Environmental Assessment  Non-native Fish Control

3.2.1.3 NON-LISTED NATIVE FISHES .................................................................59
3.2.1.4 TROUT ..................................................................................................59
3.2.1.5 OTHER NON-NATIVE FISHES ............................................................61
3.2.1.6 EFFECTS OF HIGH FLOW EXPERIMENTS ON FISHES .................61
3.2.2 FISH AND FISH HABITAT UNDER NO ACTION .................................63
3.2.3 FISH AND FISH HABITAT UNDER THE PROPOSED ACTION ..........69
3.3 CULTURAL RESOURCES ............................................................................73
3.3.1 SACRED SITES UNDER NO ACTION .....................................................74
3.3.2 SACRED SITES UNDER THE PROPOSED ACTION ............................74
3.3.3 HISTORIC PROPERTIES UNDER NO ACTION ....................................74
3.3.4 HISTORIC PROPERTIES UNDER THE PROPOSED ACTION ...........75
3.4 SOCIOECONOMIC RESOURCES ...............................................................75
3.4.1 RECREATION UNDER NO ACTION .......................................................75
3.4.2 RECREATION UNDER PROPOSED ACTION ............................................82
3.4.2.1 FISHING UNDER PROPOSED ACTION .................................................82
3.4.2.2 RECREATIONAL BOATING UNDER PROPOSED ACTION .............83
3.4.2.3 NET ECONOMIC USE VALUE OF RECREATION UNDER NO ACTION 84
3.4.2.4 NONUSE ECONOMIC VALUE UNDER NO ACTION ............................86
3.5 INDIAN TRUST ASSETS ............................................................................86
3.5.1 INDIAN TRUST ASSETS UNDER NO ACTION .......................................86
3.5.2 INDIAN TRUST ASSETS UNDER THE PROPOSED ACTION ...............87
3.6 WILDERNESS ...........................................................................................87
3.7 WILDERNESS ...........................................................................................87
3.8 ENVIRONMENTAL JUSTICE IMPLICATIONS UNDER NO ACTION ..........88
3.9 ENVIRONMENTAL JUSTICE IMPLICATIONS UNDER THE PROPOSED ACTION 88
4.0 CONSULTATION AND COORDINATION ................................................89
4.1 CONSULTATION .........................................................................................89
4.2 PUBLIC SCOPING ACTIVITIES ...............................................................89
4.3 AGENCY COOPERATION ..........................................................................89
5.0 REFERENCES CITED ...............................................................................91
6.0 APPENDICES ...........................................................................................103
APPENDIX A: NON-NATIVE FISH MANAGEMENT BELOW THE GLEN CANYON DAM REPORT FROM A STRUCTURED DECISION MAKING PROJECT 103
APPENDIX B: SCIENCE PLAN ......................................................................104
APPENDIX C: BIOLOGICAL ASSESSMENT ...............................................105
APPENDIX D: SUPPLEMENT TO BIOLOGICAL ASSESSMENT ................106
APPENDIX E: BIOLOGICAL OPINION ........................................................107
APPENDIX F: LETTER TO STATE HISTORIC PRESERVATION OFFICE WITH CONCURRENCE STAMP 108

iv
Figures

1. Geographic scope of the proposed action, showing places referenced in the text ................. 2
2. Distribution of juvenile humpback chub (*Gila cypha*). .......................................................... 6
3. Annual population estimates of adult humpback chub (age 4+) .......................................... 40
4. Estimated adult humpback chub abundance (age 4+) from ASMR ................................ ...... 58
5. Average annual electrofishing catch rates of rainbow trout in the Lees Ferry 1991–2010. .... 60
6. Expected predation of young humpback chub by trout in the absence of non-native fish removal. .............................................................................................................................. 65
7. Expected losses of adult humpback chub (age 4+) due to predation by trout in the absence of non-native fish removal. .................................................................................................................. 66
8. Fishing user days by month in the Lees Ferry reach ................................................................ 76
9. Whitewater boating in the Grand Canyon, annual use by month ....................................... 78
10. Numbers of anglers served by one fishing guide business. ................................................ 86

Tables

1. List of resources and issues evaluated. .................................................................................. 30
2. Non-native fish species presently found in the Action Area. .............................................. 58
3. Mohave and Coconino Counties, Arizona – Baseline Socioeconomic Data. ...................... 79
4. Navajo Roadside Vending and Employment ....................................................................... 80
5. Estimates of Nonuse Value .................................................................................................... 81
6. List of persons, agencies, and organizations consulted for purposes of this Environmental Assessment.................................................................................................................. 90