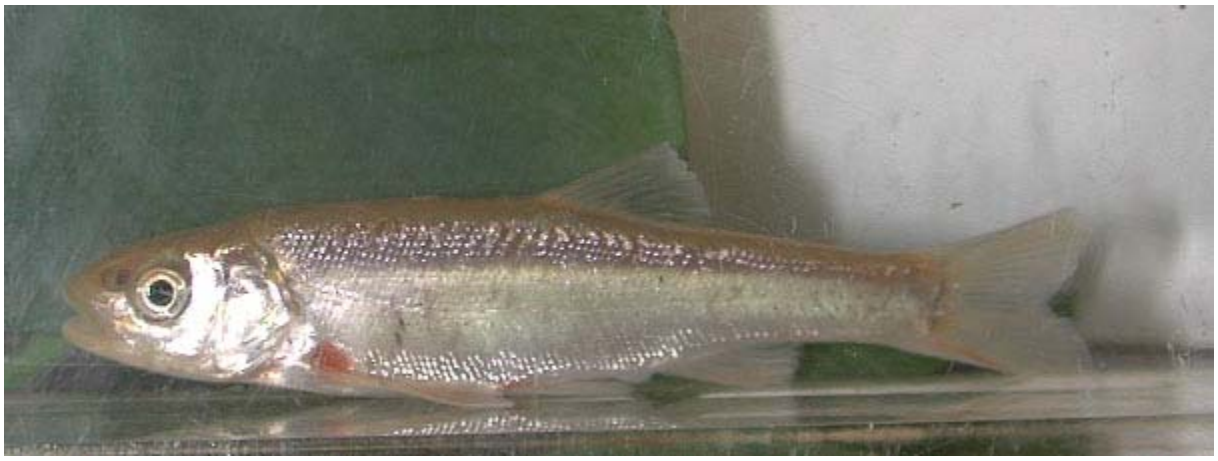
State of Utah
DEPARTMENT OF NATURAL RESOURCES
Division of Wildlife Resources – Native Aquatic Species

CONSERVATION AGREEMENT AND STRATEGY
FOR
SOUTHERN LEATHERSIDE
(*LEPIDOMEDA ALICIAE*)
IN THE STATE OF UTAH



Publication Number 10-19
Utah Division of Wildlife Resources
1594 West North Temple
Salt Lake City, Utah
James F. Karpowitz, Director

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Division of Wildlife Resources – Native Aquatic Species

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FOR
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(*LEPIDOMEDA ALICIAE*)
IN THE STATE OF UTAH

Prepared by:

Utah Division of Wildlife

May 2010

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DEFINITIONS AND ABBREVIATIONS

For the purpose of this Agreement and Strategy, the following terms are defined as follows:

BLM – The Bureau of Land Management.

BOR – The Bureau of Reclamation.

CUWCD – The Central Utah Water Conservancy District.

ESA – Endangered Species Act of 1973.

Geographic Management Unit (GMU) – A distinct area, defined by historical southern leatherside range and hydrologic and geographic boundaries.

Historical Range – The area that southern leatherside is perceived to have inhabited at the time of modern exploration and settlement of the West (Approximately 1850).

Hydrologic Unit Code (HUC) – Based on United States Geological Survey National Hydrography Dataset. Identifies hydrologic units for entire United States.

Leatherside chub – Refers to *Gila copei* prior to the change in taxonomy for the species. Also may be used when quoting other documents, or for introduced locations where the species is not known.

Mitigation Commission – The Utah Reclamation Mitigation and Conservation Commission.

Service – The United States Fish and Wildlife Service.

SLCT – The Southern Leatherside Conservation Team.

Southern leatherside – Common name for *Lepidomeda aliciae* that the SLCT elected to use because taxonomically the species is no longer considered a chub or as belonging to the genus *Gila*.

Threat – Any action or activity, past or present, that currently or in the future may prevent the continued existence of southern leatherside. Conditions such as pollution and the presence of nonnative species may also constitute threats.

UDWR – The Utah Division of Wildlife Resources.

USFS – The United States Forest Service.

CONSERVATION AGREEMENT

FOR

SOUTHERN LEATHERSIDE

(*LEPIDOMEDA ALICIAE*)

BACKGROUND

This Conservation Agreement (Agreement) has been developed to expedite implementation of conservation measures for southern leatherside (*Lepidomeda aliciae*) in Utah, as a collaborative and cooperative effort among resource agencies. The southern leatherside is identified as a "Tier II wildlife species of concern" in Utah's Wildlife Action Plan (Sutter et al. 2005). Threats exist that may warrant listing of southern leatherside as sensitive by state and federal agencies, and as threatened or endangered under the Endangered Species Act of 1973 (ESA). These threats should be significantly reduced or eliminated through implementation of this Agreement and the accompanying Conservation Strategy (Strategy).

Goal

Ensure the long-term persistence of southern leatherside within its historical range and support development of statewide conservation efforts.

Objectives

The following objectives will be required to attain the goal of this strategy:

Objective 1 – Determine the existing range of the species.
Objective 2 – Maintain and monitor the currently known and newly discovered or established southern leatherside populations and their habitat.
Objective 3 – Identify, prioritize, and implement actions to reduce threats to southern leatherside populations and habitat and evaluate the effectiveness of these actions.
Objective 4 – Restore populations in selected localities within the historical range.
Objective 5 – Augment selected populations if necessary.
Objective 6 – Maintain genetic diversity and integrity. Ensure persistence of genetically distinct populations.
Objective 7 – Identify questions and implement research that meets management needs for southern leatherside and use the findings to guide conservation efforts.
Objective 8 – Implement and incorporate provisions of the conservation strategy into signatory planning documents and budgets to ensure the conservation goal and objectives are achieved.

These objectives will be reached through implementation of the Strategy. The status of southern leatherside will be evaluated annually to assess program progress and ensure program effectiveness.

I. OTHER SPECIES INVOLVED

The primary focus of this Agreement is the conservation and enhancement of southern leatherside and the ecosystems upon which they depend; however, other species occurring within or adjacent to southern leatherside habitat may also benefit. Some of these species include Bonneville cutthroat trout (*Oncorhynchus clarkii utah*), mountain whitefish (*Prosopium williamsoni*), Columbia spotted frog (*Rana luteiventris*), mottled sculpin (*Cottus bairdii*), Utah chub (*Gila atraria*), Utah sucker (*Catostomus ardens*), mountain sucker (*Catostomus platyrhynchus*), speckled dace (*Rhinichthys osculus*), and redside shiner (*Richardsonius balteatus*). By emphasizing the conservation of habitats and ecosystems where southern leatherside occur, the accomplishment of actions identified in the Strategy should significantly reduce or eliminate threats for several of these species, and the need for federal listing pursuant to the ESA.

II. INVOLVED PARTIES

The following agencies are committed to work cooperatively to conserve the southern leatherside throughout its range, and have determined that a consistent approach, as described in this Agreement, is most efficient for conserving the species. The signatories to this document are:

Utah Department of Natural Resources
Utah Division of Wildlife Resources
1594 West North Temple
Salt Lake City, Utah 84114

United States Fish and Wildlife Service
Utah Field Office
2369 West Orton Circle, Suite 50
West Valley City, Utah 84119

Bureau of Land Management
Utah State Office
P.O. Box 45155
Salt Lake City, Utah 84145

United States Bureau of Reclamation
Provo Area Office
302 East 1860 South
Provo, Utah 84606

United States Department of Agriculture
Forest Service,
Intermountain Region
Uinta-Wasatch-Cache, Dixie, and Fishlake National Forests
324 25th Street
Ogden, Utah 84401

Utah Reclamation Mitigation and Conservation Commission
230 South 500 East, Suite 230
Salt Lake City, UT 84102-2045

Central Utah Water Conservancy District
355 West 1300 South
Orem, Utah 84058

Trout Unlimited
Utah Water Project
180 South Main Street
Providence, Utah 84332

Separate Memorandum(a) of Understanding and Cooperative Agreements will be developed with additional parties as necessary to ensure implementation of specific conservation measures.

III. AUTHORITY

The signatory parties hereto enter into this Agreement and the attached Conservation Strategy under federal law, as applicable, including, but not limited to Title 43, Section 24.6 of the Code of Federal Regulations, which states that "By reason of the Congressional policy (e.g., Fish and Wildlife Coordination Act of 1956) of State-Federal cooperation and coordination in the area of fish and wildlife conservation, State and Federal agencies have implemented cooperative agreements for a variety of fish and wildlife programs on Federal Lands", and state law, as applicable, under Title 23 Chapter 22.1 of the Utah Code stating that the "Division of Wildlife Resources may enter into cooperative agreements and programs with other state agencies, federal agencies, states, educational institutions, municipalities, counties, corporations, organized clubs, landowners, associations, and individuals for purposes of wildlife conservation."

All parties to this Agreement recognize that they each have specific statutory responsibilities with respect to the management and conservation of wildlife, and its habitat. Nothing in this Agreement or the Strategy is intended to abrogate any of the parties' respective responsibilities.

This Agreement is subject to and is intended to be consistent with all applicable federal and state laws and interstate compacts.

IV. STATUS OF SOUTHERN LEATHERSIDE

Leatherside chub are small cyprinid fish that occur in desert streams throughout the Bonneville Basin and in select parts of the upper Snake River drainage of western North America. Recent evidence indicates that leatherside chub (traditionally referred to as *Gila copei* or *Snyderichthys copei*) is composed of two distinct taxa, the northern leatherside (*Lepidomeda copei*) and the southern leatherside (*Lepidomeda aliciae*; Johnson et al. 2004). The southern leatherside is native to the Utah Lake and Sevier River drainages in Utah.

Federal and state management agencies in Utah recognize the southern leatherside as a "Tier II wildlife species of concern" that warrants special management and conservation planning considerations (Sutter et al. 2005). Monitoring efforts and surveys have identified that the range of southern leatherside has retracted relative to historical levels (Wilson and Belk 2001), primarily caused by habitat fragmentation. Much of the current fragmentation that populations experience is anthropogenic, caused by factors including irrigation projects, water diversion, habitat degradation, and the introduction of non-native fish predators. Close examination of museum records identify a number of sites where populations once existed, but now appear to be extirpated (Wilson 1996, Wilson and Belk 1996, Wilson and Belk 2001, Johnson et al. 2004). Little is known about the status and life history of southern leatherside.

V. CONSERVATION ELEMENTS

The success of any conservation or recovery program depends on eliminating or reducing the impact of conditions or activities that threaten the species existence. For consistency, the general format is based on the five criteria considered for federal listing of a species in Section 4(a)(1) of the ESA. See Strategy for specific criteria (page 21-23):

1. The present or threatened destruction, modification, or curtailment of its habitat or range
2. Disease, predation, competition, and hybridization
3. Overutilization for commercial, recreational, scientific, or educational purposes
4. The inadequacy of existing regulatory mechanisms
5. Other natural (e.g. drought) or human induced (e.g. socio-political) factors affecting its continued existence

To meet the goal and objectives of this Agreement and to address ESA listing criteria, the following conservation elements must be implemented where possible:

A. Surveys – Inventory and describe current range of the species.
B. Habitat Enhancement - Enhance and/or restore habitat conditions in designated areas throughout the historical range of southern leatherside.
C. Habitat Protection - Protect and enhance habitat (via land use changes) through land acquisition, conservation easements, or regulatory mechanisms.
D. Restore Hydrologic Conditions - Maintain, restore, and/or augment natural hydrologic characteristics and water quality.
E. Nonnative Control - Selectively control nonnative species that negatively impact southern leatherside via predation and/or competition.

