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

CONSERVATION AGREEMENT AND STRATEGY FOR COLUMBIA SPOTTED FROG (*RANA LUTEIVENTRIS*) IN THE STATE OF UTAH

Publication Number 06-01
Utah Division of Wildlife Resources
1594 W. North Temple
Salt Lake City, Utah
James F. Karpowitz, Director

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CONSERVATION AGREEMENT AND STRATEGY FOR COLUMBIA SPOTTED FROG (*RANA LUTIEVENTRIS*) *IN THE STATE OF UTAH*

Prepared by:

Carmen L. Bailey
Kristine W. Wilson
Matthew E. Andersen

Publication Number 06-01

Utah Division of Wildlife Resources
1594 W. North Temple
Salt Lake City, Utah
James F. Karpowitz, Director

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Cover: photograph by Krissy Wilson

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DEFINITIONS and ABBREVIATIONS

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

BLM – The USDI Bureau of Land Management.

BOR – The USDI Bureau of Reclamation.

CSFCT – Columbia Spotted Frog Conservation Team or Team is the technical team comprised of representatives from each signatory to the Agreement.

Division – The Utah Division of Wildlife Resources.

Geographic Management Unit (GMU) - A distinct area, primarily within Utah, defined by the historic Columbia spotted frog range and hydrologic and geographic boundaries.

Historic Range - The area that Columbia spotted frog is perceived to have inhabited at the time of modern exploration and settlement of Utah (approximately 1850).

Introduction - Release of wild or cultured Columbia spotted frog into unoccupied and secure sites for aiding conservation.

CSFCAS – The Columbia Spotted Frog Conservation Agreement and Strategy.

Nonnative - A species that historically did not occur in a specific area or habitat and that is now present usually as a result of human actions.

Reintroduction - Release of wild or cultured Columbia spotted frog into historically occupied sites for the purpose of reestablishing populations. Also referred to as "repatriation" by the Service.

Service – The USDI Fish and Wildlife Service.

Threat - Any action or activity, past or present, that currently or in the future may prevent the continued existence of Columbia spotted frog. Conditions such as pollution and the presence of nonnatives may also constitute threats.

Transplant/Translocate - Removal of Columbia spotted frog individuals from a naturally occurring population and subsequent release of these individuals into other waters for the purposes of establishing new or augmenting populations. Often conducted to provide additional security to guard against continued losses.

Mitigation Commission – The Utah Reclamation Mitigation and Conservation Commission

CONSERVATION AGREEMENT

FOR

COLUMBIA SPOTTED FROG

(*RANA LUTEIVENTRIS*)

BACKGROUND

This Conservation Agreement (Agreement) has been developed to expedite implementation of conservation measures for Columbia spotted frog (*Rana luteiventris*) in Utah as a collaborative and cooperative effort among resource agencies. Threats that warrant Columbia spotted frog listing as a sensitive species by state and federal agencies and as threatened or endangered under the Endangered Species Act of 1973, as amended (ESA), should be significantly reduced or eliminated through implementation of this Agreement and the accompanying Conservation Strategy (Strategy).

Goal:

Ensure the long-term persistence of Columbia spotted frog within its historic range and support development of statewide conservation efforts.

Objectives:

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

Objective 1 – Eliminate or significantly reduce threats to Columbia spotted frog and its habitat.
Objective 2 – Maintain existing self-sustaining populations and their habitat.
Objective 3 – Restore populations at selected localities within the historic range.
Objective 4 – Increase the size of selected populations.
Objective 5 – Maintain genetic diversity.
Objective 6 – Develop and implement an adaptive management framework by incorporating new information annually into conservation planning efforts.
Objective 7 – 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 Columbia spotted frog will be evaluated annually to assess program progress to ensure program effectiveness.

I. OTHER SPECIES INVOLVED

The primary focus of this agreement is the conservation of Columbia spotted frog and enhancement of the ecosystems upon which they depend; however, other species occurring within or adjacent to spotted frog habitat may also benefit. Some of these species include least

chub (*Ioticthys phlegethontis*), California floater (*Anodota californiensis*) and Utes ladies'-tresses (*Spiranthes diluvialis*). By emphasizing the conservation of habitats and ecosystems where Columbia spotted frog 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

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

United States Department of the Interior
Fish and Wildlife Service
P.O. Box 25486
Denver, Colorado 80225

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

Bureau of Reclamation
Upper Colorado Region
125 South State Street, RM 6107
Salt Lake City, Utah 84138-1102

United States Department of Agriculture
Forest Service, Wasatch-Cache National Forest
Administrative Offices
125 South State Street
Salt Lake City, UT 84138

Utah Reclamation Mitigation and Conservation Commission
102 W. 500 S. Suite 315
Salt Lake City, Utah 84101

Confederated Tribes of the Goshute Reservation
P.O. Box 6104
Ibapah, Utah 84034

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

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

While the Utah Field Office, Region 6 of the US Fish and Wildlife Service (Service) maintains the Federal lead in the recovery efforts for the Columbia spotted frog in Utah, the Columbia spotted frog distribution is not limited to Utah. Additional populations of spotted frog exist in Washington, Oregon, California, Idaho, Montana, Nevada, Wyoming, Alaska and British Columbia (Stebbins 2003). Signatories to this Agreement will cooperate with management agencies in other states where Columbia spotted frog occurs whenever necessary and prudent.

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 that cannot be delegated, particularly with respect to the management and conservation of wildlife, its habitat and the management, development and allocation of water resources. 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 SPOTTED FROG

In 1989, the Service was petitioned to list the Columbia spotted frog (referred to as *Rana pretiosa;* now recognized as *Rana luteiventris;* Green et al. 1996) under the Endangered Species Act (Federal Register 54(1989):42529). The Service ruled on April 23, 1993 that the listing of Columbia spotted frog was warranted as a priority 3 for the Wasatch Front populations and a priority 6 for the West Desert populations, but precluded due to higher priorities (Federal Register 58(87):27260). The major impetus behind the proposed listing was the reduction in distribution associated with impacts from urban and water developments and the introduction of nonnative species in Utah. On September 19, 1997 the Service maintained the same status for Columbia spotted frog, however, they updated the common and scientific name of the Utah populations (Federal Register 62(182):49401). The Service now refers to the frog as the Columbia spotted frog (*Rana luteiventris*). The state of Utah classifies Columbia spotted frog as a Conservation Species (Division 2005).

An interagency Conservation Agreement was developed and finalized in January 1998 (Perkins et. al. 1998) to ensure the long-term conservation of the Columbia spotted frog within its historical range. The Columbia spotted frog was removed as a candidate for listing in October 1999 following implementation of conservation activities and studies conducted pursuant with the Conservation Agreement. In June 1999, petitioners filed a complaint against the Service challenging the "not warranted" finding as a violation of the Endangered Species Act and the Administrative Procedure Act. A settlement was reached in August 2001 with the stipulation that the Service remand for reconsideration the 1999 "not warranted" finding and start a new status review and 12 month finding on the Wasatch Front population. The Service status review of the Wasatch Front Columbia Spotted Frog was completed in August 2002 (USFWS) and concluded that the Wasatch Front populations were not warranted for listing.

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 22):

1. The present or threatened destruction, modification, or curtailment of its habitat or range
2. Disease, predation, competition and hybridization
3. Over utilization 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:

A. Habitat Enhancement - Enhance and/or restore habitat conditions in designated areas throughout the historic range of Columbia spotted frog.

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

C. Restore Hydrologic Conditions - Maintain, restore and/or augment where possible natural hydrologic characteristics and water quality.

D. Nonnative Control - Selectively control nonnative species that negatively impact Columbia spotted frog via predation and/or competition.

E. Range Expansion - Conduct surveys, life history and genetic studies to determine habitat requirements for translocation of Columbia spotted frog into historic areas.

F. Monitoring - Monitoring goals seeks to detect changes in population distribution over time.

G. Mitigation - Develop site/action specific mitigation for proposed development activities as needed.

H. Regulation - Maintain and enforce Utah Wildlife Code regulations that prohibit the collection, possession, and transportation of Columbia spotted frog.

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 Columbia spotted frog.

VI. CONSERVATION SCHEDULE AND ASSESSMENT

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

Coordinating Conservation Activities

The Columbia Spotted Frog Conservation Team (CSFCT) will consist of a designated representative from signatories to this Agreement and may include technical and legal advisors and other members as deemed necessary by the signatories.

Since the areas of concern covered by this Agreement are located in Utah and the State of Utah presently has primary jurisdiction over Columbia spotted frog within the State, the designated CSFCT leader will be a Division of Wildlife Resources (Division) representative.

Authority of CSFCT shall be limited to making recommendations for the conservation of the Columbia spotted frog. These recommendations will be implemented by Team members subject to review by the Division Director for ecosystem conflict and/or opportunities for ecosystem-level or multi-species collaborative conservation. The Director will provide copies of comments, recommendations, and actions to the signatories and to other interested parties upon request.

The CSFCT will meet annually to review yearly conservation schedules and budgets, and help develop funding as necessary.

The CSFCT will meet at least semiannually to receive reports on progress and effectiveness of the Strategy implementation.

CSFCT meetings will be open to interested parties. Minutes of the meetings and progress reports will be distributed to the CSFCT, technical advisors and to other interested parties, upon request, by the CSFCT leader.

