

BIOLOGICAL ASSESSMENT
of the
Arizona Game and Fish Department's
Statewide and Urban Fisheries Stocking Program
for the years
2011-2021

Arizona Game and Fish Department and
U.S. Fish and Wildlife Service,
Wildlife and Sport Fish Restoration Program
2011



This page intentionally left blank.

Recommended Citation

U.S. Fish and Wildlife Service. 2011. Biological Assessment of the Arizona Game and Fish Department's Statewide and Urban Fisheries Stocking Program for the years 2011-2021. Wildlife and Sport Fish Restoration Program, U.S. Fish and Wildlife Service, Albuquerque, NM.

Photographs used in this document:

Fish and Wildlife Service's guidance on photo releases is to obtain a signed release if individuals are the focus of a photograph, and they are recognizable in that photograph, and for any child clearly identifiable in a photograph. This Biological Assessment contains some such pictures and, in most cases, the Service did not have contact information for those individuals. The Service chose to redact the faces in those photographs rather than eliminate the photograph because many of them also provided a visual representation of the stocking sites or provided other useful visual information.

Acronyms Used in this Document

ACS: Additional Conservation Species

AESO: U.S. Fish and Wildlife Service, Arizona Ecological Services Office

AGFD: Arizona Game and Fish Department

BA: Biological Assessment

DBCO: Draft Biological and Conference Opinion

DEA: Draft Environmental Assessment

FIN: Fishing in the Neighborhood

FWS: U.S. Fish and Wildlife Service

NEPA: National Environmental Policy Act

RPM: Reasonable and Prudent Measure

SFRA: Sport Fish Restoration Act of August 9, 1950, as amended (16 U.S. Code 777–777n)

UFP: Urban Fishing Program

WSFR: U.S. Fish and Wildlife Service, Wildlife and Sport Fish Restoration Program

Organization of This Document

Executive Summary

Briefly identifies project action and location, lead contacts for the U.S. Fish and Wildlife Service, Wildlife and Sport Fish Restoration Program and Arizona Game and Fish Department (AGFD).

Chapter 1-Introduction

Provides an introduction and overview of the AGFD Sport Fish Stocking Program, Laws, Regulations and Authorities, Action Area, description of the Proposed Action and description of the process for determining Federally listed species to be addressed in this BA. Additionally, a conservation actions program to be implemented as part of the proposed action is provided and described. The conservation actions program, as described, serves to minimize and mitigate for potential impacts of the proposed stocking actions.

Chapter 2 – Environmental baseline and Resource Conditions

The chapter provides biological and natural history information for the sport fish proposed for stocking in Arizona waters. In addition, the AGFD's role in fisheries management, legal authorities, fishing regulations, protocols and stocking procedures related to the proposed action are described in detail. These data are used to assist in the determination of potential direct, indirect, interrelated, interdependent and cumulative effects of sport fish stocking on listed, candidate and proposed for listing species and/or critical habitats.

Chapter 3- Analysis Methods and Criteria

This chapter describes the geographic and biological criteria used to develop the methods of analysis for federally listed threatened and endangered species and their critical habitat, candidate species, and two species likely to be listed in this consultation period .

Chapter 4-Species Analyses

This chapter describes the possible interactions between stocked species and consultation species.

Chapter 5-11 Individual Watershed Chapters

Each watershed containing proposed stocking locations is written into individual chapters (5-11). Several of those watershed chapters are further subdivided into Sub-Watershed documents due to file size and for ease in their distribution to the public. Within those chapters, the watershed is then divided into sub watersheds using the 8 digit Hydrologic Unit Code names. In each chapter, Biological Assessment of the Arizona Game and Fish Department's Statewide and Urban Fisheries Stocking Program

January 2011

the important hydrologic and geomorphic attributes of the watershed, distribution of listed and proposed species within the watershed, key data and isolating mechanisms that assist in making an effect determination are described. The stocking sites were then placed into complexes defined by the hydrologic connection between stocking sites and into the main tributary connection. In those cases where complexes were identified, the assessment of potential impacts and effects is analyzed as a complex, due to the close proximity or hydrologic relationship of the proposed stocking sites. Each stocking site within the sub-watershed description may include, when that information is available: the geographic location, local hydrologic and geomorphic data, key local isolating mechanisms, proximity to listed, candidate and proposed species and/or critical habitat. Thus, while the data to make an effect determination may be similar for each stocking location within the watershed and sub watershed, each assessment and determination is on a site-specific basis..