F. **Range Expansion -** Conduct life history and genetic studies to determine habitat requirements and appropriate stocks of southern leatherside for translocation into historical areas. Reintroduce southern leatherside into suitable historical habitats.
G. **Monitoring** - Monitoring goals seek to detect changes in population distribution and abundance over time.
H. **Regulation -** Maintain and enforce Utah Wildlife Code regulations that prohibit the collection, possession, and importation of southern leatherside and other state regulations to ensure protection of southern leatherside.
I. **Disease Management** - Determine the extent of infection in populations, monitor effects of pathogenic infection, and prevent further infection by implementing biosecurity protocols.
J. **Information and Education** - Increase public awareness and support for the conservation of southern leatherside.

VI. CONSERVATION SCHEDULE AND ASSESSMENT

Four general administrative actions, as outlined below, will be implemented.

Coordinating Conservation Activities

The Southern Leatherside Conservation Team (SLCT) will consist of a designated representative from signatories to this Agreement. The SLCT will consult with technical experts, legal advisors, and other interested parties as necessary.

Since the areas of concern covered by this Agreement are located in Utah and the State of Utah has primary jurisdiction over southern leatherside within the state, the designated SLCT leader will be a Utah Division of Wildlife Resources (Division) representative.

Authority of the SLCT shall be limited to making recommendations for the conservation of the southern leatherside. These recommendations will be implemented by SLCT members or contracted parties and are subject to review by the signatory agencies for ecosystem conflict and/or opportunities for ecosystem-level or multi-species collaborative conservation. The SLCT team leader will provide copies of comments, recommendations, and actions to the signatories and to other interested parties upon request.

The SLCT will meet annually to review conservation schedules and budgets and help develop funding as necessary. The SLCT will meet at least annually to receive reports on progress and effectiveness of Strategy implementation.

SLCT meetings will be open to interested parties. Summaries of the meetings and progress reports will be distributed to the SLCT and can be distributed to technical advisors and to other interested parties upon request.

The SLCT shall operate by consensus of the signatories when determining management recommendations concerning southern leatherside protection and conservation. If consensus is not achieved, agency signatories will resolve the conflict and determine how to proceed.

Individual agency commitments are presented on signatory pages (Section XI).

Implementing Conservation Schedule

As leader of the SLCT, the Division will coordinate conservation activities and monitor conservation actions conducted by participants in accordance with this Agreement and Strategy. Conservation actions will be scheduled and cooperatively reviewed on an annual basis by the signatories.

Funding Conservation Actions

Funding for this Agreement and Strategy will be provided by a variety of sources. Federal, state, and local sources will need to provide or secure funding to initiate procedures and tasks of the Agreement and Strategy.

It is understood that all funds required for and expended in accordance with this Agreement are subject to administrative approval by the appropriate local, state, or federal agencies. This instrument is neither a fiscal nor a funding obligation document.

Conservation Progress Assessment

An annual report of monitoring results and an assessment of conservation activities, accomplishments, and subsequent yearly schedules will be made by the SLCT. This assessment will be based on updates and evaluations by SLCT members. As part of the annual assessment, the objectives will be evaluated to determine if the data supports the development of more quantifiable objectives. Any revisions to the objectives will be made available in an addendum to this Agreement. The reports and assessments will be provided to each of the signatory agencies by the SLCT leader.

If threats to the survival of the southern leatherside become known that are not or cannot be resolved through this or any conservation agreement, the SLCT will immediately notify the Division Director who will notify all signatories.

VII. DURATION OF AGREEMENT

The initial term of this Agreement shall be ten years. Prior to the end of each five-year period, a thorough assessment of the effectiveness of actions implemented for the species will be conducted by the SLCT. The assessment will determine the effectiveness of this agreement and whether revisions to the goal and objectives are warranted. If all signatories agree that sufficient progress has been made towards the conservation and recovery of the southern leatherside, this Agreement shall be extended for an additional five years. Any party may withdraw from this Agreement on ninety days written notice to the other parties.

VIII. NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE

The Agreement and Strategy are being developed for planning purposes. Before any projects with a federal nexus that may impact the natural or human environment are scheduled for implementation, they will be reviewed for the potential to require National Environmental Policy

Act (NEPA) compliance (e.g. completion of an Environmental Assessment). Federal signatories to the Agreement will be consulted on any projects with the potential to require NEPA review and compliance.

IX. FEDERAL AND STATE AGENCY COMPLIANCE

During the performance of this agreement, the participants agree to abide by the terms of Executive Order 11246 on non-discrimination and will not discriminate against any person because of race, color, religion, sex, or national origin.

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

All activities and programs conducted under this Agreement shall be subject to and conform with all applicable state laws; including those laws contained in Title 23 of the Utah Code, Title 4, Chapter 37 of the Utah Code and all administrative rules and regulation promulgated thereunder.

X. LITERATURE CITED

Johnson, J. B., T. E. Dowling, and M. C. Belk. 2004. Neglected taxonomy of rare desert fishes: congruent evidence for two species of leatherside chub. Systematic Biology 53(6):841-845.

Sutter, J. V., M. E. Andersen, K. D. Bunnell, M. F. Canning, A. G. Clark, D. E. Dolsen, and F. P. Howe. 2005. Utah Comprehensive Wildlife Conservation Strategy (CWCS). Utah Department of Natural Resources, Division of Wildlife Resources. Salt Lake City, Utah.

Wilson, K. W. 1996. Habitat characteristics of leatherside chub (*Gila copei*) at two spatial scales. Department of Zoology, Brigham Young University, Provo, Utah. 35 pp.

Wilson, K. W. and M. C. Belk. 1996. Current distribution and habitat use of leatherside chub (*Gila copei*) in the Sevier and Beaver River drainages in south central Utah. Final Report to Utah Division of Wildlife Resources, Salt Lake City, Utah. Contract Number No. 93-0870. Unpublished manuscript, 24 pp.

Wilson, K. W. and M. C. Belk. 2001. Habitat characteristics of leatherside chub (*Gila copei*) at two spatial scales. Western North American Naturalist 61:36-42.

XI. SIGNATORIES

The following pages include separate agreement pages for each signatory.

SOUTHERN LEATHERSIDE
CONSERVATION AGREEMENT
UTAH DIVISION OF WILDLIFE RESOURCES

The Utah Division of Wildlife Resources (Division) hereby states its intent and commitment to assist with, participate in, and lead the implementation of the Southern Leatherside Conservation Agreement and Strategy, as prepared by the Southern Leatherside Conservation Team. Specific commitments made are as follows:

1. To provide a representative to the Southern Leatherside Conservation Team, which is made up of representatives from various agencies listed in the Agreement, to implement conservation elements described in the Strategy.

2. To assume lead responsibility for the inventory and monitoring of southern leatherside populations in the State of Utah and to annually compile and report inventory and monitoring information to all participating agencies and parties.

3. To review and provide comments to the U.S. Army Corp of Engineers regarding the issuance of 404 permits for any land development proposals that would negatively impact key southern leatherside habitats, and to work cooperatively with private land owners, land developers, and local land use planners in Utah to avoid, minimize and/or mitigate negative impacts of land development on southern leatherside habitat.

4. Continue to enforce specific state statutes and Wildlife Codes of Utah that prohibit the collection, possession, and/or importation of threatened, endangered and special concern species (including southern leatherside) unless authorized by a Certificate of Registration (COR).

5. To continue to conduct and support research to collect information on biotic and abiotic limiting factors of southern leatherside populations, habitat and ecology and to work to reduce or eliminate limiting factors.

Performance of activities above is contingent on adequate funds being made available and allocated to the Division. This Agreement shall not prohibit the Division from engaging in management actions regarding southern leatherside conservation beyond those described in this Agreement and Strategy. Such management actions will be coordinated with the Southern Leatherside Conservation Team and other appropriate parties as deemed necessary.

This Agreement shall become effective on the date of signature by the Division, and shall remain in effect until the Division chooses to withdraw from the Agreement in whole or in part, or the Agreement is terminated by consent of the Southern Leatherside Conservation Team. Either the Division or the Southern Leatherside Conservation Team may terminate the Agreement by providing 90 days written notification to the other party.

By signing this document below, the Division acknowledges that it is also signing as a party and participant to the whole of the Southern Leatherside Conservation Agreement and Strategy attached hereto.

5/11/10

James F. Karpowitz, Director
Utah Division of Wildlife Resources
Utah Department of Natural Resources

Date

SOUTHERN LEATHERSIDE
CONSERVATION AGREEMENT
US FISH AND WILDLIFE SERVICE

The U.S. Fish and Wildlife Service (Service) hereby states its intent and commitment to assist with and participate in the implementation of the Southern Leatherside Conservation Agreement and Strategy, as prepared by the interagency Southern Leatherside Conservation Team. Specific commitments made hereby are as follows:

1. To consider applications for funding to the Conservation Team and/or involved parties through the Endangered Species Act Section 6 or other grant programs for implementation of the Conservation Agreement and Strategy.

2. To provide a representative to the interagency Southern Leatherside Conservation Team.

3. To review and provide comments for any projects federally authorized, funded, or carried out that may impact the southern leatherside; under authority of the Fish and Wildlife Coordination Act, projects requiring a Clean Water Act Section 404 permit issued by the U.S. Army Corps of Engineers; and water developments proposed by the Bureau of Reclamation or private water development entities, regulated under the Federal Energy Regulatory Commission.

4. Coordinate and assist other Federal agencies to protect southern leatherside from impacts of land and water altering activities on Federal lands that may support southern leatherside.

Performance of all activities described above is contingent on adequate funds being made available and allocated to the signatory agency. This Agreement shall not prohibit the Service from engaging in management actions regarding southern leatherside conservation beyond those described in this Agreement and in the Strategy. Such management actions will be coordinated with the Southern Leatherside Conservation Team and other appropriate parties as deemed necessary.

This Agreement shall become effective on the date of signature by the Service, and shall remain in effect until the Service chooses to withdraw from the Agreement in whole or in part, or the Agreement is terminated by consent of the Southern Leatherside Conservation Team. Either the Service or the Southern Leatherside Conservation Team may terminate the agreement by providing 90 days written notification to the other party.

By signing this document below, the Service acknowledges that it is also signing as a party and participant to the whole of the Southern Leatherside Conservation Agreement and Strategy attached hereto.

L. Crist

Larry Crist, Field Supervisor
Utah Field Office
U.S. Fish & Wildlife Service, Region 6

2/22/2010
Date

SOUTHERN LEATHERSIDE
CONSERVATION AGREEMENT
US BUREAU OF LAND MANAGEMENT

The U.S. Bureau of Land Management (BLM) herby states its intent and commitment to assist with and participate in the implementation of the Southern Leatherside Conservation Agreement and Strategy as prepared by the interagency Southern Leatherside Conservation Team. Specific commitments made hereby are as follows:

1. To provide a representative to the Southern Leatherside Conservation Team, which will be made up of representatives from various agencies, as described in the Conservation Agreement.

2. To conduct a review of BLM lands in Utah which may occur within the historic range of the southern leatherside, and determine if any such lands contain suitable habitat for southern leatherside.