The CSFCT shall operate by consensus of the signatories when determining management recommendations concerning Columbia spotted frog protection and conservation. If consensus is not achieved, signatory parties with opposing views will present their positions to the Director of the Division of Wildlife Resources for resolution and determination of how to proceed. The Director shall notify all signatories of the inability to achieve consensus and of his determination.

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

Implementing Conservation Schedule

As leader of the CSFCT, the Division will coordinate conservation activities and monitor

conservation actions conducted by participants of this Agreement to determine if all actions are in accordance with the Strategy and annual schedule.

Conservation actions will be scheduled and reviewed on an annual basis by the signatories.

Funding Conservation Actions

Commitments to carry out current and future actions identified in this Agreement and Strategy will be funded by a variety of sources. In 1992, Congress signed the Central Utah Project Completion Act. Under this act, funding was authorized for surveys of sensitive plant and animal species in Utah and mitigation for federal reclamation projects that impacted Utah fish, wildlife, and recreation resources. These federal funds are administered by the Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission). In 1997, the Utah State legislature passed a bill that established the Endangered Species Mitigation Fund (ESMF) thereby making money available on a competitive basis to benefit listed species and species of special concern. The Division has been effectively competing for ESMF funding which has been used as the state match to the federal State Wildlife Grants. Federal, state and local sources will provide or secure funding to initiate procedures of the Agreement and Strategy. Some funding sources include the following:

- Federal sources include, but are not limited to: the United States Forest Service, Fish and Wildlife Service, Bureau of Land Management, Utah Reclamation Mitigation and Conservation Commission, Bureau of Reclamation, Central Utah Project Completion Act, Land and Water Conservation funds, Natural Resource Conservation Service, and State Wildlife Grants.

- State funding sources include, but are not limited to: direct appropriation of funds by the legislature, the Endangered Species Mitigation Fund, Community Impact Boards, Water Resources Revolving funds, State Department of Agriculture, and State Resource Management Agencies.

- Local sources of funding may be provided by water districts, Native American affiliations, cities and towns, counties, local irrigation companies, and other supporting appropriations and may be limited due to funding availability.

In-kind contributions in the form of personnel, field equipment, supplies etc., may be provided by participating agencies. In addition, each agency will have specific tasks, responsibilities and proposed actions/commitments related to their in-kind contributions.

It is projected that expansion of habitat and population actions will require the greatest expense during the first five years of the agreement.

It is understood that all funding commitments made under this Agreement are subject to approval by the appropriate local, state or federal authorities.

Conservation Progress Assessment

An annual assessment of conservation activities, accomplishments and subsequent yearly schedules will be made by the CSFCT. This assessment will be based on updates and evaluations by CSFCT members. This Assessment will determine the effectiveness of this agreement and whether revisions are warranted. It will be provided to the Division Director by the CSFCT. The Director will provide copies of this Assessment to the signatories of this document.

If threats to the survival of the Columbia spotted frog become known that are not or cannot be resolved through this or any Conservation Agreement, the Division will immediately 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 actions implemented for the species will be conducted by the CSFCT. If all signatories agree that sufficient progress has been made towards the conservation and recovery of the Columbia spotted frog, 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 (NEPA) COMPLIANCE

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

Green, D.M., T.F. Sharbel, J. Kearsley, and H. Kaiser. 1996. Postglacial range fluctuation, genetic subdivision and speciation in the western North American Spotted frog complex, *Rana pretiosa*. *Evolution* 50:374-390.

Perkins, J. M. and L. D. Lentsch. 1998. Conservation Strategy for Spotted Frog. Publication number 98-24, Utah Division of Wildlife Resources. Salt Lake City, Utah.

Stebbins, R. C. 2003. *A Field Guide to Western Reptiles and Amphibians*, 3rd Ed. Houghton Mifflin Company, Boston, Massachusetts.

U.S. Fish and Wildlife Service. 2002. Status Review for the Columbia Spotted Frog (*Rana luteiventris*) on the Wasatch Front, Utah . United States Department of the Interior, U.S. Fish and Wildlife Service, Region 6, Denver, Colorado. August.

XI. SIGNATORIES

The following pages include separate agreement pages for each signatory

UTAH DIVISION OF WILDLIFE RESOURCES
COLUMBIA SPOTTED FROG
CONSERVATION AGREEMENT

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

1. To assume lead responsibility for the Columbia Spotted Frog 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 Columbia spotted frog populations in the State of Utah and to annually compile and report inventory and monitoring information and provide such information to all participating agencies and parties.

3. To make recommendations to the U.S. Army Corps of Engineers regarding the issuance of 404 permits for any land development proposals that would negatively impact key Columbia spotted frog 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 Columbia spotted frog habitat.

4. To implement and enforce specific State statutes and Wildlife Codes (Wildlife Resources Code of Utah) that protect and prohibit the collection and/or importation of threatened, endangered and special concern species, including Columbia spotted frog.

5. To continue to conduct and support research to collect information on biotic and abiotic limiting factors of Columbia spotted frog populations, habitat and ecology and to cooperate with the Team partners to reduce or eliminate these 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 Columbia spotted frog conservation beyond those described in this Agreement and Strategy. Significant management actions will be coordinated with the Columbia Spotted Frog Conservation Team.

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 Columbia Spotted Frog Conservation Team. Either the Division or the Columbia Spotted Frog 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 Columbia spotted frog conservation agreement attached hereto.

James F. Karpowitz — 8/4/06

James F. Karpowitz, Director — Date
Utah Division of Wildlife Resources

U.S. BUREAU OF RECLAMATION
COLUMBIA SPOTTED FROG
CONSERVATION AGREEMENT

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

1. To provide a representative to the Columbia Spotted Frog 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 Columbia Spotted Frog 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 Columbia spotted frog 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 Columbia spotted frog conservation beyond those described in this Agreement and Strategy. Significant management actions will be coordinated with the Columbia Spotted Frog Conservation Team.

This Agreement shall become effective on the date of signature by Reclamation, 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 Columbia Spotted Frog Conservation Team. Either Reclamation or the Columbia Spotted Frog 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 Columbia spotted frog conservation agreement attached hereto.

Bruce Barrett, Area Manager, Provo Area Office
ACTING FOR
Bureau of Reclamation, USDI

6-29-06
Date

US FOREST SERVICE
COLUMBIA SPOTTED FROG
CONSERVATION AGREEMENT

The U.S.D.A. Forest Service (USFS), Wasatch-Cache National Forest, hereby states its intent and commitment to assist with and participate in the implementation of the Columbia Spotted Frog Conservation Agreement and Strategy for the management and recovery of the Columbia spotted frog populations in Utah as prepared by the interagency Columbia Spotted Frog Conservation Team. Specific commitments made hereby are as follows:

1. To provide a representative to the Columbia Spotted Frog 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 Columbia Spotted Frog Conservation Team and the Utah Division of Wildlife Resources to conduct surveys for Columbia spotted frog in historic and suitable habitats on the Wasatch-Cache National Forest, and to assist with the monitoring of any breeding populations of Columbia spotted frog, which may be found on the Wasatch-Cache National Forest.

3. To consider possible impacts of forest management decisions and plans on Columbia spotted frog and their habitat, and to take measures to avoid and/or mitigate such impacts whenever possible within constraints of the Forest Service policy and regulations. The Forest Service Manual requires that a "Biological Evaluation" be prepared for each proposed Forest Service Program or activity to ensure that Forest Service actions do not contribute to loss of viability of Sensitive Species (including Columbia spotted frog) and ensure that activities do not cause these species to move toward federal listing.

Performance of all activities described above is contingent on adequate funds being made available and allocated to the USFS. This agreement shall not prohibit the USFS from engaging in management actions regarding Columbia spotted frog conservation beyond those described in this Agreement and Strategy. Significant management actions will be coordinated with the Columbia Spotted Frog 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 Columbia Spotted Frog Conservation Team. Either the USFS or the Columbia Spotted Frog Conservation Team may terminate the Agreement by providing 90 days written notification to the other party.

By signing this document below, the Forest Service acknowledges that it is also signing as a party and participant to the whole of the Columbia spotted frog conservation agreement attached hereto.

Faye Kruger, Forest Supervisor
USDA Forest Service, Wasatch-Cache National Forest

June 27, 2006
Date

US BUREAU OF LAND MANAGEMENT
COLUMBIA SPOTTED FROG
CONSERVATION AGREEMENT

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

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

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

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

4. To maintain and improve habitat and populations of the spotted frog through adaptive management and mitigation on BLM lands. Authority for the protection of the spotted frog 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 Columbia spotted frog conservation beyond those described in this Agreement and Strategy. Significant management actions will be coordinated with the Columbia Spotted Frog Conservation Team.

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 part or in whole, or the Agreement is terminated by consent of the Columbia Spotted Frog Conservation Team. Either the BLM or the Columbia Spotted Frog Recovery 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 Columbia spotted frog conservation agreement attached hereto.