Literature Cited

Listing of Preparers and Personal Communications

Appendix A. Table of Proposed Stocking Actions

Appendix B. Department Protocols and Stocking Policies

This page intentionally left blank.

Executive Summary

The Arizona Game and Fish Department (AGFD) Sport fish Management Program goals include maintaining, managing, and enhancing the quality, abundance, availability, and diversity of sport fishing opportunities for the public while contributing to the recovery of Arizona's native fish. This document addresses this objective through an assessment of potential effects of sport fish stocking on federally listed, candidate, proposed species and/or critical habitats. During development of this document stocking regimes were modified to reduce potential conflicts with federally listed, candidate, proposed species and critical habitat. AGFD strives to manage recreational fishing opportunities that would avoid negatively impacting listed species, and proposes stocking locations and sport fish species that would not limit future conservation and recovery actions for native non-listed aquatic and riparian species.

The process undertaken within this document uses the best scientific and commercial information available, including recovery plans, conservation plans and other pertinent agreements. This document would be amended within the ten year time period whenever a species is added to or removed from the Endangered Species Act (ESA) list, proposed to be listed, or whenever the status of the species changed. Also, this document would be amended when critical habitat is designated or removed from designation, or AGFD proposes changes to the stocking action. Any of these changes would require WSFR to reinitiate intra-service consultation. Reinitiation would also be required if incidental take is reached or exceeded.

Proposed Action: The U.S. Fish and Wildlife Service Wildlife (FWS), Wildlife and Sport Fish Restoration (WSFR) Program proposes to continue to provide funding for the Sport Fish Stocking Program under the Dingell-Johnson Sport Fish Restoration Act of August 9, 1950, as amended (16 U.S. Code 777–777n) (SFRA). The SFRA directs the FWS to provide federal aid to states for the “material value in connection with sport or recreation in the marine and/or fresh waters of the United States.” With the provision of federal funding, the AGFD Sport Fish Stocking Program is subject to compliance with the ESA, as well as other applicable environmental laws and regulations. The FWS is the lead federal agency responsible for ESA compliance; the AGFD is the applicant and federal representative. The AGFD Sport Fish Stocking Program proposes to use the grant funds to maintain and enhance recreational fishing opportunities at 167 locations within 8 of the 14 watersheds in Arizona.

Type of statement: The purpose of this Section 7 Biological Assessment (BA) is to provide the data necessary to evaluate the effects of the proposed action on a location-specific basis while also considering the potential interdependent, interrelated actions and cumulative effects on federally listed, proposed species and/or critical habitats. Through this evaluation, WSFR will determine the need for informal or formal consultation and/or conference to comply with the Endangered Species Act.

This page intentionally left blank.

Table of Contents

List of Tables	x
List of Figures	xiii
Chapter 1 Introduction	1-1
Proposed Action.....	1-1
Proposed Stocking Locations & Stocked Species	1-1
Sources of Stocked Sport Fish	1-4
Sport Fish Stocking Conservation & Mitigation Program.....	1-13
Action Area.....	1-26
Individual Species Site-Specific Scale.....	1-26
Area-Wide Scale	1-27
Species Considered In The Consultation	1-28
Background.....	1-28
Species categories for Section 7 consultation on the proposed action.....	1-29
Arizona Sport Fish Stocking Program Overview	1-38
Sport Fish Program	1-38
State Rules, Regulations and Authorities	1-45
Incidental Catch and Possession of Listed Species of Fish	1-45
Transmission of Diseases.....	1-45
Transport and Introduction of Live Sport Fish by the Public	1-45
Use and Transport of Live Bait Fish and Other Organisms.....	1-45
Chapter 2 Environmental Baseline and Resource Conditions	2-1
Background.....	2-1
Sportfish Management and Stocking.....	2-5
Stocked Sportfish Species Biology.....	2-6
Apache Trout (<i>Oncorhynchus gilae apache</i>).....	2-6
Arctic Grayling (<i>Thymallus arcticus</i>)	2-7
Black Crappie (<i>Pomoxis nigromaculatus</i>)	2-8
Bluegill (<i>Lepomis macrochirus</i>)	2-9
Brook Trout (<i>Salvelinus fontinalis</i>)	2-10
Brown Trout (<i>Salmo trutta</i>)	2-11
Channel Catfish (<i>Ictalurus punctatus</i>).....	2-12
Cutthroat Trout (<i>Oncorhynchus clarkii</i>)	2-14
Gila Trout (<i>Oncorhynchus gilae</i>).....	2-15
Grass Carp (<i>Ctenopharyngodon idella</i>).....	2-17
Largemouth Bass (<i>Micropterus salmoides</i>)	2-18
Rainbow Trout (<i>Oncorhynchus mykiss</i>).....	2-19
Redear Sunfish (<i>Lepomis microlophus</i>)	2-23
Smallmouth Bass (<i>Micropterus dolomieu</i>).....	2-24
Threadfin Shad (<i>Dorosoma petenense</i>).....	2-25
Walleye (<i>Sander vitreus</i>).....	2-26
Yellow Perch (<i>Perca flavescens</i>)	2-27
Chapter 3 Analysis Methods and Criteria	3-1