3. If southern leatherside or suitable southern leatherside habitats are found on BLM lands, work in cooperation with the Utah Division of Wildlife Resources to complete survey and monitoring of southern leatherside populations and/or to evaluate habitat condition.

4. To maintain and improve habitat and populations of the southern leatherside through adaptive management and mitigation on BLM lands. Authority for the protection of the southern leatherside and its habitat is pursuant to provisions in the BLM Policy Manual and the Federal Land Policy and Management Act.

Performance of all activities described above is contingent on adequate funds being made available and allocated to the BLM. This Agreement shall not prohibit the BLM from engaging in management actions regarding southern leatherside conservation beyond those described in this Agreement and Strategy. Such management actions will be coordinated with the Southern Leatherside Conservation Team and other appropriate parties as deemed necessary.

This Agreement shall become effective on the date of signature by the BLM, and shall remain in effect until the BLM chooses to withdraw from the Agreement in whole or in part, or the Agreement is terminated by consent of the Southern Leatherside Conservation Team. Either the BLM or the Southern Leatherside Conservation Team may terminate the Agreement by providing 90 days written notification to the other party.

By signing this document below, the BLM acknowledges that it is also signing as a party and participant to the whole of the Southern Leatherside Conservation Agreement and Strategy attached hereto.

Selma Sierra, Utah State Director
U.S. Bureau of Land Management, USDI

5-24-10
Date

SOUTHERN LEATHERSIDE
CONSERVATION AGREEMENT
U.S. BUREAU OF RECLAMATION

U.S. Bureau of Reclamation (Reclamation) hereby states its intent and commitment to assist with and participate in the implementation of the Southern Leatherside Conservation Agreement and Strategy as prepared by the Southern Leatherside Conservation Team. Specific commitments made hereby are as follows:

1. To provide a representative to the Southern Leatherside Conservation Team, which will be made up of representatives from various state and federal agencies, tribes, and local entities.

2. To work in cooperation with the Southern Leatherside Conservation Team and the State of Utah to conduct surveys on Reclamation lands, to assist with monitoring of any breeding populations that may be found on Reclamation land, and to cooperate and assist in eradication/control of non-indigenous species.

3. To consider possible impacts of Reclamation management plans on southern leatherside and their habitat, and to take measures to avoid and/or mitigate such impacts whenever possible within the constraints of Reclamation policy and authority

Performance of all activities described above is contingent on adequate funds being made available and allocated to Reclamation. This agreement shall not prohibit Reclamation from engaging in management actions regarding southern leatherside conservation beyond those described in this Agreement and Strategy. Such management actions will be coordinated with the Southern Leatherside Conservation Team and other appropriate parties as deemed necessary.

This Agreement shall become effective on the date of signature by the participating party, and shall remain in effect until Reclamation chooses to withdraw from the Agreement in whole or in part, or the Agreement is terminated by consent of the Southern Leatherside Conservation Team. Either Reclamation or the Southern Leatherside Conservation Team may terminate the Agreement by providing 90 days written notification to the other party.

By signing this document below, Reclamation acknowledges that it is also signing as a party and participant to the whole of the Southern Leatherside Conservation Agreement and Strategy attached hereto.

Bruce C. Barrett, Area Manager
Provo Area Office
U.S. Bureau of Reclamation, USDI

Date 2/4/10

SOUTHERN LEATHERSIDE
CONSERVATION AGREEMENT
US FOREST SERVICE

The U.S.D.A. Forest Service, Intermountain Region (USFS) and the Uinta-Wasatch-Cache, Manti-La Sal, Dixie, and Fishlake National Forests, hereby state their intent and commitment to assist with and participate in the implementation of the Southern Leatherside Conservation Agreement and Strategy for the management and recovery of southern leatherside populations, as prepared by the interagency Southern Leatherside Conservation Team. Specific commitments made hereby are as follows:

1. To provide a representative from each Forest to the Southern Leatherside Conservation Team, which will be made up of representatives from various agencies, groups, and individuals, as described in the Strategy.

2. To work in cooperation with the Southern Leatherside Conservation Team and the Utah Division of Wildlife Resources to conduct surveys for southern leatherside in historic and suitable habitats on the National Forests, and to assist with regular status assessments of any known populations on these Forests.

3. To consider possible impacts (both positive and negative) of land management actions on the southern leatherside and its habitat within its historic range. To identify and take measures to avoid and/or mitigate such impacts, if thought to be detrimental, whenever possible within constraints of Forest Service policy, regulations, and plans.

Performance of all activities described above is contingent upon the annual receipt of adequate funding. This agreement shall not prohibit the USFS from engaging in management actions regarding southern leatherside conservation beyond those described in this Agreement and Strategy. Such management actions should be coordinated with the Southern Leatherside Conservation Team.

This Agreement shall become effective on the date of signature by the USFS, and shall remain in effect until the USFS chooses to withdraw from the Agreement in whole or in part, or the Agreement is terminated by consent of the Southern Leatherside Conservation Team. Either the USFS or the Southern Leatherside Conservation Team may terminate the Agreement by providing 90 days written notification to the other party.

The U.S. Forest Service, Intermountain Region, is granted authority to enter into this commitment through the National Forest Management Act of 1976 and the Sikes Act of 1960.

By signing this document below, the Forest Service acknowledges that it is also signing as a party and participant to the whole of the Southern Leatherside Conservation Agreement and Strategy attached hereto.

Harvey Forsgren, Regional Forester
USDA Forest Service, Intermountain Region

February 5, 2010
Date

SOUTHERN LEATHERSIDE
CONSERVATION AGREEMENT
UTAH RECLAMATION MITIGATION AND CONSERVATION COMMISSION

The Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission) hereby states its intent and commitment to assist with and participate in the implementation of the Southern Leatherside Conservation Agreement and Strategy as prepared by the Southern Leatherside Conservation Team. Specific commitments made are as follows:

1. To provide a representative to the Southern Leatherside Conservation Team, which is made up of representatives from various agencies as described in the Conservation Strategy.

2. To incorporate southern leatherside conservation actions to the appropriate Mitigation Commission programs, as described in the current Mitigation Commission's Final Mitigation and Conservation Plan. These may include, but are not limited to, the Statewide Program elements: Fish Hatchery Restoration and Construction, Sensitive Species Inventory and Database, Stream and Riparian Restoration Enhancement.

3. To protect southern leatherside populations and suitable habitat on Mitigation Commission owned lands through appropriate management plans.

4. To implement mitigation and conservation actions as identified in the Conservation Agreement and Strategy attached hereto, which may include evaluating population and habitat status, or determining threats and/or identifying conservation actions that could protect and where appropriate enhance southern leatherside habitat, in fulfillment of its commitment as part of the Utah Lake Drainage Basin Water Delivery System, a component of the Central Utah Project.

Performance of activities above is contingent on adequate funds being made available and allocated to the Mitigation Commission. This Agreement shall not prohibit the signatory agency from engaging in management actions regarding southern leatherside conservation beyond those described in this Agreement and in the Conservation Plan. Such management actions should be coordinated with the Southern Leatherside Conservation Team.

This agreement shall become effective on the date of signature by the Mitigation Commission, and shall remain in effect until the Mitigation Commission withdraws from the Agreement in whole or in part, or the Agreement is terminated by consent of the Southern Leatherside Conservation Team. Either the Mitigation Commission or any signatory may terminate their participation in the Agreement by providing 90 days written notification to the other parties.

By signing this document below, the Mitigation Commission acknowledges that it is also signing as a party and participant to the whole of the Southern Leatherside Conservation Agreement and Strategy attached hereto.

Michael C. Weland, Executive Director
Utah Reclamation Mitigation and Conservation Commission

2/23/10
Date

SOUTHERN LEATHERSIDE
CONSERVATION AGREEMENT
UTAH CENTRAL WATER CONSERVANCY DISTRICT

The Central Utah Water Conservancy District (District) hereby states its intent and commitment to assist with and participate in the implementation of the Southern Leatherside Conservation Agreement and Strategy, as prepared by the interagency Southern Leatherside Conservation Team. Specific commitments made hereby are as follows:

1. To provide a representative to the interagency Southern Leatherside Conservation Team.

2. To work in cooperation with the state of Utah and other parties to this Agreement to implement actions identified in the Strategy.

3. To consider possible impacts of District activities and plans on southern leatherisde and their habitat, and avoid and/or mitigate such impacts whenever possible within the constraints of District policy and authority.

Performance of all activities described above is contingent on adequate funds being made available and allocated to the District. This Agreement shall not prohibit the District from engaging in management actions regarding southern leatherside conservation beyond those described in this Agreement and in the Strategy. Significant management actions will be coordinated with the Southern Leatherside Conservation Team and other appropriate parties as deemed necessary.

This Agreement shall become effective on the date of signature by the District, and shall remain in effect until the District chooses to withdraw from the Agreement in whole or in part, or the Agreement is terminated by consent of the Southern Leatherside Conservation Team. Either the District or the Southern Leatherside Conservation Team may terminate the agreement by providing 90 days written notification to the other party.

By signing this document below, the District acknowledges that it is also signing as a party and participant to the whole of the Agreement attached hereto.

Gene Shawcroft
Central Utah Water Conservancy District

13 May 2010
Date

SOUTHERN LEATHERSIDE
CONSERVATION AGREEMENT
TROUT UNLIMITED

Trout Unlimited (TU) hereby states its intent and commitment to assist with and participate in the implementation of the Southern Leatherside Conservation Agreement and Strategy for the management and recovery of southern leatherside populations, as prepared by the interagency Southern Leatherside Conservation Team. Specific commitments made hereby are as follows:

1. To provide a representative to the Southern Leatherside Conservation Team, which will be made up of representatives from various agencies, groups, and individuals, as described in the Strategy.

2. To work in cooperation with the Southern Leatherside Conservation Team and the Utah Division of Wildlife Resources, to conduct surveys for southern leatherside in historic and suitable habitats when TU project work occurs in these areas..

3. To provide pertinent research and restoration updates to the Southern Leatherside Conservation Team while coordinating these efforts with all involved parties.

Performance of all activities described above is contingent upon the annual receipt of adequate funding. This agreement shall not prohibit TU from engaging in management actions regarding northern leatherside conservation beyond those described in this Agreement and Strategy. Such management actions should be coordinated with the Southern Leatherside Conservation Team.

This Agreement shall become effective on the date of signature by TU, and shall remain in effect until TU chooses to withdraw from the Agreement in whole or in part, or the Agreement is terminated by consent of the Southern Leatherside Conservation Team. Either TU or the Southern Leatherside Conservation Team may terminate the Agreement by providing 90 days written notification to the other party.

By signing this document below, Trout Unlimited acknowledges that it is also signing as a party and participant to the whole of the Southern Leatherside Conservation Agreement and Strategy attached hereto.

Kirk Dahle — 2/2/2010
Utah project coordinator, Trout Unlimited — Date

CONSERVATION STRATEGY

FOR

SOUTHERN LEATHERSIDE

(LEPIDOMEDA ALICIAE)

INTRODUCTION

The southern leatherside (*Lepidomeda aliciae*: Cyprinidae, formerly referred to as *Gila copei* and *Snyderichthys copei*) is a small desert fish endemic to streams within the southern and eastern portions of the Bonneville Basin of Utah (Johnson and Jordan 2000). Within this historical range, populations are declining relative to historical observations. Examination of museum records identify a number of sites where southern leatherside populations once existed but now appear to be extirpated (Wilson 1996, Wilson and Belk 1996, Wilson and Belk 2001, Johnson et al. 2004).