Henri R. Bisson, ActingUtah State Director
USDI. Bureau of Land Management

2/27/06
Date

UTAH RECLAMATION MITIGATION AND CONSERVATION COMMISSION
COLUMBIA SPOTTED FROG
CONSERVATION AGREEMENT

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 Columbia Spotted Frog Conservation Agreement and Strategy as prepared by the interagency Spotted Frog Conservation Team. Specific commitments made are as follows:

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

2. To incorporate Columbia spotted frog conservation actions into the appropriate Mitigation Commission programs, as described in the Mitigation Commission's current Mitigation and Conservation Plan.

3. To protect Columbia spotted frog populations and suitable spotted frog habitat located on Mitigation Commission owned lands through appropriate management plans.

Performance of the activities outlined above is contingent on adequate funds being made available and allocated to the Mitigation Commission. This agreement shall not prohibit the Mitigation Commission from engaging in management actions regarding Columbia spotted frog conservation beyond those described in this Agreement and Strategy. Significant management actions will be coordinated with the Columbia Spotted Frog 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 chooses to withdraw from the Agreement in part or in whole, or the Agreement is terminated by consent of the Columbia Spotted Frog Conservation Team. Either the Mitigation Commission or the Columbia Spotted Frog Conservation Team may terminate the Agreement by providing 90 days written notification to the other party.

By signing this document below, the Mitigation Commission acknowledges that it is also signing as a party and participant to the whole of the Columbia spotted frog conservation agreement attached hereto.

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

6/28/06
Date

US FISH AND WILDLIFE SERVICE

COLUMBIA SPOTTED FROG CONSERVATION AGREEMENT

The U.S. Fish & Wildlife Service in Region 6 (Service) hereby states its intent and commitment to assist with and participate in the implementation of the Columbia spotted frog Conservation Agreement and Strategy, as prepared by the interagency Columbia Spotted Frog Conservation Team. Specific commitments made hereby are as follows:

1. To provide funding opportunities through the ESA Section 6 process to the Conservation Team and/or involved states for implementation of the Agreement, as allowed by applicable law.

2. To provide a representative to the interagency Columbia spotted frog Conservation Team.

3. To review and provide comments for any Federal projects that may impact the Columbia spotted frog, under authority of the Fish & Wildlife Coordination Act, including (1) projects requiring a Clean Water Act section 404 permit issued by the U.S. Army Corps of Engineers, (2) water development projects created by the Bureau of Reclamation and (3) private water development projects regulated under the Federal Energy Regulatory Commission.

4. Coordinate and assist other Federal agencies to protect Columbia spotted frog from land and water altering activities that may impact Service lands that may harbor Columbia spotted frog.

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 signatory agency from engaging in management actions regarding Columbia spotted frog conservation beyond those described in this Agreement and in the Strategy. Significant management actions will be coordinated with the Columbia spotted frog Conservation Team.

This Agreement shall become effective on the date of signature by the participating party, and shall remain in effect until the signatory party to withdraw from the Agreement in whole or in part, or the Agreement is terminated by consent of the Columbia Spotted Frog Conservation Team. Either the signatory party of the Columbia spotted frog Technical 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 Columbia spotted frog conservation agreement attached hereto.

for Mitch King, Regional Director
U.S. Fish & Wildlife Service, Region 6

7-25-06
Date

UTAH CENTRAL WATER CONSERVANCY DISTRICT
COLUMBIA SPOTTED FROG CONSERVATION AGREEMENT

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

1. To provide a representative to the interagency Columbia Spotted Frog 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 Columbia spotted frog 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 signatory agency. This Agreement shall not prohibit the signatory agency from engaging in management actions regarding Columbia spotted frog conservation beyond those described in this Agreement and in the Strategy. Significant management actions will be coordinated with the Columbia Spotted Frog Technical 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 the signatory party to withdraw from the Agreement in whole or in part, or the Agreement is terminated by consent of the Columbia Spotted Frog Conservation Team. Either the signatory party of the Columbia Spotted Frog Technical 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.

Terry J. Hickman — 27 June 2006

Terry J. Hickman
Central Utah Water Conservancy District

Date

CONFEDERATED TRIBES OF THE GOSHUTE RESERVATION
COLUMBIA SPOTTED FROG
CONSERVATION AGREEMENT

The Confederated Tribes of the Goshute Reservation herby states its intent and commitment to assist with and participate in the implementation of the Columbia Spotted Frog Conservation Agreement and Strategy as prepared by the interagency Columbia spotted frog Conservation Team. Specific commitments made hereby are as follows:

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

2. To conduct a review of Tribal lands in Utah which may occur within the historic range of the Columbia spotted frog, and determine if any such lands contain suitable habitat for Columbia spotted frog.

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

4. To maintain and improve habitat and populations of the Columbia spotted frog through adaptive management and mitigation on Tribal lands.

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

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

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

Chairman

11/02/05
Date

CONSERVATION STRATEGY

FOR

COLUMBIA SPOTTED FROG

(*Rana luteiventris*)

INTRODUCTION

The purpose of the Columbia spotted frog Conservation Strategy (Strategy) is to describe specific actions and approaches required to expedite implementation of conservation measures for the Columbia spotted frog (*Rana luteiventris*). These actions will be implemented by the Columbia Spotted Frog Conservation Team, which is comprised of representatives from each signatory to the Columbia Spotted Frog Conservation Agreement (Agreement). The goal of these actions is to ensure the long-term persistence of Columbia spotted frog within its historic range. The following document begins with a summary of current knowledge of Columbia spotted frog life history including population distributions, taxonomy, species descriptions, legal status, and ongoing threats to Columbia spotted frog. The subsequent sections describe conservation elements, which are specific management actions that will be implemented to reduce threats and expand Columbia spotted frog populations. The populations have been divided into separate Geographic Management Units (GMU) along hydrologic drainages. Threats and conservation actions have been prioritized within each GMU in Utah. Lastly, the methodology of adaptive management and Strategy implementation is explained.

LEGAL STATUS

In 1989, the U. S. Fish and Wildlife Service (Service) was petitioned to list the spotted frog (referred to as *Rana pretiosa*) under the Endangered Species Act (Federal Register 54(1989):42529). The Service ruled on April 23, 1993 that the listing of spotted frog was warranted as a priority 3 for the Wasatch Front populations and a priority 6 for the West Desert populations, but precluded due to higher priorities (Federal Register 58(87):27260). One of the main concerns behind the petition was the reduction in distribution associated with impacts from urban and water developments and the introduction of nonnative species in Utah. On September 19, 1997 (Federal Register 62 (182):49401, the Service maintained the same status for spotted frog, however, they updated the common and scientific name of the Utah populations. The Service now refers to the spotted frog in Utah as the Columbia spotted frog (*Rana luteiventris*).

An interagency Conservation Agreement was developed and finalized in January 1998 to ensure the long-term conservation of the Columbia spotted frog within its historical range. The Columbia spotted frog was removed as a candidate for listing in October 1999 subsequent to the various conservation activities and studies conducted pursuant with the Conservation Agreement.

In June 1999, petitioners filed a complaint against the Service challenging the "not warranted" findings as a violation of the Endangered Species Act and the Administrative Procedure Act. A settlement was reached in August 2001 with the stipulation that the Service remand for reconsideration of the 1999 "not warranted" finding and start a new status review and 12 month finding on the Wasatch Front population. The Service status review of the Wasatch Front Columbia Spotted Frog was completed in August 2002 (USFWS) and concluded that the Wasatch Front populations were not warranted for listing as candidate status.

The purpose of this document is to describe specific actions and strategies required to expedite implementation of conservation measures for Columbia spotted frog as a cooperative effort among resource agencies in Utah. The goal of these actions is to ensure the long-term conservation of this species within its historic range in Utah. Though the primary focus of this Strategy is conservation and enhancement of spotted frog, it may also reduce or eliminate threats and improve habitat for other associated species that would require the need for Federal protection pursuant to the Endangered Species Act of 1973, as amended (ESA).

SPECIES DESCRIPTION

Columbia spotted frogs belong to the anuran family of "true frogs", Ranidae. Twenty-three species of ranids occur in the United States of which only four are native to Utah, the northern leopard frog, *Rana pipiens*, the relict leopard frog, *Rana onca*, the lowland leopard frog, *Rana yavapaiensis*, and the Columbia spotted frog (Fig. 1). The green frog (*Rana clamitans*), and the bull frog, (*Rana catesbeiana*) also occur in Utah, however, these species do not naturally occur west of the Rockies and have been introduced into many areas throughout the West.

Ranids are typically characterized as slim-wasted, long-legged, smooth-skinned jumpers with webbed hind feet with a pair of dorsolateral folds (glandular folds) that extend from behind the eyes to the lower back. In Utah, adult spotted frogs range from 40 mm to 100 mm (Tanner 1931) and average between 45 mm and 80 mm (Ross et al. 1993, 1994) in snout vent length (SVL). Color and pattern descriptions of individuals from Utah include a brownish-black dorsal coloration with little or no spotting pattern. They differ from spotted frogs in the Pacific Northwest that possess numerous dorsal spots (Nussbaum et al. 1983, Stebbins 2003). Spotted frogs along the Wasatch Front generally possess a salmon color ventrally and yellow to yellow-orange coloration ventrally in the West Desert and Sanpete County, however coloration can be quite variable between populations in Utah. The throat and the ventral region are sometimes mottled. The head has a dark mask with a light stripe on the upper jaw and the eyes are turned slightly upward. The dorsolateral fold is usually present in spotted frogs, however may be absent in some individuals. Male frogs have swollen thumbs with darkened bases.

