sharing with other agencies has not been considered within this Plan-EA.

Conditions for Providing Assistance

PCRFCDD would be responsible for the O&M of the project for the 50-years of its evaluation life. Prior to construction, a separate O&M agreement based on NRCS Title 180, National Operation and Maintenance Manual, Part 500, Subpart C would be made between NRCS and PCRFCDD. The agreement would continue through the design life of the project and could be modified with NRCS' approval. Project Sponsor (District) and NRCS would make annual inspections of project measures to assure the quality of ongoing O&M. PCRFCDD would be in charge of scheduling O&M inspections and be responsible for any necessary work. PCRFCDD would coordinate with the COT to conduct any O&M activities to assure that work is conducted in an acceptable manner. All procedures would be followed as specified in the O&M agreement between the project Sponsor and NRCS.

8.7 Economic and Structural Tables

As required by the National Watershed Program Manual, Part 506 – Exhibits (subpart B – Economic and Structural Tables), the following six tables are provided to present a breakdown of the economic and structural information for the Preferred Alternative separated by Problem Area. [Table 2](#) (390-NWPM, Part 506, Subpart B, Section 506.11, Economic Table 1) presents the estimated installation cost and [Table 3](#) (390-NWPM, Part 506, Subpart B, Section 506.12, Economic Table 2) presents the estimated cost distribution.

Table 2 - Estimated Cost Distribution of Preferred Alternative (Brawley Wash Watershed, Arizona, 2024\$)¹

Works of Improvement	Unit	Number (Non-Federal Land)	Estimated Cost ^{1/}		
			Public Law 83-566 Funds	Other Funds	Total
Problem Area No. 2 - Tortuga Ranch - Alternative 1	No.	1	\$1,221,000	\$25,800	\$1,246,800
Problem Area No. 6 - Prickle Desert - Alternative 3	No.	2	\$2,770,500	\$39,800	\$2,810,300
Problem Area No. 7 - Tucker Road, Alternative 1	No.	3	\$968,500	\$21,500	\$990,000
Total Project			\$4,960,000	\$87,100	\$5,047,100

Prepared: November 2024.

1/ Price base: 2024.

2/ Federal Funds include NRCS Engineering Services and Project Administration (\$236,000 of \$4,960,000 Public Law Funds), which are not included when calculating eligible federal cost-share. Permit costs (\$45,000 of the \$87,100 Other Funds) are also not included. Therefore, federal cost share is based on Total Eligible Project Cost of \$4,766,100.

Table 3 - Estimated Cost Distribution - Water Resource Project Measures (Brawley Wash Watershed, Arizona, 2024\$)¹

Works of Improvement	Installation Cost -----Federal Funds ^{2/} -----				Installation Costs -----Other Funds-----						Total Installation Cost
	Construction ^{3/}	Engineering Services ^{4/}	Project Admin. ^{3/}	Total Public Law 566	Construction	Engineering Services	Real Property Rights	Required Permits	Project Admin.	Total Other Funds	
Problem Area No. 2 - Tortuga Ranch, Alternative 1	\$1,157,600	\$57,600	\$5,800	\$1,221,000	\$0	\$5,000	\$0	\$15,000	\$5,800	\$25,800	\$1,246,800
Problem Area No. 6 - Prickle Desert, Alternative 3	\$2,622,900	\$134,500	\$13,100	\$2,770,500	\$0	\$11,700	\$0	\$15,000	\$13,100	\$39,800	\$2,810,300
Problem Area No. 7 - Tucker Road, Alternative 1	\$948,500	\$20,300	\$4,700	\$968,500	\$0	\$1,800	\$0	\$15,000	\$4,700	\$21,500	\$990,000
TOTAL	\$4,724,000	\$212,400	\$23,600	\$4,960,000	\$0	\$18,500	\$0	\$45,000	\$23,600	\$87,100	\$5,047,100

Prepared: November 2024.