Recent evidence also indicates that southern leatherside is one of two taxa formerly known as leatherside chub (*Snyderichthys copei*) and qualifies as a unique species (Johnson and Jordan 2000, Dowling et al. 2002, Johnson et al. 2004, Belk et al. 2005). In the recent past, the need for conservation actions to address the decline of leatherside chub was evaluated for the entire historical range of the species. Conservation needs will now be assessed for both the northern (*Lepidomeda copei*) and southern leatherside separately within their respective ranges. This change in assessment may highlight an increased need for conservation actions for southern leatherside. Management agencies in Utah recognize southern leatherside as a "species of concern" that warrants special consideration in terms of management and conservation planning (Sutter et al. 2005).

This conservation strategy has been developed to identify and expedite implementation of conservation measures for the southern leatherside with the desired outcome of ensuring the long-term conservation of southern leatherside within its historical range. Conservation actions needed include: identifying current distribution and abundance within historical range, reducing threats, identifying and implementing research needs, and maintaining and restoring habitat connectedness and complexity where possible. Actions described in this plan are intended to stabilize existing populations and reduce or eliminate the potential for further species declines by removing or reducing threats within known historical southern leatherside range in Utah.

TAXONOMIC STATUS

The Provo River is the type locality for the southern leatherside (*Squalius aliciae*; Jouy 1881; Dowling et al. 2002). Since 1881, leatherside chub have been assigned and subsequently removed from different genera multiple times (Lee et al. 1980, Johnson et al. 2004). Miller (1945) placed leatherside chub in the monotypic genus *Snyderichthys*, and then Uyeno (1960) relegated it to the genus *Gila*, subgenus *Snyderichthys*. Many (e.g., Lee et al. 1980, Robins et al.

1991, Sigler and Sigler 1996, Johnson and Jordan 2000, Wilson and Belk 2001, Johnson et al. 2004) have followed Uyeno's (1960) recommendation of *Gila copei*.

Recent research indicates leatherside chub is composed of two distinct species neither of which follows the previously recognized taxonomy. Genetic analysis by Johnson and Jordan (2000), Dowling et al. (2002), and Johnson et al. (2004) support two evolutionary distinct species of leatherside chub. These species consist of the northern leatherside (*Lepidomeda copei*) located in the Snake River and Bear River drainages and the southern leatherside located in the Utah Lake and Sevier River drainages. Results show that both species are related to the plagoptrins (*Meda*, *Lepidomeda*, and *Plagopterus;* Coburn and Cavender 1992) with northern leatherside more closely related to the existing spinedace genus *Lepidomeda* than to southern leatherside (Johnson and Jordan 2000, Dowling et al. 2002, Johnson et al. 2004).

In addition to the phylogenetic species concept model, Johnson et al. (2004) also used the similarity and ecological species concept models to support the separation of leatherside chub into two species. Cranial shapes of northern leatherside differ significantly from those of the southern leatherside supporting two species under the similarity species concept model. Significantly different growth and foraging rates at different temperatures for individuals from northern and southern leatherside support the separation of leatherside chub into two species under the ecological species concept model (Johnson et al. 2004). This study is compelling because it uses multiple lines of evidence to arrive at a shared result; that the geographically distinct populations of leatherside chub are more accurately described as two species.

Evolutionary events associated with the current distributions of the two species and are still unclear. The distribution of the northern and southern leatherside may have resulted from hydrologic events associated with Lake Bonneville during the Pleistocene (Smith 1978). Leatherside chub may have expanded from the Bonneville Basin into the upper Snake River approximately 14,500 years ago (Jarrett and Malde 1987). An alternate hypothesis is movement of the leatherside chub from the upper Snake River through the Bonneville Basin, to the pluvial White River of Nevada and into the Colorado River (Dowling et al. 2002).

DESCRIPTION AND ECOLOGY

Species Description

With the division of leatherside chub into two taxa, separate descriptions for northern and southern leatherside have yet to be developed. At this time the general description is an amalgamation of traits that apply to both northern and southern leatherside. Characteristics prevalent in both species include the leathery appearance created by very small scales on a trim tapering body, rounded dorsal and anal fins, and the origin of the dorsal fin behind the insertion of the pelvic fins. The average length of northern and southern leatherside varies between 76 to 127 mm. Meristic characteristics typically include eight rays in the dorsal and anal fins, 75 to 85 lateral line scales, and two rows of pharyngeal teeth usually numbering 2, 4-4, 2. Typically, the body color of both sexes is bluish above and silver below. During the spawning season, males and females have additional golden-red coloring at the upper end of the gill opening and between the eye and upper jaw. Males also have orange to red coloring on the axils of the paired fins, on

the base of the anal fin, and on the lower lobe of the caudal fin (Sigler and Miller 1963, Sigler and Sigler 1987, Sigler and Sigler 1996).

At least two characteristics distinguish southern leatherside from northern leatherside: cranial shape and size-at-age. Southern leatherside have shallower heads with longer snouts than northern leatherside (Johnson et al. 2004). Body sizes of southern leatherside are about 15% larger than northern leatherside at a given age (Belk et al. 2005). Future investigations may find additional species trait differences between southern and northern leatherside.

Life History Traits

Before 1995, very little was known about the life history traits of leatherside chub (Johnson et al. 1995). Life expectancy was thought to be less than five years and spawning occurred sometime between June and August (Sigler and Miller 1963, Sigler and Sigler 1987, Johnson et al. 1995, Sigler and Sigler 1996). Studies have increased our knowledge since that time, but specific traits belonging to northern and southern leatherside have not been delineated. Current knowledge of leatherside chub life history traits is attributed to both species.

Johnson et al. (1995) determined the maximum life span of the southern leatherside to be at least eight years. Growth rate for both species is rapid in early years and decreases at the onset of sexual maturity (Johnson et al. 1995). Reproduction begins at age two or at lengths greater than 50 mm total length. Spawning appears to occur in spring during high water, and it is likely influenced by temperature. A laboratory study on northern leatherside documented spawning later in the summer than has been recorded in the wild (Billman et al. 2008). A female may lay more than 2,500 eggs (92 mm SL, 14.6 g) but fecundity is related to length and weight. The average documented egg production of a mature leatherside chub female is 1,813 eggs (n=9, Johnson et al. 1995).

A captive-breeding study examining preferred spawning habitat and early life history characteristics documented that northern leatherside greatly preferred spawning on small cobble and at the highest velocity tested (10cm/s) rather than large cobble, pebble, or an artificial spawning mat and slower velocities (Billman et al. 2008). Northern leatherside also spawned at multiple times and over a longer period under laboratory conditions than previously documented in the wild. The habitat selection portion of this study showed northern leatherside preferred uncovered pools and the upper portion of riffles rather than covered pools and the lower portion of riffles. While similar results may be inferred for southern leatherside, additional study is needed to determine spawning preferences for southern leatherside.

Belk et al. (2005) found many southern and northern leatherside life history traits to be similar. Date of hatching varied widely within populations but was not significantly different between southern and northern leatherside populations. Age at maturity is also similar between both species, with the majority of fish maturing at two years. Belk et al. (2005) found differences in temperature specific growth rates for the two species, with southern leatherside having relatively higher growth rates at warmer temperature and northern leatherside at colder temperature (Belk et al. 2005).

Habitat

Southern leatherside inhabit desert streams of the Bonneville Basin. Southern leatherside require flowing water and do not persist in lakes or reservoirs (Krissy Wilson pers. comm.). Stream systems occupied by both species have a broad range of widely varying physical conditions including high variability of stream flow, annual precipitation, gradient, elevation, conductivity, and pH (Wilson 1996, Wilson and Belk 2001). The elevational range of observations for southern leatherside is from 1132 to 2608 m. The temperature range utilized by southern and northern leatherside has been reported from 10 to 23.3˚C, but both species tend to favor rivers and streams with water temperatures between 15.6 to 20˚C (Sigler and Sigler 1987, Sigler and Sigler 1996). Microhabitat variables associated with leatherside chub presence include low water velocities (2.5 – 45 cm/sec), intermediate water depths (25 – 65 cm), and low percent composition of sand-silt or gravel substrates (Wilson 1996, Wilson and Belk 2001). Adult and juvenile leatherside chub utilize the main channel of streams more often than off channel habitats, but in the presence of nonnative predators, such as brown trout (*Salmo trutta*); leatherside chub shift habitat use to off channel habitats (Walser et al. 1999, Olsen and Belk 2001). Southern leatherside occur in streams with a broad range of temperatures and have habitat requirements of healthy riparian vegetation and intact streambanks.

HISTORICAL RANGE

The historical range of southern leatherside encompasses the southeastern margins of the Bonneville Basin in Utah (Figure 1; Baxter and Simon 1970, Simpson and Wallace 1982, Sigler and Sigler 1987, Johnson et al. 1995). For the purpose of this conservation strategy, historical observations are defined as those observations occurring in and before 1993 and recent observations as observations occurring from 1994 to 2009. This selection of historical and recent observations will help to identify spatial and temporal gaps where additional surveys are needed.

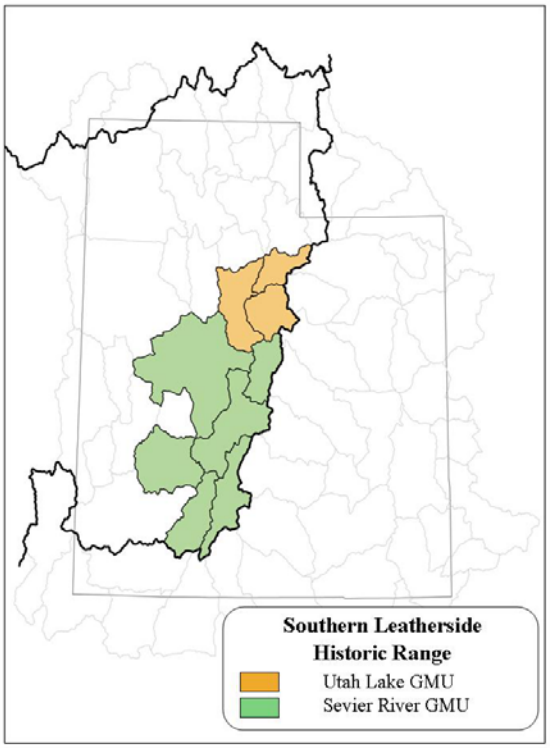

Figure 1. Southern leatherside historical range

The historical range of southern leatherside includes the American Fork, Provo River, and Spanish Fork drainages of the Utah Lake Basin and the San Pitch River, East Fork Sevier River, Beaver River, and the lower, middle, and upper Sevier River drainages of the Sevier River Basin. No records of observations or specimens have been collected from the Weber and Salt Lake basins located between the northern and southern leatherside species distributions. Recent surveys have also not produced leatherside chub in these areas. Observations of introduced leatherside chub populations have been found in the Strawberry, Green, and Fremont rivers within the Upper Colorado River Basin, but these observations are not within the historical range of southern leatherside (Figure 2).