Figure 1. Columbia spotted frog in Miller Spring, Juab County, Utah. (*Photo by R. Fridell)*

The Columbia spotted frog is similar to and often mistaken for the leopard frog. Specific characteristics which distinguish the spotted frog from the sympatric leopard frog include: rougher skin, shorter limbs (the heel of the hind limb when adpressed seldom reaches the nostrils), larger webs between the toes, smaller tympanum, and the smooth round eyes which are turned slightly upward. Other distinguishing characteristics of the leopard frog are very large conspicuous spots and a mostly white ventral surface compared to the pigmented ventral surfaces of the spotted frog.

SYSTEMATICS AND TAXONOMY

The systematic and taxonomic relationship of spotted frog occurring in Utah to other spotted frog has been described in several manners. Originally, two subspecies of *Rana pretiosa* were described for populations occurring within Utah (Thompson 1913, Wright and Wright 1949). These two subspecies, *R. p. pretiosa* and *R. p. luteiventris*, were described based on pigmentation characteristics of frogs collected from the Wasatch Front and the West Desert populations. As additional specimens were examined, variability of characteristics within and between populations was described (Morris and Tanner 1969). Recent studies have provided additional information on the taxonomic relationships of the Utah populations to other poulations in the Intermountain west (Green et al. 1996 and Green et al. 1997). Green et al. (1997) speculated, based on biochemical and morphological data, that spotted frog should be taxonomically described as two groups at the species level: Oregon Spotted Frog (*Rana pretiosa*), and Columbia Spotted Frog (*Rana luteiventris*). They suggested that all spotted frog populations occurring within Utah were *Rana luteiventris*. Currently, the Utah populations are referred to as the Columbia spotted frog.

To best manage populations of spotted frog it is necessary to have a good understanding of within and among-population genetic structure. Quantification of within-population genetic variation will determine whether or not the populations have undergone severe reductions in population size (historically or recently) and may therefore be prone to the effects of inbreeding depression. Due to the large geographic distance between the West Desert and the Wasatch Front, it is unlikely that any gene flow is occurring between these two basins. Therefore, quantification of among-population genetic variation will lend insight into the level of migration (gene flow) occurring among populations within and possibly among regions (e.g. the West Desert). Interpretation of genetic variation will be more appropriately applied to determining whether or not there has been sufficient time for divergence and/or if these regions were potentially founded by different dispersal routes. Both within and among-population genetic analysis will help to 1) determine appropriate management units for spotted frog and 2) aid in the determination of potential sources for broodstock or translocation should the need arise.

ECOLOGY AND LIFE HISTORY

The spotted frog tends to be more of an aquatic specialist than most ranids. The majority of sightings and captures of this species have occurred while the frogs were submersed in water. Spotted frog typically inhabit a variety of habitat types including cold water ponds, streams, lakes, and springs adjacent to mixed coniferous and subalpine forest, grassland and brush land (Morris and Tanner 1969, Stebbins 2003). In Utah, it is usually found in semipermanent ponds (Welch and MacMahon 2005) with cool, clear spring-fed water and organic substrates (Dumas

1966, Morris and Tanner 1969). Habitat usually consists of a small spring, pond or slough with a variety of herbaceous emergent, floating, and submergent vegetation. Vegetation most commonly associated with least chub includes: bullrush (*Scirpus* sp.), sedges (*Carex* spp.), cattails (*Typha* sp.), duckweed (Lemnaceae), rushes (*Juncus* spp.), watercress (*Nasturtium officinale*), grasses (Graminae) and algae. Additional species of vegetation found associated with the Snake Valley populations include saltgrass (*Distichilis spicata*), elodea (*Elodia* sp.), pondweed (*Xanthium spinosum* and *X. strumarium*), giant reed (*Phragmites*) and sandbar willow (*Salix* sp.) (Ross et al., 1994). Morris and Tanner (1969) suggest that deep silt or muck bottoms are required for hibernation and torpor. The occurrence of spotted frog populations in the West Desert is ecologically intriguing because this highly aquatic ranid frog has life history traits that enable them to survive in isolated springs of high salinity and temperature (Hovingh 1993).

Spotted frogs emerge from hibernation in the spring and tend to utilize different habitats depending on their needs. For example, in Yellowstone National Park, sexually immature individuals tended to inhabit aquatic habitats away from breeding adults until the summer when first, second, and third year male and female age-classes and females in the fourth year move back to or near the area from which they emerged from hibernation (Turner 1958). Breeding adults use areas in the absence of the other age-classes and move to sites near the younger frogs as the water begins receding from the breeding area (Turner 1958). Often, adult frogs disappear after breeding, perhaps burrowing into the substrate. Turner (1960) suggested that spotted frogs utilize small home ranges. In Yellowstone National Park, frogs were recaptured at or near the same location used for breeding. Turner (1960) also indicated that emigration and immigration between populations may be closely balanced over the long term, although this aspect was not well documented or studied. It is unclear what spotted frogs do and where they are outside of the breeding season in Utah. Habitat use and movement studies were initiated in 1997. Preliminary results indicate that spotted frog in Utah do not move great distances and remain in or near the breeding areas (Ammon and Wilson 2000; Wilson et. al. 2004). Intensive mark-recapture and/or radiotelemetry studies are required in order to determine actual movement patterns in the Utah populations.

Breeding occurs early with the spring thaw and although spotted frog are known to use temporary bodies of water for breeding in more mesic parts of their range (Turner 1960, Licht 1971), in Utah, breeding sites are predominantly associated with a spring or some other permanent water source (Morris and Tanner 1969, Hovingh 1993, Ross et al. 1993, Ross et al. 1994, Welch and MacMahon 2005). In the West Desert, spotted frog begin breeding in early-March and continue to the middle of April (Hovingh 1993). Wasatch Front populations begin breeding in early-March as well; however, breeding populations at higher elevations tend to begin breeding toward the end of March and continue through the end of April. This has also been noted in other populations of spotted frog in British Columbia (Licht 1975) and Wyoming (Yellowstone National Park) (Turner 1958) and is attributed to temperature differences. One male usually begins vocalizing, stimulating the other males to call simultaneously. The vocalization is described as a "clicking" noise (Morris and Tanner 1969), but may also be described as a soft "bubbling" sound. Calls consist of 5-50 clicks per call and last about 1-10 seconds (Stebbins 2003).

Egg deposition is stimulated by a single pair of frogs followed by other spotted frogs depositing eggs in the same area. It has been reported that they will also deposit eggs in the same area

annually (Morris and Tanner 1969, Nussbaum et al. 1983). Individual females may oviposit more than one clutch of eggs annually (Morris and Tanner 1969); however, this has not been confirmed in Utah populations. Sex ratios have not been quantified in Utah. For population estimates derived from monitoring information for the 1991-1993 surveys; however, Division used estimates of 1:1 sex ratios (Ross et al. 1993, Ross et al. 1994).

Egg masses tend to be deposited in open, shallow (<20 cm) areas and within 2 m of the shoreline with water temperatures ranging between 11°C and 20°C (Ross et al., 1993, 1994). Studies in the Heber Valley reported a tendency for deposition to occur in the northwestern portion of wetland ponds (Ammon and Wilson 2000). Egg masses are weakly adhesive and form an irregular mass or globular cluster approximately 7.5 to 20 cm in diameter. The egg mass may become weakly attached to vegetation (*Chara* spp.) for a short period of time and float to the surface, exposing the top layer of eggs. Wind and water currents often move masses around and they may begin to break up. Eventually the egg masses may become separated and covered with debris. Number of eggs per egg mass are quite variable, ranging from 147 to 1160 eggs (Toone 1991). Individual eggs are typically larger than other ranids and can have one or two envelops. Hatching rate varies directly with water temperature (Toone 1991).

DISTRIBUTION

The overall distribution of spotted frog is continuous from southeastern Alaska and western Alberta, to the Pacific coast in Washington and Oregon. Its southern extent ranges into Nevada and Utah where populations are isolated and highly fragmented (Tanner 1931, Tanner 1978, Linsdale 1940, Banta 1965, Turner and Dumas 1972, Hovingh 1993, Ross et al. 1993, Ross et al. 1994). Postglacial climatic shifts naturally distributed spotted frog populations amongst drainage areas in Utah. These populations represent the southern extent of the species (Stebbins 1985).
The Bonneville Basin within Utah encompasses the area that was covered by ancient Lake Bonneville and which, today, lies within the Great Basin province. The entire Great Basin province is distinguished geologically by its characteristically parallel north-south mountain ranges that are separated by broad, alluviated desert basins (Christiansen 1951) and valleys. The steep, gravelly slopes of these ranges are prominently marked by benches and other shore features of Lake Bonneville. Numerous springs are present at the base of the mountains (Bick 1966) and in the valley floors. Several aquatic species have maintained an existence as relict populations in these springs, including spotted frog, least chub, and several species of mollusks (Hovingh 1993). Populations of these species are, however, rare and in some areas declining. The rapid deterioration of these aquatic environments, primarily from agricultural practices, has caused other unique Bonneville Basin species, such as *Rhinichthys osculus relictus* , a subspecies of speckled dace, to become extinct (Hubbs et al. 1974).