^{1/} Price Base: 2024.

^{2/} Federal cost share for total eligible flood protection measure costs is 100%. Federal engineering services and project administration costs, as well as permit costs, are not included when calculating eligible federal cost share. Therefore, federal cost share for construction is based on total eligible project cost of \$4,766,100.

^{3/} Total construction cost of \$4,724,000 includes cultural and environmental mitigation costs of \$555,200.

^{4/} Engineering services costs are assumed to be 7% of the construction cost (excluding contingency), as well as the cost of delineating flow corridors at each site. Of this cost, 92% is to be borne by Public Law 83-

8.8 Flood Damages Reduced for the Preferred Alternative

This section considers how modeled damages would change under the Preferred Alternative, separately for each Problem Area. When damages are reduced relative to the FWOFI, the Preferred Alternative achieves a flood damage reduction benefit. To compute damages with the Preferred Alternative for each Problem Area, considered independently of each other, hydraulic model runs were completed. The resultant depth grids by flood event were used to recompute damages with the inclusion of the structural or non-structural mitigation of the Preferred Alternative. This Preferred Alternative computation was completed for each monetized damage category.

Structures and Vehicles

The Preferred Alternative would reduce flood depths for properties within close proximity to each Problem Area. The Brawley Wash Economics Appendix D_11-14-2024 report in **Subappendix D.1.1** presents the monetary flood damage reduction that would result to study area structures and vehicles under each alternative.

Agricultural Crop Loss

To estimate the change in agricultural damage from the Preferred Alternative, hydraulic modeling was conducted and results are presented in Appendix D-1. Agricultural acreage in the project area is primarily grassland/pasture, cotton,

alfalfa, and durum wheat. As shown in the model results, none of the alternatives materially change flood damage to agricultural land.

Infrastructure Damages

The Preferred Alternative would reduce flood damages to study area infrastructure. GIS analysis comparing with and without project conditions was conducted and the results are presented in Brawley Wash Economics Appendix D_11-14-2024 report and in [Table 4](#) . While the Preferred Alternative would reduce flood depths and extent of flooding on study area roadways, none of the alternatives change the overtopping condition of the eight bridges in the 100-year flood event.

Table 4- Estimated Average Annual Flood Damage Reduction Benefits (Brawley Wash Watershed, Arizona, 2024\$)¹

Item ^{2/}	Estimated average annual damage		Damage Reduction Benefit ^{2/}
	Without Project	With Project	
Structures and Vehicles	\$1,369,600	\$1,301,800	\$67,800
Infrastructure	\$3,143,300	\$3,010,200	\$133,100
Insurance Administration Costs	\$246,500	\$230,700	\$15,800
TOTAL	\$4,759,400	\$4,542,700	\$216,700

Prepared: November 2024.

^{1/} Price Base: 2024.

^{2/} Agricultural damages with and without project were also measured, but there was a negligible reduction in flood damages to agriculture from the Preferred Alternative.

Summary of Flood Damages Reduced for Flood Damages

Under the Preferred Alternative, average annual benefits would be approximately \$216,700; average annual costs would be \$192,090, and benefit cost ratio would be 1.13 (see Table 5). Monetized damages by event were converted to expected annual damages (EAD). EAD is an estimate of annualized economic impacts of flooding considering the probability of occurrence for the full range of modeled flood events. Computation of expected annual damages (EAD) for the Preferred Alternative is based on integration of the frequency-damage function for the 10-, and 100-year recurrence interval flood events that were modeled for this study. EAD is also presented in present value dollars, which is the value today of the stream of EAD over the evaluation period (50-years), considering the FY24 federal discount rate (2.75%). Benefits and costs are presented in FY24 price levels.