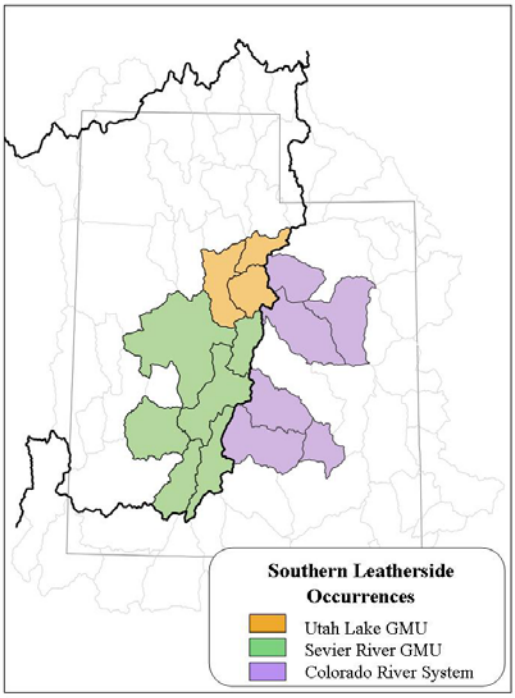

Figure 2. Southern leatherside occurrences

CURRENT DISTRIBUTION

Geographic Management Units

Southern leatherside have been documented in three 4th level hydrologic unit codes (HUC) in the Utah Lake drainage and six 4th level HUCs in the Sevier River drainage. Introduced populations of leatherside chub have been observed in six 4th level HUCs in the Colorado River Basin and are still persisting in the Fremont River, Pleasant Creek, Dirty Devil River, and Quitchupah Creek (southern three HUCs). It is not known if these populations are southern or

northern leatherside. If these populations are southern leatherside, they may have management implications.

The HUCs within the historical range of southern leatherside can be grouped into two hydrologic units, which delineate areas ideal for geographic management units (GMU): the Utah Lake Basin management unit and the Sevier River Basin management unit (Figure 3). Since each GMU delineates a drainage system, they are ideal organizational units for conservation actions for southern leatherside. Additional HUCs that do not contain historical southern leatherside observations have been included in the GMUs in order to promote connectivity for metapopulation dynamics. The observations from the six HUCs in the Colorado River Basin are outside the historical range of southern leatherside and will not be identified within a GMU, but future research may indicate that the populations may have management implications.

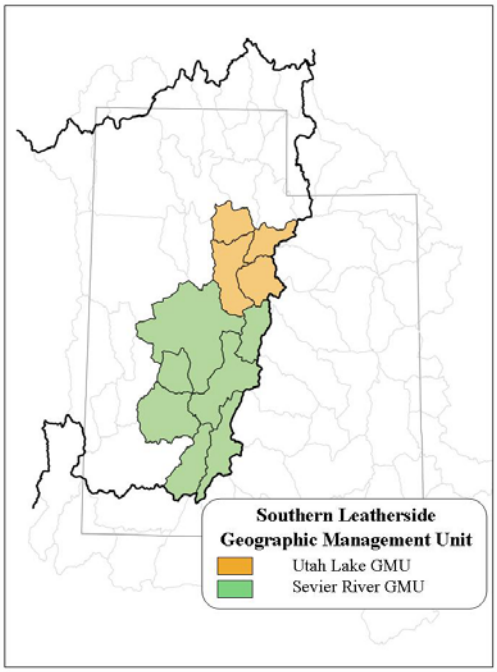

Figure 3. Southern leatherside geographic management units

THREATS

The success of any conservation or recovery program depends on eliminating or reducing the impact of activities that threaten the species' existence. Several problems and threats have been identified and described for southern leatherside by federal and state agencies. For consistency purposes, even though the species is not federally listed, threats were identified based on the criteria of federal listing as required by Section 4(a)(1) of the ESA. The following discussion summarizes the significant threats to southern leatherside that will be addressed by conservation actions described in this Strategy.

Destruction, Modification, or Curtailment of Habitat

Southern leatherside distributions have become increasingly fragmented over time, resulting in the loss of populations as well as individuals within populations (Wilson 1996, Wilson and Belk 1996, Wilson and Lentsch 1998, Wilson and Belk 2001). Some of this fragmentation is natural and has occurred over thousands of years in conjunction with historical changes in climate and geography. However, much of the current population fragmentation is anthropogenic, caused by factors such as irrigation projects, habitat degradation, urbanization, and the introduction of nonnative fish predators.

Habitat fragmentation is a substantial threat to southern leatherside populations. Southern leatherside that once occupied contiguous drainages, such as the Sevier River system, are now divided into smaller subpopulations with limited opportunity for genetic exchange. Habitat fragmentation is increased by barriers impassable to southern leatherside from culverts, diversions, dams, and dewatering. Additionally, the water in many systems is fully or overly

allocated to water users leaving no water in the stream for southern leatherside. Fragmentation limits access to preferred or necessary habitats, which ultimately threatens population viability. Populations subject to habitat fragmentation have a high probability of extirpation because of disjunct and restricted distributions, which increases the vulnerability of southern leatherside to environmental or demographic perturbations. Small isolated populations are more susceptible to catastrophic loss and impacts from demographic stochasticity than are larger, more widely distributed populations (Allendorf and Leary 1988, Lande 1988, Nagel 1991). Natural climatic events such as flood, fire, and drought may threaten fragmented populations. These forces, in combination with poor land use practices, pose threats as long as southern leatherside range remains fragmented and populations are small.

Habitat degradation from water development (e.g., diversions and dams), stream alterations (e.g., channelization, barriers, etc.), and unmanaged grazing are substantial threats to southern leatherside populations. Channelization increases water velocity and removes instream structure, reducing quantity and quality of potential habitat for southern leatherside. Poor grazing practices can alter sediment transport regimes and streambank stability and can change water quality, substrate composition, and channel structure (Armour et al. 1991). Full or over-allocation of available water can also lead to complete dewatering of streams resulting in a loss of southern leatherside habitat. Specific ramifications include loss of instream flow, loss of instream cover, increased water temperature, and loss of preferred substrate.

Over-utilization for Commercial, Recreational, Scientific or Educational Purposes

The use of live baitfish by anglers is not permitted in southern leatherside range (UDWR 2004). Prohibiting anglers from transporting live fish for bait reduces the possibility of having competing species released by anglers into waters inhabited by southern leatherside. In Utah, southern leatherside is a state protected species and regulations have classified this species as a prohibited fish that may not be taken, held in possession, or commercially harvested (R657-3-23, R657-13-13 and R657-14-8). The Utah Division of Wildlife Resources strictly reviews, monitors, and controls all scientific and educational collection permits issued for activities in the state. Due to these limitations, over-utilization by anglers is likely not a major threat. Also, the number of southern leatherside taken for scientific and/or educational purposes is quite low and the fish do not face the threat of overharvesting.

Disease, Predation, Competition, and Hybridization

Nonnative fish predators appear to ecologically fragment southern leatherside into patchy peripheral stream habitats, potentially impacting local demographic processes such as growth rate, fecundity, and survivorship. Predation not only causes mortality, but also influences habitat choice (Walser et al. 1999). While southern leatherside evolved with piscivorous native Bonneville cutthroat trout, introduction of nonnative fish such as brown trout are likely increasing predation and competition pressure. Southern leatherside are known to avoid predation by using habitat not utilized by brown trout, such as side channels and backwaters (Olsen and Belk 2001). Maintaining habitat complexity increases the ability for southern leatherside to coexist with native and nonnative fish predators. Introduced species such as brown trout and brook trout (*Salvelinus fontinalis*) are likely having a deleterious effect on southern leatherside populations (Wilson and Belk 2001, Nannini and Belk 2006).

At one point, northern leatherside were thought to be hybridizing with speckled dace in Wyoming but genetic testing showed no evidence of hybridization between these two species. There have been no other reports or documentation of hybridization for southern leatherside.

There are no known diseases or pathogens which currently pose a significant threat to the persistence of southern leatherside. Strict decontamination procedures are followed to clean all waders and sampling equipment between sites for all aquatic species. Disease testing and certification procedures are followed when moving aquatic species between watersheds to minimize the spread of disease.

Inadequate Regulatory Mechanisms

In Utah, southern leatherside, has been placed on the Utah Sensitive Species List (UDWR 2003) and is considered a "Tier II wildlife species" as outlined in the Comprehensive Wildlife Conservation Strategy (Utah Wildlife Action Plan; Sutter et al. 2005).

Regulations and laws regarding water use, rights, and consumption pose a threat to southern leatherside habitat and stream hydrology. Instream flows for southern leatherside are difficult to obtain and as a result southern leatherside distribution is fragmented due to dewatering during periods of high water usage.

Other Natural or Human Induced Factors Affecting Continued Existence

Natural or human induced climatic events such as flood, fire, and drought may be threats to southern leatherside. These climatic events in combination with other stresses may have a negative impact on southern leatherside populations, although direct impacts are unknown.

GOAL AND OBJECTIVES

Overall, southern leatherside distribution is reduced from the historical distribution (Wilson and Belk 2001) with much of this loss occurring over the past 50 to 100 years. In light of these declines, conservation actions are being identified and developed to manage and conserve southern leatherside.

Goal

Ensure the long-term persistence of southern leatherside within its historical range and support development of statewide conservation efforts.

Objectives

The following objectives will be required to attain the goal of this strategy:

Objective 1 – Determine the existing range of the species.
Objective 2 – Maintain and monitor the currently known and newly discovered or established southern leatherside populations and their habitat.
Objective 3 – Identify, prioritize, and implement actions to reduce threats to southern leatherside populations and habitat and evaluate the effectiveness of these actions.
Objective 4 – Restore populations in selected localities within the historical range.

Objective 5 – Augment selected populations if necessary.
Objective 6 – Maintain genetic diversity and integrity. Ensure persistence of genetically distinct populations.
Objective 7 – Identify questions and implement research that meets management needs for southern leatherside and use the findings to guide conservation efforts.
Objective 8 – Implement and incorporate provisions of the conservation strategy into signatory planning documents and budgets to ensure the conservation goal and objectives are achieved.

CONSERVATION ELEMENTS

The following section outlines the general list of conservation actions or elements that will eliminate or reduce threats to southern leatherside as well as expand its range back into historical localities. Each general element includes a list of specific methods, which may be implemented, given funding, at statewide or site-specific levels.

A. Surveys

Inventory and describe current range of southern leatherside.

1. Identify historical southern leatherside distribution and localities utilizing museum records, agency reports, collection permits, grey literature, and other sources.
2. Survey historical localities of southern leatherside for the presence of extant populations.
3. Using identified historical distribution, survey potential habitat for southern leatherside.
4. Determine areas suitable for reintroduction.

Expected Products

a. Maps of historical southern leatherside range and current distribution.
b. Identification of potential reintroduction sites.

B. Habitat Enhancement

Enhance and/or restore habitat conditions in designated areas throughout the historical range of southern leatherside.

1. Identify streams with extant southern leatherside or potential reintroduction sites. Evaluate southern leatherside habitat and assess habitat degradation, presence of nonnatives, disease, and other threats.
2. Restore habitat where possible, creating habitat complexity and connectivity for southern leatherside.
3. Implement habitat enhancements that may include some or all of the following: removal of diversion structures, modification of barriers to allow fish passage, bank stabilization, enhancement of native vegetation, riparian fencing, nonnative removal, and implementation of compatible grazing practices.

Expected Products

a. Increased suitable southern leatherside habitat.
b. Reduction of threats of predation and competition from nonnative species.
c. Reduction of future habitat degradation from erosion and ungulate grazing.