Very little information is available, particularly, quantitative information, on the historic occurrence of spotted frog in Utah. Information that is available is limited to intermittent museum collection records and anecdotal information (Toone 1991), and surveys conducted in the mid 1900's (Tanner 1931, Turner 1960). Based on this information, spotted frog along the Wasatch Front are thought to have historically occurred in the Spanish Fork River, Utah Lake, Provo River, Jordan River, and Upper Weber River Drainages (Table 1). During 1991 and 1992, all historically known locations, as well as other suitable wetlands within its historic range, were surveyed for the occurrence of spotted frog (Ross et. al, 1993). Results of this survey indicated

that the distribution of spotted frog along the Wasatch Front had declined (Figure 2). Spotted frogs were not found in the Jordan River or the Lower Weber River drainages. Populations were still occuring in the San Pitch River, Spanish Fork River, Utah Lake, and Provo River.

Spotted frogs have been recorded to occur historically in the West Desert in the Tule Valley, Snake Valley, and Ibapah Valley drainages. Surveys in the West Desert indicate that Columbia spotted frog distribution has remained relatively stable (Toone 1991, Cuellar 1992, Hovingh 1993, Ross et al. 1994).

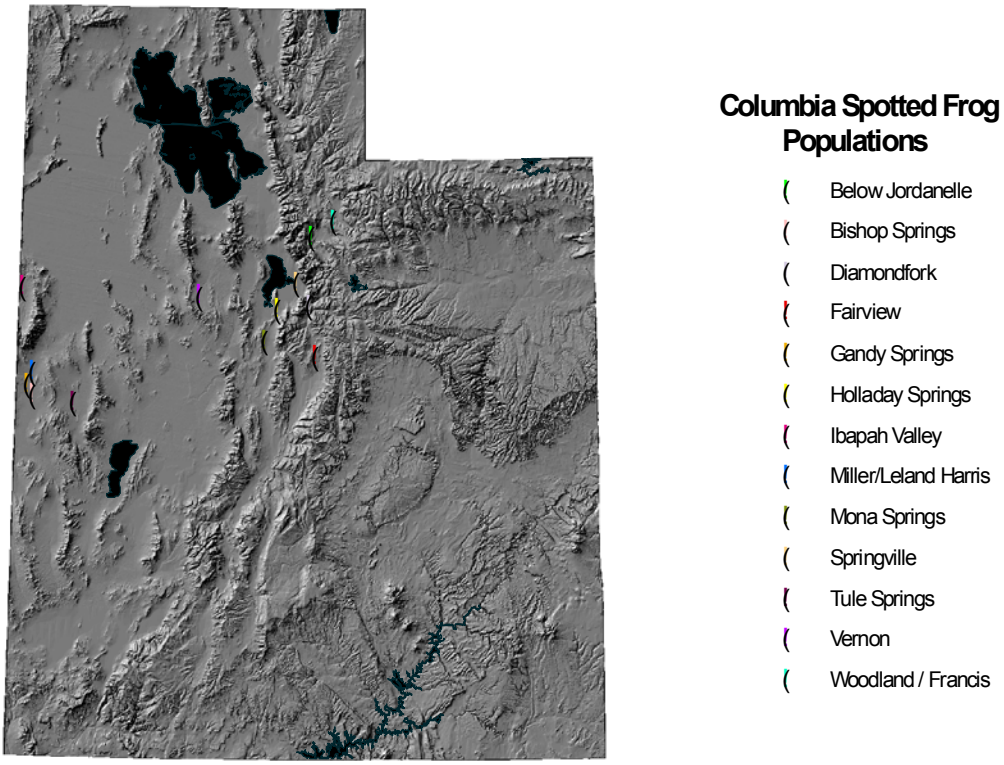

Figure 2. Current distribution of Columbia spotted frog populations in Utah.

Toone (1991) conducted an inventory in Snake Valley and Tule Valley, Cuellar (1992) completed a population study in Gandy Salt Marsh, and Hovingh (1993) studied spotted frog life history in Tule Valley. In 1993, Division conducted a comprehensive survey during the breeding season of all known and potential spotted frog habitat to assess spotted frog distribution, population, and habitat characteristics in the West Desert (Ross et al 1994). Areas surveyed consisted of saline mud flats, terminal lakes, and spring complexes in the Tule, Snake, and Ibapah Valley drainages. Columbia spotted frogs were found to occur in all historic localities in abundant numbers (Table 1, Figure 2). Specific areas where populations of spotted frog were found included: North and South Tule Spring, Willow Spring, Coyote Spring, the Tule turnoff to Tule Valley, the Leland Harris/Miller spring complex, Gandy Marsh, and the Bishop Spring complex in Snake Valley, and in the valley floor of Ibapah Valley.

Table 1: Summary of GMU subunits and spotted frog subunit occurrence and property ownership.

GMU	SUBUNIT	SUBUNIT CODE (USGS 1974)	HISTORIC OCCURRENCE	CURRENT OCCURRENCE	PROPERTY OWNERSHIP
Wasatch Front	Spanish Fork River	16020202	X		
	- Springville			X	UDWR
	- T-Bone Bottoms			X	Private
	- Diamond Fork			X	USFS/URMCC[2]
	- Holladay Springs			X	Private
	Utah Lake	16020201	X		
	- Burraston Ponds			X	Private
	- Mona Springs			X	URMCC
	Provo River	16020203	X		
	- Upper Provo/Above Jordanelle Reservoir			X	Private/Utah State Park/ USFS
	- Middle Provo/Heber Valley			X	URMCC/Private
	Jordan River	16020204	X		
	Upper Weber River	16020101	X		
	- Swaner Nature Preserve			X[1]	Private
	Lower Weber River	16020102	X		
Sevier River	San Pitch River	16030004	X		
	- Fairview			X	Private
	Middle Sevier River	16030003	X		
	Lower Sevier River	16030005	X		
West Desert	Tule Valley	16020303	X		
	- -Coyote Springs			X	BLM
	- Willow Springs			X	BLM
	- North Tule			X	BLM
	- South Tule			X	BLM
	Snake Valley	16020301	X		
	- Gandy Marsh			X	BLM
	- Leland Harris			X	Private/BLM
	- Miller Springs			X	Private
	- Bishop Springs/Twin Springs			X	Private/BLM/SITLA[3]
	Ibapah Valley	16020306	X	X	Private/Goshute
	West Great Salt Lake	16020308			
	North Great Salt Lake	16020309			
	Skull Valley	16020305			
	Tooele Valley	16020304			

[1]Experimental (established) population
[2]Utah Reclamation Mitigation and Conservation Commission
[3]School and Institutional Trust Lands Administration

PROBLEMS FACING THE SPECIES

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 spotted frog by federal and state agencies as well as the public. These threats were identified based on the criteria for Federal listing as required by Section 4(a)(1) of the ESA. The following discussion summarizes the significant threats to spotted frog that will be addressed by conservation actions described in this Strategy.

Present or Threatened Destruction, Modification, or Curtailment of its Habitat or Range (Habitat Loss)

Habitat loss and degradation have been indicated as major causes of the declines in spotted frog populations and distribution (Hovingh 1993, Ross et al, 1993). Loss of habitat due to water and urban development and agricultural practices has resulted in many small isolated populations. This increase in fragmentation has caused a loss in population connectivity that maintains the genetic integrity of spotted frog. This threat is particularly present along the Wasatch Front. Habitat degradation due to agricultural practices is also a major threat facing all populations in Utah. Although no studies have been conducted on the springs occupied by spotted frog, numerous other reports link livestock trampling and grazing with frog habitat degradation (water quality, vegetation type, habitat morphology etc.). The majority of occupied and unoccupied habitats are currently not protected against grazing practices, and those that are have only recently been protected with cattle exclosures.

Other habitat alterations also threaten spotted frog populations such as water development activities (e.g. irrigation practices). Water levels have been identified as important in the life history of spotted frog (Hovingh 1993). Many springs along the Wasatch Front have been depleted through diversions or capped and pumped. Similarly, the conversion from flood irrigation to sprinkler irrigation systems may eliminate currently occupied habitats. Interest has also been expressed in water development and mining activities within Snake Valley. These activities could significantly lower the water table, dry up springs and/or contaminate springs and marshes populated by Columbia spotted frog.

Predation, Competition, and Disease (Nonnative Interactions)

Surveys of spring complexes indicate that where nonnative aquatic species have been introduced, spotted frog breeding populations have typically declined (Ross et al 1994). Introduced sport fish, including largemouth bass (*Micropterus salmoides*), rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutt*a) and brook trout (*Salvelinus fontinalis*) are probably predators on spotted frog. In addition to sport fish, other nonnative aquatic species such as common carp (*Cyprinus carpio*), Western mosquitofish (*Gambusia affinis*), rainwater killifish (*Lucania parva*), plains killifish (*Fundulus zebrinus*) fathead minnow (*Pimephales promelas*), and the bullfrog (*Rana catesbeiana*) also have been released into spotted frog habitat. The mosquitofish poses a direct threat to the spotted frog because of its known aggressive predation on eggs and young of other fishes and amphibians (Meffe, 1985; Sigler and Sigler, 1987).