Table 5 – Comparison of Preferred Alternative Benefits and Costs Brawley Wash Watershed, Arizona, 2024\$)¹

Works of Improvement	Total Average Annual Equivalent Benefits	Average Annual Equivalent Costs ^{2/}	Benefit-Cost Ratio
Problem Area No. 2- Tortuga Ranch-Alternative 1	\$56,300	\$47,453	1.19
Problem Area No. 6- Prickle Desert-Alternative 3	\$77,000	\$106,959	0.72
Problem Area No. 7- Tucker Road, Alternative 1	\$83,400	\$37,679	2.21
TOTAL	\$216,700	\$192,090	1.13

Prepared: November 2024.

^{1/} Price Base: 2024.

^{2/} From Table 4.

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Robert Davis	Quiet Creek
<i>Month and year of preparation or update: May 2026</i>	

11. DISTRIBUTION LIST

A Notice of Availability for the Draft Plan-EA will be distributed to the following: Federal, state, and local agencies; community representatives; and area NGOs. The agency, representative, and organizational contacts included on the mailing list are as follows:

11.1 Agencies

- Bureau of Land Management
- Bureau of Reclamation
- Arizona State Land Department
- Arizona Game and Fish Department
- Arizona State Historic Preservation Office
- Arizona Department of Environmental Quality
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- Pima County
- City of Tucson

11.2 Tribes

- Ak-Chin Indian Community
- Fort McDowell Yavapai Nation
- Gila River Indian Community
- Hopi Tribe
- Mescalero Apache Tribe
- Pascua Yaqui Tribe
- Pueblo of Zuni
- Salt River Pima-Maricopa Indian Community
- San Carlos Apache Tribe
- Tonto Apache Tribe
- Tohono O'odham Nation
- White Mountain Apache Tribe
- Yavapai Apache Nation

11.3 Businesses, Property Owners, and Residents

Individual businesses, property owners, and residents within and surrounding the action area were not contacted during scoping and release of the Draft Plan-EA. The names of private stakeholders and members of the public who received notice of the Draft Plan-EA are not included in this section for privacy reasons.

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13. APPENDICES A-E

APPENDIX A – Comments and Responses

APPENDIX B – Project Maps

APPENDIX C – Supporting Maps

APPENDIX D – Investigation and Analysis

D.1 – ECONOMIC ANALYSIS

D.2 – HYDROLOGY AND HYDRAULIC (H&H) ANALYSIS

D.3 – SOILS AND GEOLOGY

D.4 – BIOLOGICAL RESOURCES

D.5 – SOCIOECONOMICS

D.6 – PRELIMINARY ALTERNATIVES DEVELOPMENT AND FORMULATION PROCESS

APPENDIX E – Supporting Information

APPENDIX A - COMMENTS AND RESPONSES

(The following documents were submitted in Electronic PDF – Appendix A – Comments and Responses)

CONTENTS:

- Attachment 1 - Brawley Wash Plan-EA Preliminary Draft - Comment Response Log (Rev. 07/13/2026)
- Attachment 2 - Brawley Wash Plan-EA Public Outreach Comments
- Attachment 3 - Initial Section 106 Consultation on the Brawley Wash PL-566 Watershed Flood Prevention Operations (WFPO) Project Tribal Letters and Affect Response Letters (December 2020)
- Attachment 4 - Class I Cultural Resources Results Notification Letters (August 2024)
- Attachment 5 – Additional Class III Cultural Resources Inventory Results Notification Letters (January 2025)
- Attachment 6 - Section_106_Class III Cultural Resources - New APE Consultation Letters - Agency Consultation
- Attachment 7 – Pascua Yaqui Letter and Response – Brawley Wash Plan-EA (July 02, 2026)

APPENDIX B – PROJECT MAPS

(The following documents were submitted in Electronic PDF – Appendix B – Project Maps)

CONTENTS:

- Figure 1 - Study Location Map
- Figure 2 - Vicinity Map
- Figure 3 - Watershed Planning Area Map