C. Habitat Protection

Protect and enhance habitat (via land use changes) through land acquisition, conservation easements, or regulatory mechanisms.

1. Identify, prioritize, and protect southern leatherside habitats.
2. Acquire conservation easements with landowners. The easements will provide for long-term habitat and water protection and provide habitat enhancement as needed.
3. Pursue land and water acquisition as necessary in critical areas where conservation easements do not apply.
4. Develop cooperative agreements with landowners. The agreement will specify methods to eliminate or reduce impacts on southern leatherside habitats.
5. Develop agreements (Memoranda of Understanding (MOU), etc) with local, state, and federal agencies to protect southern leatherside habitats as needed.

Expected Products

a. Agreements, easements, acquisitions, and/or cooperative agreements with private landowners and/or public entities to protect southern leatherside and its habitats as needed.

D. Restore Hydrologic Conditions

Maintain, restore, and/or augment natural hydrologic characteristics and water quality.

1. Identify water needs in current and potential southern leatherside habitats.
2. Protect by acquisition, easement, MOU, and/or Cooperative Agreements.
3. Identify minimum flow and temperature standards and maintain instream flow.
4. Maintain natural hydrologic conditions.

Expected Products

a. Secure water sources for southern leatherside habitats.

E. Nonnative Control

Selectively control nonnative species that negatively impact southern leatherside via predation and/or competition.

1. Determine detrimental interactions between southern leatherside and nonnative species (predation, competition, hybridization, or disease).
2. Control or modify stocking, introductions, and spread of nonnative aquatic species where appropriate.
3. Reduce or eliminate detrimental species where feasible.

Expected Products

a. Research identifying the negative impact of nonnatives on southern leatherside.
b. Reduction of the spread of nonnative species and their impacts on southern leatherside.

F. Range Expansion

Conduct life history and genetic studies to determine habitat requirements and appropriate stocks of southern leatherside for translocation into historical areas. Reintroduce southern leatherside into suitable historical habitats.

1. Survey southern leatherside habitats for potential reintroduction sites as needed.
2. Develop site selection criteria and select sites for reintroductions as needed.
3. Conduct genetic surveys to determine relatedness of any new southern leatherside populations.
4. Complete all necessary compliance needed to introduce southern leatherside.
5. If needed, establish hatchery stocks of southern leatherside to facilitate repatriation.

Expected Products

a. Data outlining the relatedness within and among southern leatherside populations.
b. Recommendations for range expansion protocols.
c. Expansion of southern leatherside distribution and associated increased population stability.

G. Monitoring

Monitoring goals seek to detect changes in population distribution and abundance over time.

1. Develop monitoring program with standardized protocols for established southern leatherside populations and habitat.
2. Evaluate monitoring on a regular basis and amend conservation actions as indicated by monitoring results.
3. Maintain southern leatherside database.

Expected Products

a. Baseline population data to monitor effectiveness of conservation actions.
b. Evaluations of population health and viability.
c. Warnings when populations or distributions decline will trigger additional study and appropriate conservation actions.

H. Regulation

Maintain and enforce Utah Wildlife Code regulations that prohibit the collection, possession, and importation of southern leatherside and other state regulations to ensure protection of southern leatherside.

1. Maintain and enforce current code regulations that prohibit the collection, possession, and importation of southern leatherside.

2. Ensure biosecurity protocols (i.e. HACCP) are followed and enforced through the state permitting process.

   Expected Products
   a. Enforcement of regulations should eliminate the threat of over-utilization.
   b. Prevent stocking of species that could have a potentially negative impact to southern leatherside and its habitat.
   c. Enforcement of violations and penalties.
   d. Improved communication and cooperation among local government and public interest groups.
   e. Prevention of introduction and/or spread of pathogens and diseases.

I. Disease Management

Determine the extent of infection in populations, monitor effects of pathogenic infection, and prevent further infection by implementing biosecurity protocols.

1. Adopt and require the use of disease and pathogen protocols for augmentation and reintroduction of southern leatherside.
2. Incorporate disease and pathogen protocols into research and collection permits.
3. Follow biosecurity protocols when moving fish, personnel, and field equipment between sites.

   Expected Products
   a. Identification and reduction of potential threats of disease and pathogen infection.

J. Information and Education

Increase public awareness and support for the conservation of southern leatherside.

1. Produce and distribute educational information on southern leatherside to the public and encourage other natural resource agencies to incorporate southern leatherside awareness into their Information and Education (I & E) programs.
2. Educate the public on the values of protecting ecosystems and restoring native species.

   Expected Products
   a. Educational products made available for schools, special interest groups, and the public (i.e. fact sheets, posters, educational documents, interpretive signs, public website).
   b. Increased public support for conservation programs.

SOUTHERN LEATHERSIDE GMUS

Southern leatherside locality records are compiled from the following Utah Division of Wildlife Resources sources: the Utah Natural Heritage Program database, the Native Aquatic Species Program database, state Certificate of Registration (COR) reports, stream survey information, and agency and contracted reports. Sources outside the Division have also been utilized. Many records do not list small native fish to species, rather to a general grouping such as minnow or chub that cannot be verified to species, and therefore only those records that identified leatherside chub to species were used so that this may not be an exhaustive list of all the historical southern leatherside localities.

The Utah Lake GMU and the Sevier River GMU within the Bonneville Basin represent the entire known historical range for the southern leatherside. The type locality for the southern leatherside (*Squalius aliciae*; Jouy 1881) is located in the Provo River HUC (16020203; Dowling et al. 2002).

Utah Lake Drainage GMU

Historically, southern leatherside were observed in three 4th level HUCs within the Utah Lake drainage: the American Fork River HUC (16020201); the Spanish Fork River HUC (16020202); and the Provo River HUC (16020203). This GMU also contains one additional HUC, the Jordan River HUC (16020204), which does not have records of southern leatherside distribution.

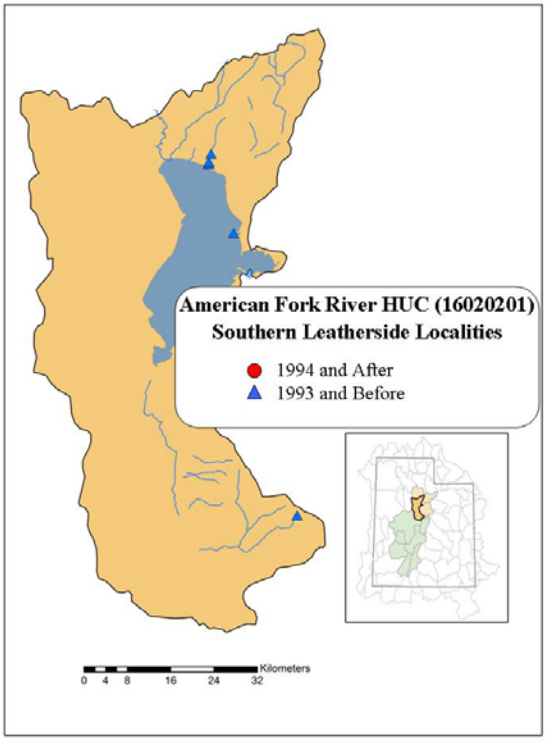

Figure 4. American Fork River HUC southern leatherside localities

American Fork River HUC (16020201)

There are five historical southern leatherside observations recorded for this unit (Figure 4). They are recorded for Hop Creek, American Fork River, and Utah Lake. No records of recent observations exist. The last recorded observation for southern leatherside in Hop Creek occurred during 1975 and this creek has not been surveyed since that time. The lower reaches of the American Fork River were last surveyed in 1992 with no southern leatherside documented. The lower reach of the American Fork River where southern leatherside were historically found is frequently dewatered in the summer months and does not sustain fish populations. As southern leatherside are unable to persist in lake environments (Krissy Wilson pers. comm.), the Utah Lake observation was likely not from a resident population. The last record of southern leatherside in this HUC was from 1976, indicating a potential loss of southern leatherside populations in the American Fork River HUC.

Spanish Fork River HUC (16020202)

Historical and recent southern leatherside observations are available for the Spanish Fork River HUC (Figure 5). Multiple historical observations occur at Spanish Fork, Thistle Creek, Soldier Creek, Diamond Fork, Sixth Water Creek, Fifth Water Creek, Santaquin Creek, and Spring Creek. Southern leatherside populations may have been lost in Sixth Water Creek and Fifth Water Creek. The last year southern leatherside were observed and the last year each stream was surveyed follows respectively: Sixth Water Creek, 1975 and 2003 and Fifth Water Creek, 1975 and 1991.

Extant populations occur in Spanish Fork, Thistle Creek, Nebo Creek, Soldier Creek, Santaquin Creek, and Spring Creek. Population estimates in Thistle and Soldier creeks were reported to range in size from 1,139 to 8,369 individuals per km (Wilson and Lentsch 1998). Population estimates from Thistle Creek in 2007 range from 1,360 to 3,900 individuals per km (UDWR 2009).

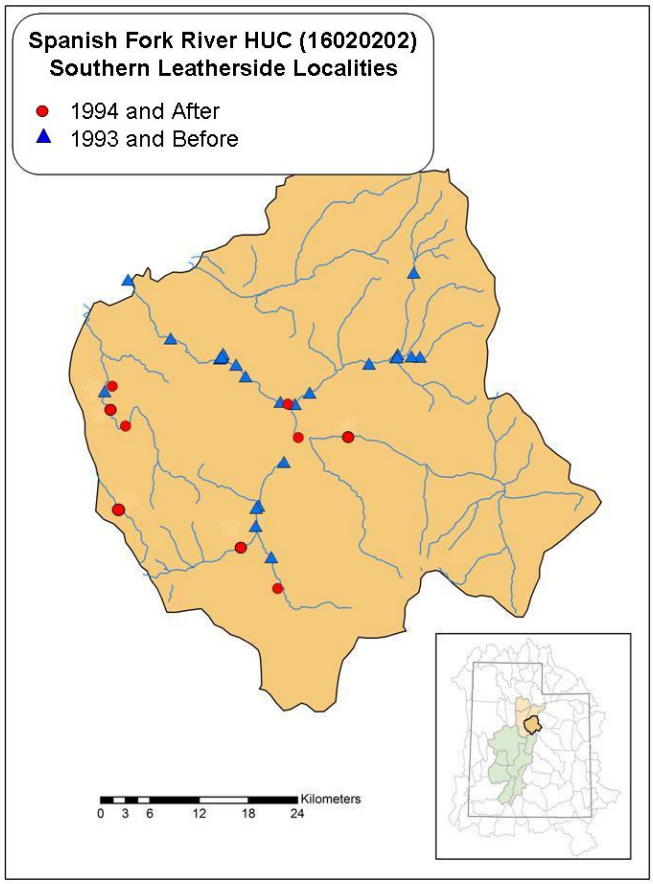

Figure 5. Spanish Fork River HUC southern leatherside localities

More than 500 southern leatherside were reintroduced into Diamond Fork from Soldier Creek, Spanish Fork, and Thistle Creek from 2006 – 2008 (UDWR 2009). Post-stocking monitoring in 2009 has documented 15 southern leatherside in the reintroduction areas (Chris Crockett pers. comm.). Monitoring of this new population will continue to document the success of the reintroduction.