Other species that present possible negative interactions with spotted frog include reptiles (snakes), amphibians (salamanders, frogs) ducks, gulls, herons, and egrets (Ross et al, 1993). Under normal situations, predation or competition from these sources normally would not injure healthy populations of spotted frog. However, the effects of the interactions with the above combined sources could result in further depletions of already fragile populations.

In the fall of 2001, chytrid fungus (*Batrachonytrium dendrobatidis*) was detected in spotted frogs in three separate locations in the Heber Valley resulting in the initiation of an intensive monitoring plan. Chytrid fungus infects only the keratinized epithelium of amphibians, limiting it in tadpoles to their mouthparts. Normal spotted frog tadpoles exhibit well-defined black and bilaterally symmetrical oral-disk, jaw sheath (beak) and toothrows (2 upper, 2 lower). Chytrid

infected tadpoles lack pigment in either toothrows or beak, which may be accompanied by redness and swelling in more advanced cases (Fellers et al, 2001). Examination was performed before tadpoles began to metamorphose since the beak and toothrows lose pigment with the transformation of the mouth.

All sites with egg masses were sub-sampled for tadpoles with the goal being 10 to 20 tadpoles from each egg mass site. Tadpoles were captured using a hand-held dip net and observed with a 10X or 16X magnification hand lens. Photos of abnormal tadpole mouths were taken. In an effort to determine the effects of chytrid fungus on the post-metamorphic life stages of spotted frogs, surveys were conducted for mortalities throughout the field season. High mortalities may correlate with periods of thermal shifts (Sredl 2000) due to the predilection of chytrid for cooler temperatures (Loncore et al, 1999); therefore surveillance efforts are especially important at emergence in the spring and after the first cold snap of fall. Live frogs captured during VES (Visual Encounter Surveys) were inspected for clinical signs of chytrid while being processed. Clinical signs include: loss of righting reflex, failure to seek shelter, reddening of ventral skin, extension of hind limbs, accumulations of sloughed skin (skin tags), ulcers or hemorrhage, secondary infections. Samples were collected for PCR testing from 11 frogs at 10 sites distributed evenly throughout the Heber Valley. One half of a broken toothpick was used to lightly scrape the ventral thigh surface while the other half was used to scrape the abdomen in two directions. Samples were stored in screw-top vials filled with (75%) ethanol.

Chytrid Prevention/Biosecurity Measures: Due to the presence of chytrid fungus in the Heber Valley and the fact that anthropogenic transportation of pathogens is a factor commonly driving the spread of wildlife emergent infectious diseases (Daszak et al, 2001), the following disease prevention protocol was established in 2002 and currently adhered to when conducting field work. Before leaving a site all mud and debris is removed from boots and gear and rinsed with clean water. Quat 128 (Waxie product) is applied at a 1:100 solution, as a disinfecting agent, to boots and other equipment by either spraying or submerging in a bath. Multiple sets of waders, nets, calipers etc., are utilized to allow gear to dry between disinfecting and use. A designated set of equipment (net head, caliper, container for use on scale, etc.,) is maintained for each hydrological distinct area and is stored in a separate container when not in use.

Other diseases or incidence of parasitism has not been studied. Based on monitoring and surveying activities and observations, these do not appear to be major threats affecting spotted frog.

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

Over utilization for commercial, scientific or educational purposes does not currently pose a threat to spotted frog. Through the Collection, Importation and Collection proclamation (citation) the Divisions prohibits any collection and possession of Columbia spotted frog unless authorized by the Columbia Spotted Frog Conservation Team.

Inadequacy of Existing Regulatory Mechanisms (Regulations)

Several regulatory mechanisms have been established to assist in the protection and conservation of spotted frog. Through the Collection, Importation and Collection proclamation (Utah Code

R657-53) the Division prohibits any collection and possession of Columbia spotted frog unless authorized by the Columbia Spotted Frog Conservation Team.

Other Natural or Human Induced Factors Affecting the Continued Existence of Columbia Spotted Frog (Other Factors)

Other human induced factors that potentially threaten spotted frog include a proposed mosquito abatement program throughout Utah due to the threat of West Nile Virus. There is currently a Memorandum of Understanding between statewide Mosquito Abatement Districts and the Division to regulate release of mosquitofish and the use of harmful pesticides. Habitat with known populations of spotted frog will be treated with BTI (an organic mosquito larvae pesticide that does not have a harmful effect on amphibians).

GOAL AND OBJECTIVES

Goal:

Ensure the long-term persistence of Columbia spotted frog within its historic range and support development of statewide conservation efforts.

Objectives:

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

Objective 1 – Eliminate or significantly reduce threats to Columbia spotted frog and its habitat.
Objective 2 – Maintain existing self – sustaining populations and their habitat.
Objective 3 – Restore populations at selected localities within the historic range.
Objective 4 – Increase the size of selected populations.
Objective 5 – Maintain genetic diversity.
Objective 6 – Develop and implement an adaptive management framework by incorporating new information annually into conservation planning efforts.
Objective 7 – 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 a general list of conservation actions or elements that will eliminate or reduce threats to Columbia spotted frog as well as expand its range back into historic localities. Each general element includes a list of specific methods, which may be implemented, either at a statewide level or site-specific level. Since the degrees of frog management action will vary between populations, specific conservation actions are prioritized and implemented within each GMU as described in the next section.

A. Habitat Enhancement

Enhance and/or restore habitat conditions in designated areas throughout the historic range of Columbia spotted frog.

1. Evaluate Columbia spotted frog habitat at each proposed enhancement site and possible reintroduction sites and assess habitat degradation, presence of nonnatives, disease and other threats.
2. Reduce or remove the identified threats to Columbia spotted frog.
3. Implement habitat enhancements that may include some or all of the following: bank stabilization, enhancement of native vegetation, dredging of springheads, riparian/spring fencing, nonnative removal, and implementing compatible grazing practices.
4. Maintain, restore and augment, where possible, the natural hydrologic characteristics and water quality.

Expected Products

a. Increased suitable Columbia spotted frog habitat.
b. Reduction of predation and competition risks from nonnative species.
c. Reduction of future habitat degradation from erosion and ungulate grazing.

B. Habitat Protection

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

1. Identify, prioritize, and protect Columbia spotted frog 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 those impacts on Columbia spotted frog habitats.
5. Develop agreements (Memoranda of Understanding, etc) with local, state and federal agencies to protect Columbia spotted frog habitats as needed.

Expected Products

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

C. Restore Hydrologic Conditions

Maintain, restore and augment where possible the natural hydrologic characteristics and water quality. Specific actions will be identified within individual GMU's.

1. Identify water needs in current and potential Columbia spotted frog habitats.
2. Protect by acquisition, easement, MOU, and/or Cooperative Agreements.
3. Maintain natural hydrologic conditions.

Expected products

a. Provide water for Columbia spotted frog habitats.

D. Nonnative Control

Selectively control nonnative species that negatively impact Columbia spotted frog via predation and/or competition.

1. Control or modify stocking, introductions, and spread of nonnative aquatic species where appropriate.
2. Explore options to utilize Columbia spotted frog as a method of mosquito abatement in lieu of using nonnative western mosquitofish.
3. Reduce or eliminate detrimental species where feasible.
   Expected Products
   a. Reduction of the spread of nonnative species and their impacts on Columbia spotted frog.

E. Range Expansion

Range expansion is a multistage process. The initial stages will begin by locating and assessing current Columbia spotted frog populations in Utah. Life history studies will establish the environmental and specific habitat requirements for Columbia spotted frog. Genetic research will determine the levels of molecular diversity within and between populations of Columbia spotted frog. Expansion of Columbia spotted frog populations and distribution will occur through introduction or reintroduction from either transplanted Columbia spotted frog or Columbia spotted frog raised in a designated hatchery facility.

Inventory

1. Preliminary Survey (office oriented) - Intensive literature review of historic localities including museum records. Identify gaps and possible areas of occupation with aerial photography. Define distributions (define historical habitat)
2. Reconnaissance (field oriented) - Site visit with ground-truthing. Conduct preliminary watershed/drainage basin assessment.
   Expected Products
   a. Library of previous studies and relevant sampling methodology.
   b. Preliminary species and habitat list.
   c. Data from previous or similar studies.
   d. Information on present land use and habitat quality.
   e. Potential spotted frog habitats for range expansion.
   f. Current population distribution.

Baseline Studies

1. Conduct habitat assessment to determine suitability for spotted frog range expansion. (e.g. winter hibernacula, breeding habitat, thermal refuge, bank condition, vegetation, water flow, water chemistry).
2. Determine dispersal corridors, habitat fragmentation and connectivity between populations.
   Expected Products
   a. Habitat assessments of occupied spotted frog habitat
   b. Habitat evaluations for future range expansion

Genetic Integrity

1. Conduct genetic surveys to determine relatedness of any new Columbia spotted frog populations.
2. Establish introduction, reintroduction, and transplant protocols based on criteria of maintaining genetic integrity and maximizing genetic variability.
3. Develop protocols to manage genetic drift between source and refuge populations.
   Expected Products
   a. Relatedness and genetic variation within and among Columbia spotted frog populations.
   b. Protocols to manage genetic drift.
   c. Range expansion protocols.