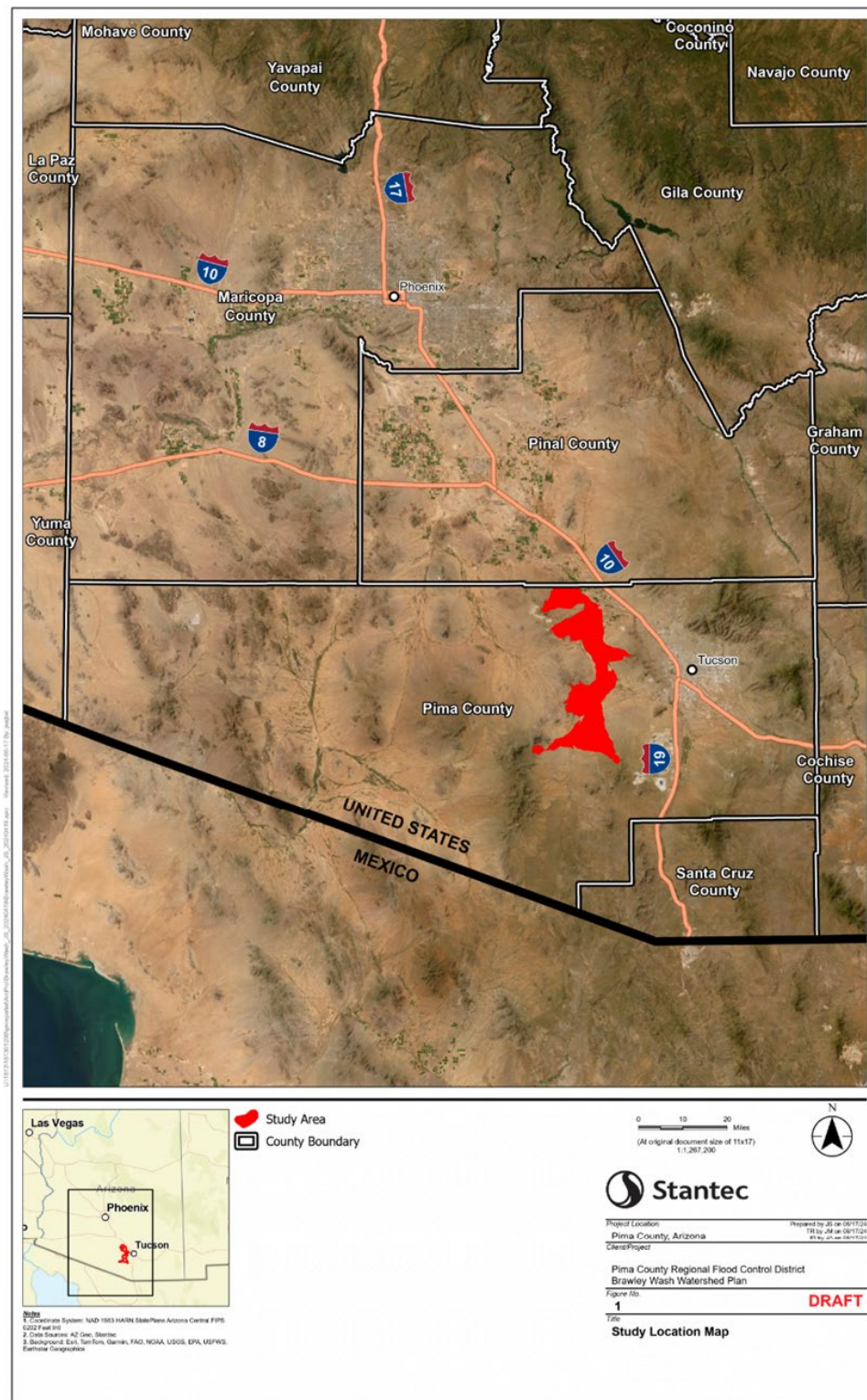


Figure 1 – Study Location Map

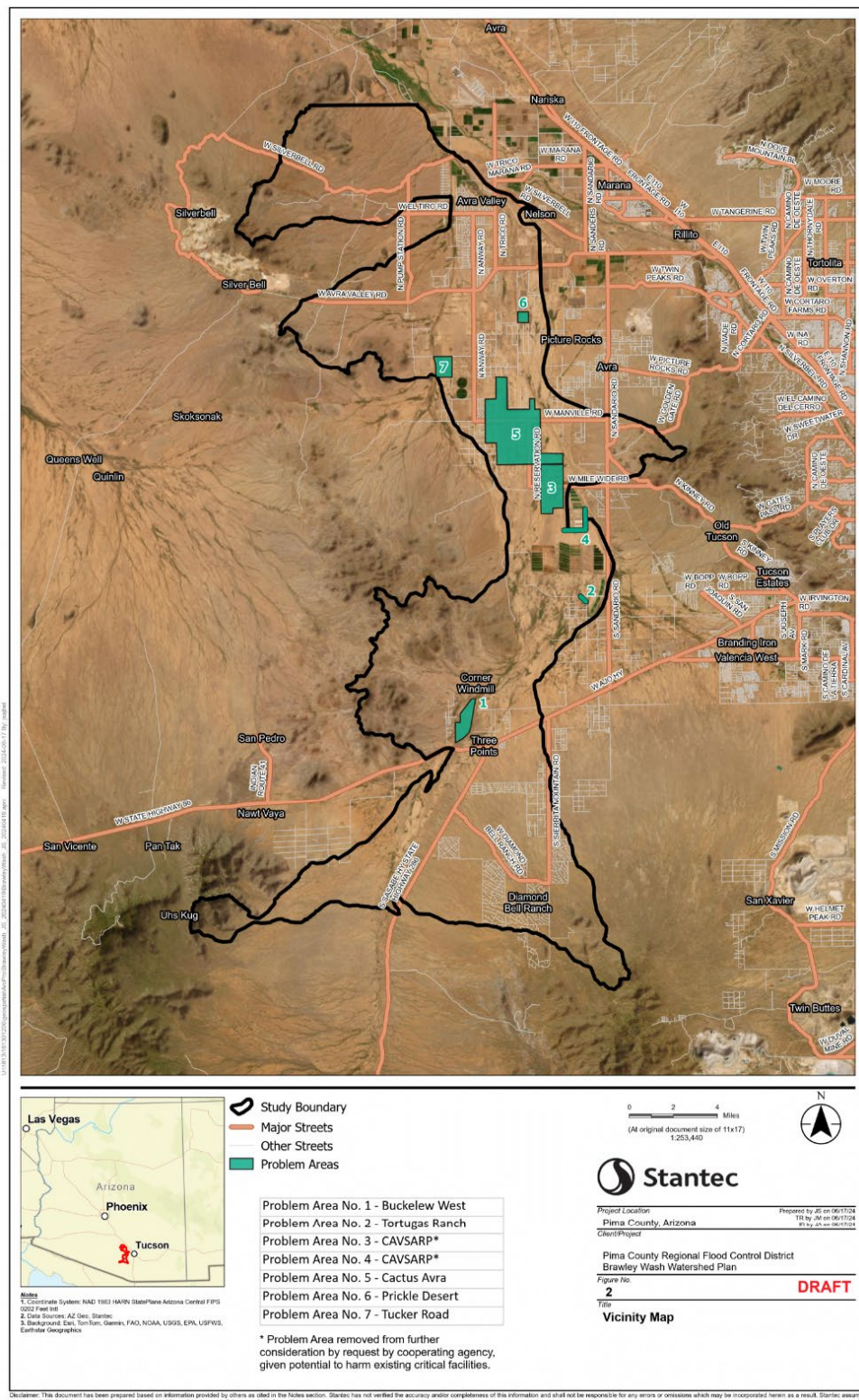