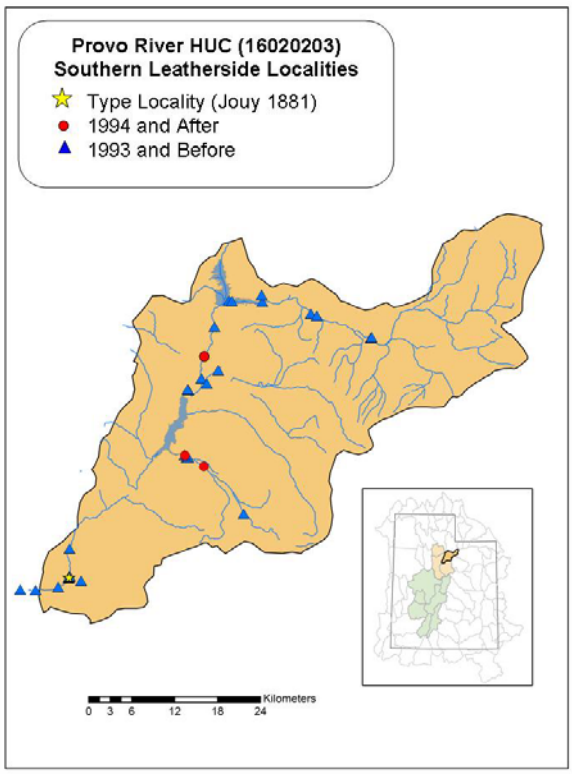

Figure 6. Provo River HUC southern leatherside localities

Provo River HUC (16020203)

For clarification, there are two streams in this unit named Spring Creek and both are tributaries of the Provo River. One is a tributary to Main Creek (Spring Creek (1)) and the other flows directly into the Provo River and is associated with Lake Creek (Spring Creek (2)). The lower reach of the Provo River refers to downstream of Deer Creek Reservoir, middle reach between Deer Creek and Jordanelle reservoirs, and the upper reach above Jordanelle Reservoir.

Historical observations of southern leatherside occur in the upper, middle, and lower reaches of the Provo River, as well as Main Creek, Spring Creek (1), Spring Creek (2), and Snake Creek within this HUC (Figure 6). The type locality for the southern leatherside (*Squalius aliciae*; Jouy 1881) is located in the lower reaches of the Provo River (Dowling et al. 2002). Historically, southern leatherside were found in low numbers in the Provo River (5 to 115 individuals per km), Spring Creek (2) (5 to 320 individuals per km; Campbell 1993, CUWCD 1993), and Lake Creek (16 individuals per km, CUWCD 1993). Southern leatherside were last recorded in the lower reaches of the Provo River in 1957 even though surveys have been conducted routinely since then. Records for the upper reaches (above Jordanelle Reservoir) of the Provo River also indicate a loss of the population with the last southern leatherside observation recorded in 1973 and surveys conducted as recently as 2002.

Extant populations exist in the Wallsburg area streams of Spring Creek (1) and Main Creek. A population estimate for Spring Creek (1) in the Round Valley documented southern leatherside numbers of 240 (± 20) individuals per km (Wilson and Lentsch 1998). Surveys of Main Creek in 2007 documented southern leatherside at low numbers comprising < 3% of the fish community composition (UDWR 2009). Genetic analysis of southern leatherside indicates that the population in Main Creek is genetically distinct from other southern leatherside populations in the Spanish Fork River and Sevier River basins although this may be a result of low sample size for this population (Belk et al. 2010). Currently, only two systems within the Provo River HUC are known to have self-sustaining populations of southern leatherside (Main Creek and Spring Creek (1)). In 2006, UDWR documented a southern leatherside in a seasonally connected side channel to the middle Provo (Chris Crockett pers. comm.). This observation indicates that southern leatherside may still be present in this reach in low numbers. Additional surveys are planned for this section of the Provo River to verify and determine the extent of southern leatherside.

Threats

The most immediate threats to southern leatherside in the Utah Lake GMU are habitat degradation and competition and predation from nonnative fish.

Habitat degradation

Stream alterations, unmanaged livestock grazing, and water development (diversions and dams) have caused substantial habitat degradation through channelization, simplification of habitat, and habitat fragmentation. Portions of this system are also completely dewatered for irrigation during periods of high water usage. Channelization and diking has increased water velocity, removed instream structure, and reduced the amount of preferred habitat of southern leatherside. Habitat complexity and connectivity are critical to ensure the persistence of southern leatherside especially in reaches where they face predation from nonnative brown trout.

Introduction of Nonnative Species, Disease

Introduced species such as brown trout and brook trout are likely having a deleterious effect on southern leatherside populations in this HUC. Predation and competition by these introduced nonnative species pose a threat to southern leatherside.

Sevier River Drainage GMU

Historically, southern leatherside were found in six of the seven 4th level HUCs within the Sevier River drainage: the Upper Sevier River HUC (16030001), the Middle Sevier River HUC (16030003), the Lower Sevier River HUC (16030005), the East Fork Sevier River HUC (16030002), the San Pitch River HUC (16030004), and the Upper Beaver River HUC (16030007). There are no recorded observations within the Lower Beaver River HUC (16030008), but it has been included in this GMU to promote connectivity for metapopulation dynamics. Even though southern leatherside populations in the Sevier River drainage have been reported at densities of 680 to greater than 2,000 individuals per km (Combes and Hardy 2000), southern leatherside distribution has been reduced to 58% of its original range in this system (Wilson and Belk 1996). Anthropogenic fragmentation is a factor in the reduction of range within this once highly connected system (Wilson 1996, Wilson and Belk 1996, Wilson and Belk 2001).

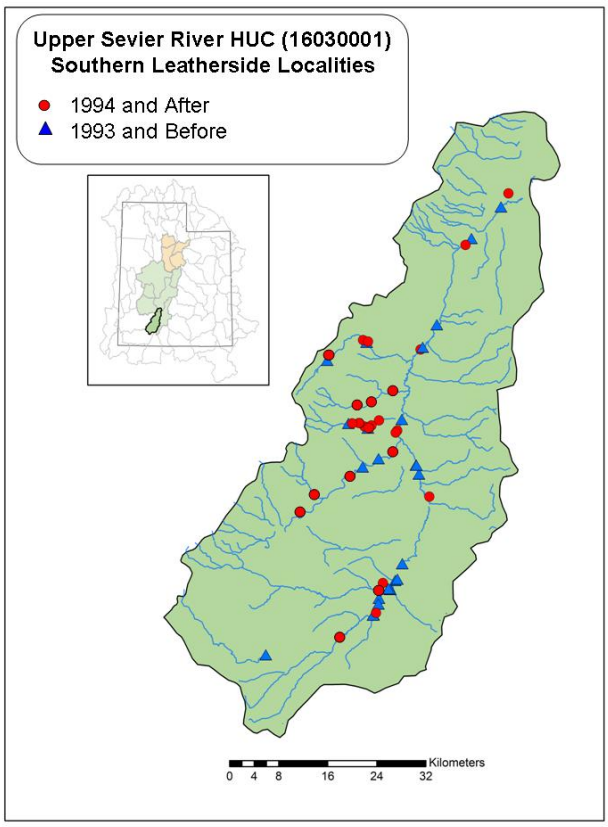

Figure 7. Upper Sevier River HUC southern leatherside localities

Upper Sevier River HUC (16030001)

Southern leatherside occurrences are found in eight streams in this HUC: Threemile Creek, Bear Creek, Panguitch Creek, Butler Creek, Mammoth Creek, Asay Creek, Duck Creek, and the mainstem of the upper Sevier River (Figure 7). Historical observations have been recorded for Duck Creek, with the last reporting date occurring during 1950.

Recent observations occur in the mainstem of the Sevier River and Threemile, Bear, Mammoth, Panguitch, Butler, and Asay creeks. The southern leatherside occurrence from Threemile Creek is the result of a reintroduction from Bear Creek following a rotenone treatment in1994 to remove nonnative fish. Population estimates are approximately 2,611 individuals per km of stream (Combes and Hardy 2000). A UDWR survey in 2004 documented southern leatherside at six out of seven sites along Threemile Creek. In 2006, a rotenone treatment was conducted on Panguitch Lake to enhance sport fisheries in the lake. The southern leatherside and other native fish in Panguitch Creek were also impacted by this treatment. Following the treatment, 206 southern leatherside were translocated from Butler Creek to Panguitch Creek in July 2006. Surveys in 2007 and 2008 on Panguitch Creek (UDWR 2009) revealed southern leatherside populations at several sites below Panguitch Lake.

East Fork Sevier River HUC (16030002)

Historical southern leatherside observations are recorded in four streams in this HUC: Clay Creek, Otter Creek, Kanab Creek, and the East Fork Sevier River (Figure 8). Recent observations of southern leatherside are recorded for all of the four streams above, except Kanab Creek. Southern leatherside were last recorded in Kanab Creek during 1953.

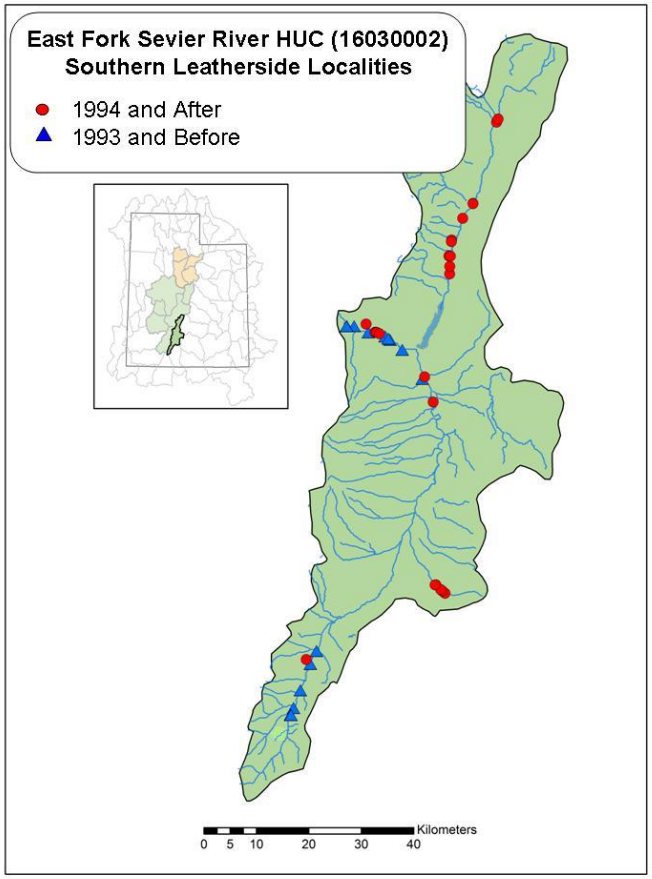

Figure 8. East Fork Sevier River HUC southern leatherside localities

Surveys completed in 1999 documented extant southern leatherside populations in Otter Creek and Clay Creek with 984 and 18 individuals found respectively within a 0.4 km stretch of each creek (Combes and Hardy 2000). Two UDWR survey efforts conducted on Otter Creek in 2004, documented southern leatherside at six out of seven sites along the creek. The extant population in Otter Creek is the result of a reintroduction of southern leatherside from the East Fork Sevier River after a rotenone treatment to remove nonnative fish (Combes and Hardy 2000). Clay Creek was surveyed again in 2004 by UDWR and southern leatherside were found at all five sites surveyed. The East Fork Sevier River was also surveyed by UDWR between 2004 and 2007 in Black Canyon, Kingston Canyon, near Tropic Reservoir, and near John's Valley. Southern leatherside were found in Black Canyon, Kingston Canyon, and near John's Valley. Black Canyon and Kingston Canyon both underwent habitat restoration projects starting in 2004. Post restoration surveys did not document a difference in southern leatherside populations between reference and control sites (UDWR 2009). Southern leatherside were not documented during surveys in 2004 in the East Fork Sevier River and tributaries, including Kanab Creek, near Tropic Reservoir.