Introduction to Methods.....	3-1
Structure for Assessment	3-1
Watershed Analysis of hydrologic Connectivity	3-1
Species and Critical Habitat Evaluated.....	3-1
Species Interaction Approach	3-3
Chapter 4 Species Analyses.....	4-1
Species Interactions and Effects Analysis	4-1
Interactions between stocked fish and native fish species	4-1
Interactions between stocked fish and birds and mammals	4-59
Interactions between stocked fish and amphibians and reptiles	4-70
Area-Wide Analyses of illegal stocking and bait transfer	4-85
Interdependent, Interrelated Actions and Cumulative Effects.....	4-102
Interdependent Actions	4-102
Interrelated Actions.....	4-102
Cumulative Effects.....	4-106
Chapter 5 Colorado River Watershed	5-1
Chapter 6 Little Colorado River Watershed.....	6-1
Chapter 7 Gila River and Wilcox Playa Watershed.....	7-1
Chapter 8 Salt River Watershed	8-1
Chapter 9 Verde River Watershed.....	9-1
Chapter 10 Santa Cruz River Watershed.....	10-1
Chapter 11 Bill Williams River Watershed.....	11-1
Literature cited.....	1
Personal Communications and Contributors.....	1
Personal Communications	1
Contributors	5
Appendices.....	1
Appendix A. Proposed Actions	2
Appendix B. Department Protocols and Stocking Policies	73
Warm and Cool Water Fish Statewide Stocking Protocol.....	73
Urban Fishing Program Start-up and Augmentation Stocking Guidelines.....	75

List of Tables

Table 1. Species proposed for stocking in Arizona waters under the Sport Fish Stocking Program.....	1-2
Table 2. Fish length (in inches) ranges for fry, fingerling, sub-catchable or catchable categories. A size range is only indicated for those sizes proposed for stocking.	1-4
Table 3. Water source information and risk of contamination of Non-Target Organisms for AGFD hatcheries.	1-10

Table 4. Procedural steps that additionally serve as detection points for non-target organisms for AGFD hatchery operations. 1-11

Table 5. Draft Biological and Conference Opinion Focal Species 1-14

Table 6. Mandatory ESA Conservation Actions..... 1-16

Table 7. Mandatory NEPA Mitigation Actions. 1-22

Table 8. ESA Conservation Commitments that will be implemented contingent upon funding availability; actions are targeted at Additional Conservation Species (ACS) but may also benefit Focal and NEPA sensitive aquatic species. 1-23

Table 9. List of aquatic species found in Arizona considered in biological and conference opinion with initial determination of “may affect” for exposure to stocked sport fish or their progeny and illegal transport of nonnative organisms, parasites or diseases. 1-29

Table 10. List of non-aquatic species found in Arizona considered in biological and conference opinion with initial determination of “may affect” due to anglers accessing stocking sites. 1-30

Table 11. List of aquatic species found in Arizona considered in biological and conference opinion with initial determination of “may affect” for potential effects of the illegal transport by anglers and other persons of stocked species or their progeny that may also transfer parasites or diseases. 1-31

Table 12. Aquatic species in Arizona unlikely to be affected by direct or indirect effects of the proposed action (including illegal transport of stocked fish or their progeny, parasites or diseases) but will be considered globally and rationale for that determination. 1-32