Figure 2 – Vicinity Map

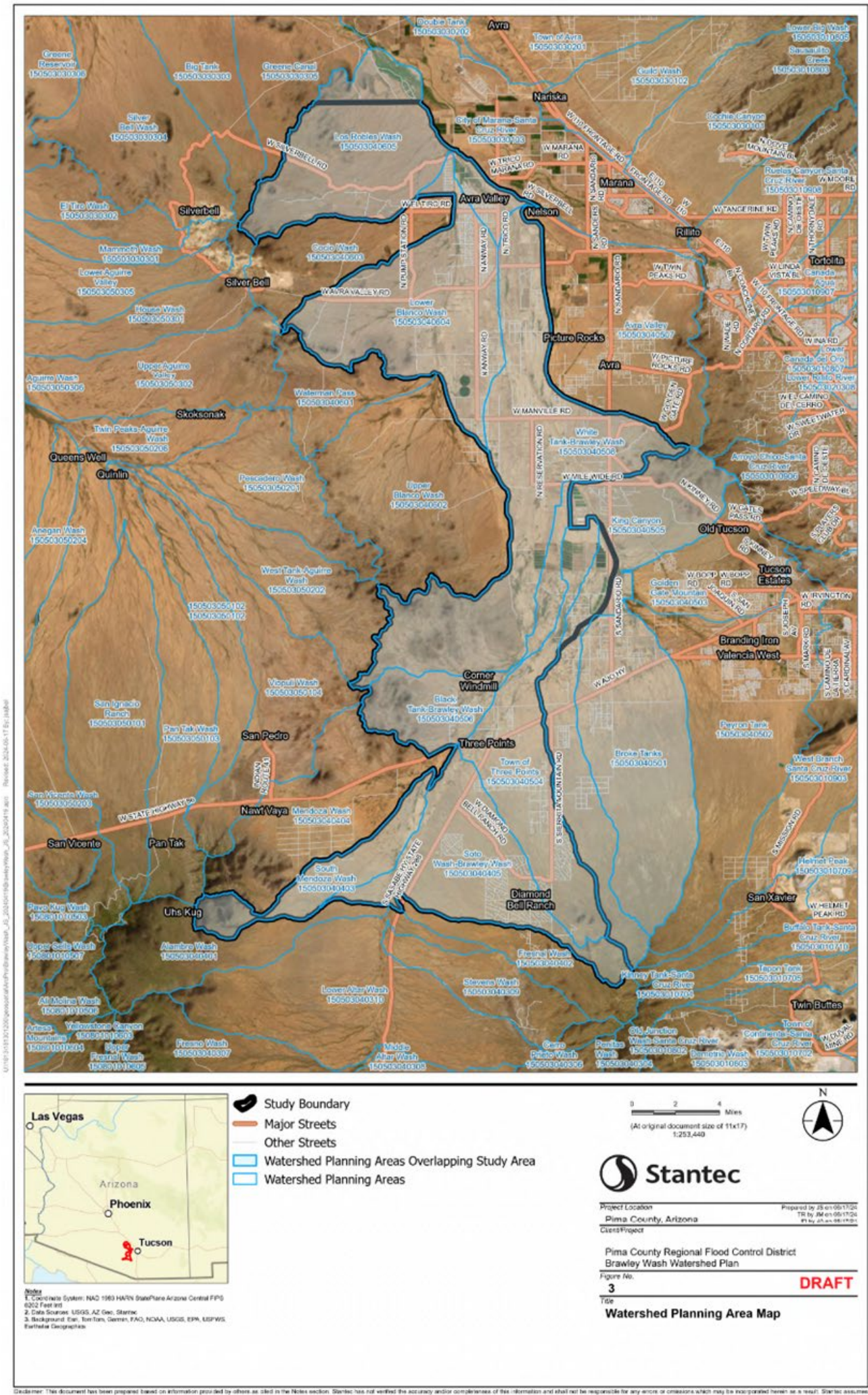


Figure 3 – Watershed Planning Area Map

APPENDIX C – SUPPORTING MAPS

(The following documents were submitted in Electronic PDF – Appendix C – Supporting Maps)