Middle Sevier River HUC (16030003)

Historical observations of southern leatherside are recorded for five streams within this HUC: Lost Creek, Little Lost Creek, Clear Creek, Salina Creek, and the mainstem Sevier River (Figure 9). The last recorded observation of southern leatherside from Little Lost Creek was in 1970.

Recent observations and extant populations occur in Lost Creek, Salina Creek, Gooseberry Creek, Clear Creek, and the mainstem of the Sevier River. Within the Sevier River near Annabella, Utah, 35 southern leatherside per km were captured during a 2000 survey for fish community composition (Combes and Hardy 2003). Surveys conducted by UDWR in 2007 found southern leatherside in low densities at three of six sites in the Sevier River south of Yuba Reservoir (UDWR 2009). Surveys conducted by UDWR and USFS in 2007 documented southern leatherside in the lower portions of Clear Creek below, but not above a diversion structure which may be a barrier to movement for southern leatherside.

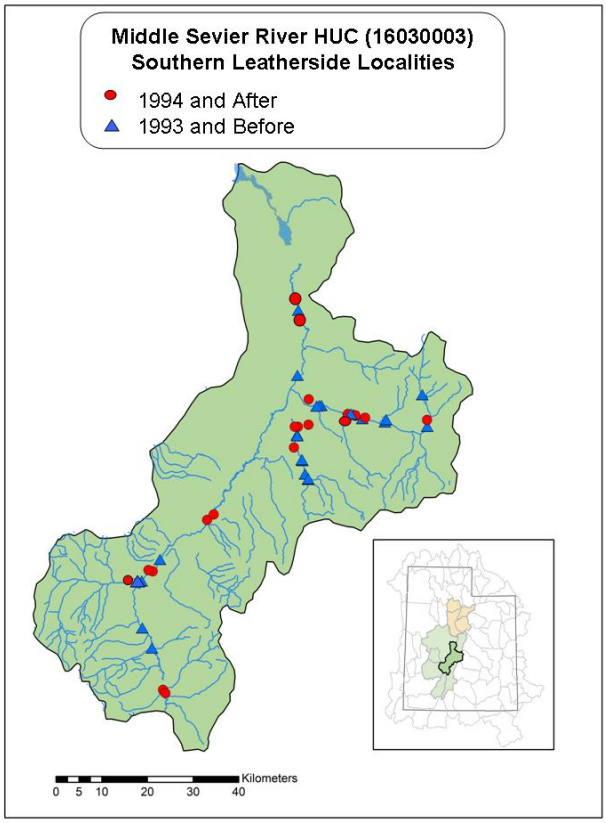

Figure 9. Middle Sevier River HUC southern leatherside localities

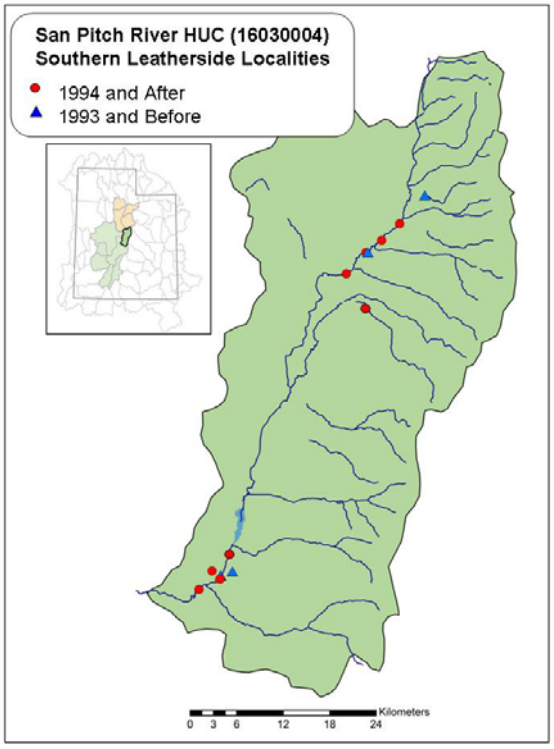

Figure 10. San Pitch River HUC southern leatherside localities

San Pitch River HUC (16030004)

Within the San Pitch River HUC, historical southern leatherside observations are recorded for the San Pitch River, Manti Canyon, and Cedar Creek (Figure 10). Extant populations of southern leatherside occur in Canal Creek and at multiple locations in the San Pitch River.

Locally abundant southern leatherside populations have been found in the San Pitch River as recently as 2007. The results of 2001 survey efforts documented southern leatherside at only five of 21 sites surveyed. UDWR surveys conducted in 2007 documented southern leatherside at five of eight sites surveyed with population estimates at three of these sites ranging from 500 – 1,500 southern leatherside per km. Surveys in 2009 resulted in documentation of a previously unknown population of southern leatherside in Canal Creek.

Lower Sevier River HUC (16030005)

Historical southern leatherside observations are recorded for the Sevier River, Molten Springs, and Meadow Creek within this HUC (Figure 11). Observations were last recorded in Molten Spring and Meadow Creek during 1954 and 1932 respectively.

Populations of southern leatherside persist in the Lower Sevier River. Combes and Hardy (2003) surveyed the Lower Sevier River in 1999, 2000, and 2001 for fish community composition. During 1999, Combes and Hardy surveyed 15 sites and did not document southern leatherside. Nine sites were surveyed during 2000, modifying the previous survey locations to include potential southern leatherside habitat and captured four southern leatherside near Sevier Canyon (Combes and Hardy 2003). During 2001 Combes and Hardy (2003) surveyed

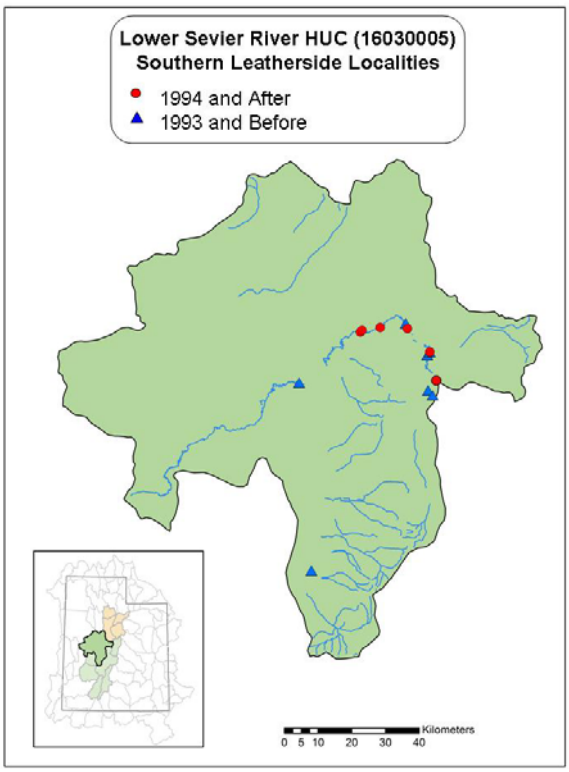

Figure 11. Lower Sevier River HUC southern leatherside localities

the nine sites surveyed in 2000 and an additional six sites, totaling 15 sites. Southern leatherside were found near Leamington Canyon and Mills Valley, both of which were also surveyed in 2000, but not at Sevier Canyon (Combes and Hardy 2003).

Upper Beaver River HUC (16030007)

Southern leatherside are believed to be extirpated from the Beaver River system (Figure 12; Wilson 1996, Wilson and Belk 1996, Wilson and Belk 2001). Southern leatherside were observed in this system during 1872, 1876, and last recorded during 1949.

Southern leatherside have not been found in subsequent surveys including a survey conducted by UDWR in 2004 of the Beaver River downstream of Minersville Reservoir.

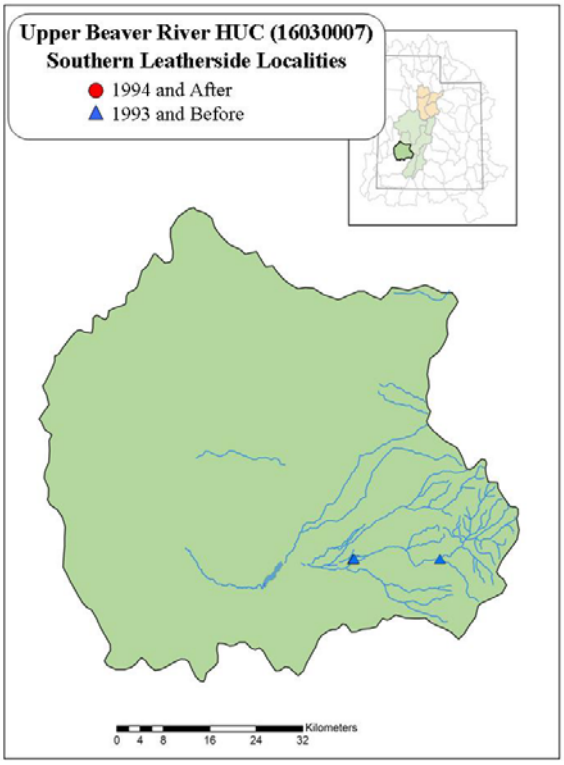

Figure 12. Upper Beaver River HUC southern leatherside localities

Threats

The primary threats to southern leatherside in the Sevier River GMU are habitat degradation and competition and predation from nonnative fish.

Habitat degradation

Stream alterations, dewatering, unmanaged livestock grazing, and water development (diversions and dams) have caused substantial habitat degradation through channelization, simplification of habitat, and habitat fragmentation. Portions of this system are completely dewatered for irrigation during periods of high water usage. Channelization and diking has increased water velocity and removed instream structure and limited the preferred habitat of southern leatherside. Habitat complexity and connectivity are critical to ensure the persistence of southern leatherside, especially in reaches where they face predation from nonnative brown trout.

Introduction of Nonnative Species, Disease

Introduced species such as brown trout and brook trout are likely having a deleterious effect on southern leatherside populations in this HUC. Predation and competition by these introduced nonnative species pose a significant threat to southern leatherside.

CONSERVATION TEAM MANAGEMENT

The success of this Strategy will depend upon the ongoing cooperation among the signatories to the Agreement. Each signatory agency will continue their participation via a representative on the Southern Leatherside Conservation Team. The primary duties of the Team include: coordination of conservation activities, review and revision of the Conservation Strategy (as needed), review of annual assessment report, and the technical review of proposals and ongoing conservation activities.

The population and habitat data collected from monitoring programs have provided vital feedback on the management of southern leatherside conservation actions. Monitoring population trends allows the Conservation Team to assess the effectiveness of their management actions. This method of adaptive management incorporates flexibility into conservation actions. The results of the Team's management actions are measured through monitoring population trends. Annual monitoring of southern leatherside populations is the primary method to provide feedback to the Conservation Team and is the only method we have to measure and demonstrate the achievements of the Agreement and Strategy.

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