Refuges, reintroductions and introductions

1. Establish permanent refuge populations in the Bonneville Basin through reintroduction and introductions as per protocols established under Genetic Analysis.
2. Restore Columbia spotted frog to self-sustaining populations.
3. Follow transplant protocols (Utah Code 23-14-21) by receiving approval from local government officials (e.g., County Commissions), the Resource Development Coordination Committee, and the Regional Advisory Councils).
   Expected Products
   a. Expansion of Columbia spotted frog distribution and restored stability of current spotted frog populations.

F. Monitoring

Monitoring seeks to detect changes in populations over time. Monitoring will track Columbia spotted frog distribution and assess reproductive effort.

1. Develop a strategy for implementing monitoring protocols within each GMU. The monitoring protocols should be able to measure the annual change in populations (sensitivity) and the population response associated with specific conservation actions will have a monitoring strategy tailored to address or determine the effectiveness of that specific action.
3. Determine specific areas to be monitored, the method of monitoring (e.g. VES for egg masses) and the frequency of monitoring.
4. Collect / establish baseline habitat conditions at all occupied Columbia spotted frog locations. Evaluate conditions of populations and habitat conditions as necessary using baseline data. The habitat monitoring frequency and intensity will be triggered by environmental conditions and/or results from population monitoring. Biologist will monitor additional parameters (e.g., water level, precipitation), as necessary, to help interpret population fluctuations.
3. Maintain Columbia spotted frog database
   Expected Products
   1. Habitat assessments of Columbia spotted frog populations.
   2. Habitat Management Plan for Columbia spotted frog populations (as needed).
   3. Baseline population data to monitor effectiveness of conservation actions.
   4. Regular (annual or every 3rd year) evaluations of population health and security.

G. Mitigation

1. Identify impacts from existing and proposed watershed development that affect Columbia spotted frog habitat. Impacts will be assessed and mitigation will be determined on a case-by case basis.
2. Develop site-specific mitigation for proposed water development and future habitat alteration, where needed.

   Expected Products

   a. Mitigation projects offsetting impacts to Columbia spotted frog and its habitat.

H. Regulation

1. Maintain and enforce current Utah Division of Wildlife Resources code regulations that prohibit the collection, possession, transportation, and importation of Columbia spotted frog and nonnative species.
2. Maintain consistency with the State of Utah Policy on Fish Stocking and Transfer Procedures.

   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 Columbia spotted frog and its habitat.
   c. Enforcement of violations and penalties.
   d. Improved communication and cooperation among local government and public interest groups.

I. Disease Management

Chytrid fungus (*Batrachochytrium dendrobatidis*) has been implicated in severe amphibian die-offs worldwide and poses a potential significant threat to Utah's amphibian populations. Chytrid fungus will be the primary focus of disease management for Columbia spotted frog, but risks from other pathogens may also be addressed.

1. Determine the health status of wild populations.
2. Conduct testing to identify the presence of chytrid fungus and other relevant pathogens in Columbia spotted frog populations or habitat.
3. Determine the extent of infection in populations and monitor effects of pathogenic infection on each life stage.
4. Prevent transmission of pathogens among populations by implementing field disinfection protocols, preventing unauthorized transportation and release of amphibians among water bodies and by encouraging anglers to disinfect equipment between movements among water bodies.
5. Test for pathogens prior to introduction into new habitats. Conduct introductions only when amphibians from source and recipient populations are not infected with pathogens of concern. Increase public awareness and support for the conservation of Columbia spotted frog.

   Expected Products

   a. Identification of potential threats due to chytrid infection.
   b. Prevent further infection of chytrid into new habitats and amphibian populations.

J. Information and Education

Increase public awareness and support for the conservation of Columbia spotted frog.

1. Educate the public on the values of protecting ecosystems and restoring threatened species.
2. Produce and distribute educational information on Columbia spotted frog to the public and encourage other natural resource agencies to incorporate Columbia spotted frog awareness into their I and E programs.

   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.

GEOGRAPHIC MANAGEMENT UNITS

The historic and current distribution of spotted frog has been separated into three geographic management units (GMU's) that are based on hydrologic subregions (USGS 1974). These units are the Sevier River GMU, Wasatch Front GMU, and the West Desert GMU (Figure 1). These GMUs have been further divided into subunits consistent with the United States Geological Survey hydrological description of Utah (USGS 1974) to assist in further defining distribution, describing threats, and prioritizing conservation measures to be implemented. These subunits have been assigned a name by the Division with corresponding USGS accounting codes as shown in Table 1.

WASATCH FRONT GEOGRAPHIC MANAGEMENT UNIT

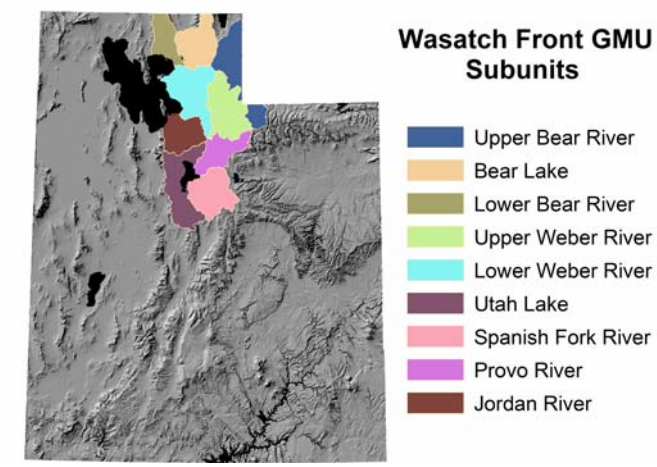

Figure 3. Management subunits within the Wasatch Front GMU.

Subunits where historic records of spotted frog had occurred include Utah Lake, Spanish Fork, Provo River, Jordan River, Upper Weber River, and in the Lower Weber River. Currently a total of seven populations are known to occur in this GMU (Figure 3 and Table 2). They occur in the Utah Lake, Spanish Fork, Provo River, and Upper Weber River subunits. The collection sites, breeding sites, and monitoring sites that have typically been described in the literature and are part of the seven identified populations for this GMU are summarized in Table 2.

Threats:

Habitat Degradation

The major threat in this GMU is loss of habitat due to urbanization and water development. Agricultural areas and mountain foothills have been converted into neighborhoods and wetland areas in the valleys have been drained and diked.

Detrimental Interactions

Several nonnative fish species have been introduced into these areas for purposes of mosquito abatement and recreational fishing opportunities. Competition and predation by nonnative species have

Table 2. Summary of subunits containing spotted frog populations within the Wasatch Front GMU.

Subunit	Population
Spanish Fork River	Springville Hatchery
	T-bone Bottoms
	Holladay Springs
	Diamond Fork
Utah Lake	Burraston Wetland Complexes Pond and Mona Springs
Provo River	Heber Valley: area between Jordanelle Reservoir and Deer Creek Reservoir
	Woodland: Provo River corridor above Jordanelle Reservoir
Upper Weber	Swaner Nature Preserve: introduced population in 2004

significantly impacted spotted frog populations and will continue to present a threat. Those non-natives that pose the largest threat to the Columbia spotted frog are: largemouth bass, common carp, fathead minnow, American bullfrog.

Conservation Actions

Range Expansion, *Habitat Enhancement, Nonnative Control, Habitat Protection, Restore Hydrologic Conditions, Monitoring, Mitigation*, *Regulations*

SEVIER RIVER GEOGRAPHIC MANAGEMENT UNIT

Water in the Sevier River Basin historically flowed into pluvial Sevier Lake, but for the most part is currently diverted for agricultural purposes. It is thought that spotted frog in this GMU became separated from the remaining spotted frog populations on the Wasatch Front following the decline of ancient Lake Bonneville. Areas where spotted frogs occur average about 1785 meters in elevation and are only known to occur in the San Pitch River subunit where the primary land use is agricultural. One population has been identified for this GMU near the town of Fairview (Table 3).

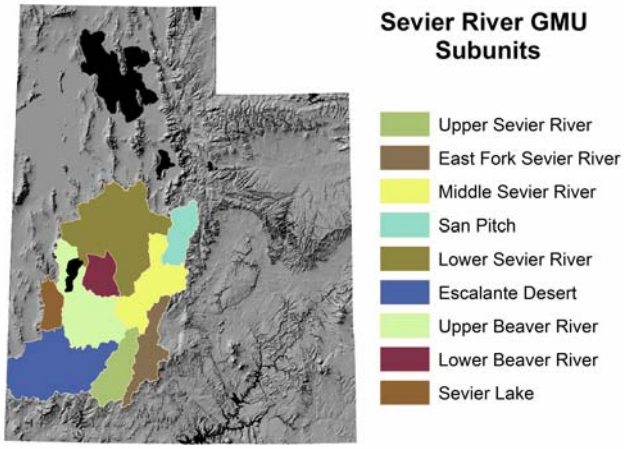

Figure 4. Management subunits within the Sevier River GMU.

No spotted frog occurrences are known to currently or historically occur within the Middle Sevier River or Lower Sevier River subunits. The actions for these subunits are associated with determining if spotted frog historically or currently occurred in them. Since the distribution and occurrence of spotted frog in these subunits remain unclear, threats and conservation goals can not be described until surveys of theses drainages is conducted.