CONTENTS:

- Figure 4 - Economic Analysis Study Area Boundary
 - Figure 5 - Hydraulic Structures within Study Area (1 of 6)
 - Figure 6 - Hydraulic Structures within Study Area (2 of 6)
 - Figure 7 - Hydraulic Structures within Study Area (3 of 6)
 - Figure 8 - Hydraulic Structures within Study Area (4 of 6)
 - Figure 9 - Hydraulic Structures within Study Area (5 of 6)
 - Figure 10 - Hydraulic Structures within Study Area (6 of 6)
 - Figure 11 - Study Area Agriculture
 - Figure 12 - Prime and Unique Farmland
 - Figure 13 - NWI Topo Problem Area - Prickle Desert
 - Figure 14 - NWI Topo Problem Area - Overview
 - Figure 15 - NWI Topo Problem Area - Tortuga Ranch
 - Figure 16 - NWI Topo Problem Area - Tucker Road
 - Figure 17 - Pima County RRH Overview
 - Figure 18 - Pima County RRH Prickle Desert
 - Figure 19 - Pima County RRH Tortuga Ranch
 - Figure 20 - Economic Analysis 10-Year Inundation Boundary
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APPENDIX D – INVESTIGATION AND ANALYSIS

(The following documents were submitted in a separate .docx – Brawley Wash Plan-EA Appendix D)

CONTENTS:

- Subappendix D.1 – Economic Analysis
 - Subappendix D.2 – Hydrology and Hydraulic (H&H) Analysis
 - Subappendix D.3 – Soils and Geology
 - Subappendix D.4 – Biological Resources
 - Subappendix D.5 – Socioeconomics
 - Subappendix D.6 – Preliminary Alternatives Development and Formulation Process
-

APPENDIX E – SUPPORTING INFORMATION

CONTENTS:

- Table 25 – Eliminated Alternatives and Rationale
- Table 26 – Summary and Comparison of Alternative Plans
- Table 27 – Details for the Preferred Alternatives
- Table 28 – Estimated Average Annual Costs (Brawley Wash Watershed, Arizona, 2024\$)¹
- Table 29 – Cost Details for the Preferred Alternatives
- Table 30 – Table 4 - Estimated Average Annual Costs (Brawley Wash Watershed, Arizona, 2024\$)¹
- Table 31 – Agency Consultation Record
- Table 32 – Location of Problem Area APE

(The following documents were submitted in Electronic PDF – Appendix E – Supporting Information)

- Attachment 14 - Preliminary Alternatives Selection Memo - Brawley Wash Watershed Plan and Environmental Assessment (PCRCD Contract: CT-FC290 - December 20, 2022)
 - Attachment 15 - Data Collection Technical Memorandum - Brawley Wash Watershed Plan and Environmental Assessment (PCRCD Contract: CT-FC290 - March 16, 2023)
 - Attachment 16 - Letter - NRCS Evaluation FPPA Ruling (May 21, 2024)
 - Attachment 17 - Class I Cultural Resources Inventory for the Brawley Wash Watershed Plan Alternatives, Pima County, Arizona (May 2024) (Revised July 2024)
 - Attachment 18 - Class III Cultural Resources Inventory Results Report (October 2024) (revised February 2025)
 - Attachment 19 - Letter - NRCS Section 12 Notification - Public Law 83-566 (February 10, 2025)
 - Attachment 20 - Class III Cultural Resources Inventory of the Tucker Road Problem Area, Brawley Wash Watershed Plan Alternatives, West of Tucson, Pima County Arizona (April 2025) Report
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