Table 13. All other listed, proposed, or candidate species in Arizona determined not to be affected by direct or indirect effects of the proposed action and rationale for that determination. 1-34

Table 14. Stocking sites with potential New Mexico meadow jumping mouse exposure for impacts related to sport fish stocking..... 3-11

Table 15. Stocking sites with potential yellow-billed cuckoo exposure for habitat or disturbance effects..... 3-18

Table 16. Stocking sites with potential yellow billed cuckoo exposure for impacts related to sport fish stocking..... 3-22

Table 17. Operations and procedures followed by AGFD hatcheries to collect, sort, transport, and stock native and nonnative fish. 3-35

Table 18. Criteria used and data considered to characterize the likelihood that Chiricahua or northern leopard frogs occupy a site or area. 3-39

Table 19. Criteria used to characterize the likelihood of exposure of dispersing Chiricahua or northern leopard frogs to stocked fish. 3-41

Table 20. Criteria used to characterize the likelihood of exposure of Chiricahua or northern leopard frogs to dispersing stocked fish. Flow and known reasons that alter the “suitability of dispersal corridor” determined as in Table 19. 3-42

Table 21. Criteria for determining whether northern Mexican gartersnakes occupy a site/stocking complex and the likelihood of exposure to stocked sport fish. 3-48

Table 22. Criteria for determining whether narrow-headed gartersnakes occupy a site/stocking complex and the likelihood of exposure to stocked sport fish. 3-53

Table 23. Pathogens that are found in wild fish in Arizona waters. Also noted is their occurrence in Arizona hatcheries. 4-5

Table 24. Fish species proposed for stocking into Arizona waters. A * indicates a native fish species. The nonnative fish species proposed for stocking under this program are all currently found in Arizona. 4-6

Table 25. Stocking situations (1-6) that apply to the proposed Apache trout stocking sites. 4-26

Table 26. Sportfish stocking sites with potential effects to Mexican spotted owls. 4-63

Table 27. Records of original nonnative fish stockings in Arizona by species and known stocking source. 4-88

Table 28. Records of the first documentation of stocking by species in Arizona, origin unknown or suspected (not verified), and the first year of known stockings with known stocking source, if applicable. The first introduction of fish from unknown sources were subsequently stocked by the state or federal agency. 4-90

Table 29. Records of first capture of a fish species stocked illegally (intentionally or unintentionally) through suspected sources: bait releases (B), aquaria releases (Aq), and unknown (potentially angler introductions or by the Fisheries Commission). 4-92

Table 30. Number and percent of proposed stocking locations by species proposed for stocking considered new (no previous stocking records per location) and the number and percent of locations currently or historically stocked within the respective watersheds..... 4-101

Appendix A. Table 31. Stocking sites, species, numbers, season and size of fish proposed for stocking for the period covered by this consultation. 2

Appendix B. Table 32. Stocking rates for selected species into state waters of Arizona..... 73

Appendix B. Table 33. Urban Fishing Program fish stocking rates for Put-and-Take stockings.
.....**Error! Bookmark not defined.**

Appendix B. Table 34. Urban Fish Stocking Program stocking rates for new or reclaimed ponds.
.....**Error! Bookmark not defined.**

List of Figures

Figure 1. Proposed statewide stocking location within all three AGFD stocking programs..... 1-3

Figure 2. Critical control point decision tree. 1-9

Figure 3. Overview of the objectives employed by the Statewide Sport Fish Stocking Subprogram..... 1-43

Figure 4. Chronology of native fish occurrences and nonnative fish introductions in Arizona. . 2-3

Figure 5. The number of fish first introduced in Arizona using data from the U.S. Commission of Fish and Fisheries, newspaper records, and the Arizona Statewide Hatchery Database. The number includes both authorized and unauthorized introductions. 4-88

Figure 6. Nonnative fish introduced in Arizona by an unknown source and the year they were first documented in the state. 4-94

Figure 7. Comparison between the percent of proposed stocking locations considered new (red; no previous stocking records per location) and the percent of locations currently stocked or historically stocked within the respective watersheds. The data are grouped by fish species and all watersheds combined..... 4-100

Figure 8. Estimated population increase in Arizona 2003 – 2050..... 4-108