Threats:

Habitat Degradation

The major threat in this area is loss of habitat due to agricultural practices and water development for municipal and agricultural purposes. Livestock grazing specifically impacts the habitat by trampling, reducing vegetation, and decreasing water quality. Other agricultural practices such as cropland development have also significantly impacted Columbia spotted frog populations and habitat. Water development projects have caused a reduction in habitat due to decreased water levels and the capping and drying of spring complexes.

Table 3. Summary of subunits containing Columbia spotted frog populations within the Sevier River GMU.

Subunit	Population
San Pitch River	Fairview: Milburn south to Mt. Pleasant
Middle Sevier River	No historic or current occurrences
Lower Sevier River	No historic or current occurrences

Detrimental Interactions
In addition to habitat loss, nonnative species introduction poses a significant threat to spotted frog. Several nonnative fish species have been introduced into these areas for purposes ranging from mosquito abatement to recreational fishing opportunities. Competition and predation by nonnative species has significantly impacted spotted frog populations and continues to present a threat in this unit. Those non-natives that pose an immediate or potential threat to the Columbia spotted frog are: largemouth bass, rainbow trout, brown trout, brook trout, common carp, Western mosquitofish, rainwater killifish, plains killifish, fathead minnow, American bullfrog, and Raccoons.

Conservation Actions

Range Expansion, *Habitat Enhancement, Nonnative Control, Habitat Protection, Restore Hydrologic Conditions, Monitoring, Mitigation*, *Regulations*

WEST DESERT GEOGRAPHIC MANAGEMENT UNIT

Populations of spotted frog are currently known to exist in Tule Valley, Snake Valley, and Ibapah Valley subunits. The Tule Valley subunit is located between the House Range and the Confusion Range in Juab County. Populations of spotted frog occur at Coyote Spring, Willow Spring, North Tule and South Tule. Snake Valley subunit is located between the Deep Creek Mountains and the Confusion Range. Currently occupied areas within Snake Valley include Bishop Spring Complex, Gandy Salt Marsh spring complex, Leland Harris spring complex, and Miller Spring, all of which spotted frog currently occur. Historic records have also been recorded in the Calleo Spring and the Redden Spring Complexes. In the Ibapah Valley subunit, spotted frog occur along the valley floor which is located northwest of the Deep Creek Mountains in Tooele County and extends into Nevada. Ibapah Valley is also associated with several stream reaches including Deep Creek, West Creek, East Creek, and Middle Creek of the Deep Creek Mountains.

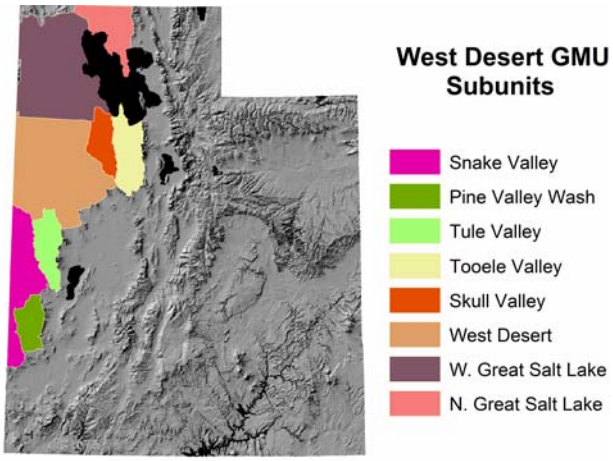

Figure 5. Management subunits within the West Desert GMU.

No spotted frog occurrences are known to currently or historically occur within the W. Great Salt Lake, N. Great Salt Lake, Skull Valley, or Tooele Valley subunit. The actions for these subunits are limited to determining if spotted frog historically or currently occurred in them. Since the distribution and occurrence of spotted frog in these subunits remain unclear, threats and conservation goals can not be described.

Threats:

Habitat Degredation

Major threats in this GMU are: degradation of habitat due to livestock grazing, oil and gas exploration, and alteration of wetland/spring complexes due to groundwater withdrawal. . Livestock grazing specifically impacts the habitat by trampling shorelines, reducing vegetation, and decreasing water quality and accelerating succession of spring complexes. Oil and gas exploration may lead to a decrease in water quality, water contamination and potentially alter groundwater pathways. Alterations to wetland/spring habitat include diversions for agricultural or municipal purposes.

Table 4. Summary of subunits containing Columbia spotted frog populations within the West Desert GMU.

Subunit	Population
Tule Valley	Coyote Springs
	Willow Springs
	North Tule: Includes North Tule spring, Tule Spring and unnamed spring
	South Tule
Snake Valley	Leland Harris/Miller
	Gandy Salt Marsh
	Bishop Springs: Includes Foote Reservoir, Twin Springs and Bishop Springs
Ibapah Valley	Ibapah
West Great Salt Lake	none known
North Great Salt Lake	none known
Skull Valley	none known
Tooele Valley	Vernon

Detrimental Interactions

Several nonnative fish species have been introduced into some of the subunits for purposes ranging from mosquito abatement to recreational fishing opportunities. Competition and predation by nonnative species such as the bullfrog has impacted spotted frog populations and continues to present a threat. Those non-natives that pose an immediate or potential threat to the Columbia spotted frog are: largemouth bass, common carp, Western mosquitofish, and American bullfrog.

Conservation Actions

Range Expansion, *Habitat Enhancement, Nonnative Control, Habitat Protection, Restore Hydrologic Conditions, Monitoring, Mitigation*, *Regulations*

CONSERVATION TEAM MANAGEMENT

The success of this Strategy will depend upon the ongoing cooperation of among the signatories to the Agreement. Each signatory agency will continue their participation via a representative on the Columbia Spotted Frog 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 the Division's monitoring program has provided vital feedback on the management of Columbia spotted frog conservation actions. The Division's monitoring program for the Columbia spotted frog has been ongoing for approximately 10 years. Monitoring population trends allows the Conservation Team to assess

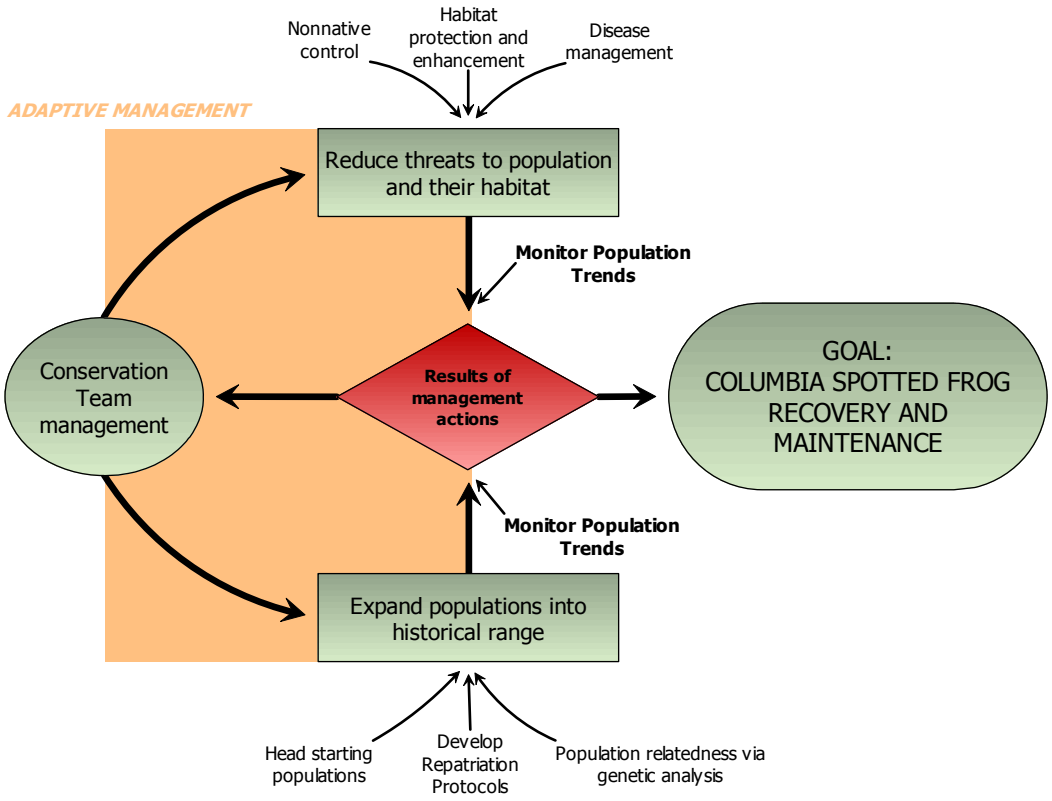

Figure 6. Diagram demonstrating the association of management actions to the goal of the CSFCAS. Observing the population trends through the Division's monitoring program will enable the Conservation Team to examine the effectiveness of their management decisions. The feedback from the results of the conservation actions allows for ongoing adaptive management of Columbia spotted frog activities.

the effectiveness of their management actions. This method of adaptive management incorporates flexibility into conservation action (Fig. 6). "Specifically, it is the integration of design, management, and monitoring to systematically test assumptions in order to adapt and learn" (Sapalsky et al. 2001). The results of the Team's management actions are measured through monitoring population trends. Annual monitoring of Columbia spotted frog 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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